Change in Metaphorical Framing: Metaphors of TRADE in 225 Years of State of the Union Addresses (1790–2014)

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The literature provides diverging perspectives on the universality and stability of economic metaphors over time. This article contains a diachronic analysis of economic metaphors describing trade in a corpus of 225 years of US State of the Union addresses (1790–2014). We focused on two types of change: (i) replacement of a source domain by another domain and (ii) change in mapping within a source domain. In our corpus, five source domains of trade were predominant: (i) PHYSICAL OBJECT, (ii) BUILDING, (iii) CONTAINER, (iv) JOURNEY, and (v) LIVING BEING. Only the relative frequency of the CONTAINER source domain was related to time. Additionally, mappings between source and target domains were mostly stable. Nevertheless, our analyses suggest that the TRADE metaphors in our corpus are related to concreteness in a more nuanced way as typically assumed in conceptual metaphor theory: metaphors high in the concreteness dimension of physicality and low in the concreteness dimension of specificity are likeliest to be used over longer time periods, by providing communicators with freedom to adjust the metaphor to changing societal circumstances.

1. INTRODUCTION

Metaphors are pervasive in political communication, providing a framework through which politicians may present their worldviews (Lakoff 1996/2002). One area of discourse especially relevant to politicians is the status of a country's economy, as the economy is a driving factor in a country's prosperity, and thus critical to politicians' fates as leaders. Some studies suggest that metaphors for economic issues are relatively similar and stable across languages (Bratoz 2004; Arrese and Vara-Miguel 2016; Negro 2016). However, other studies reveal subtle differences in the use of economic metaphors between languages (Semino 2002; Charteris-Black and Musolff 2003; Wang *et al.* 2013) and genres (e.g. specialized vs. non-specialized economic discourse; Skorczynska and Deignan 2006). Thus, the extent to which specific metaphors reflect universal perspectives on the economy remains unclear.

This question can be answered by supplementing synchronic with diachronic studies of metaphors in economic discourse. Burgers (2016) suggests that modelling the ways metaphors change over time can provide insight into

how conceptualizations of topics, such as economics, have changed. He mentions two types of change that can reflect such differences: (i) fundamental transformation in which one specific metaphor is replaced by another (i.e. a change in source domains as in Hurley 2014) and (ii) incremental transformation in which a specific metaphor remains in place but changes its meaning (as in Nerghes *et al.* 2015). To examine these issues, we conducted a diachronic corpus analysis focusing on how metaphorical framing of one target concept in economic discourse, namely, 'trade', changed over time. The concept of 'trade' has been a conventional economic term since at least the 18th century and has not undergone a semantic shift, making it well suited for diachronic analysis. It is also a key term for politicians, as trade has typically been associated with political power (Gordon 2004).

Our corpus data come from State of the Union (SOU) addresses delivered by the US Presidents (Ahrens 2015). SOUs are speeches to the Congress that have been delivered on a roughly annual basis from 1790 to the current time, comprising a diachronic corpus of 225 years of comparable political speeches (1790–2014).

2. METAPHORICAL FRAMING

Metaphors are 'cross-domain mappings' between a source domain and a target domain (Lakoff and Johnson 1980/2003). When discussing abstract (non-physical) target concepts through metaphor, speakers often use more concrete (physical) source domains (Lakoff and Johnson, 1980/2003). For instance, describing the economic situation of 2007–8 as a 'financial tsunami' (Horner 2011) maps elements from the natural disaster of a tsunami (i.e. physical source) to the economic crisis in 2007–8 (i.e. non-physical target). The 'financial tsunami' implies that the root causes of the economic crisis can be seen as a natural disaster rather than something man-made, which prevents specific social actors from being designated as the culprit for the dire economic situation. Thus, the 'financial tsunami' metaphor can subtly imply important beliefs about the origin of the economic crisis, thereby serving as a frame for rationalizing responsibility and for proposing subsequent solutions.

Psychological and sociological approaches have demonstrated that metaphorical frames are important tools in political discourse (Burgers *et al.* 2016; Semino *et al.* 2018). From a psychological perspective, scholars test the impact of metaphorical frames through conducting experimental studies in which participants are typically exposed to a metaphorical frame and a non-metaphorical control frame (Nicaise 2014). From a sociological perspective, scholars test the importance of metaphors through (critical) discourse analysis (CDA) in which they study how specific metaphorical frames dominate a discourse over time (e.g., Wang *et al.* 2013). However, CDA studies typically select metaphorical frames that are already used to some degree in the discourse, raising the possibility that frames that did not catch on may have been excluded. Thus, it is important to supplement CDA studies with bottom-up analyses that can also

include unsuccessful frames to further unravel which kinds of frames are more or less successful in dominating a discourse over time.

3. DIACHRONIC CHANGES IN METAPHORICAL FRAMING

Time is one of the most important factors determining the change of frames. First, a specific frame may become more or less dominant because the issue itself may receive more or less attention (Hu and Liu 2016; Damstra and Vliegenthart 2018; Granath and Ullén in press). For instance, Alejo (2010) shows that CONTAINER is a conventional and widely used domain to metaphorically talk about economic topics (e.g. metaphorical expressions like *open market* suggesting that the market is a container that can be open or closed). Imagine that we find changes in the number of CONTAINER metaphors in economic topics over time. If this is the case, it may be that economic topics in general receive more or less attention, while the percentage of CONTAINER metaphors within that attention has remained unchanged. Thus, when studying variation in frames of a specific issue over time, it is crucial to distinguish variation in general issue attention from variation in the use of specific (metaphorical) frames. Thus, in line with current research (Hu and Liu, 2016; Damstra and Vliegenthart 2018; Granath and Ullén in press), we ask our first research question (*RQ1*): *How does attention to the topic of trade vary over time?*

Next, diachronic change can be modelled in two ways: fundamental and incremental change (Burgers 2016). Under fundamental change, a specific frame becomes less popular and is replaced by another frame. This is reflected in Damstra and Vliegenthart (2018) who studied frame variation in reports on the financial crisis in Dutch newspapers between 2007 and 2013. They found that time was a stronger predictor of frame variation than the specific newspaper, which suggests that studying diachronic changes is pivotal in uncovering when particular frames may dominate a specific discourse.

For metaphorical frames, De Landtsheer (2015) compared different economic metaphors in Flemish–Belgian news from 2006 to 2013. She found that journalists used more powerful economic metaphors when economic indicators showed poor economic performance. Furthermore, Hodgson (2005) studied biological metaphors in economic texts between the 1880s and the 1980s. He found that these metaphors were popular among academics during this 100-year period except between World Wars I and II. Thus, we find that the use and popularity of specific metaphors may change over time, leading to *RQ2*: *How does the use of specific trade metaphors vary over time?*

While metaphors from a particular source domain may be used more or less often, the scope of mapping within the same source domain can also change ('incremental change', Burgers 2016). Iliev and Axelrod (2017) introduce two dimensions of abstractness: physicality and specificity. Theories of metaphor like conceptual metaphor theory (CMT; Lakoff and Johnson 1980/2003) assume that many metaphors include a physical source domain and a non-physical target domain. Yet, on the specificity dimension, metaphors can

change. Iliev and Axelrod (2017: 716) define specificity as a 'dimension [of abstractness] along the general-specific axis[1], where greater abstractness is defined as greater generality and inclusiveness' (see also Beukeboom and Burgers 2019). Under this definition, a word like 'house' is more specific than 'building', while a word like 'cottage' is more specific than 'house'. Applied to metaphor, Nerghes *et al.* (2015) demonstrate that, during the financial crisis (2006–11), 'toxic' was used metaphorically in news media in different ways. Before the crisis, toxic was used metaphorically in combination with generic nouns (e.g. expressions like *toxic waste*, to refer to economic debt). Yet, when the crisis progressed, these metaphors became more specific through references to specific financial products (e.g. *toxic mortgage* which is a more specific kind of debt than an expression like *toxic waste*). Thus, the financial crisis saw a narrowing of the semantic domain of the 'toxic' metaphor, implying more specificity.

A second example of incremental change involves more radical meaning shifts. For EU discourse, Musolff (2017) describes how the metaphor 'Britain at the heart of Europe' changed over its discourse career. When first introduced in the early 1990s, this metaphor had a positive valence, reflecting a Britain central to the European Union (EU). Yet, over time, the metaphor was re-appropriated by EU opponents who portrayed its metaphorical body as sick, dying, or dead. In that way, the metaphor changed in valence from positive to highly negative. Thus, while the same source domains ('toxic', 'at the heart of Europe') are invoked, their diachronic meaning shift is considerable.

At the same time, some metaphorical frames seem impervious to diachronic change. For instance, Lakoff (1996/2002) proposed two conflicting metaphorical frames based on the source domain of FAMILY to talk about nation states: a more conservative 'strict father' and a more liberal 'nurturant parent' frame. Ohl, Pfister, Nader, and Griffin (2013) tested and confirmed Lakoff's (1996/2002) hypothesis that US Republicans use more 'strict father' metaphors than Democrats by studying the metaphors used in US Presidential campaign ads (1952–2012). However, Ohl *et al.* (2013) did not find any differences over time in the use of these metaphorical concepts, which suggests no incremental change. Ahrens (2011) noted similar findings for Presidential SOU and Radio Addresses over a twenty-five-year period (1980–2006). Similarly, some authors suggest that economic metaphors are stable across languages and cultures (Bratoz 2004; Arrese and Vara-Miguel 2016; Negro 2016), which could imply that they are stable across time as well. Thus, we propose *RQ3. How does the meaning of trade metaphors change?*

These three questions (attention to trade, variation in trade metaphor usages, and semantic shift in trade metaphor meaning) provide insight into whether and how metaphorical frames change over time, thereby providing a different way to think about the question of the universality or semantic prevalence of a given metaphorical frame.

4. METHOD

4.1 Materials

To answer our *RQs*, we conducted a diachronic corpus analysis of comparable political speeches focusing on US SOU addresses. SOU addresses are mandated in Article II, Section 3 of the US Constitution, which states that the President should 'from time to time' provide Congress with information about the 'state of the union'. As noted by Peters (http://www.presidency.ucsb.edu/sou.php#nixon1973), these addresses are usually given once per year, following the precedent set by President Washington (1789–97). Since 1933, the SOU address has usually been delivered orally to a joint session of Congress. Prior to that (i.e. 1801–1912), SOU addresses were usually written reports sent to Congress at the start of a new session.

Our corpus starts with the first SOU address delivered by President Washington on 8 January 1790 and ends with President Obama's SOU address delivered on 28 January 2014, thus spanning 225 years. The total corpus includes 229 SOU addresses[2] delivered by 42 different presidents[3] (for an overview, see the additional data on the Open Science Framework—OSF—at https://osf.io/da6ny/).[4] The SOU addresses were downloaded from the UCSB Presidential Project website (http://www.presidency.ucsb.edu/sou.php) into text files to determine the word count, which was calculated using WordList (tokens/running words in texts) in WordSmith 6.0. The total word count was 1,825,258 words.[5] The average number of words per speech was 7,970.56 ($SD = 5,466.53$, range $= 1,093$–$28,1789$ words).

4.2 Case study: Metaphors of TRADE

The SOU corpus provides a unique opportunity to track the use of economic metaphors by politicians over more than two centuries. Of course, the specific economic construct examined is important, as many economic terms that are now conventional were not yet in usage in 1790.[6] Thus, to find comparable cases over time, we focus on TRADE as a target concept.[7] We extracted all instances of the target concept TRADE through a simple keyword search in the Corpus of Political Speeches (Ahrens, 2015) which yielded 1,159 cases. Next, we excluded all uses of the word 'trade' as part of a proper noun, such as references to government agencies (e.g. Bureau of Trade), specific agreements or laws (e.g. General Agreement on Tariffs and Trade), and buildings (e.g. the World Trade Center). This left us with 1,121 cases for analysis.

4.3 Procedure

First, we examined the specific use of 'trade', and coded whether 'trade' was used as a head noun, a modified head noun (e.g. fur trade; global trade) or whether trade modified another head noun (e.g. trade negotiation; trade

policy). We found that trade was used as a head noun 550 times, as a modified head noun 402 times, and as a modifier of another head noun 169 times.

Next, we established whether 'trade' was part of a metaphorical expression by coding whether words modifying trade or modified by trade were metaphorical, making TRADE a target concept in a metaphorical expression.[8] Following the Metaphor Identification Procedure (MIP; Pragglejaz Group 2007) and its updated version MIPVU (Steen *et al.* 2010), we used dictionaries to establish the basic ('literal') meaning of words. If the basic meaning was distinct from the meaning and context, and the contextual meaning could be understood by referring to the basic meaning, we coded a word as metaphorical. Because we use historical data, we established the basic meaning through historical dictionaries, given that the meaning of words can shift over time. We used the 1828 edition of *Webster's Dictionary* (http://webstersdictionary1828.com/) for all SOUs until the end of the US Civil War (President Abraham Lincoln), the 1913 edition (https://www.websters1913.com/) for all SOUs from the start of Reconstruction (President Andrew Johnson) until World War II (President Franklin Delano Roosevelt), and the contemporary edition (https://www.merriam-webster.com/) for all SOUs from the end of World War II (President Harry S. Truman) onwards.

When a word was coded as metaphorical, we also determined its source domain. We first analyzed 131 cases to establish which source domains seemed to predominate. In these cases, we identified source domains in a bottom-up procedure and followed source domains identified in previous studies on economic metaphors. Our findings were in line with previous studies on metaphor in economics, as we identified the source domains of PHYSICAL OBJECT (Morris *et al.* 2007; López and Llopis 2010), CONTAINER (Semino 2002; Alejo 2010), LIVING BEING (Wang *et al.* 2013; Domaradzki 2016), JOURNEY (Semino 2002; Skorczynska and Deignan 2006), and BUILDING (Skorczynska and Deignan 2006; López and Llopis 2010; see Table 1 for examples).[9] Please note that the domain of PHYSICAL OBJECT is a superordinate category that also comprises the domains of CONTAINER and BUILDING.

4.4 Reliability

We calculated inter-coder agreement following Wimmer and Dominick (2013), who recommend that a subset of 10–25 per cent of the data should be used for intercoder reliability analysis (see the OSF project at https://osf.io/da6ny/ for data and analyses). We randomly selected 200 cases for analysis for two coders. Reliability in coding the grammatical function of 'trade' (head noun, modified head noun, and modifier of another head noun) was 'almost perfect' (Cohen's κ = .84; 90.5 per cent agreement, qualifications from Landis and Koch 1977). However, reliability of coding for whether 'trade' was part of a metaphorical expression was only 'moderate' (κ = .46; 74.0 per cent agreement). The coders then discussed and resolved disagreements and adapted the coding sheets accordingly. A second round of reliability coding on 200 different

Table 1: Corpus examples of TRADE *metaphors from the different source domains; key terms in underlined italics*

Source domain	Example
PHYSICAL OBJECT	'the banking industry in the _great seats of trade_ on the seaboard'. (Martin Van Buren, 1838)
CONTAINER	'the steps which have been taken toward the execution of a law for _opening a trade_ with the Indians will likewise be presented for the information of Congress'. (George Washington, 1795)
BUILDING	'the United States [. . . .], already engaged in _laying the groundwork of a vast foreign trade_'. (William Howard Taft, 1912)
LIVING BEING	'Great Britain had also a restrictive policy, which _placed fetters and burdens on trade_'. (James K. Polk, 1848)
JOURNEY	'We can help our partners [. . .] _move toward a free trade zone_ throughout this entire hemisphere'. (George H. W. Bush, 1991)
Non-metaphor	'The bill will permit the gradual elimination of tariffs here in the United States and in the Common Market on _those items in which we together supply 80 percent of the world's trade_'. (John F. Kennedy, 1962)

cases was conducted, which revealed 'substantial agreement' (κ = .61; 90.0 per cent agreement). In addition, we had 'substantial agreement' for all five source domains: PHYSICAL OBJECT (κ = .69; 84.4 per cent agreement), CONTAINER (κ = .77; 94.4 per cent agreement), LIVING BEING (κ = .61; 86.9 per cent agreement), and JOURNEY (κ = .62; 92.5 per cent agreement). Agreement for BUILDING was 'almost perfect' (κ = 1.0; 100 per cent agreement).

5. RESULTS

In this section, we describe our diachronic analyses of attention to trade (*RQ1*) and the use of different metaphors for trade (*RQs 2–3*) over time in US SOUs (1790–2014). In some years, zero mentions of trade were made in the SOU. Furthermore, in 1933, no SOU was delivered. To deal with such cases, we aggregated the data on the 5-year level. This means that every data point reflects average scores for a 5-year period (1790–4, 1795–9, etc.). All data and data-analytic procedures are available from OSF at https://osf.io/da6ny/.

We conducted all statistical analyses with *IBM SPSS Statistics for Windows*, version 24. We present the statistical analyses in two different ways. First, we check for associations between time and the variable of interest by calculating bivariate Pearson correlation coefficients (as in Damstra and Vliegenthart 2018). These provide an indication of time's relationship to the variable of interest. When the bivariate correlation coefficient is significant, we follow up with a time-series analysis, as various authors (Koplenig 2017; Tay

2017) have observed that standard correlation tests are inappropriate when dealing with temporal data, since errors might be autocorrelated. This means that observations are not independent, because a previous observation (e.g. at time t-1) is related to the next observation (at time t). We checked for this possibility by inspecting the autocorrelation function (ACF) and partial auto-correlation function (PACF) of the respective variable. In cases where ACF and PACF indicated autocorrelation, we estimated a time-series model based on the parameters suggested by the ACF and PACF outcomes.[10]

5.1 Attention to the topic of TRADE

We found 1,121 instances of TRADE in our corpus, of which 849 were meta-phorical. In response to *RQ1*, the solid line in Figure 1 demonstrates attention to TRADE in SOUs over time, regardless of metaphoricity. Statistical analyses reveal no correlation between time and trade references ($r = .14$, $p = .37$). Upon further inspection, relative attention to trade spiked between 1840–4, 1910–14, and 1980–9. During these periods, important trade tariffs and trade agreements were discussed and implemented including the Tariff of 1842 (pro-tectionist tariff), the Mann–Elkins Act of 1910 (legislation on interstate trade) and the Trade and Tariff Act of 1984.
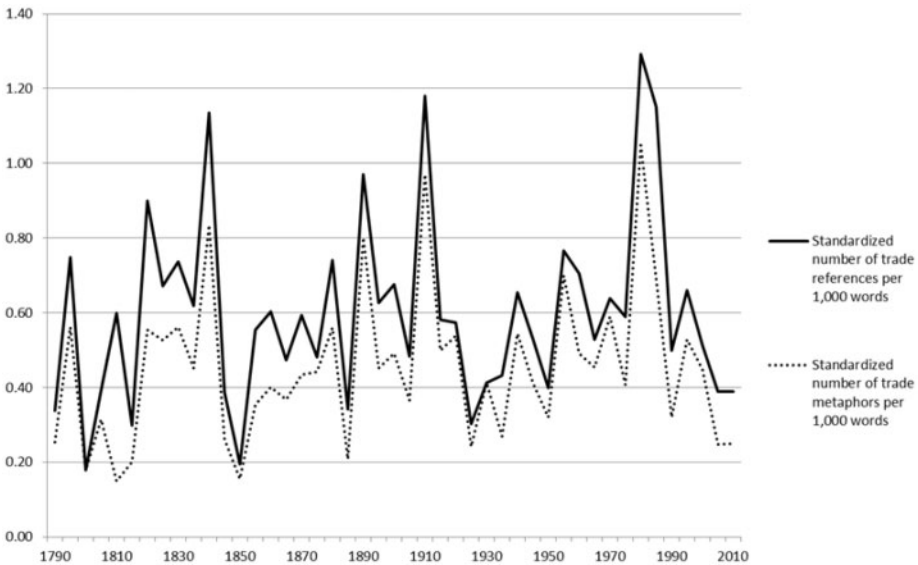

Figure 1: Standardized number of trade references and metaphors per 1,000 words

5.2 Metaphors of TRADE over time

Next, we plotted how the use of TRADE metaphors changes over time (*RQ2*). When focusing on the general use of TRADE metaphors, we zoom in on two indicators: (1) the standardized number of TRADE metaphors and (2) the relative percentage of TRADE references that are metaphorical.

Indicator 1 considers the overall increase for references to TRADE. For Indicator 1, we computed the relative number of TRADE metaphors per 1,000 words of SOU addresses (see the dotted line in Figure 1). Here, we find no evidence for an association between time and TRADE metaphors ($r = -.20$, $p = .18$). A downside of Indicator 1 is that it does not control for change in attention to the general topic of TRADE. Given that many TRADE references are metaphorical (849 out of 1,121 instances), these could be related. For Indicator 2, we divide the number of TRADE metaphors by the total number of references to TRADE, thereby revealing the percentage of TRADE metaphors. Thus, Indicator 2 controls for general change in attention to TRADE. Again, we find no association between time and the percentage of TRADE metaphors ($r = .15$, $p = .33$).[11]

To explore the relation between metaphors of TRADE and time further, we turn to the different source domains. We calculated the percentage of metaphorical TRADE references from the source domains of PHYSICAL OBJECT, LIVING BEING, JOURNEY, and CONTAINER (see Figure 2 for descriptive statistics).[12] We found no association between time and the domains of PHYSICAL OBJECT ($r = .14$, $p = .34$), LIVING BEING ($r = .08$, $p = .60$), and JOURNEY ($r = .13$, $p = .41$). However, we did find a positive association between time and relevant frequency of TRADE metaphors from the CONTAINER domain ($r = .43$, $p = .003$).

We conducted an additional time-series analysis for the percentage of container metaphors. An inspection of the ACF and PACF suggests that errors are correlated and that a model with *lag1*, as the main predictor may be the best fit for the data. A regression model with *lag1* as a predictor of metaphorical trade references was significant ($B = .478$, $SE = .136$, $t = 3.52$, $p = .001$). This leads to the predictive model $Y_t = 5.81 + .478*Y_{(t-1)} + \varepsilon_t$, with Y_t representing the percentage of metaphors with a container source domain at a specific 5-year period, $Y_{(t-1)}$ representing the percentage of metaphors with a CONTAINER source domain in the previous 5-year time period ('lag1') and ε_t representing an error term. This model explained 22.8 per cent of total variance (see Figure 3 displaying actual observations and model predictions). Inspection of residuals suggest that they are normally distributed (Shapiro Wilk = .96, $df = 44$, $p = .15$). ACF and PACF suggest no autocorrelation of residuals, indicating proper model fit. Thus, we find evidence of a positive relation between usage of the CONTAINER metaphor for TRADE in SOU addresses and time.[13]

5.3 Differences in meaning of TRADE metaphors

Our third *RQ* considered differences in the meaning of TRADE metaphors. To answer this question, we qualitatively analyzed the source domains of PHYSICAL
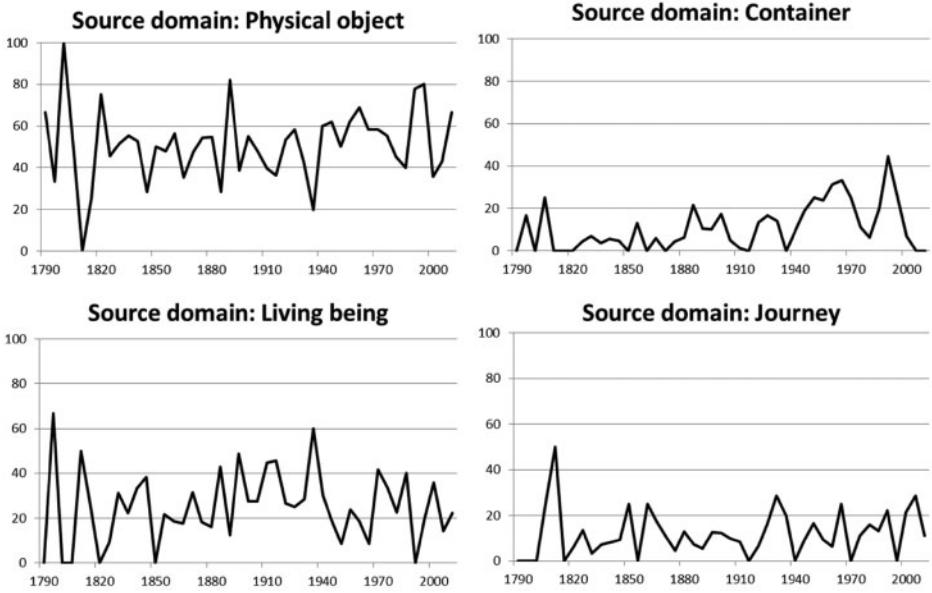
Figure 2: Percentage of metaphorical trade references from different source domains in US State of the Union Addresses (1790–2014)
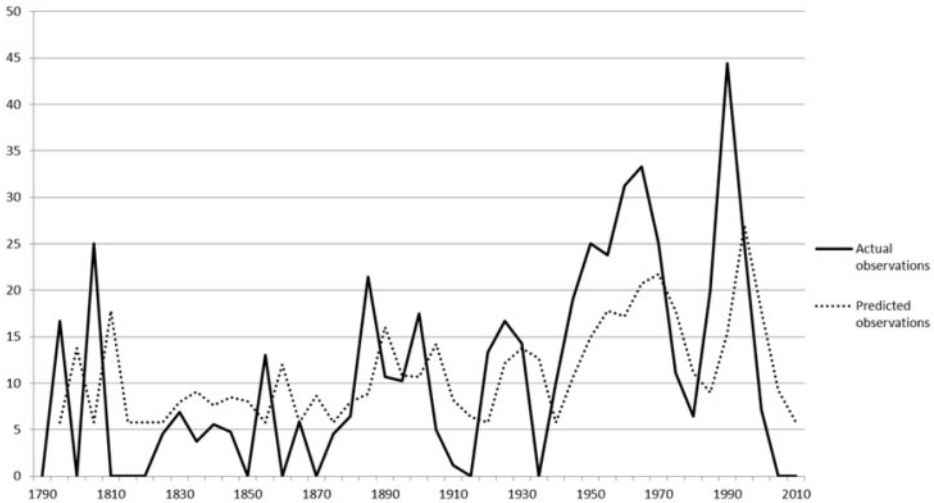

Figure 3: Percentage of metaphorical trade references with a CONTAINER source domain in State of the Union Addresses (1790-2014)

Note: The area between the two lines indicates the variance unexplained by the model.

OBJECTS (including CONTAINER and BUILDING), LIVING BEINGS, and JOURNEYS. These source domains comprised 752 out of 849 metaphors in the corpus. We found little evidence that the use of these source domains differed across grammatical constructions (trade as head noun, modified head noun, or modifier).[14]

Next, we focused on incremental semantic change by examining the specificity and physicality of the metaphors in each source domain, as it has been postulated that one of the purposes of metaphors is to make abstract concepts like 'trade' more concrete (see Lakoff and Johnson 1980/2003, and many others). Examples (1)–(3) demonstrate that the metaphors are highly physical in that they refer to an abstract concept like TRADE by means of physical entities like physical objects or living beings. At the same time, these metaphors are relatively unspecific, leaving room for reinterpretation and debate.

1. 'The importance of _enlarging our foreign trade_ [...] can not be over-estimated'. (Rutherford B. Hayes, 1877)
2. 'I've asked our allies and friends to join with us in _restraining their own trade_ with the Soviets'. (Jimmy Carter, 1981)
3. 'I believe as strongly tonight as I did the first day I got here, _the only direction forward for America on trade—the only direction for America on trade is to keep going forward_'. (William J. Clinton, 2000)

For example, (1) suggests an indirect metaphor comparing trade to an unspecified PHYSICAL OBJECT. Example (2) discusses trade as if it were an unspecified LIVING BEING needing to be restrained. Example (3) talks about 'going forward', thereby evoking a generic JOURNEY metaphor through a reference to a 'direction' (i.e. source-path-goal schema, see Lakoff 1987). Such physical and unspecific metaphors were used across the various source domains and across time in a similar way. However, when we zoomed in on the source domains in more detail, we found that each contained unique variations as discussed below.

5.3.1 The source domains of physical objects, containers, and buildings

Metaphorical expressions from the PHYSICAL OBJECTS domain displayed trade as a distinct and discrete entity. With 443 metaphorical cases in the corpus, the source domain of PHYSICAL OBJECTS was used most often. Furthermore, the source domains of CONTAINER and BUILDING constitute subsets of this domain. It is noteworthy that these two sub-domains mainly feature physical and unspecific metaphors similar to Examples (1)–(3). Most metaphors from the BUILDING source domain refer to a generic sense of the act of construction (e.g. 'building up a trade'), or to general structural supports of a building (e.g. 'support extended trade'). Most CONTAINER metaphors refer to either a stable, closed container (e.g. 'contained in a trade bill' or 'confined exclusively to Transatlantic trade'), an expanding, closed container (e.g. 'expansion of trade') or a closed container that needs to be opened (e.g. 'opening up a trade'). Moreover, while the percentage of CONTAINER metaphors fluctuates over time (see Figures 2 and 3), the patterns of metaphorization for CONTAINER metaphors are relatively consistent.

While the mappings of the CONTAINER and BUILDING metaphor subsets did not fluctuate, other metaphors within the PHYSICAL OBJECT domain did change over time. First, we found that metaphors referring to 'suppression'[15] were only used in reference to slave trade and other forms of human trafficking. This metaphor was first used by President James Monroe in 1819:

4. 'Due attention has likewise been paid to *the suppression of the slave trade*'.

This specific metaphor remained popular with 19th-century Presidents in the build-up to, during, and in the aftermath of the US Civil War. The last use of this metaphor in an SOU address was in 1893 which referred to:

5. 'Article XII of the general act of Brussels, signed July 2, 1890, for *the suppression of the slave trade* and the restriction of certain injurious commerce in the Independent State of the Kongo and in the adjacent zone of central Africa'. (Grover Cleveland, 1893)

In this way, the 'suppression' metaphor has a clear historical component, as it was linked to the abolition of the slave trade only. This may have made the metaphor too politically sensitive or too fixed to subsequently be applied to other types of trade.

Finally, in some cases, we find more specific instances of metaphors from the PHYSICAL-OBJECT domain, such as the following:

6. 'I emphasize the leadership which this nation can take when the time comes for a renewal of world peace. Such an influence will be greatly weakened if this Government *becomes a dog in the manger of trade selfishness*'. (Franklin Delano Roosevelt, 1940)

Example (6) connects trade to physical objects that are more specific than those discussed so far, by referring to trade selfishness in terms of a manger. Example (6) features a small metaphorical scenario (Musolff 2017), alluding to Aesop's fable of the Dog in the Manger (Gibbs 2008). In this fable demonstrating the power of envy, a dog lies in a manger not eating and prevents other animals from doing so as well. In this speech, during the early days of World War II when the USA was not yet officially at war, Roosevelt warns that the US Government should not act as the proverbial dog in the manger through its trade policies but should rather work toward taking a leadership role in trade after the end of the war. Such specific examples were relatively rare across the corpus.

5.3.2 The source domain of living beings

For the LIVING BEINGS domain, we found two main types of references: (i) to antagonists, and (ii) to living beings in need of protection or nourishment. For antagonists, consider the following:

7. 'The bill will include legal and regulatory reforms and *weapons to fight unfair trade practices*'. (Ronald Reagan, 1987)

8. 'But what makes the Soviet threat unique in history is its all-inclusiveness. Every human activity is pressed into service as a weapon of expansion. Trade, economic development, military power, arts, science, education, the whole world of ideas—all are *harnessed to this same chariot of expansion*'. (Dwight D. Eisenhower, 1950)

In Examples like (7) and (8), TRADE is conceptualized as an antagonist, albeit in two different ways. Example (7) includes a generic reference to trade as an enemy needing to be fought. This reference is generic because it is unclear whether TRADE should be seen as either a dangerous animal or human being. By contrast, Example (8) is more specific in presenting TRADE as a horse harnessed to an antagonistic chariot of expansion. In such examples, TRADE is thus framed as a dangerous living being.

For living beings in need of protection or nourishment, consider the following:

9. 'There is still great uncertainty as to whether our *well-nigh extinguished German trade* in meat products *can revive under its new burdens*'. (William McKinley, 1900)
10. 'We need to [...] *foster foreign trade*'. (Dwight D. Eisenhower, 1956)

Examples (9) and (10) show how trade is conceptualized as different living beings in need of protection. In Example (9), trade is described as a living being close to death (for unclear reasons) and needing to be revived. Example (10), by contrast, presents trade as a child needing to be fostered. These examples of the LIVING BEING source domain thus emphasize protection and nourishment.

While many LIVING BEING metaphors focus on either living beings who are antagonistic or in need of protection, other examples of this source domain can be found as well, although not as often, such as:

11. 'Tonight, I ask you to give me *the strong hand of trade promotion authority*'. (George W. Bush, 2001)

Example (11) discusses trade promotion authority by emphasizing positive strength. That is, trade promotion authority is presented through the metonym of 'hand' as a human person who has a specific strength the president wants to use. Such examples demonstrate a use of LIVING BEING metaphors beyond antagonist or individual in need of protection.

5.3.3 The source domain of journey

Like the other domains, most references from the JOURNEY source domain are relatively unspecific. Various JOURNEY metaphors simply imply some sort of forward motion, like Example (3). Yet, other cases focus on unspecific physical paths, like the following:

12. 'The return of gold and silver to *the avenues of trade* may be invited'. (Andrew Johnson, 1867)

Example (12) discusses an 'avenue' (thereby implying a path) without further specifying the type or geographical location of said avenue. This leaves it up to the reader to infer these details (or not). Nevertheless, some examples are more specific, such as a reference to:

13. 'the desire to *retain trade in time-worn ruts*, regardless of the inexorable laws of new needs and changed conditions of demand and supply'. (Grover Cleveland, 1895)

Webster's 1913 dictionary defines a 'rut' as a 'track worn by a wheel or by habitual passage of anything'. In this metaphor, it seems that trade has remained unchanged for so long that it left a 'rut' in the metaphorical 'avenue'. In Cleveland's frame, these ruts are considered negative and are used as a reason to change the trade practices of the time. Thus, while most JOURNEY metaphors are unspecific, some more specific examples can be found in the corpus as well.

6. DISCUSSION AND CONCLUSION

Our study focused on the temporal aspects of framing and aimed to uncover how metaphorical framing of TRADE metaphors has changed in 225 years of Presidential SOU speeches. We considered both the number of (metaphorical) trade references (*RQs 1* and *2*) and the type of metaphors (*RQ3*). For *RQ3*, we focused on the two main dimensions of concreteness (Iliev and Axelrod 2017): physicality and specificity. We found that metaphors remaining in use over the time span of our corpus were both highly physical and very unspecific.

RQ1 considered attention to the topic of trade in SOU speeches over time. We found that the number of references to trade in these speeches is relatively stable, suggesting that 'trade' is a useful applied topic for diachronic analysis. While no differences in the overall use of 'trade' references were found, we did find some differences when considering specific grammatical constructions. First, we found that the use of trade as a modifier (e.g. trade deal) only came into use in the SOU corpus after the 1880s, suggesting that this grammatical usage of trade is relatively new.[16] We also find some cases of trade as a modified head noun (e.g. carrying trade and slave trade) that have only been used in the 18th and 19th centuries. Such differences suggest that the target concept of 'trade' has undergone a number of profound changes in 225 years, but that overall attention to the topic has remained relatively constant.

RQ2 asked whether the amount of TRADE metaphors changed over time. In total, 75.7 per cent of TRADE references (i.e. 849 out of 1,121) were metaphoric, which reveals that TRADE has been a topic that has been primarily discussed through metaphorical frames. Nevertheless, only the CONTAINER source domain increased in relative usage over time, mostly from the 1880s onwards. From this time, rhetoric on nation states started to include the metaphor of

comparing states to containers (Taylor 1994). Our data corroborate this hypothesis for trade discourse in SOUs.

These results primarily support perspectives proposing that economics metaphors are relatively impervious to change (Bratoz 2004; Arrese and Vara-Miguel 2016; Negro 2016). Additionally, the types of metaphors that Presidents used to discuss economic subjects have remained relatively stable. Thus, we found relatively little fundamental transformation in the framing of TRADE metaphors in SOUs over 225 years, even though the way trade occurs (i.e. by carriage, ship, truck, air, and Internet) and is measured (on hand-written balance ledgers or electronically as part of a complex financial system) has changed considerably over the past two centuries.

RQ3 asked how the meaning of TRADE metaphors changed over time. Here, we observed a number of differences. First, some metaphors have disappeared over time, such as 'suppression' metaphors from the domain of PHYSICAL OBJECTS to refer to the slave trade. After the abolition of slavery across the globe, the specific ontological referent ('slave trade') no longer existed, and these metaphors were no longer used. The close connection of these metaphors to the slave trade may have made the expression too controversial to be used in other contexts.

Second, we found a number of clear mappings for the source domains of PHYSICAL OBJECT (including BUILDING and CONTAINER), JOURNEY, and LIVING BEING. Source–target mappings were generally constructed with reference to the same elements (see Ahrens 2010). For instance, most JOURNEY metaphors emphasized economic forward motion along some path. For the source domain of LIVING BEING, we identified multiple options, such as references to antagonists or to people in need of protection. Yet within this relatively limited set, we similarly found a number of fixed connections between the source and target domains. Only for the PHYSICAL-OBJECT domain did we find a variety of different mappings. Given that this domain contains the sub-domains of BUILDING and CONTAINER, this variation may be a result of its categorical broadness.

Third, most TRADE metaphors were relatively unspecific, in that they provide few details and are ambiguous. For instance, a number of the antagonist metaphors from the LIVING-BEING domain could be read as referring to either a human or an animal antagonist. Similarly, various LIVING-BEING metaphors referring to nurture were unspecific in that they could imply references to either small children or sick people (both of whom must be nurtured). Most metaphors in our corpus were unspecific in these ways.

According to Iliev and Axelrod (2017), specificity and physicality are the two main dimensions of concreteness. All metaphors in our corpus score high on the physicality dimension, because they all describe the concept of TRADE in physical terms. For the physicality dimension, thus, our results corroborate a well-known hypothesis from CMT (Lakoff and Johnson 1980/2003) that metaphors typically make abstract concepts more concrete. By contrast, most metaphors from our corpus score relatively low on the specificity dimension. An explanation for low

specificity lies in the genre of SOU addresses, which need to cover the state of the entire USA on all relevant policy issues in a relatively short amount of words. To that end, relatively generic TRADE metaphors allow the President to discuss a large variety of different types of trade in relatively few words.

Furthermore, the combination of being high in physicality and low in specificity may be a precondition for metaphors to remain in usage for a long period of time. The physicality dimension could work to make complex and abstract topics like TRADE more tangible and provide a frame of thinking about these concepts, such as proposed by CMT. Additionally, low specificity could make the metaphor more resilient to changes in the target concept and for larger societal changes, by providing the communicator with freedom to adjust the metaphor to changing circumstances. Given that methods and measurements of trade have changed considerably over the past two centuries, the low degree of specificity in the metaphors chosen by this target domain has likely allowed for them to continue to be used. To the best of our knowledge, this hypothesis that metaphors high in physicality and low in specificity may be best suited for long-term use is a new addition to the literature. Future research may corroborate this hypothesis by focusing on a longitudinal analysis of expressions from different branches of government (e.g. legislative and judicial), in cultural contexts different from the USA or in discourse domains other than political communication (e.g. health communication and academic discourse).

Another caveat of our study is that SOUs are a very specific set of speeches. An advantage of this choice is that these speeches are highly comparable in their overall goal, thereby creating a corpus that is well suited for diachronic comparison. A downside is that the amount of speeches per year is limited to one or two. We recommend supplementing our analyses with other types of political speeches that allow for an increase of the number of words per year. Similarly, we focused on one specific concept (TRADE). After all, most economic concepts that are common today (e.g. inflation) were introduced relatively recently.[17] Future research could thus strive to identify other political topics that are similar to 'trade' in that their meaning has remained relatively constant over a longer period of time. Finally, readers should note that we found an effect of time in only one of the four source domains for which we tested (the CONTAINER domain). Future research should seek to replicate this result, to identify whether our results reflect a change that can be found in other CONTAINER metaphors (regardless of the target) or whether results are specific to the target concept of TRADE.

In sum, our study identified how trade metaphors changed over time in a corpus spanning 225 years. We found that five source domains were predominant when discussing trade: PHYSICAL OBJECT, BUILDING, CONTAINER, JOURNEY, and LIVING BEING, indicating no fundamental shift in the framings used for this concept. For one of these source domains (CONTAINER), we found a positive relation between relative frequency and time. Additionally, we found that the mappings between the source and target domains were mostly stable during this 225-year period. Finally, our analyses also suggest that the relationship

between metaphor and concreteness is not as straightforward as typically assumed (Lakoff and Johnson 1980/2003). Instead, our data suggest that metaphors that are high in physicality and low in specificity may have the greatest likelihood of remaining in use for centuries.

NOTES

1   Iliev and Axelrod (2017) use the term 'precision'. However, in the context of corpus analysis, the term 'precision' is also used to assess the quality of an information search (Saito and Rehmsmeier 2015). To prevent potential confusion, we follow the terminology of Beukeboom and Burgers (2019), who use the term 'specificity'.

2   The corpus includes the speech given by George W. Bush (43rd President) after the 9/11 terrorist attacks in 2001, as it was given to a joint session of Congress.

3   In the period 1790–2014, the USA had 44 presidents, 2 of whom never delivered an SOU address: (i) William Henry Harrison (9th President, 1841), who died 31 days into his first term, and (ii) James Garfield (20th President, 1881), who was shot within four months of assuming office and died of his injuries approximately 2 months later.

4   Sometimes presidents also summarized their SOU addresses for the general public. For consistency purposes, the corpus we used consisted entirely of addresses to Congress, whether given written or orally.

5   Any text that was not part of the official message to Congress was not included in the word count or in the analysis. This includes header information such as '4 - 4th Annual Message November 6th, 1792' or information such as budget calculations that were sometimes included as a written addendum to the address.

6   For instance, the term 'inflation' was only used 23 times in all SOU addresses until the end of the World War II (1790–1945) and 218 times in the period after the World War II (1946–2016), thus revealing an imbalanced distribution.

7   Following conventions established by Lakoff and Johnson (1980/2003), we write both source and target concepts in small capital letters.

8   In all decisions, coders first looked at the 15 words preceding and the 15 words following the use of the word 'trade'. When this passage of 31 words was unclear (e.g. it was part of a longer sentence), coders looked at the entire paragraph.

9   We also coded for the source domain of SYSTEM (Horner 2011) and included a miscellaneous category for examples not included in the other source domains. The SYSTEM category contained examples such as: 'Our goal must be a day when the *free flow of trade*, from the tip of Tierra del Fuego to the Arctic Circle, unites the people of the Western Hemisphere' (Ronald Reagan, 1988). However, as reliability for these two categories (system: κ = .49; miscellaneous: κ = .39) was too low, we do not report on these data further.

10 For a detailed explanation of using and interpreting ACF and PACF, see Tay (2017).

11 We also calculated how the percentage of TRADE metaphors in the different grammatical constructions of TRADE changed over time, using the same 5-year intervals as in the other analyses. We found no differences within two of the three grammatical constructions

(trade as a main noun: $r = -.070$, $p = .66$; trade as a modifier of a head noun: $r = .15$, $p = .46$). We did find an association between time and trade as a modified head noun ($r = .46$, $p = .004$). However, to run these analyses, we needed to have at least one case of the different grammatical constructions per time period to be able to calculate a percentage. Some grammatical constructions (e.g. trade as a modifier; trade as a modified head noun) were not used in specific time periods, leading to missing data for these time periods (as it is not possible to divide by 0) which impacts the statistical power of these specific analyses.

12 We also considered the BUILDING domain but decided against running the statistical analyses because this domain was very infrequent with only 11 observations in the entire corpus. This meant too few observations to run a statistical analysis with sufficient power. By contrast, in the corpus as a whole, we found 443 TRADE metaphors from the PHYSICAL-OBJECT domain, 227 metaphors from the LIVING-BEING domain, 87 metaphors from the JOURNEY domain, and 85 metaphors from the CONTAINER domain.

13 We checked for the party affiliation of the respective Presidents and calculated a variable of the percentage of years in each 5-year period in which a Democratic President held office, starting in 1828, the year in which the first Democratic President held office. We found no statistically significant correlations (with at least $p < .05$) for party affiliation and (i) relative number of TRADE references per 1,000 words, (ii) relative number of TRADE metaphors per 1,000 words, and (iii) percentage of metaphorical TRADE references from the source domains of PHYSICAL OBJECT, LIVING BEING, JOURNEY, and CONTAINER.

14 We also checked for differences in metaphor use and source domain use over grammatical categories (trade as head noun, modified head noun, or modifier). We found a weak association between presence of metaphor and grammatical category, $\chi^2(2) = 6.43$, $p = .040$, Cramer's $V = .07$. Inspection of residuals showed that constructions in which trade was a modifier were slightly more often literal compared to the general distribution. For grammatical category, some metaphors were mixed and could belong in two source domains. An example is the statement 'Trade and barter, no longer governed by a wild and speculative mania, rest upon a solid and substantial footing' (John Tyler, 1844), which combines elements from the source domain of PHYSICAL OBJECT ('rest upon a solid and substantial footing') and LIVING BEING ('governed by a wild and speculative mania'). Excluding such mixed cases, we found a trend between the use of source domains and grammatical category, $\chi^2(4) = 8.90$, $p = .064$, Cramer's $V = .08$. Inspection of residuals showed that constructions with trade as a head noun contained slightly more JOURNEY metaphors than expected. However, both analyses show only weak associations and should thus be interpreted with caution.

15 The basic ('literal') meaning of suppression in the 1828 Webster's dictionary is 'the act of suppressing, crushing or destroying'.

16 We found only one use of trade as a modifier prior to the 1880s, in the expression 'trade regulation' (Abraham Lincoln, 1862).

17 Other concepts, such as 'economy', which typically meant 'frugality' in the late 18th century and early 19th centuries, changed in meaning over time.

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