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Using space to talk and gesture about numbers

Evidence from the TV News Archive

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This paper examines naturally occurring gestures produced in descriptions of numbers and quantities in television newscasts. The results of our analysis show that gestures reveal the metaphorical and spatial nature of numerical thinking. That is, speakers' hands mimic known spatial mappings between space and quantity, including horizontal mappings (smaller quantities left, larger quantities right), vertical mappings (smaller quantities down, larger quantities up) and size-based mappings (smaller quantities "small", larger quantities "large"). Speakers frequently switch between these different spatial mappings, and they sometimes combine them within the same gesture. This points to the flexibility of how metaphors can become expressed in gesture, and how domains such as number and quantity can be conceptualized through multiple compatible source domains.

Keywords: metaphor, mathematics, number, quantity, TV news

Introduction

Numbers structure many everyday activities. People use numbers to make phone calls, schedule meetings, file taxes and count calories. Given their pervasiveness and importance, it comes as no surprise that people frequently talk about numbers. This includes talk about concrete quantities, as in "There was a huge number of cars on the road", or abstract quantities, as in "There's a huge number of ideas to consider here". Descriptions of concrete and abstract quantities are also prevalent in the popular media, including TV news reports. For instance, on any given day, the typical TV viewer may hear a reporter state that Fairfax County, Virginia, has an "unusually high number of copperhead snakes", or that "The White House has only proposed a miniscule number of budget cuts". In watching news reports, TV viewers also observe people making manual gestures while speaking about quantities. For instance, in criticizing the miniscule number of budget cuts during an

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interview, a politician might make a pinching gesture with their index finger and thumb to emphasize how small and insignificant the cuts are.

In this paper, we investigate gestures about number that are produced during TV news broadcasts. Our data is taken from the TV News Archive, a free, online, searchable database that contains hundreds of thousands of recorded TV news programs (http://archive.org/details/tv). Our analysis of number in gesture focuses on three spatial metaphors often used by American English speakers: MORE IS UP, MORE IS TO THE RIGHT, and MORE IS BIG. In terms of Conceptual Metaphor Theory (Lakoff & Johnson, 1980; Gibbs, 1994; Kövecses, 2002), each of these metaphors has a target domain of quantity, expressed through three different source domains: vertical space, horizontal space and physical size. Our results offer new insights into how these metaphors are expressed in gesture in natural discourse, and how they interact with other uses of gesture. Finally, our study demonstrates the utility of the TV News archive as a novel research tool for gesture research.

Background

With MORE IS UP, MORE IS BIG, and MORE IS TO THE RIGHT, the target domain of quantity is structured in terms of a spatial source domain. With the first of these metaphors, MORE IS UP, quantities are conceptualized on a vertical axis, with smaller quantities at the bottom and larger ones at the top. With MORE IS BIG, quantities are construed as having physical size, with smaller quantities covering smaller area or volume, and larger quantities covering larger area or volume. Finally, with MORE IS TO THE RIGHT, quantities are configured along a horizontal axis, with smaller quantities to the left, and larger ones to the right. Each of these metaphors has a flip side: LESS IS DOWN, LESS IS SMALL, and LESS IS TO THE LEFT.

These three metaphors have different origins and motivations. MORE IS UP and MORE IS BIG are thought to stem from embodied experience with the real world. For example, when pouring water into a glass, verticality and quantity are naturally correlated (Lakoff, 1987, p. 276). Similarly, physical size and quantity are correlated. For instance, rock piles can be large or small, depending on number of stones. Verticality and quantity are also associated with numbers in measurement. A "higher" quantity is associated with a "higher" number when working with beakers for measuring liquid volume and wall-mounted yardsticks for measuring body height. And when measuring size, "larger" numbers are associated with physically larger objects. In contrast, MORE IS TO THE RIGHT is shaped by cultural conventions, including writing direction (see Dehaene, 1997; Göbel, Shaki, & Fischer, 2011; Núñez, 2011) and conventional orientations for graphs, calendars, and price lists on menus. The MORE IS TO THE RIGHT metaphor is consistent with

the orientation of a mental time line: In cultures where writing goes from left to right, time is conceptualized as going from left to right (Cooperrider & Núñez, 2009; Weger & Pratt, 2008). But in cultures in which writing goes from right to left, numbers are conceptualized as going from right to left (see review in Göbel et al., 2011), and time is conceptualized as going from right to left as well (Fuhrman & Boroditsky, 2010).

What evidence is there to show that people think about numbers in terms of space? One source of evidence for these metaphorical conceptualizations of number comes from their ubiquity in everyday language. For example, expressions such as "this is a *high* number" and "prices are *rising*" reflect MORE IS UP and expressions such as "this is a *huge* sum" and "we have a *large* number of contestants this year" reflect MORE IS BIG. However, there are no obvious linguistic expressions for the metaphor MORE IS TO THE RIGHT in English. Statements such as "This number is further to the *right*" or "The number of applicants is going *rightward*" are rarely used to describe greater or increasing quantity.

Further evidence comes from experimental work. For example, to support the conceptual basis of MORE IS UP, Winter and Matlock (2013) showed that when participants are asked to generate a sequence of numbers as randomly as possible while performing simultaneous vertical head movements, they tend to generate higher numbers when looking upward, and lower numbers when looking downward (for a related finding, see Hartmann, Grabherr, & Last, 2011). Similarly, when participants have to make speeded judgments about quantities, they respond more quickly with a vertically high button to a large quantity, and a vertically low button to a small quantity (Sell & Kaschak, 2012; see also Pecher & Boot, 2011).

For MORE IS BIG, Henik and Tzelgov (1982) conducted an experiment in which small or large numbers were presented in small or large font. They found that participants were quicker to make judgments about large numbers when presented in a large font, and relatively smaller numbers when presented in a small font. Another experiment on size and quantity looked at grip aperture in relation to thinking about numbers. Andres and colleagues (Andres, Davare, Pesenti, Olivier, & Seron, 2004) reasoned that in interacting with objects, the size of an object determines the appropriate hand shape. Because large physical size is associated with large numbers, thinking about large numbers should be associated with more open hand shapes and wider grip apertures. In their task, participants had to view numbers and indicate whether they were even or odd by responding with either hand-opening movements or hand-closing movements. Results from electromyographic recordings showed that initiating grip *closure* was generally quicker with small numbers than with large numbers. In similar experiments, Lindemann, Abolafia, Girardi, and Bekkering (2007) asked participants to indicate whether displayed numbers were even or odd by responding via a precision grip (index

finger and thumb together) or a power grip (all fingers grasp, as if holding a pipe). The results revealed that participants responded more quickly with the precision grip to small numbers and the power grip to relatively larger numbers.

Finally, other psychological experiments on number cognition have investigated MORE IS TO THE RIGHT. Fischer (2003) asked participants to indicate whether a number was even or odd by pointing to the left or right with their index fingers. Participants more quickly pointed to the right after seeing a large number and more quickly to the left after seeing a small number. Loetscher, Schwarz, Schubiger, and Brugger (2008) showed that when participants were asked to call out a random sequence of numbers while moving their head rhythmically left and right, they generated larger numbers when looking to the right than when looking to the left (see also Winter & Matlock, 2013).

In the present study, we are interested to what extent MORE IS UP, MORE IS BIG and MORE IS TO RIGHT manifest themselves in naturally occurring co-speech gestures. We would like to help achieve a better understanding of how gestures work in metaphorical discourse (e.g., Cienki, 1998; Cienki & Müller, 208; Cooperrider & Núñez, 2009; Müller, 2009; Müller & Tag, 2010), focusing on conversations about numbers. Because gestures are thought to reflect mental content (e.g., McNeill, 1992, 2005; Calbris, 2011; Goldin-Meadow, 2003), they potentially provide an additional, converging source of evidence for conceptualization of numbers in terms of space.

Discourse about mathematics is replete with gestures. Students and teachers often use gestures when talking about mathematics (e.g., Núñez, 2004; Goldin-Meadow, 2003; Marghetis & Núñez, 2013). These gestures often reflect students' understanding of a mathematical concept (see, for instance, Alibali, Bassok, Solomon, Syc, & Goldin-Meadow, 1999; Cook, Yip, & Goldin-Meadow, 2012; Marghetis & Núñez, 2013). They can also help students understand mathematical concepts (Goldin-Meadow, Nusbaum, Kelly, & Wagner, 2001) and form new mathematical ideas (Nemirovsky, Rasmussen, Sweeney, & Wawro, 2012). Many of these findings deal with relatively complex math (arithmetic, algebra, calculus). Here, we are primarily interested in the basic mathematical concepts of number and quantity.

Our analysis of spontaneous gestures explores how people express these basic building blocks in discourse. We show how speakers' metaphorical conceptualizations of number and quantity are reflected in gesture. Previous research on the experimental side has focused on studying horizontal, vertical or size-based mappings *in isolation*. Participants in such experiments are commonly constrained to respond only within one dimension (e.g., vertically). Because of this, the picture we have of mental associations between space and quantity appears to be static. But what happens when we observe behavior in a more flexible medium of

expression such as gesture? Gesture research attests to the versatility and flexibility with which the human body is used to express a host of different concepts, ideas and discourse functions (Kendon, 2004; McNeill, 1992, 2005; Streeck, 2009). With this more versatile mode of expression, spatial metaphors may appear more flexible than is conveyed by the experimental literature.

Our study

Database and search strategy

For our study, we used the TV News archive, a massive online data repository of TV News recordings. At the time we collected the data for this study (between April, 2013, and July, 2013), the database contained over 350,000 news programs from many U.S. networks (http://archive.org/details/tv). The archive represents a large portion of news broadcasted between 2009 and 2013.

Working with the TV News Archive has many benefits for gesture research. It offers researchers the opportunity to examine spontaneous gestures in long streams of discourse and across numerous examples. It also offers the opportunity to share video recordings of gestures, and make analyses transparent to a wide audience of gesture researchers (see Appendix B and C). Moreover, with the TV News Archive, there is no concern that speakers are aware of being analyzed by gesture researchers.

Using the TV News Archive search feature, we searched for expressions with the word "number" and spatial adjectives such as "high" and "tiny". We also searched for expressions that implied a change of quantity, such as "rising number" or "shrinking number". Appendix A lists the full set of search terms.

Analysis

Our search resulted in a corpus of 552 videos overall. Many, however, had no clearly visible gestures. From the corpus, we selected a subset of 27 examples where gestures were clearly visible and where speakers repeatedly (more than once) referred to numerical quantities in a small stretch of discourse. This allows us to look at how speakers contrast different quantities gesturally. Our analysis of gestures relating to quantity follows Cienki and Müller's (2008) classification of four metaphor-to-gesture correspondences:

(1) The same metaphor is expressed in speech *and* gesture.
E.g.: MORE IS UP: "Costs keep on rising" with upward hand movement

(2) A metaphor is expressed in gesture, but not in co-occurring speech.
E.g.: MORE IS UP: "Two million new users" with upward hand movement

(3) Different metaphors are expressed in speech and gesture.
E.g.: MORE IS UP and MORE IS BIG: "Costs keep on rising" with outward moving hands that reflect an increase in size

(4) A metaphor is expressed in gesture, but there is no correlate in speech.
E.g.: MORE IS TO THE RIGHT: Rightward hand movement in discussion of increased costs

Here we add two new categories, (5) and (6), to provide additional insights into the link between co-occurring speech and gesture:

(5) Multiple metaphors are *consecutively* expressed in the same utterance or within the same discourse.
E.g.: MORE IS TO THE RIGHT followed by MORE IS BIG: The speaker produces a rightward hand movement in discussion of increased costs and then uses an outward oriented expansion gesture to emphasize the quantity

(6) Multiple metaphors are *simultaneously* expressed in the same gesture.
E.g.: MORE IS TO THE RIGHT and MORE IS BIG: The speaker produces a leftward hand movement with an internally contracting hand shape in discussion of a small quantity

Results and discussion

Table 1 displays an overview of the examples we consider. The examples are roughly categorized into the six different categories proposed above. However, as mentioned below, not all assignments are clear-cut by any means. All examples have permanent URLs associated with them and are listed in Appendix B so the reader can view the gestures and verify our analysis. Gesture stroke phases are marked in bold italics in the transcripts below each picture.

We will focus on discussing examples of case (1) (same metaphor in speech and gesture) in § A, followed by a discussion of case (3) (different metaphor in speech and gesture) in § B. We then move toward discussing case (5) (consecutive expression of different metaphors) in § C. We will discuss other cases of gesture-to-speech correspondence throughout these subsections as they are embedded in the other examples. After introducing different examples in this section "Results and discussion", we summarize key insights and generalizations across examples under the heading "General discussion". Appendix C provides additional examples for two recurring gesture types that we found, palms-down vertically oriented

gestures in line with MORE IS UP, and precision grip gestures associated with the phrase "tiny number", or, MORE IS BIG (see discussion below).

Table 1.

Case	Section	Type	Examples
1	§ A	Same metaphors in speech and gesture	Figure 1, 2, 3, 4, 5, 7, 8, 9, 11
2	across sub-sections	Metaphor in gesture with no concomitant metaphorical speech	Figure 1, 2, 6, 7, 8, 10b, 11
3	§ B	Different metaphors in speech and gesture	Figure 6, 7
4	across sub-sections	Gesture with no verbal metaphorical correlate	Figure 6, 7, 8, 9, 10, 11c
5	§ C	Consecutive expression of multiple metaphors	Figure 8, 9/10
6	across sub-sections	Simultaneous expression of multiple metaphors	Figure 7, 9

A. Same metaphor used in speech and gesture. Figure 1 depicts still images of a gesture sequence that can be interpreted as reflecting MORE IS UP. In the relevant stretch of discourse, the debate in question (screened on CSPAN) surrounds the issue of Medicare costs. Saxby Chambliss, the Senator of Georgia mentioned that hospitals only get returned 90% of the cost they put into care. In response to this, the Senator of Wyoming, John Barrasso, says "The 90% figure is actually a high number". While he does so, he moves his left hand upward in two noticeable gesture strokes. With the first stroke on "high", the speaker raises his hand to shoulder level (Figure 1a), followed by a second stroke aligned with "number", in which the speaker raises his hand a second time to eye level (Figure 1b). In producing these two movements, the speaker extends his index and middle finger together so that they are pointing upward at the completion of the phrase "high number". The two gesture strokes are tightly aligned with the two words of the phrase, indicating that the verticality expressed in the metaphorical language forms a coherent semantic unit with the vertical movement of the left hand. This is an instance of category (1), because MORE IS UP is expressed both in gesture and in speech.

The Senator goes on to explain how there are a number of physicians "who get reimbursed less than that" (less than 90% of the cost). While articulating this clause, his left hand repeatedly bounces downward (see Figure 1c), with a flat hand shape, palm facing down toward the podium. The last two bounces are tightly aligned with the phrase "less than that", where the left hand moves downward with the word "less", upward with "than", and downward again with "that". The deictic "that" refers back to 90% figure mentioned previously. In conjunction with the preceding gesture, where the fingers pointed upward, the repeated use of movements along the vertical axis makes an explicit contrast between high and low. The bouncing movement is also an example of gesture-to-metaphor correspondence

case (2), with a metaphor being expressed in gesture (LESS IS DOWN) that is not mentioned in speech.

a. b. c.

that 90% figure is actually a ***high (...)*** (...) ***number.*** And I know a number of physicians in hospitals especially in rural communities, ***who get reimbursed less than that.***

Figure 1. Example of MORE IS UP. Bold italics indicate speech that co-occurs with the stroke phase of the respective gesture. (a) The speaker's left hand starts at stomach level and raises to shoulder level. (b) His index and middle finger are pointed upward at completion of the second stroke. (c) The speaker lowers his left hand in several pat down movements.

Figure 2 shows another instance in which the speaker, Republican political commentator Glenn Beck, is discussing figures related to health care. The speaker produces a gesture that seems to reflect MORE IS UP: He moves his left hand downward in a wiggly fashion (Figure 2a) while saying "Let's just say, let's take the low number for fraud in our medical system". The downward movement coincides with the entire phrase, culminating on a hold at low position that coincides with "low number". At the start of the movement, the palm is facing toward the video camera; it ends up palm facing downward (as was the case for example 1).

The speaker then says "It is three percent. For the government, that's acceptable, three percent". There are downward-oriented strokes for both occurrences of "three percent" (Figure 2b and Figure 2c), with the palm facing down and slightly toward the speaker.

The repeated reference to "three percent" in conjunction with similar gestural components can be interpreted as an instance of "catchment" (McNeill, 2005), where gestural elements recur over a longer stretch of speech. From this perspective, the re-use of the phrase "three percent" with particular gestural features shows consistent expression of the same (vertically oriented) spatial imagery. This can be likened to a multimodal anaphor, and it is a specific instance of the more general case where the repetition of a verbal utterance happens together with the repetition of a gesture (see also Kendon, 2004). Together with the previously mentioned

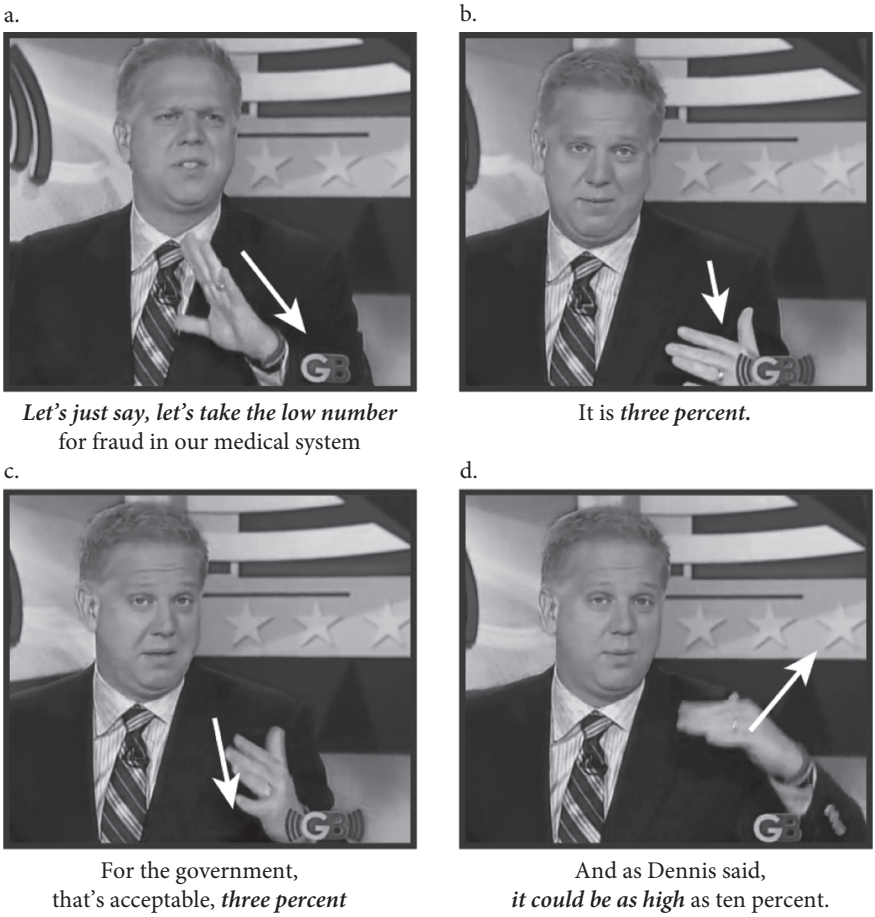


Figure 2. Example of MORE IS UP. (a) Palm facing toward the camera, the speaker moves his hand down from chin level to stomach level in a waving fashion. (b) The speaker raises his hand at "three" and drops it down at "percent". (c) The previous gesture is repeated. (d) The hand is raised in a waving motion.

"low number" (a verbal expression of a vertical metaphor), the repetitions create semantic coherence in this small stretch of discourse.

Finally, the speaker moves his left hand upward (Figure 2d), the stroke aligned with "it could be as high". The movement stops on the word "high" and subsequently, the left hand goes back to rest position. The number referred to in this context ("ten percent") is the numerically larger quantity and noticeably associated with an upward-directed hand movement. The vertical hand movements create contrast where two quantities ("three percent" vs. "ten percent") are expressed with different relative positions along the vertical axis. Thus, throughout the whole

passage, a vertical frame is kept active and used in a contrastive fashion. This is important because otherwise, the relatively small downward bounces that co-occur with "three percent" (Figure 2b and 2c) could easily be interpreted as mere meaningless beat gestures when seen in isolation. However, the context of the whole sequence reveals that these two smaller movements may signal semantic content as well, namely, a small quantity.

It is worth noting that in both examples considered so far, the palms are facing downward to indicate a small quantity in conjunction with a verbal expression that makes use of vertical language. The palm facing downward position seems to be used frequently when talking specifically about "high" or "low" numbers, as is shown by additional examples in Appendix C. In all of these additional examples, the palm is facing downward, with the pinky finger toward the camera. The hand thus forms a horizontal surface, which can then assume different positions for different quantities on the vertical axis.

We now move to cases of MORE IS BIG. The speaker shown in Figure 3 repeatedly refers to a "big number" in the context of discussing the number of competitions relating to the development of energy storage technology. He produces several gestural movements as he explains that 32,000 competitions "is a big number. And it could be bigger, but it's a big number". The speaker's left hand is constrained by holding a microphone, so he uses his right hand to gesture outward, moving his hand away from the center of his body. The strokes occur with the phrases "big number" and "bigger", and are performed with the palm facing upward. These gestures might co-signal multiple things here. One possibility is that the gesture serves a performative function, with the open hand shape as an instance of a palm presenting gesture (see Kendon, 2004, pp. 265–275; see also Müller, 2004), where

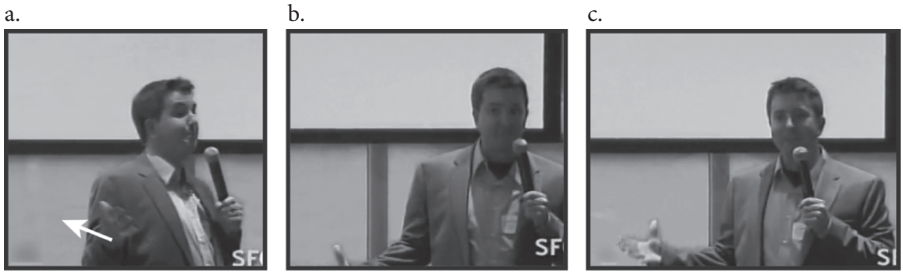


Figure 3. Example consistent with MORE IS BIG. (a) With his right hand open, the speaker gestures outward, away from his body. (b) Palm facing upward, the speaker makes another outward-oriented gesture. (c) Another similar gesture.

speakers are opening the hand to "present" a topic or idea that is being talked about. However, as "big number" is the topic in focus of this stretch of discourse, a second plausible interpretation is that the opening movement indicates a large quantity, in line with the repeated verbal metaphor that implies size. This interpretation is also consistent with the experimental evidence discussed above which shows that hand-opening movements are associated with large quantities and hand-closing movements with small quantities (Andres et al., 2004).

These two interpretations of the same gesture are not necessarily mutually exclusive; the gesture sequence might signal *both* quantity and discursive functions. Note, furthermore, that this is another case of catchment, where similar hand movements recur in conjunction with similar verbal expressions.

Figure 4 shows a speaker who is discussing economic disparity in front of a live audience. Again, gesture and speech focus on size. While talking about "a growing number of people", the speaker positions his index finger and thumb as if holding a little object (the index and thumb are extended, but held apart). At first glance, this relatively constricted hand shape may not seem to be associated with the large quantity implied in his speech. However, closer inspection shows that he later produces an *even more constricted* hand shape when talking about a "shrinking number of people". The index finger and the thumb, previously held apart, move together tightly aligned with the phrase "shrinking", perhaps indicating that this movement is about size. Then, the index finger and thumb open up again while moving toward the right when talking about "enormous wealth". In isolation, the first gesture (with index finger and thumb held apart) would be difficult to interpret, but the contrast in the given context (relatively small > even smaller) reveals the conceptualization of numbers in terms of size, consistent with MORE IS BIG and LESS IS SMALL.

Figure 4. Example of MORE IS BIG. (a) The speaker lifts his right hand, index and thumb extended and opposed but held apart. (b) As he says "shrinking number of people", index and thumb move toward one another, the stroke aligned with the phrase "shrinking". (c) Then, as he says "enormous wealth", his thumb and index finger move apart again, as he moves his arm to his right.

The relatively small contrast signaled by relative positions in hand shape might be motivated by the speaker's limited movement capabilities (his elbow rests on a table in front of him). Clearer examples of contrast involving MORE IS BIG can be seen in Figure 5, which show two different speakers contrasting a "tiny number" of people with a "large number of people" (Figure 5a), or a "huge amount of money" (Figure 5b). In both cases, the speech makes it clear that two quantities are to be contrasted and uses of verbal expressions relate to similar contrasts in size ("tiny", "large", "huge").

In the left column, the speakers produce gestures of "precision grip" (see Kendon, 2004, Ch. 12). The speaker in Figure 5a, when referring to a "tiny number" of people, extends the index finger and thumb of his right hand, bringing them close together but apart, as if holding a small pellet. When making a similar reference, the speaker in Figure 6b uses two hands, forming a clear ring type

a.

(...) a very tiny number of very whealthy people (...)

(...) and a very ***large*** number of people who have very little.

b.

There is a ***tiny number of people*** that are contributing (...)

(...) a ***huge*** amount of money this election.

Figure 5. Two examples of MORE IS BIG where small and large quantities are contrasted verbally and gesturally. For both (a) and (b), the speakers talk about a "tiny number" in the left column and use some type of precision grip gesture. They then immediately move their arms outward, aligned with the adjectives "large" and "huge" respectively.

gesture (see Kendon, 2004, Ch. 12), with the index finger and thumb touching each other in a curled fashion, as if forming a ring (the other fingers are extended here). Precision grip gestures such as these often indicate the specificity, exactness or significance of a particular topic or idea (Kendon, 2004, Ch. 12; Lempert, 2011; see also Calbris, 2011, pp. 21–22). In the current examples, the precision grips might also fulfill these discourse-pragmatic functions, as if the speakers seize or hold carefully a "small" idea or topic. This is particularly likely the case as a "tiny number" is precisely what this stretch of discourse is about — hence, the speakers may well want to highlight the significance of this number. However, the subsequent gesture, where the hands and arms move from the center of the body outward, make it clear that the gestures also mark a contrast between small space and large space, in line with LESS IS SMALL/MORE IS BIG.[1]

Again, the discourse-pragmatic functions and the implied quantity are not mutually exclusive; the same gesture may signal both. A gesture that metaphorically expresses holding an idea or topic between one's fingers can simultaneously express the notion that it is a "small" quantity. To further support the idea that precision grips may signal quantity on top of pragmatic factors such as specificity and significance, Appendix C lists additional examples of precision grips in conjunction with the phrase "tiny number". In some of these, the index finger and thumb are extended, held apart, as if holding a small object. In others, two hands together assume a ring type gesture. And in yet others, all fingers are held together in a finger bunch ("grappolo" gestures, Kendon, 2004, Ch. 12). What is consistent across these different types of precision grips (that may have different additional pragmatic functions), is that the hand shape can be seen as assuming a relatively contracted and "small" position.

a.

The very low number.
And they're very angry.

b.

And then you have ***the flipside ...***

Figure 6. (a) The speaker extends her left hand with open palm facing upward, and (b) moves both hands so the fingertips point toward her right.

B. Different metaphors in speech and gesture. Figure 6 shows an example that can potentially be interpreted as an instance of MORE IS TO THE RIGHT (thus, perhaps, reflecting category (3) in Table 1). The speaker talks about voters for Barack Obama and contrasts a "low number" of white voters (Figure 6a) with a large number of black voters. As she says "the flipside", she moves both hands to her right in a sliding fashion (Figure 6b). The speech clearly reflects a vertical metaphor, whereas the gesture is consistent with large quantities being toward the right. This interpretation is problematic, however. Topics, ideas and objects being talked about are frequently positioned in gesture space (McNeill, 1992; the same happens conventionally in signed languages, Liddell, 2003). And when speakers want to convey a contrast between different ideas, they frequently use two contrasting sides of their body as spatial loci (see, e.g., Sweetser, 2007, p. 209). As the "low number" is mentioned before the larger quantity ("a lot of"), order is conflated with quantity in this example: Sequences are conventionally expressed from left to right in Western culture, so the left-to-right going horizontal orientation could equally well be the result of the order with which things are mentioned. Hence, this example is highly ambiguous and points to difficulties in drawing conclusions about MORE IS TO THE RIGHT based on gestural data alone.

The gesture sequence shown in Figure 7 is perhaps a more compelling case of MORE IS TO THE RIGHT. The verbal metaphor used is "tiny number", thus implying size-based conceptualization. This speaker also contrasts two quantities. He first talks about "an overwhelming amount of evidence", using his right hand, with the palm open, facing upward (see Figure 7a). He puts the hand back on the podium, lifting both hands up again toward the right when saying "on one side" (Figure 7b).

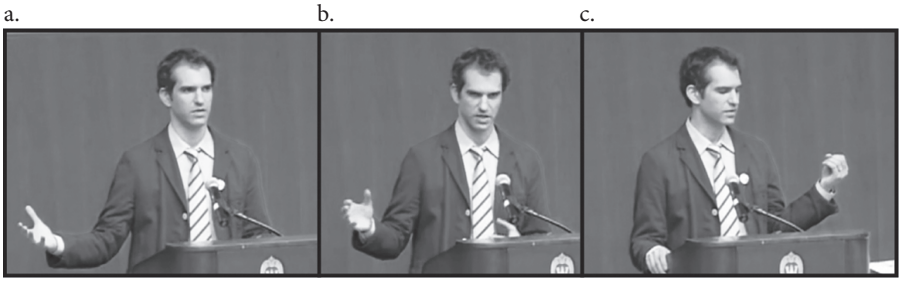


Figure 7. (a) When talking about a relatively large amount (of evidence), the speaker performs a palm-presenting type gesture on his right body side with his right hand. (b) Another stroke co-occurs with the phrase "on one side". (c) Then, when talking about a "tiny number", the speaker switches hands and bunches his fingers together, all on the left side of his body.

Then, he gestures with his left hand on his left side, the hand shape contracted into a grappolo shape with all fingers curled together. Similar to the example shown in Figure 7, the use of contrasting gesture space clearly seems to convey discourse-pragmatic functions. Two topics are associated with spatial loci on the right and left side of the speaker's body. However, note that in this example the speaker *first* talks about the larger quantity, and consistent with MORE IS TO THE RIGHT, this topic is associated with right body space and the right hand. Then the speaker switches hands to talk about the smaller quantity on his left side with the left hand. If the order of mentioning completely determined the side of gesture space, we would expect the reverse orientation, moving from left to right.[2]

There are several interesting things to point out about this gesture sequence. The right-to-left going nature of the sequence is consistent with MORE IS TO THE RIGHT and hence potentially reflects case (3): gesture expresses a metaphor that has no known expression in speech. What's more, the hand shape is open (palm facing up) when talking about the large quantity and contracted to a *grappolo* when talking about a "tiny" number. While discursive functions may play a role here, the open versus closed hand shape is also consistent with depicting large versus small quantities. That size, or quantity, is of particular importance in the speaker's overall message is highlighted by the alignment of the stroke phases with the adjectives "overwhelming" and "tiny". If, as we believe, the hand shape and horizontal orientation are both relating to numerical quantity on top of relating to pragmatic functions, then this example may also be interpreted as an instance of case (6), the *simultaneous* expression of two metaphors in gesture or, at least, a gesture that is consistent with being interpreted with respect to two different metaphors, MORE IS BIG and MORE IS TO THE RIGHT.

C. Quick succession of different metaphors in gesture. The speaker shown in Figure 8 is talking about poll numbers. He first refers to a small number of voters and then to a large number of voters. As the speaker says, "The first poll put it at two point eight percent", he gestures with his left hand assuming a contracted shape, bouncing the hand forwards (away from his body). The speaker then talks about "higher numbers". Whereas the previous quantity was not described in terms of spatial language (i.e., "two point eight percent" does not invoke space), this expression evokes the metaphor MORE IS UP. Similar to what we have seen before in the case of vertical associations between space and numbers (Examples 1, 2; see also Appendix C), the speaker holds both palms facing downward. This time, however, he moves his hands upward in a stroke aligned with the phrase "higher numbers", indicating that the verticality expressed in gesture and speech form a conjoined semantic unit. Finally, both hands (palms facing downward) are moved toward a lower position on the vertical axis with the phrase "than that". Similar to example 1, the expression "than that" is back-referential and, together with the

a.

The first poll put him at ... *... two point eight percent support.*

b.

Even my candidates had ***higher numbers ...*** ***... than that.***

Figure 8. Example of MORE IS UP and perhaps MORE IS TO THE RIGHT and MORE IS BIG. (a) The speaker's left hand moves away from his body and further to the speaker's left in a bouncing fashion (see curled arrows on the right side). The hand assumes a closed fist. (b) Palms facing downward, the hands are moved upward on the phrase "higher numbers", and then downward on the phrase "than that".

simultaneously expressed hand movement and the preceding gesture at high position, this creates contrast along the vertical axis.

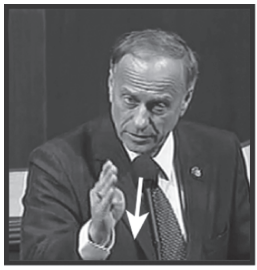
This last example is another clear example of MORE IS UP and case (1) — gesture and speech co-express the same metaphor. More speculatively, it is interesting that the speaker chooses to gesture the smaller quantity ("two point eight percent") on his left body side, looking toward the left side of the audience, and then turns toward his right before speaking about "higher numbers". However, similar to what we have seen before, the horizontal dimension is more difficult to interpret with respect to quantity. This could be an example of a horizontal mapping to quantity, or it could also result from order of mentioning, or an intentional decision to engage the different halves of the audience. Finally, note that the hand shape is contracted, with all fingers together forming a fist. As before, this might be mainly pragmatic and imply specificity or significance. Yet again, it is at least

consistent with LESS IS SMALL (a small quantity is mapped onto a contracted hand shape), and thus reminiscent of the examples shown in Figure 5 and 7.

Figures 9 and 10 show another example where multiple source domains are used in quick succession. Here, the speaker talks about different percentage values relating to health care costs. He first says "And eight and a half percent is a low number", with the right hand (flat palm facing inward) moving downward on the phrase "low number" (Figure 9a). He then explains "Some of those numbers go up to ten point one percent, and on up into the twenties, twenty-four, twenty-five, twenty-eight and even thirty-five percent of overall healthcare costs" (Figure 9b). As he articulates the list, he moves his hand to the right and upward in small, punctuated steps as he refers to each percentage in the progression. The gestures appear to mark successive ascending points on a graph that he is "painting" with his hand.[3] One might argue that depicting a line graph is not necessarily reflective of the metaphors MORE IS TO THE RIGHT and MORE IS UP. However, graphs often make use of metaphor as well (see, e.g., Tversky, 2001) and trends in graph production are culturally consistent with known space/number mappings (Tversky, Kugelmass, & Winter, 1991; Fischer, Dewulf, & Hill, 2005). Thus, to the extent that graphs themselves are mappings of numbers onto space, gestures that depict these graphs reflect a similar mapping.

In the gesture shown in Figure 10a, the speaker repeats the rightward-oriented movement with the same hand shape, but now, the movement is less upward and more toward the right. Critically, the same speaker subsequently uses a different type of gesture, consistent with a size-based based mapping, in Figure 10b. Here he incrementally moves both hands outward as he describes the progression of quantity from "one third" to "overall cost". This switch to an expansion rather than

a.



And eight and a half percent is a ***low number***.

b.

Some of those numbers go up to ten point one percent, and on up into the twenties, twenty -four, twenty-five, twenty-eight and even thirty-five percent of overall healthcare costs.

Figure 9. Example of MORE IS TO THE RIGHT and MORE IS UP. (a) Palm facing leftward and downward, the speaker looks toward his hand on his right. (b) The speaker raises his right hand and simultaneously moves it rightward in a sequence of small upward steps.

a.

Now ***I won't range up*** in there ...

b.

... into that ***one fourth ...*** ... to ***one third of the overall cost ...***

Figure 10. Example of MORE IS TO THE RIGHT and MORE IS BIG. (a) The speaker sweeps his hand from left to right (and slightly upward). (b) The speaker switches to using both hands. He moves them from a position close to the center of his body to a position further away, his palms facing toward the camera.

a rightward-sliding gesture coincides with the speaker's switch from talking about percentage points to talking about proportions. Figures 9 and 10 together illustrate a quick succession of different source domains to convey the same basic target domain. The first sequence (Figure 9) largely follows MORE IS TO THE RIGHT and MORE IS UP (consistent with graph conventions), and the second sequence transitions from the horizontal metaphor to MORE IS BIG (Figure 10).[4] All this happens while the speech predominantly reflects a vertical mapping ("low number", "go up", "range up"). This sequence thus shows a mix of different verbal expressions and gestures that are consistent with different spatial mappings.

In our final example, depicted in Figure 11, the speaker discusses the number of users of a particular Internet platform, comparing it to the world population. He begins by referring to the smallest quantity in this discourse context, noting that 175 million people have been added to the platform's user base, which he observes is a "huge number". He continues to make comparisons that relate different quan-

a.

A hundred and seventy five million people on the thing now ... ... adding a ***huge number*** of users everyday.

b.

Six billion people on the planet. ***Probably three billion*** of them with kind of modern grid electricity and maybe telephones. (...)

c.

(...) ***Hundred and seventy five million ...*** ***... to three billion*** is a big challenge.

Figure 11. Example of MORE IS BIG and MORE IS TO THE RIGHT. (a) With flat palms facing inward, the speaker utters a relatively longer phrase, while holding the hands and arms in the same position. Then, he opens this position in an arc-like fashion aligned with the phrase "huge number". (b) Hands move wide apart and subsequently closer together. (c) With his palms facing inward without touching each other, the speaker moves both hands from his left side to his right side, while at the same time moving them upward.

tities to each other, and in the end, repeats the main comparison of "175 million people" to "6 billion".

The sequence exemplifies many interesting characteristics, including the consistent use and re-use of gesture-speech complexes, as well as the metric use of gesture space. The first quantity ("175 million people") is accompanied by a relatively open arm position: the two hands meet, palms facing toward the body, forming an empty space between the arms and the speaker. When emphasizing that this quantity is a "huge number", the speaker moves his arms away from his body in an arc-like fashion, similar to the previously discussed examples 5a and 5b. When subsequently talking about the largest quantity in this stretch of discourse (the world population), the speaker moves his hands outward, in fact, outside the view of the camera. In contrast, when later talking about the smaller quantity of a 3 billion subset of the world population, he moves his hands inward again to about half of the previous gesture space, as if metrically mapping the subset quantity "3 billion" to about half the open space of "6 billion".

Finally, the speaker reiterates his main point with a different gesture by moving his hands left to right, as well as slightly upward. This last sequence might show a switch from MORE IS BIG to MORE IS TO THE RIGHT. Note again, however, that a different interpretation is possible for the horizontal dimension: Here, the speaker is talking about change, so the rightward movement might be an instance of a transversal gesture to show the left-to-right going passage of time or order of temporal events (Cooperrider & Núñez, 2009; Calbris, 2011, pp. 60, 132–135).

One additional detail warrants mention. When the speaker says "kind of modern grid electricity and maybe telephones", he rotates both of his arms in an alternating fashion, keeping them in roughly the same areas shown in Figure 11b, right panel. This has two possible interpretations. The oscillating movement could be interpreted as "more or less" or "approximately" (Kendon, 2004, pp. 169–170). This interpretation is supported by his uses of vagueness indicators such as "probably" and "kind of". Alternatively, the oscillating movement might be an instance of holding something in place for inspection (see, e.g., Kendon, 2004, pp. 130–131), or, in this case, as keeping the numerical referent active in the mind of the interlocutor. Again, we see that a movement (alternating rotations or "oscillation") often related to certain meanings or pragmatic functions is combined with the spatial position that was previously used when talking about numerical quantities.

General discussion

We examined a set of gestures produced by speakers as they talked about quantities during television broadcasts of news, speeches, and interviews. Our analysis

revealed several recurring themes. First, many of the gestures were consistent with concomitant verbal expressions. As Kendon (1980, p. 211) put it nicely, there are many instances where it looks "as if the speech production process is manifested in two forms of activity simultaneously", and this also happens when speakers metaphorically talk about quantity in terms of space, where the gestural medium gives a visual impression of physical size, or position along an axis. In terms of Mittelberg's (2013) notion of "exbodiment", we see such gestures as the "turning outward" of speakers' metaphorical concepts via means of the body. Using Calbris' language (2011, p. 293), we can say these gestures are, perhaps, the mental image's witness, reflecting metaphorical conceptualization of quantity in terms of space.

Within Cienki and Müller's (2008) scheme discussed above, these gestures fit most closely into category (1), where there is a close correspondence between the metaphors expressed in gesture and the metaphors expressed in speech. Such cases provide converging evidence for the proposal that numbers are structured in terms of space — not just in language and not just in psychological experiments, but also in gestures. A particularly close match between the experimental literature and our study is the finding that precision grips are associated with small numbers (as in the experiment by Lindemann et al., 2007), and open hand shapes with large numbers (as in the experiment by Andres et al., 2004). These gestures can thus be seen as direct gestural reflections of the same principles in spontaneous discourse.

Verticality, too, was consistently expressed in gesture, mirroring experiments that find vertical associations between space and numbers (such as Winter & Matlock, 2013; Hartmann et al., 2011; Sell & Kaschak, 2012; Pecher & Boot, 2011). Although more difficult to interpret, we also found instances of gesture sequences that appeared to reflect a horizontal number line. These are instances of category (3): Gestures that reflect metaphors that are different from the verbal metaphor being used. And they are instances of category (4): Gestures that have no corresponding conventional English expressions. However, we have to bear in mind that many of the horizontal examples were more ambiguous than the vertical or size-based ones. This is because speakers commonly turn left or right when they speak to different parts of the audience, or they gesture from left to right when discussing two topics in sequence or indexing positions in space with contrasting ideas. Thus, at present, the evidence for a horizontal gestural expression of numerical quantity is mixed. Precisely because the horizontal dimension is used in gesture for so many different things is it difficult to look at the role of quantity along this particular axis. Compared to this, the evidence for a gestural expression of MORE IS BIG and MORE IS UP is stronger.

All these cases (where the use of space in gesture reflects verbal metaphorical expressions) are important for a central claim of Conceptual Metaphor Theory, which is that metaphors are "primarily a matter of thought and action and only

derivatively a matter of language" (Lakoff & Johnson, 1980, p. 153). To test this claim, it is necessary to consider evidence beyond just linguistic examples, such as metaphorical expressions like "high numbers" and "tiny numbers" (see Gibbs, 1996). That gestures employ space in a manner consistent with these verbal metaphorical expressions gives *independent* support for the metaphorical conceptualization of quantity, on top of linguistic and experimental evidence.

Examining gestures produced in the wild also allows us to look beyond the constrained contexts of previously established experimental results. Across all our examples, speakers talked about quantities of different orders of magnitudes, spanning quantities from tens to billions. This is informative because it shows that mental associations between space and number extend beyond the spans of numbers ordinarily tested in psychological experiments, where usually only a limited range is investigated, e.g., the numbers from 0 to 9 (e.g., Dehaene, Bossini, & Giraux, 1993), or the numbers from 1 to 30 (Loetscher et al., 2008; Winter & Matlock, 2013). Gestures in our analysis show that associations between space and number that have been found for these limited ranges may extend to much larger quantities as well. This suggests that the spatial mappings for number are quite general and not restricted to a certain range. Hence, the association between space and numbers must be flexible: For example, the speaker in Figure 1 gestures vertically when talking about numbers of up to 90%, and the speaker in Figure 2 uses a similarly large vertical displacement when talking about 3 to 10%. Thus, what matters is the discourse context, and whether a quantity is small or large relative to the other numbers being discussed.

Naturally, the way metaphors are realized through gestures varies across different speakers. Gesture has many degrees of freedom and hence "the methods of conceptualization available in gesture — that is, the specific ways in which embodied, enactive forms are created to organize and represent content — are diverse" (Streeck, 2009, p. 162). In the present case, we have seen that for vertical metaphors, speakers may use a gesture where the palm is facing downward, or they might use a pointing finger that moves up or down a line. Similarly, we have seen size-based gestures realized in different ways, including precision grips of different kinds or delimiting two hand gestures where the hands are moved inward or outward to represent small or large quantities. This shows that what matters are not conventionalized hand shapes and movements, but instead, the most salient aspect of the representation (Mittelberg & Waugh, 2009, p. 337). In this case, speakers express the main axis (vertical or horizontal) or dimensions (small or large size), using whatever gestural means available.[5] As long as the overall spatial structure of the mapping (horizontal, vertical, size-based) is preserved, speakers can make full use of their bodies in many different ways.

Across multiple examples, we saw that speakers may repeatedly stay within a single spatial frame. When the same verbal expression is repeated together with a similar gesture, this can be understood as an instance of McNeill's "catchment" (McNeill, 2005), which may create coherence across a longer speech-gesture sequence (see also Cardona, 2008, p. 76). In some cases, the speakers produce multiple gestures that contrast within one dimension (e.g., small vs. large in example 5, low vs. high in examples 1, 2), which allows contrasting different quantities within the established spatial source domain.

We have seen people re-use particular source domains, but we have also seen them switch between domains, or mix them. These switches are reminiscent of research on mixed metaphors (Quinn, 1991; Shen & Balaban, 1999). Mixed metaphors are frequent and can complement each other to enrich the meaning of a text passage (Kimmel, 2010, p. 113). We show that gesture also provides evidence for rapid shifting back and forth between different conceptual mappings. One motivation for this rapid switching might be that speakers want to highlight the same quantity from multiple perspectives. However, the switch may also be motivated by other considerations that have nothing to do with quantity per se. For example, the speaker in example 11 might switch to a horizontal gesture to express change on top of expressing quantity differentials.

In this context, it is worth noting that the different source domains in MORE IS UP, MORE IS TO THE RIGHT, and MORE IS BIG appear to be largely compatible with each other, exhibiting what Kimmel (2010, p. 107) calls "image-schematic affinity". This suggests that varied conceptual representations in speech and gesture can be compatible and integrated together, as in the case where a speaker talks about a "tiny number" (which suggests size) on left body space. Imagine a ball that is moving from left to right and from low to high while at the same time transforming from small to large size. The possibility of coming up with such a mental image highlights the potential for consistency of these metaphors.

That we see different spatial frames in gesture suggests that the way we think about quantity is flexible. To the extent that gestures give insight into the speaker's conceptual world, the flexibility we have seen in gesture may speak to the flexibility of the underlying conceptual mappings between space and number. This is, in fact, mirrored by some recent movements within the experimental literature. Fischer (2006) discusses how much of what has previously been thought of as "rigid" in the numerical domain can be influenced by context, such as preceding experience with certain spatial mappings (see also Fischer & Brugger, 2011). For example, Bächtold, Baumüller, and Brugger (1998) trained participants on the mental image of a clockface (where smaller numbers tend to be on the right side), which reversed their orientation of MORE IS TO THE RIGHT. These results fit with the present findings

and altogether suggest that there are multiple, flexible ways of construing the target domain of quantity (see also Fischer & Campens, 2008; Shaki & Fischer, 2012).

Finally, as part of the flexibility in speech and gesture, the gestures discussed here can readily become part of ongoing discourse and take on other communicative functions above and beyond signaling literal quantity. As discussed above, precision grips have been proposed to serve important pragmatic functions (Kendon, 2004, Ch. 12; Lempert, 2011), and so have gestures with the open hand (Kendon, 2004, Ch. 13; Müller, 2004). Yet, our analysis above and the additional examples presented in Appendix C reveal that these gestures may at the same time be also used to signal quantity. It may often be the case that the pragmatic and "quantitative" meaning coincide (for a similar example, see Calbris, 2011, pp. 21–22). For example, a precision grip gesture produced in coordination with the spoken phrase "tiny number" might at the same time represent a small quantity and also serve to emphasize the specific and particular nature of an idea that the speaker wants to highlight. To the extent that the pragmatic meaning of specificity or exactness is often thought to have its metaphorical origin in grasping a small object (see Kendon, 2004, Ch. 12), the quantitative meaning might have the same embodied origin: Grasping a small quantity is associated with smaller hand shapes, and it is also a rather precise and specific movement. Hence, both pragmatic and size/quantity meanings of the precision grip gesture may share the same origin, or an "analogical link" (Calbris, 2011). In terms of Calbris (2011), the precision grip gesture is "polysemous" and at the same time "polysign", that is, the gesture may have different meanings in different situations ("polysemous"), and it may also have different, mutually compatible meanings in the same situation ("polysign").

It is important to point out that similar precision grip gestures are used to express actual size differences, such as seen in Figure 12, where the speaker talks about "little tiny numbers" that are engraved on a pace maker (seen lying on the table). The similarity to the metaphorical instances talked above and seen in Appendix C is supportive of the idea that both pragmatic and semantic uses of the gesture stem from

Figure 12. A precision grip gesture while a speaker talks *literally* about "tiny numbers" that are engraved on a pace maker.

ritualized forms of instrumental action (Kendon, 2004; Morris, 1977). Thus, the same act of seizing or grasping something in a precise fashion may have multiple, compatible semantic extensions. More generally, Streeck (2009, Ch. 6) argues that when we use our hands to depict, this does not only reflect the need to convey visual images such as — in our case — the visual image of a small object or a small collection of objects, but it also reflects the interactions that people have with such objects, such as grasping, holding, putting. He emphasizes that "gestures do not usually correspond to what we see, but what we know about something" (ibid., p. 150) — and in our case, they correspond to what we know about handling small quantities.

From a broader perspective, our results show that the meaning of gestures is locally situated and derives meaning not just from the human body and conventional metaphors, but also from the ongoing discourse context (see Mittelberg & Waugh, 2009, pp. 332–333; Müller, 2009). Thus, metaphoricity in gesture is a flexible and dynamic notion (Müller, 2009). Thus, a quantity gesture is not just a quantity gesture, but it can simultaneously serve other functions in discourse.

Conclusions

Gesture reveals the spatial nature of thinking and talking about numbers. Our analysis of speech produced during television broadcasts shows that gestures readily reflect known metaphors for quantity such as MORE IS UP, MORE IS BIG and perhaps, MORE IS TO THE RIGHT. But, they do so not just in one-to-one correspondences between speech and gesture, but also in one-to-many correspondences. Quantity is flexibly construed using gestures that reflect multiple source domains. When associations between space and numbers are studied in a more spontaneous mode of communication outside constrained laboratory settings, the underlying mappings appear to be more flexible and fluid. They extend to a large range of numerical quantities, and are expressed through the use of a variegated set of gestural forms. Thus, metaphoricity is a complex notion that not just depends on previously established associations that stem from culture or embodied experience, but that also depends on the local context, the ongoing discourse and complex interactions between speech and gesture.

Notes

1. Note how the eye brows are raised when talking about the larger quantity.

2. A larger number of examples with positional contrasts need to be analyzed to be able to see whether the positions of contrasting discourse topics are modified by the topical quantity.

When talking about horizontal positional contrasts, it will furthermore be important to point out that implied time (Cooperrider & Núñez, 2009; Calbris, 2011, Ch. 6) and emotional valence (Casasanto & Jasmin, 2010; Casasanto & Chrysikou, 2011) may also co-determine which side is chosen to highlight which aspect of the discourse.

3. It should be noted, however, that there is no line graph that the speaker uses in his speech. A look at the whole passage reveals that he is otherwise only using pie charts (depicted on a flip chart behind him).

4. Again, there might be alternative pragmatic functions for this sequence. In Figure 10 in particular, the speaker assumes a vertically oriented flat open palm (called "VP gesture" by Kendon, 2004, pp. 251–255). Such a hand shape is often associated with a person signaling an intention to halt his or her current line of action, or to metaphorically express disapproval or a negative statement. Thus, it is perhaps no coincidence that the concomitant verbal phrase uses the negative "I won't range up in there".

5. In terms of blending theory (such as Parrill & Sweetser, 2004), we might say that different parts of the Real Space in which gesture happens can be mapped onto the space representing the source domain.

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Appendix A

Static search terms	Dynamic search terms
high number	increasing number
low number	decreasing number
higher number	growing number
lower number	shrinking number
large number	rising number
small number	falling number
larger number	
smaller number	
big number	
little number	
bigger number	
vast number	
huge number	
tiny number	

Appendix B

Figure	Link
1	http://archive.org/details/CSPAN2_20091211_170000_U.S._Senate#start/10938/end/10972
2	http://archive.org/details/FOXNEWS_20090723_210000_Glenn_Beck#start/1195/end/1230
3	http://archive.org/details/SFGTV_20121026_010000#start/1095/end/1128
4	http://archive.org/details/CSPAN2_20120923_001500_Book_TV#start/1070/end/1109
5	http://archive.org/details/KQED_20120505_023000_This_Week_in_Northern_California#start/678/end/708 http://archive.org/details/CURRENT_20120717_010000_The_War_Room_With_Jennifer_Granholm#start/1005/end/1035
6	http://archive.org/details/WRC_20090913_140000_The_Chris_Matthews_Show#start/1110/end/1144
7	http://archive.org/details/CSPAN2_20110306_010000_Book_TV#start/334/end/364
8	http://archive.org/details/CSPAN2_20090615_033000#start/210/end/240
9	http://archive.org/details/HLN_20091117_220000_Prime_News#start/2645/end/2681
10	(same as 9)
11	http://archive.org/details/WHUT_20090902_030000_Charlie_Rose#start/2360/end/2394
12	http://archive.org/details/WJLA_20090825_110000_ABC_News_Good_Morning_America#start/4245/end/4275

Appendix C. More examples reflecting MORE IS UP

Link (http://archive.org/details/…)	Verbal expression
CSPAN2_20090624_130000#start/1291/end/1326	low number
WJZ_20090923_210000_Eyewitness_News_at_5#start/3022/end/3057	low number
FOXNEWS_20100625_170000_America_Live#start/2278/end/2312	low number
FOXNEWS_20110511_100000_FOX_and_Friends#start/5896/end/5933	high numbers
MSNBCW_20111220_110000_Morning_Joe#start/7458/end/7492	low/high number, down
WRC_20091026_110000_Today#start/12250/end/12290	amping up, high number
CSPAN_20091124_180000_U.S._House_of_Representatives#start/4743/end/4779	high number
CSPAN2_20090722_130000_U.S._Senate#start/4930/end/4960	tiny number
CSPAN_20100107_120000_Washington_Journal#start/8138/end/8168	tiny number
CNBC_20100128_000000_The_Kudlow_Report#start/3088/end/3118	tiny number
WRC_20100328_140000_The_Chris_Matthews_Show#start/288/end/318	tiny number
CSPAN_20100505_030000_Capital_News_Today#start/6571/end/6601	tiny number
CSPAN2_20100505_130000_U.S._Senate#start/6955/end/6985	tiny number
WMPT_20100622_220000_PBS_NewsHour#start/1677/end/1707	tiny number
SFGTV2_20100729_183000#start/25/end/55	tiny number

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