The news is American but our memories are…Chinese?

Cross-National Comparison of News and Memories

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Abstract
Are our memories of the world well described by the international news coverage in our country? If so, sources central to international news may also be central to international recall patterns—indeed, they may reflect an American-centric focus, given the previously proposed central U.S. position in the news marketplace. We asked people from four different nationalities (China, Israel, Switzerland, and the U.S.) to name all the countries they could think of. We also constructed a network representation of the world for each nation based on the co-occurrence pattern of countries in the news. To compare news and memories, we developed a computational model that predicts the recall order of countries based on the news networks. Consistent with previous reports, the U.S. news was central to the news networks overall. However, though national recall patterns reflected their corresponding national news sources, the Chinese news was substantially better than other news sources at predicting both individual and aggregate memories across nations. Our results suggest that news and memories are related but may also reflect biases in the way information is transferred to long-term memory—potentially biased against the transient coverage of more ‘free’ presses. We discuss possible explanations for this ‘Chinese news effect’ in relation to prominent cognitive and communications theories.

Keywords: memory, media, corpus analysis, agenda-setting theory, network analysis
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In 1898, the USS Maine was sunk in the harbor of Havana, Cuba. Two prominent New York newspapers (the New York Journal and New York World) claimed Spain at fault on the basis of limited evidence, and proceeded to report the event with incendiary language – in particular, focusing on Spain’s harsh treatment of the Cubans. This was followed by the U.S. and Spain entering the Spanish-American War, which lasted 10 weeks with a cost of approximately 14,000 lives. However, prior to the beginning of the war, the illustrator for the New York Journal, Frederic Remington – who was in Cuba – telegraphed William Randolph Hearst, the owner of the New York Journal, and reported that the conditions in Cuba were not as volatile as reported. Hearst is claimed to have responded, “You furnish the pictures, and I’ll furnish the war” (Dyal, Carpenter, & Thomas, 1996).

Though this so-called yellow journalism may not have been the primary cause of the Spanish-American war, it is nonetheless a tribute to the putative power of the media in forming our cognitive representations that Hearst’s influence in the Spanish-American war is one of the most frequently told stories in the history of journalism (Campbell, 2000). Given this potential for the media to influence our beliefs, memories, and perceptions, it is critical that we understand the relationship between the media and our collective and individual memories of the world.

This is of particular importance given the widely observed central position of U.S. news in the international news marketplace (Barnett, 2001; Chang, Himelboim, & Dong, 2009; Segev & Blondheim, 2010; Tunstall, 2008; Wu, 2000). That is, to the extent that our memories reflect the news, news sources central to the news marketplace will play a dominant role in shaping worldviews. In the present study, we address these concerns by combining perspectives from cognitive and communication sciences. Specifically, we
develop a computational model and network approach to evaluate the capacity of different news sources to predict the results of a standard memory task applied to people from different nations (“name all the countries you can think of”). Before describing this study in more detail, we first provide a brief review of the evidence concerning media, memory, and the representativeness of international news sources.

**The News and Memory**

News and memory share a complex relationship that is becoming an increasingly important component of communications research (Tenenboim-Weinblatt, 2013; Garde-Hansen, 2011; Zelizer, 2008). A dominant focus of much of this research is on the causal relationship from news to memories. This is typically framed in relation to some version of the availability heuristic (Tversky & Kahneman, 1973), which proposes that the ease of retrieval of an event is an indicator of its relative frequency in the environment and thus its importance. Research has demonstrated the availability heuristic’s effects on topics ranging from risk assessment to self-ratings on personal traits (Agans & Shaffer, 1994; Corby & Homa, 2011; Hertwig, Pachur, & Kurzenhäuser, 2005; Schwarz et al., 1991). A form of the availability heuristic specifically applied to the news is agenda-setting theory, which claims that the news influences the perceived importance of issues by repeating and emphasizing them (Kiousis, 2004; McCombs & Shaw, 1993; Scheufele & Tewksbury, 2007). For example, in a study by Wanta, Golan, and Lee (2004), people’s rankings of countries as of “vital interest” to the U.S. was found to be significantly correlated \( r = 0.57 \) with the frequency and valence of prominent network newscasts.

In another study more specifically focused on the question of causality, participants were asked to rate the importance of multiple national issues (e.g., defense capabilities and pollution) before and after viewing newscasts that highlighted these differing issues (Iyengar, Peters, & Kinder, 1982). The results demonstrated a strong effect of news exposure on participants’ subsequent perceptions of issue importance. With respect to the availability
heuristic, agenda-setting theory may therefore be interpreted as the news influencing the likelihood that social groups will make decisions based on events (e.g., “Germany: Nuclear Power Plants to Close by 2022”, 2011), by increasing the ease of recall of those events (e.g., the nuclear meltdown in Fukushima in March 2011).

Yet, the news-memory nexus is certainly not unidirectional. Together with informing and altering the views of its readers, journalists can also represent the world in ways that appeal to the reader’s pre-existing biases and interests (e.g., McCombs & Shaw, 1972; Mullainathan & Schleifer, 2005). Taken together, the above suggest a feed-forward process in which the news influences our interests and our interests in turn influence the news. This would lead one to predict a strong and detectable relationship between the news and national recall patterns, especially if the news in different countries focuses on different international content.

The Representativeness of International News Sources

There is ample evidence to suggest that news in different countries tends to focus on different content (Segev, 2010a; Segev & Blondheim, 2010). For example, Segev (2010a) found that, per news document, French news is less likely to mention the U.S. in its news relative to other European and Asian news sources, whereas countries like Israel and Russia are more likely to mention themselves. These differences are rooted, among others, in different journalistic practices. Hanitzsch (2011) used cluster analysis to identify international differences in journalistic cultures and practices. Journalists in Western countries like the U.S. and Switzerland identified most strongly with a “skeptical and critical attitude towards the government and business elites” (p. 485, Hanitzsch, 2011)—a detached watchdog style. Journalists in China, on the other hand, held views associated with what Hanitzsch (2011) called opportunist facilitators, providing positive information about the political and business leadership. A further category relevant to the present article is that of the populist disseminator, common in countries like Israel and Romania, which are associated with
attracting the widest possible audience.

These differences would seem to necessarily provide different representations of international affairs. Moreover, these journalistic practices are likely to be strongly influenced by media ownership and government oversight—with public and privately owned presses being dominantly driven by consumer preferences and state-owned presses being dominantly driven by political opportunity. As an example, according to Reporters without Borders (December, 2011), a non-profit organization that acts as a consultant to the United Nations, “China, Iran, and Eritrea continue to be the world’s biggest prisons for the media.” Along with other reports of Chinese censorship (e.g., Minemura, 2010), this would suggest that Chinese news has a different, more cloistered, view of the world than news from more putatively “free” presses.

Despite apparent differences, some recent empirical studies focusing on the flow of international news between nations suggests that news sources may have become more similar over time—providing less nationally distinctive news—and that the U.S. news appears to represent a primary source in the international news marketplace. In a longitudinal study of networks of telecommunications between 1978 and 1996, Barnett (2001) found that the overall network of news became denser (i.e., more inter-connected). This reflects an increase in the amount of shared news between nations. However, Barnett (2001) and others (Chang et al., 2009; Segev & Blondheim, 2010; Wu, 2000) have consistently found that the U.S. is at the center of these news networks, receiving the highest number of news references relative to other countries. This may indicate that the world’s news are (or “were,” according to Tunstall, 2008) American and may suggest that, of all countries, the U.S. news may also be most representative of the aggregate memory representation around the world. Indeed, to the extent that events around the world are synchronized by their presence in the international news (e.g., Dayan & Katz, 1992), the U.S. media may have a lion’s share of the global stage. In other words—to extend Tunstall’s (2008) generalization—not only may the news be
American, but our collective recall patterns of the world may be American as well—reflecting the dominance of the American representation of international affairs.

Yet, one observation speaks against this potential Americanization of world memories. Long-term memories reflect associations built in memory over repeated exposures to information. Recent investigations using cognitive memory models have shown that memories can be predicted using large text corpora, based on the principle that memory records associations between co-occurring stimuli in the external environment (Hills, Jones, & Todd, 2012; Hills, Mata, Wilke, Samanez-Larkin, 2013). Importantly, however, memories are less influenced by massed exposure than by spaced exposure. Research from cognitive psychology on human memory has consistently demonstrated that spaced training—providing ample time between information exposure—leads to more stable long-term associative representations between items in memory than does massed exposure—with repetitive information exposure compacted into short intervals (e.g., Ebbinghaus, 1885; Bjork, 1988; Cepeda, Pashler, Vul, Wixted, & Rohrer, 2006). With respect to the news, news items that revisit topics over a period of months or years would better reflect spaced-training paradigms, whereas news items that present back-to-back articles over a period of days but then fail to revisit the topic again would reflect massed-training paradigms.

News in more autonomous (i.e., free) information markets, like Western news sources, may reflect environments where the news has a greater tendency to follow short-term fashions—similar to massed information presentation. If this is the case, we may expect the U.S. news to be a poor predictor of collective international recall patterns, because long-term memories may be least sensitive to transient world events. On the other hand, less free presses, like the Chinese news may tend to report more systematically on status-quo international relationships, which appeal to existing power centers (Hanitzsch, 2011), and thus reflect long-standing international relationships. Though non-Chinese readers are less likely to see this news, it may nonetheless correspond better to what people recall over years.
The Current Study

The current study addresses these issues by comparing national news with national recall patterns across countries that differ in terms of proposed international news role and press freedom. Specifically, we chose China, Switzerland, Israel, and the United States in order to meet the following criteria: 1) in order to capture the proposed dominant source in the news marketplace (i.e., the U.S. news, Segev & Blondheim, 2010; Tunstall 2008), 2) in order to capture an extreme alternative to the U.S. in terms of press freedom and journalistic style, but with a large readership (i.e., China), and 3) to provide two sources with less extreme positions in the world news marketplace (i.e., Israel and Switzerland). These countries also reflect the broad differences in journalistic styles, as discussed above (Hanitzsch, 2011). Further, we chose these countries because they were geographically isolated from one another and would therefore be less likely to cover similar local news events.

Based on the literature cited above, we provide two alternative sets of hypotheses: First, to the extent that agenda-setting theory is a dominant factor in explaining memories, peoples’ memories for country names (a ubiquitous piece of information provided in essentially all international news coverage) will be best predicted by the national news to which people are most frequently exposed. Second, we predict that the U.S. news will be central to the news marketplace and that—following on the first hypothesis—if national news predicts national recall patterns, then U.S. news will best predict the recall patterns of all nationalities. However, if news and memories represent different kinds of information—each obeying different kinds of biases—then we predict that long-term memories of country names may be best predicted by a less transient (i.e., less free) press (i.e., the Chinese news). Moreover, it also follows from this prediction that national news sources will better correlate with other national news sources than with corresponding national recall patterns, which will
best correlate with one another. To test these hypotheses we examine the statistical relationships between the network co-occurrence structure of news and memories.

**Method**

**Participants**

We collected online data from 131 participants from China, the U.S., Israel, and the German-speaking part of Switzerland. Fifteen participants dropped out at the beginning of the process, indicating an 89% completion rate. All participants were volunteers, recruited from university student populations using flyers and word-of-mouth; each was entered to win an Ipod Nano. The average age of all participants was 23.3 years old (Switzerland = 23.22, China = 23.79, Israel = 25 and the U.S. = 21.2). The reported range of media use ranged from less than 1 hour per day (9%), 1-3 hours a day (46%), 3-6 hours a day (32%), and greater than 6 hours a day (13%). The preferred media was the internet (93.6%), but also encompassed newspapers (66.7%) and television (42.8%). Over all participants, 63.5% reported using media in their own language only. There was no significant difference in terms of news consumption. A one-way ANOVA shows that the mean differences in news consumption are not significant across nations with $F(3, 122) = 2.565, p = .058$.

**Procedure**

Using an online form, participants were first asked demographic information and then to type all the country names they could recall from their memory in their own language, with no time limit. The task was online from October 27, 2010 to March 31, 2011. We registered the IP of users in order to avoid multiple submissions. Country names were corrected for spelling by an automated computer program. Names that could not be identified as a known country were removed. In total, all participants recalled together $n = 5,524$ country-names, representing $n = 1,855$ names recalled by the 36 Swiss participants, $n = 1,079$ names recalled
by the 29 Chinese participants, \( n = 1,292 \) names recalled by the 31 Israeli participants, and \( n = 1,298 \) names recalled by the 30 U.S. participants.

**News Collection and Analysis**

News items were collected from popular news sites in the four target countries. The popularity of news sites was determined using statistics provided by the World Association of Newspapers, the State of the News Media in 2010, Nielsen online, and IVW (Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e.V.). Two of the top three news sources overall from each country were used, based on availability. The final list of news sources included: CNN and the New York Times (for the U.S.), TagesAnzeiger and NZZ (for Switzerland), the People Daily and Sina (for China), and Ynet and Haaretz (for Israel). These were supplemented by the Google News editions created for each country, which reports hundreds of news sources in multiple languages ranked automatically by traffic and other relevant factors (see Segev, 2010b).

In each of these popular news sites all textual news items from five main topical categories were collected every other day using RSS feeds, including “top news”, “world news”, “business and economy”, “technology”, and “entertainment and culture”—categories common to all news sources. The news data was sampled over a period of 18 months between April 1, 2010 and October 31, 2011 at 12:00 UTC. In total, 139,729 news documents from 12 news sites (3 for each country) were collected, including data, and countries mentioned. A database of 195 country names in four different languages was built based on the list of country names available from the International Organization for Standardization. Native-speakers translated country names into all languages, identifying common and alternative names (e.g., “USA” and “United States of America”), as well as excluding ambiguous names. In addition, for comparison with a spatial distribution of countries on the earth, we also produced a matrix for the 195 countries indicating how distant each pair of countries is across the surface of the earth based on nearest border.
here, the probe cue is the previously-generated item, \( Q_{t}=I_{t-1} \), and \( A(Q, I)=S(I_{t-1}, I) \), with \( S(I_{t-1}, I) \) equal to the co-occurrence of the two countries for a given news source.

As an example, if Australia occurred with the UK 400 times for a news source, then \( S(“Australia”, “UK”) = 400 \). Thus, the two retrieval structures (representing frequency and co-occurrence in the news) are each a matrix providing the retrieval strength for each remaining country in relation to the cue.\(^{ii}\)

Using SAM, we determined the best-fitting saliency parameter, \( \beta_j \), for each set of cues and for each participant by minimizing the log likelihood function (see Lewandowsky & Farrell, 2011). This allowed us to compute the overall likelihood of each participant’s pattern of recall based on the news. We compared several models using frequency and co-occurrence in the news individually and combined. The best model for all countries was the combined model, which is the model we report here.

**Results**

The mean number of countries produced over all participants was 47.2 (SD = 27.24). An ANOVA using nationality to predict the number of countries recalled revealed a significant difference between the four nationalities (\( F(3, 113) = 3.159, p = .03 \)). Participants from Switzerland produced the most countries (\( M = 57.9 \)), then the U.S. (\( M = 46.3 \)), Israel (\( M = 46.1 \)), and China (\( M = 37.2 \)). Where noted below, we controlled for these differences by including a covariate for total number of items recalled.\(^{iii}\)

**Do national news sources predict national recall patterns?**

Results of the model fits using the improvement in the Bayesian Information Criteria (Lewandowsky & Farrell, 2011) relative to a random model where all countries are equally likely are presented in Figure 1. We also present the model fits to news sources separated into six month periods of before, during, and after the recall data collection period. The results are suggestive of a national news-memory relationship. Note that national recall patterns are, in all but one case (Switzerland, -6 months prior to the study), either best predicted by their own national news or by Chinese news.\(^{iv}\) Using a linear mixed effects ANOVA with random
effects for period and participant (Pinheiro & Bates, 2004), we predicted improvement in model fit based on participant nationality and news nationality, after including a covariate for total number of countries recalled (the covariate for number of countries recalled was significant, $F(1, 112) = 774.3, p < .001$, supporting its inclusion in the analysis). The results indicate a significant main effect of participant nationality ($F(3, 112) = 6.39, p < .001$), a significant main effect of news nationality ($F(3, 1275) = 282.97, p < .001$), and a significant interaction between the two ($F(9, 1275) = 51.68, p < .001$). The main effect for news nationality is indicative of the Chinese news apparent superiority in predictive power. The main effect of participants reflects that different country’s participants are fit to varying degrees of improvement by news sources. However, most importantly, the interaction indicates that the predictive power of a news source depends on the nationality of the individuals being predicted. Consistent with agenda-setting theory and the larger news-memory relationship, these results support the notion that national recall patterns and national news sources are strongly correlated.
Figure 1. Model fits predicting order of recall for each individual from each nationality using different national news sources. The figure also shows the fits for three six-month periods, prior-to, during, and following the data collection period. The y-axis indicates the BIC improvement over a random model.

**What news sources best reflect the collective international recall patterns?**

To address this question, we used each individual news source to predict recall data from all nations collectively. Surprisingly, the best predicting news source over all nationalities was the Chinese news (Figure 2). Individual t-tests comparing Chinese news with each other country’s news all produce $p < .001$, favoring the China news. This provides evidence that the Chinese news best reflects the order of country memory production among the news sources we examined. This further indicates that despite the statistically significant news-memory relationships apparent in Figure 1, collective memories across all nations are significantly more similar to Chinese news than to other nations’ news.

![Figure 2. The performance of the different national news sources to predict the collective memories across all nations. Error bars are SEM.](image-url)
Is the above Chinese news effect a function of the Chinese news best reflecting the spatial proximities of countries on the earth? To test this, we computed the product-moment correlation for each news network and the pairwise spatial distribution of countries on the earth. The countries with the best correlations between news co-mentions and spatial distance across the earth were the U.S. news ($\beta=.050$, $p<.001$) and the Israeli news ($\beta=.050$, $p<.001$), followed by the Swiss news ($\beta=.045$, $p<.001$) and then the Chinese news ($\beta=.035$, $p<.001$). Thus, the Chinese news does not gain its predictive advantage from best reflecting the spatial distribution of countries on the earth.

**How representative are national news sources and national recall patterns?**

One interpretation of the above results is that the Chinese news may have a privileged central position in the news marketplace. A strict news-memory mapping (e.g., a strong form of agenda-setting theory) would predict this, allowing Chinese news to best reflect international recall patterns. Alternatively, as we note in the introduction, long-term memories may share distinct biases against information that is transient and massed—typical of much Western contemporary news. To investigate the above results further and to provide an additional measure of similarity between recall and the news, we compared collective networks of recall with news co-occurrence networks. Networks of recall were produced for each nationality by producing a transition matrix, in which cells in the matrix indicate the number of times that one country followed another country in the order of productions collected over all participants from that nation. We also computed two additional networks combining data for all participants of all nationalities and the news of all nationalities respectively. Using these ten networks—reflecting both recall and news networks—we computed the product-moment correlation for each pair of networks, and used the inverse of the correlations to provide pairwise distances for a multi-dimensional scaling (MDS). This allowed us to generate a visual representation of the relative distances between the different network representations.
Figure 3 presents the resulting MDS visualization, showing two clear patterns. First, recall networks cluster together separately from news networks, indicating that news is best correlated with other news while recall patterns are best correlated with other recall patterns. A statistical test of shared information supports the visual conclusion: an ANOVA predicting network correlations using a factor indicating either shared nationality (e.g., Israeli news with Israeli recall) or shared information (e.g., Israeli news with Chinese news) was significant ($F(1,14) = 4.70, p < .05$), indicating that similar kinds of information are more highly correlated ($M = .42$) than non-similar kinds of information ($M = .22$).

Second, consistent with the results of the model predictions, the Chinese news was closer to the recall networks than the other news sources. An ANOVA using a factor representing national news sources to predict the correlations between co-occurrence in the

Figure 3. The multi-dimensional scaling of national news networks and networks of collective national recall. The scaling is based on one over the correlations, providing a measure of distance between different networks.
news and co-occurrence in the recall networks produced a significant difference \( F(3,12) = 6.57, p < .01 \), with Chinese news having the highest mean correlation with the recall networks \( M = .30 \), followed by the U.S. \( M = .23 \), Swiss \( M = .19 \), and Israel news \( M = .12 \). This supports the claim that our collective memories are best predicted by Chinese news.

**Is the news still American?**

One question remains: Does the U.S. news show the highest degree of similarity with other news sources? Our results suggest that it does. Consistent with previous work (Segev & Blondheim, 2010; Tunstall, 2008), U.S. news had the highest mean correlation with other news sources overall: U.S. \( M = .59 \), Switzerland \( M = .49 \), China \( M = .44 \), and Israel \( M = .31 \). Though this relationship is not statistically significant—an ANOVA predicting the correlations between news sources based on nationality was not significant \( F(3,8) = 1.25, p = .35 \)—it is nonetheless consistent with previous claims that the U.S. news has a central position in the news marketplace. In other words, the best predictor of world news is the U.S. news.

**Discussion**

Our memories of the world often reflect representations of secondary sources such as the news. Because news from different nations may represent different national interests and journalistic practices, this may in turn suggest that news differentially aligns with recall, depending on the nationality of those doing the recalling—a prediction consistent with agenda-setting theory. The present study makes four contributions regarding the relationship between news and memory. First, we found that a nation’s news is highly correlated with the recall patterns of its nationals—consistent with agenda-setting theory and more generally with a strong news-memory relationship. To our knowledge, this is the first cross-national statistical account of the correlation between news and recall. Second, our results support the notion that U.S. news has a central position in the news marketplace (Segev & Blondheim,
However, third, our results suggest that recall patterns of county names—across the nationalities we examine—are best predicted by the Chinese news. Importantly, this indicates that the centrality of the U.S. in the news marketplace is not necessarily reflected in people’s cognitive representations—an important distinction that we discuss further below. This also suggests that not all news sources may be equivalent when it comes to predicting world memories and that, indeed, news and memories may represent different kinds of information. Fourth, and consistent with the above, we found that networks of recall patterns and news sources clustered into categories associated not with nationality, but with information type (news with news and memories with memories). We discuss each of these findings further below.

Using a cognitive memory model, our results showed that national news did favorably predict the order in which countries were recalled by individuals who were most likely to have read that (or a related) national news source. This suggests cognitive representations based not only on frequency of encounter in the environment (e.g., Anderson & Schooler, 1991), but also on the associative structure of items in relation to one another (e.g., Hills & Pachur, 2012; Hills et al., 2012). More importantly, these representations are shown to reflect their nation of origin. Past research has demonstrated a predictive relationship between global sources of information and the mind. For example, print news and textbooks were both found to be predictors of human memory and inference on topics ranging from lexical priming to estimates of human beliefs about causes of death (Hertwig, Pachur, & Kurzenhäuser, 2005; Jones & Mewhort, 2007; Slovic, Fischhoff, & Lichtenstein, 1982). Studies also indicate that individuals of different nationalities perceive the world differently (reviewed in Nisbett, 2003). The present research demonstrates an important common link between these two lines of research, showing that insights into cognitive representations provided by large text corpora may also reflect national differences in the way we perceive and represent the world. Though consistent with agenda-setting theory, this represents a further contribution by
indicating that national cognitive differences may be available not only from experimental paradigms, but also from national news sources.

However, our results also indicate that the above conclusion must be met with a degree of caution. Memories are likely to be influenced by a host of socio-cultural factors separate from the media. National differences between news and recall are not simply a matter of news directly mapping onto memory. Rather, the best predictor of information from a given source (i.e., news or memory) appears to be information from the same source, regardless of nationality. In other words, news and memories are different kinds of things and they appear to obey different kinds of principles (see Segev & Hills, in press; see also Baden, 2010).

Thus, while national news sources are likely to be entwined with the underlying cognitive representations of their nationals, transitions from news to memory are likely to be met with additional constraints. The difference between spaced and massed memory offers one explanation to support the relationship between memory and long-term international relationships in the news. As an example, U.S. and Israel are commonly found together in the news—representing their long-standing political associations—and this connection was represented in all of our news networks. However, observations that Libya shared key similarities with Iraq have been fairly transient, but were especially prominent in the U.S. news during 2011. This relationship went unmentioned in the Chinese news. These represent only a few examples consistent with our broader findings. However, future communications and psychology research will be needed to establish to what extent the spaced vs. massed training effects explain news-memory relationships more generally.

Perhaps the most surprising finding of the present study was that the Chinese news was best aligned with the recall patterns across all nations. Given the unlikely explanation that Chinese news has some secret access to international memories, this implies the presence of a third variable that causes both, independently of one another. Though we do not have a definitive explanation for this ‘Chinese news effect’, it is important to recognize that,
whatever the explanation, it cannot be a factor that—within nations—is likely to influence both news and memories equally (e.g., organized schooling). A potential explanation is suggested by the observation that memories and the news appear to share different phenomenological characteristics. That is, as suggested above, news sources are likely to be differentially sensitive to international events. It may be that Chinese news is less sensitive to world events and thus better reflects long-term memories. In partial support of this hypothesis, the network level correlations between the first and last six months of news we collected were the highest for China (M=.92) and Israel (M=.93), followed by the U.S. (M=.74) and Switzerland (.49); this can also be seen by comparing the first and last six months for each nation’s news in Figure 1. This indicates that the Chinese and Israeli news may be the slowest to adapt to changes in international events. Moreover, the Chinese news networks have the highest number of co-occurring pairs of countries in their news (2448), followed by Israel (1588), the U.S. (848), and Switzerland (604). Combined, these two findings suggest that Chinese news is both resilient to short-term changes in world events and may also provide a more holistic representation of international relationships.

Consistent with this holistic representation, the ‘Chinese news effect’ may also derive from more general cultural differences in environmental perception. In a study comparing Chinese and American students, Ji, Peng, and Nisbett (2000) found that Chinese were more attentive to relationships in the environment than Americans, while Americans were more attentive to certain objects in the environment. If national news is aligned with the cognitive biases of its nationals, then Ji and colleagues (2000) result is consistent with our observation that Chinese news is more reflective of world memory. That is, because Chinese news, more than other nations, reports interactions among nations, the Chinese news may be a more objective indicator of the world’s inter-relations, and consequently, be a better predictor of the world’s collective memory.
The Chinese news effect may also involve international differences in journalistic cultures and practices. As described above, the journalistic style of Chinese journalists mainly reflects that of opportunistic facilitators while those of the US and Switzerland dominantly reflected that of detached watchdogs, with Israel represented mainly by populist disseminators (Hanitzsch, 2011). This explains, to some extent, why countries experiencing demonstrations and social instabilities during the Arab Spring (such as Libya) were highly mentioned in American and Swiss news, but less so in Chinese news. It is very reasonable that Chinese journalists, that are more loyal toward power centers, are less likely to focus on social revolutions. Countries experiencing the Arab Spring events were also much less likely to be recalled in the memory of people from all nationalities (see also Segev & Hills, in press).

Because Israeli news attempts to appeal to its readers, reporting on the Arab Spring events in Israel appeals to local audiences with regional developments that may threaten their own security. This is particularly interesting in light of the much higher self-reference and regional focus found on the Israeli news (Segev, 2010; Segev & Blondhein, 2010). Being highly focused on regional affairs, also explains the lower correlation we found between the Israeli news and the recall networks of all other nationalities.

The present work has several limitations. First, our recall data reflects a single point in time (one six month period)—a potential problem with any news analysis. Though our news data from six months before and after our recall study support our overall findings, our results may not generalize to other periods of news coverage. Future work will be needed to establish how memories of the world and news coverage change over longer periods of time. Our work is also limited to a participant population representing but a small fraction of the world population and may not generalize to all parts of the world. Indeed, other news sources besides the Chinese news may better predict aggregated world memory (e.g., our memories may be best predicted by the North Korean news), but we were naturally limited in our ability
to cover all news sources. Nonetheless, our general results do not appear to reflect statistical artifacts of using specific news sources—as we report in the methods, using smaller subsets of the news controlling for country mentions produced the same results that we present here. Moreover, our statistical effects strongly support a correlation with the Chinese news—one that held across all nations and is highly unlikely to have occurred by chance. Our work is also limited in that it is based on recall of countries. We chose countries because they are mentioned in almost every international news article. However, country names necessarily fall short of a complete description of the interface between news and memory. Finally, the news coverage we collected represents a statistical average of what participants might have seen and thus may not reflect what participants actually experienced. Moreover, memories are likely to be influenced by countless other stimuli besides the news and our analysis is necessarily coarse due to its inability to control for individual level interactions with the media. Collecting such data represents a challenging task, but future research—possibly in the laboratory—will be needed to establish how direct experience with the news influences memory.

In sum, our results support a news-memory relationship, but also point to an apparent separation between how our news and our memories represent the world. Consistent with much previous work, we found that the U.S. news was central to the news networks we examined, supporting the notion that the news is arguably still American. However, our memories appear to be better predicted by the Chinese news, which we suggest is a likely consequence of memory biases discussed in the psychological literature. In principle, if this is due to the transient nature of more ‘free’ presses, then more transient presses should more generally be less representative of long-term memories within nations—a prediction for future research.
References


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Notes

1 The news data we used is described further in Segev & Hills (in press) and can be accessed online at http://www2.warwick.ac.uk/fac/sci/psych/people/academic/thills/thills/networkdata.xls

2 SAM, as proposed by Raaijmakers and Shiffrin (1981), uses sampling-with-replacement, while here we use sampling-without-replacement (see also Hills & Pachur, 2012; Hills et al., 2012). None of our conclusions hinge on this assumption.

3 The main conclusions reported are not dependent on this covariate.

4 A sign-test indicates that the national news being in the better half of the predictions for all countries across all time points is extremely unlikely by chance alone ($p < .001$).

5 We also analyzed an evenly distributed sampling of exactly 500 documents for each nation over all news sources, and an evenly distributed sampling of 80 documents from each nations’ Google News. Despite this large reduction in data, the qualitative pattern of results remained the same as those reported for the entire data set—Chinese news consistently predicted more individuals’ patterns of recall than any other news source.