The group-sphere model of international news flow: A cross-national comparison of

news sites

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Abstract

Why are some countries mentioned very frequently in international news while other

are not? Seeking to improve previous explanations in the literature, this study employs

a large corpus of news sites in 11 countries and 10 languages over a three-year period.

A systematic computer-driven analysis revealed a similar pattern common to

international news in all countries. The best explanation for the prominence of a

foreign country in the news included variables from three *groups* (national traits,

relatedness, and events), each representing different *spheres* (economic, social, and

political) respectively. The conceptual contribution and empirical implications for

future studies are discussed.

Keywords: International news, news flow theory, country prominence, news sites,

cross-national comparison

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Why are some countries more newsworthy than others? Over the years, scholars have

studied the relationship between the news prominence of a country and its physical;

economic; political; social; and cultural traits, such as its size or economic power. It

has been widely accepted that international news in different countries and languages

is fundamentally different (Kayser, 1953; Gerbner and Marvanyi, 1977; Segev, 2010;

Segev and Hills, 2013; Wilke et al., 2012), reflecting local interests and agendas. It

has also been argued that the presence or absence of other countries in the news has

further implications on decision-making (Hawkins, 2008) and on general public

opinion (Wanta et al., 2004).

   While previous studies largely agree on the most important determinants of a

country's news worthiness, this paper systematically collects these various factors in

order to offer a broad comparative analysis of news sites from individual nations. It

then uses a computer algorithm to find all combinations of variables and suggests the

best-fit models to separately explain the prominence of foreign countries in the news

of each nation. A prevalent pattern was observed in the news from all countries: A

similar combination of variables taken from different groups and spheres as detailed

below were found to be very instrumental in explaining the prominence of countries.

Current news-flow theory

The different ways in which international information was reported and disseminated

worldwide was already attracting academic attention in the 1950s (International Press

Institute, 1953; UNESCO, 1954). Theories attempting to explain the news-worthiness

of certain issues and actors soon emerged (Galtung and Ruge, 1965; Ostgaard, 1965).

These theories further stimulated a growing body of empirical research to identify the

main determinants of the international news flow (Robinson and Sparkes, 1976;

Rosengren, 1970).

Today it is widely accepted that the prominence of a foreign country in the

news is attributed to three *groups* of variables: (a) national traits (e.g., the size and

power of the foreign country); (b) relatedness, namely proximity to that foreign

country (e.g., in terms of geography or demography); and (c) events (e.g., natural

disasters, wars, conflict, or local protests) (Golan and Wanta, 2003; Segev, 2015,

Sheafer et al., 2013; Shoemaker et al., 1991; Wu, 2000). While national trait variables

can explain the similar focus of international news on global actors, such as the US,

relatedness variables explain their different regional focus. Event-oriented variables

can explain both the regional and global focus based on the extent of the event and its

relevance to the reporting country.

National traits

Variables of this group often measure the size of a country and its economic and

political power. Following Wallerstein's (1974) World System Theory (WST), Chang

(1998) classified states as core, semi-peripheral, or peripheral, and found that core-

countries get much greater news attention than semi-peripheral and peripheral

countries. Similarly, Galtung and Ruge (1965) stressed the significance of news

originating in elite nations among the selection criteria. The economic power of a

country was found to be a particularly important determinant of its news prominence

(Ishii, 1996; Kim and Barnett, 1996; Robinson and Sparkes, 1976; Segev, 2015;

Segev and Blondheim, 2013a; Wu, 2000, 2007). Military power is another important

indicator for locating countries on that divide (Shenhav et al., 2012), followed by population size (Charles et al., 1979; Dupree, 1971; Rosengren, 1977).

Relatedness

The second group of variables measures the economic, political, social, and cultural proximity between a reporting and a reported country. It corresponds with Galtung and Ruge's (1965) concept of 'meaningfulness' or Harcup and O'Neill's (2001) 'relevance.' It was found, for example, that bilateral trade is a strong predictor of mutual newsworthiness of two countries (Charles et al., 1979; Kariel and Rosenvall, 1983; Rosengren, 1977, Segev and Blondheim, 2013a; Wu, 2000). Geographic proximity (Cohen, 2013; Dupree, 1971; Galtung and Ruge, 1965; Wilke et al., 2012) and cultural proximity, which often refers to ethnic similarity (Shoemaker et al., 1991), as well as immigration, travel, and shared languages (Chang et al., 1987; Kariel and Rosenvall, 1983), were also found to be determinants of international news coverage.

Events

The third group of variables measures the deviance of a country, including involvement in conflicts (Golan and Wanta, 2003; Segev, 2015), as well as political, economic, and social changes (Chang et al. 1987; Shoemaker et al., 1986; 1991). Natural and human disasters, which have become more common, global, and newsworthy around the world (Pantti et al., 2012) are also included in this group. Events correspond with Galtung and Ruge's (1965) concepts of 'threshold' and 'unexpectedness,' and with Harcup and O'Neill's (2001) 'magnitude' and 'surprise.' Social media increasingly play a role in the global spread of deviant events and their coverage in traditional news outlets, enhancing the news prominence of more peripheral countries. The social uprisings in the Middle East, for example,

demonstrate that smaller and less powerful countries such as Tunisia and Syria can get very high news attention worldwide, at least for a time, due to their provision of outstanding news events. Natural disasters such as a tsunami or earthquake affecting some countries underscore the same point.

As was found by previous studies, variables of each group can be taken from different *spheres*. Thus, for example, variables of the national trait group could measure economic, political, and military power, or the population and geography of a country. Variables of the relatedness group could similarly measure economic, social, cultural, or geographic proximity between countries. Finally, variables of the event group could measure the political, economic, social, or geographic deviance of a country. Yet, most of the studies mentioned above did not systematically operationalize variables using this group-sphere division to explain the news prominence of countries.

Previous methods of analysis

News flow studies share a similar goal, that is, to explain the newsworthiness of countries, but they differ greatly in terms of the period of observation, number of countries in focus, operationalization of determinants, and methods of analysis. Table 1 summarizes some of the representative studies on international news flow and the main methods employed to understand the determinants of country prominence in the news. While early studies (Robinson and Sparkes, 1976; Rosengren, 1977; Shoemaker et al. 1986, 1991) mainly examined correlations between the news prominence of countries and their respective attributes, more recent studies have employed multiple linear regressions in order to further understand the relationship between the determinants (Segev, 2015; Wu, 2000, 2007).

Similarly, while most studies focused on the news in one or two countries (Golan and Wanta, 2003; Ishii, 1998; Robinson and Sparkes, 1976; Rosengren, 1977; Shoemaker et al., 1986, 1991; Wu, 2007), many fewer studies attempted to unveil the larger international picture (Wu, 2000; Segev, 2015). Most importantly, as noted earlier by Wu (2000), none of the studies mentioned above attempted to construct a comprehensive theoretical framework based on their empirical findings.

[Table 1 about here]

As can be seen from Table 1, Wu's (2000) study was the first to offer a great variety of news-flow determinants and empirically test them in a large number of countries. In order to explain the news prominence of countries, he studied the international news section of newspapers from 38 countries. He used multiple regression models for each country individually, and found that trade volume with the reporting country and the number of international news agencies are the strongest predictors of countries' news prominence. Additionally, when combining the data from newspapers of all 38 countries, he found that the US was by far the most prominent country, followed by France, the UK, Russia, and China. In other words, it was found that the economic power of a country was a particularly strong predictor of its news prominence.

However, in order to achieve a large sample of countries by manually coding country mentions, Wu's (2000) study was limited to only two weeks of news coverage. Additionally, his explaining variables were taken from the first and second groups only, national trait and relatedness, without taking into account the crucial factors of the event group (such as international or national conflicts or natural disasters). In a later study, Wu (2007) compared news-flow determinants in print, broadcast, and online news in the US alone. He found that online news was generally

comparable to print and broadcast news, and could be explained by similar determinants.

Segev (2015) followed this path when studying the international news flow in various news sites around the world. In line with Wu (2007), he found that news-site content could be equally explained by similar determinants. He went, however, a step further by operationalizing news flow determinant from the event group, and was among the first (see also Segev and Blondheim, 2013a) to systematically choose variables from various spheres. His sample included news sites from various countries that were all aggregated into one composite measurement of news prominence. This approach indeed provided one robust model to explain the newsworthiness of countries, but did not allow cross-national comparison.

These limitations are addressed in the following analysis. It uses a much larger pool of variables taken from all three groups (national traits, relatedness and events) and spheres (economic, political, social, and geographic). Moreover, many of the limitations of manual coding are addressed when automatically mining online news and exploiting computation power. This is particularly relevant in order to achieve a much larger sample of news items from many countries over a longer period, but also in order to automatically calculate all possible combinations of variables in a multiple linear regression model.

Following the conclusive findings of previous studies (Ishii, 1996; Kim and Barnett, 1996; Robinson and Sparkes, 1976; Segev and Blondheim, 2013a; Segev and Hills, 2013; Wu, 2000, 2007), the first hypothesis is that:

H1. The economic power of a country will be the most significant factor in its news prominence in most countries.

Additionally, in line with the general theory and findings of previous studies (Segev, 2015) it is expected that:

H2. A composition of determinants from all three theoretical groups will provide the best explanation for news prominence in most countries.

In order to address H1, the most relevant variables in each country were evaluated by testing the correlation between country news prominence and the respective predicting variables in each country. In order to address H2, all possible regression models were tested in combinations of two, three, and four variables in order to identify the models with the highest explanatory power. This was carried out for the news in each country individually. Finally, the multicollinearity within variables was further examined, and one most robust model was chosen to represent the best explanation of the news prominence in each country.

Methods

News collection and analysis

The data analysed in this study were collected from a variety of news sites in 11 different countries (China, Egypt, France, Germany, Iran, Israel, Japan, Russia, Spain, the UK, the US). These countries were selected on the basis of several considerations. First, countries with a large number of online users were chosen, since they often act as cultural and media centres for the smaller countries in their peripheries (Tunstall, 2008). Applied to the internet, this factor should reflect the popularity of the language used in the country (i.e., the most popular online languages such as Arabic, Chinese, English, French, German, Japanese, and Spanish were preferred).

Second, economically leading countries were chosen. As the previous studies surveyed above suggest, a combination of economic, political, and cultural factors

contribute to their news prominence. Hence, analysis of this kind should particularly include countries with a high Gross Domestic Product (GDP) such as China, France, Germany, Japan, the UK, and the US. Finally, when addressing the question of news prominence, previous studies displayed the particularly high news prominence of Middle Eastern countries (Segev and Blondheim, 2013b). News sites from Egypt, Iran, and Israel (in Arabic, Persian, and Hebrew respectively) were therefore included, as they represent prominent geopolitical centres of that region.

In each of the countries selected for analysis, three popular news sites were chosen for tracking. Two of them were popular and well-established news sources, such as the *New York Times* in the US or the *BBC* in the UK. When available, the third news source was the *Google News* site of each country, a news aggregator of several hundreds and sometimes thousands of popular country-specific news sources. The popularity of news sites was determined by cross referencing of several indicators and sources, including the recent statistics provided by the *World Association of Newspapers*,[i] the *State of the News Media*,[ii] Nielsen online,[iii] and Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e.V. (*IVW*). The list of popular news sites was further supported and validated by online tools such as *Alexa* and *Google Trends*.

In each news source, five main topical categories were observed, including 'top news,' 'world news,' 'business and economy,' 'technology,' and 'entertainment and culture.' These categories were chosen to capture the broader context of international news coverage including the political, economic, social, and cultural aspects. Additionally, these categories were common to all news-sites and thus enabled a cross-national comparison. Although 'sport' is an important and popular category, it was not systematically available in all news sites during the first years of

the sampling period. Some of the 'soft' aspect of international news was therefore captured by the larger 'entertainment and culture' category.

The data of each of the chosen news sites was collected based on its RSS feeds if available, or by direct web-mining of the text in each news category every other day over a period of three years between February 1, 2009 and January 31, 2012 at 12:00 UTC. In total, 983,741 news items from 33 news sites were collected and analysed. It is important to note that these news items were not a random sample, but rather the entire collection of news items that appeared in the RSS feeds of the chosen news sites during the three-year period. Table 2 summarizes the list of countries and news sites used for the analysis as well as the number of news items provided by each.

[Table 2 here]

For each news item the date, title, content, category, and source were automatically identified and documented. The title of each news item and its content were used to extract the countries mentioned in it. For this purpose, a database of 195 country names in 10 different languages was built.[iv] Several native-speaker research assistants were employed to translate country names into these languages. For each country name, the research assistants were asked to provide all the common names and alternative names (e.g. 'United States,' 'USA,' and so on). Then they were asked to omit all alternative country names that might be ambiguous and therefore yield irrelevant search results.

On the basis of this list, the software could automatically identify what countries were mentioned in each news item. A validation process was carried out by randomly choosing 100 news items and manually coding the mentioned countries. There was 78% of agreement between the human coder and the software. This was mainly since the software counts only nouns (such as 'the US' or 'USA'), while

human coders also included adjectives (such as 'American'). Including nationalities would, however, reduce the validity of the cross-language comparison due to divergent grammatical rules in different languages.

The number of news items mentioning each country was further compared to the number of words in each news item mentioning the countries. This was done to study whether the frequency of country mentions corresponds with the news item length. It was found that the two variables were very significantly correlated (Pearson r between .98 and 1 for news in all countries). Previous studies (Segev, 2010, 2015; Segev and Blondheim, 2013a; Segev, Sheafer, and Shenhav, 2013) further showed that focusing on country name mentions in a high volume of news items provides a very good proxy of the actual attention a country gives to another in its news outlets.

The dependent variable, country prominence, was calculated for the news in each country based on the percentage of news items that mentioned a country out of the total news items that mentioned country names. For this purpose, self-reporting of country names was omitted, thus American news items that mentioned the US or Chinese news items that mentioned China were not included.

A possible caveat is that new sites within each country may vary greatly in terms of their international scope. This could especially be the case when comparing *Google News*, an aggregator that automatically selects news items, with other news sources that employ human editors. However, a Spearman test showed a very high correlation between the country rankings in *Google News* and that of other news sites of the same county (ranging from $r = .836$, $p < .01$ in Russia to $r = .907$, $p < .01$ in the US and France). The country-ranking correlations between news sites and *Google News* from different countries were significantly lower (A Fisher z-transformation indicated significant differences between the two with $p < .01$). In other words, the

country prominence and ranking in *Google News* was very similarly to that of other news sites from the same country.

News-flow determinants

A series of political, economic, social, and geographic indicators was gathered based on the three groups of variables (i.e., national traits, relatedness, and events) suggested by the literature surveyed above on international news flow. Although some studies utilized intra-media variables (Rosengren, 1070), such as the presence of international news agencies (Wu, 2000), the current analysis deliberately focused on variables that are external to and could affect the communication sphere. The main purpose was therefore to explore to what extent external factors taken from all other spheres (politics, economy, society, and geography) could explain the communication sphere.

The initial list consisted of more than 50 variables (including various measurements of conflict intensity, GDP per capita, Gini coefficient, bilateral tourism, common languages, percentage of English speakers, press freedom, human rights indicators, democracy index, life expectancy, crime rate, death rate from violence, literacy rate, and colonial history), but the final 21 variables found to be the most significantly correlated with the news prominence of countries are reported here:

National trait variables

CINC (political). The Composite Index of National Capability developed by Singer et al. (1972) is a comprehensive index for the general power of a country based on its population, urban population, iron and steel production, energy consumption, military personnel, and military expenditure. The latest CINC scores are from 2007 (http://correlatesofwar.org).

Military capability (political). Based on a qualitative assessment of the Economist Intelligence Unit's analysts, this variable measures the level of military sophistication and extent of research and development in each country on a scale of 1 to 5. The 2010 scores were used in this study (http://www.visionofhumanity.org/gpi-data/#/2010/mcap).

GDP (economic). Calculated in US dollars and based on the World Economic Outlook Database of the International Monetary Fund. The 2010 data were used in this study (http://www.imf.org).

External debt (economic). Measures the total public and private debt owed to nonresidents based on the 2010 data from the CIA Factbook (https://www.cia.gov/library/publications/the-world-factbook).

Population (social). Based on the World Population Prospects of the UN Department of Economic and Social Affairs Population Division, the 2010 data were used in this study (http://esa.un.org/unpd/wpp/unpp/panel_population.htm).

Area (geographic). Measures the size of a country in square kilometres based on the Demographic Yearbook of the UN Statistics Division (http://unstats.un.org/unsd/demographic/products/dyb/dyb2008/Table03.pdf).

Relatedness variables[v]

Conflict intensity (political). Measures the extent of international conflicts between two countries (see event-oriented variables below).

Bilateral trade (economic). Measures the total value of imports and exports of a country in US dollars. The 2010 data is based on the Direction of Trade Statistics Yearbook of the International Monetary Fund (http://www.imf.org/external/data.htm).

Foreign population (social). The foreign-born population in a country is based on national censuses conducted between 2000 and 2011 as reported by the UN Statistics Division (http://data.un.org/Data.aspx?d=POP&f=tableCode%3a44).

Region (geographic). The number of countries sharing the same region with a country is based on the UN classification of regions. (http://unstats.un.org/unsd/methods/m49/m49regin.htm).

Border (geographic). The number of countries sharing the same border with a country is based on the CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook).

Event-oriented variables

Conflict intensity (political). The extent of national and international conflicts of a country on a scale of 0 to 2 between 2009 and 2010 is based on PRIO Armed Conflict Dataset v.4-2011.

GPI (political). The Global Peace Index is composed by the Institute for Economics and Peace and measures the level of countries' peacefulness. It is scaled from 1 to 5, the lower the score the more peaceful the country. The 2010 data is available from http://www.visionofhumanity.org.

GTI (political). The Global Terrorism Index ranks and compares countries according to the impact of terrorism. It combines various factors related to terrorist attacks over a ten-year period. The 2012 data was extracted from the Institute for Economics and Peace report (http://reliefweb.int/sites/reliefweb.int/files/resources/2012-Global-Terrorism-Index-Report.pdf).

Unemployment (economic). The unemployment rate measures the percentage of economically active population without work. The 2010 data is based on the CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook).

GDP change (economic). The change in percentages between the GDP level of 2009 and that of 2010. See also the GDP variable.

Death disaster (social). The total death toll from natural disasters that occurred between 2009 and 2010 is based on the International Disaster Database (EM-DAT) (http://www.emdat.be).

Interaction variables

      Following previous findings (Segev, 2015) showing that religion is a potential variable interacting with conflict intensity, five more variables—the number of Buddhists, Christians, Hindus, Jewish, and Muslims in each country—were considered. This list represents the dominant religions in the reporting countries. Data is based on reports of Pew Research Center (http://www.pewforum.org/2011/01/27/the-future-of-the-global-muslim-population/), the CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook), and the US State Department's International Religious Freedom Report (http://www.state.gov/j/drl/rls/irf/2010/index.htm). These variables were studied individually, but also as interaction variables with conflict-related variables (conflict intensity and GPI) after normalizing all variables. While the number of Buddhists, Christians, Jewish, and Muslims in each country significantly correlated with the news prominence, the number of Hindus was not significantly correlated with country prominence. The following analysis therefore includes only the four significant

variables: The number of Buddhists, Christians, Jewish, and Muslims in each country and their interaction with conflicts.

Results

Possible predictors of news prominence in each county

Table 3 summarizes the results of a Pearson correlation between the news prominence of countries and the political, economic, social, and geographic variables composing the three groups of explanatory factors discussed above. Variables from the national traits and the event-oriented groups were tested for correlation with the observed news prominence of each country. For example, the news prominence of countries in American news was tested for correlation with their GDP, as was their general level of conflict, etc. Variables from the relatedness group, on the other hand, differed for each country and were tested separately for correlation with the news prominence of each specific country. Thus, for example, the prominence of countries in American news was tested for correlation with the US level of trade with those countries (imports and exports).

The average prominence of countries (labelled as AVG) was tested for correlation with the accumulated value of the relatedness variable of each country. For example, the correlation of global news prominence with the trade variable was tested by calculating first the total imports and exports of each country with all other countries. Likewise, the correlations of average news prominence with the conflict and the border variables were tested by calculating first the total number of countries with which each country has conflicts, or the total number of countries with which each country has common borders respectively. In order to ensure the normal distribution of the variables, a logarithmic transformation was used for most of the

variables (excluding binary variables). Values marked in grey shade represent significant correlations only ($n > 130$, $p < .01$, 2-tailed).

[Table 3 about here]

Table 3 shows that all variables from the national trait group in almost all countries highly correlated with news prominence. In other words, the size and power of a country were very strong predictors of its news prominence. Looking more specifically at the national trait variables, GDP had the strongest correlation with news prominence of countries. The external debt of a country was similarly a powerful predictor of its news prominence. In fact, these two variables were strongly correlated ($r = .92$). Hence, in line with H1, the national trait variables, particularly economic power, were the strongest predictors for news prominence in the news sites of almost all countries.

The economic power of countries also had the strongest correlation with news prominence among relatedness variables. Countries in a trade relationship were more likely to mention each other in the news than countries with mutual conflicts, shared population, or shared borders. However, due to data availability, the average number of cases of this variable was relatively small ($n = 82$), rendering it less appropriate for further analyses. Foreign population, on the other hand, was also significantly correlated with news prominence in almost all countries.

Within the group of event-oriented variables, economy did not play a significant role. Instead, conflict intensity and the global terrorism index displayed a weak but still significant correlation with news prominence, followed by the death toll from natural disasters (in which the average number of cases was also relatively small, $n = 107$). Economic instabilities, as measured by changes in GDP between 2009 and 2010 and unemployment rate, did not correlate at all with news prominence.

Best fit models of each country

Table 4 outlines the best-fit regression model for each country separately. As

mentioned above, using a computer algorithm, all possible combinations of two, three,

and four variables were entered into a linear regression model. After testing for

multicollinearity, the regression model with the highest R^2, involving at least $n = 130$

countries was identified. Due to the relatively small number of reported countries in

Egyptian news during the three-year sampling period (n = 61), Egypt was omitted

from the regression analysis stage.

Table 4 shows, in agreement with H2, that for all countries (apart from Iran)

the best-fit model included variables from all three groups: national trait, relatedness,

and event. In line with the correlation analysis above and in support of H1, GDP was

found to be the most significant factor from the national trait group in all countries.

This provides a clear indication of the importance of the economic power of a country

in determining its news prominence around the world.

[Table 4 about here]

When looking at the relatedness group of variables, foreign population was a

significant predictor for the country news prominence in the US and all European

countries. Being in the same region was a significant predictor for the country news

prominence in China and Japan. Having common borders was a significant predictor

for the country news prominence in Iran and Israel. Thus, international news in the

US and Europe reflected the social aspect of relatedness. More particularly, country B

would have more chances to appear in the news of country A if it were related to the

foreign population of country A. In China, Japan, Iran, and Israel, however, the

relatedness dimension was more geographically dependent. Regional countries were

more likely to appear in their news. Russia was the only country in which two relatedness variables contributed individually and significantly to the explanation of its country news prominence—foreign population and common border. This finding is particularly intriguing in view of Russia's location between Europe and Asia.

Considering the third group of events, in almost all countries (apart from Iran), the intensity of international conflicts (as reflected in the conflict intensity and GPI variables) was the most significant predictor of news prominence. For some countries (China, Germany, Israel, and the UK), the interaction between conflict intensity and the number of Muslims in that country was a much stronger predictor of their news prominence. In other words, international conflicts of Muslim countries were much more newsworthy than international conflicts of non-Muslim countries. Finally, in Iran, international conflicts were not significant in a regression model. Instead, the number of Muslims in a country was a significant predictor.

Table 4 compares these findings with those of Wu (2000). In Wu's study, bilateral trade and the presence of news agencies were found to be the most important determinants of country prominence in the news. While bilateral trade was a variable from the relatedness group, the presence of international news agencies (AP, AFP, CNN, and Reuters) could be considered more of a national-trait-related variable, since it does not strictly entail an interaction between specific countries. In models where GDP was a significant predictor of news prominence, bilateral trade was not, perhaps due to the strong correlation between the two variables.

It is clear from this comparison, however, that the range of the adjusted r-squared in Wu's models ($0.172 <= R^2 <= 0.36$) was significantly lower than that found in the current study ($0.499 <= R^2 <= 0.723$). This difference, it is argued, is not only a result of the smaller number of variables in Wu's study, but perhaps more

importantly, the fact that most of these variables belonged to the same group and sphere. As Table 4 shows, most variables in Wu's models were taken from only one or two groups (national trait and relatedness). There were no variables representing the event group. Similarly, most variables represented the economic, communication, and geographical spheres, but there were no variables representing the political and social spheres.

Although Wu found the presence of news agencies a significant factor, it was not included in this study since it represents the communication sphere itself. In trying to explain what influences the communication sphere, that is, the prominence of countries in the news, the current study seeks to find the answer in other spheres—the economic, political, and social. But even without including variables from the communication sphere, the variance of country-news prominence explained by a combination of diverse groups and spheres was extremely high.

Discussion

Following traditional and more recent studies on news flow, this paper systematically surveyed variables from different groups and spheres in order to compare and explain the prominence of counties in international news from around the world. Utilizing advanced web-mining techniques and a large corpus of online news data over a three-year period, it identified remarkable patterns that are common to news in different countries, and thus lay the foundations for the expansion of the theory.

In line with previous studies, many of which examined the print news (Ishii, 1996; Kim and Barnett, 1996; Robinson and Sparkes, 1976; Segev and Blondheim, 2013a; Segev, 2015; Wu, 2000, 2007), the first assumption was that country's GDP would have the strongest association with online news prominence. The present study

indeed confirmed this observation. The economic power of a country was also the most significant variable associated with its prominence in online news around the world. Similarly, bilateral trade was a very prominent factor among the relatedness variables. But in line with some previous observations (Ishii, 1998; Chang et al., 1987; Rosengren, 1977), foreign population and region and borders were also found to be important factors of country news prominence among the relatedness variables, representing the social and geographical spheres respectively.

The political sphere was more apparent among event-oriented variables, particularly the conflict intensity as operationalized by two different measurements. In some (non-Muslim) countries, international conflicts involving Muslims were more newsworthy than others. By contrast, in Iran, Muslim countries were more newsworthy than others, but conflicts were a less significant predictor in general.

 In search for the best-fit model, the findings clearly support the second assumption, showing that in the news of most countries a combination of three factors—GDP, foreign population or region, and conflict intensity—accounted for between 50% and 75% of the variance of country-news prominence. The models developed in this paper outperformed the previous models suggested by Wu (2000, 2007), and not only as a result of using a larger data set and a much longer period of observation; it is mainly a result of systematically operationalizing variables from different *groups* and *spheres*.

A strikingly similar combination of variables taken from different groups and spheres was independently found to be the most instrumental in the news from all countries. Each variable of the three groups represented a different sphere of the explanation: while the GDP is a national trait variable representing the economic sphere, foreign population, region, and borders are relatedness variables representing

the social and geographical spheres respectively, and the conflict intensity and GPI are event variables representing the political sphere.

The religion sphere was also found to be an important dimension. In particular, the number of Muslims was a significant variable in regression models of many countries. At first, the number of Muslims could be interpreted as a national-trait variable; however, its use was meaningful mostly in interaction with conflict intensity—a variable from the event group. In Iran, this variable was a significant predictor of its own. But since Iran is a Muslim country, the number of Muslims could be seen as an expression of religious and even ideological proximity. Hence, for Iran this variable was more of a relatedness variable.

The interaction between the number of Christians and conflict intensity negatively correlated with news prominence. In other words, while international conflicts involving Muslims were more newsworthy in general, international conflicts involving Christians were marginalized. Thus, religion variables tended to behave in most analyses more as relatedness variables—they show that for some countries (in particular the UK, Germany, China, and Israel) the 'different' (that is Muslims) is newsworthy when it is in conflict, while for other countries (Iran) the 'similar' (that is, again, Muslims) is newsworthy in general.

Based on these findings, Table 5 summarizes the group-sphere model, and its contribution to expanding the international news-flow theory. In order to achieve a comprehensive explanation, variables should be taken from all three groups and from as many spheres as possible. Variables from the same sphere, for example, GDP and bilateral trade, are likely to correlate with each other. They may provide a similar explanation, and therefore would not fit together in the same regression model.

[Table 5 about here]

It is important to acknowledge, however, the limitations of this study. First, the present analysis is based on news sites from countries with the largest number of online users. An ideal study should include more countries representing more regions. Specifically, there are many fewer news-flow studies in developing countries. Although they get most of their news from international news agencies, their news flow might be more regional in focus and thus require further modifications in the current theory.

Second, one of the assumptions of many news-flow-related studies is that 'external' variables that are not part of the news production process, such as economic power or political events in a country, can explain its news prominence around the world. In fact, there are also various 'internal' factors, such as the structure of international telecommunications, the presence of news agencies (Wu, 2000), as well as the editorial practices and traditions that affect the news prominence of a country (see also Rosengren's [1970] distinction between intra and extra media determinants). Yet, as mentioned earlier, the approach taken here and in many similar studies is that the external factors also have a certain effect on internal factors, particularly when looking at a long period of news coverage from various news sources. For example, although the editors of one Chinese news site might take a more regional approach than the editors of other news sites, they would all find it difficult to ignore the economic crisis in the US, which could directly affect the Chinese economy as well. It might be worthwhile, however, to examine more thoroughly this specific relationship between external variables and those related to the editorial decision-making and journalistic tradition in each outlet separately.

Third, this study analysed the text appearing on news sites, following traditional news-flow research on newspaper content. It was similarly concerned with

country mentions in the news and their possible determinants. Images were not

studied directly, although they are certainly crucial in framing the coverage of foreign

countries and attracting peoples' attention. In fact, images play an important role as

early as the gatekeeping process, as international stories containing images are often

preferred (Moisy, 1996). Although the presence of foreign journalists promotes the

newsworthiness of a country, amateur images are increasingly important in the global

dissemination of news (Andén-Papadopoulos, 2011). Additionally, images do not

require the knowledge of a particular language, and might therefore, at least in theory,

spread globally better than text.

These conditions potentially offer greater representation for images originating

in less central and powerful countries. The power and attractiveness of a country as

operationalized by the news-flow variables (national trait, relatedness, and event) may

still provide a solid reasoning for the global dissemination of news images. Yet, the

processes of image production, increasing dissemination though social media

channels, and the content of images may mediate and influence the newsworthiness of

certain events around the world, and thus require further research.

It was beyond the scope of this paper to draw a comprehensive picture of the

news coverage in the entire world, or to explore the journalistic practices behind it.

The main goal was rather to expand news-flow theory further by offering the new

concepts of group and sphere. This was achieved by systematically testing variables

from various groups and spheres, and by running all possible combinations of

multiple regression models in the news sites of different countries. To this end, the

web-mining tools employed here allowed exploring a much larger corpus of data and

many more languages than in the past. The findings clearly displayed a similar pattern

common to news sites around the world, in which the group and sphere factors, when

integrated properly, can explain much of their international scope. The economic power of a country (national trait), its social and geographic proximity to the reporting country (relatedness), and its political deviance (events) can together determine much of its newsworthiness. Bearing these findings in mind, future studies should seek to employ and develop the emerging news-flow theory accordingly.

References

Andén-Papadopoulos K (2011) *Amateur Images and Global News*. London and

Chicago: Intellect Books.

Charles J, Shore L and Todd R (1979) The *New York Times* coverage of equatorial

and lower Africa. *Journal of Communication* 29: 148–155. DOI:

10.1111/j.1460-2466.1979.tb02957.x

Chang TK (1998) All countries not created equal to be news: World system and

international communication. *Communication Research* 25: 528–563. DOI:

10.1177/009365098025005004

Chang TK, Shoemaker P and Brendlinger N (1987) Determinants of international

news coverage in the US media. *Communication Research* 14: 396–414. DOI:

10.1177/009365087014004002

Cohen AA (ed) (2013) *Foreign news on television: Where in the world is the Global

Village?* New York, NY: Peter Lang.

Dupree JD (1971) International communication: View from 'a window on the world'.

The International Communication Gazette 17: 224–235. DOI:

10.1177/001654927101700403

Galtung J and Ruge MH (1965) The Structure of Foreign News. *Journal of Peace

Research* 2(1): 64–91. DOI: 10.1177/002234336500200104

Gerbner G and Marvanyi G (1977) The many worlds of the world's press. *Journal of

Communication* 27(1): 52–66. DOI: 10.1111/j.1460-2466.1977.tb01797.x

Golan GJ (2008) Were in the world is Africa? Predicting coverage of Africa by US

television networks. *The International Communication Gazette* 70: 41–57.

DOI: 10.1177/1748048507084577

Golan G and Wanta W (2003) International elections on the US network news: An examination of factors affecting newsworthiness. *Gazette* 65(1): 25–40. DOI: 10.1177/0016549203065001135

Harcup T and O'Neill D (2001) What is news? Galtung and Ruge revisited. *Journalism Studies* 2(2): 261–280. DOI: 10.1080/14616700118449

Hawkins V (2008) *Stealth Conflicts: How the World's Worst Violence is Ignored*. Hampshire, UK: Ashgate. DOI: 10.1080/17400201.2011.589501

International Press Institute (1953) *The Flow of News*. Zurich: International Press Institute.

Ishii K (1996) Is the U.S. over-reported in the Japanese press? Factors accounting for international news in the Asahi. *Gazette* 57: 134–144. DOI: 10.1177/001654929605700205

Kariel HG and Rosenvall LA (1983) Cultural affinity displayed in Canadian daily newspapers. *Journalism & Mass Communication Quarterly* 60(3): 431–436. DOI: 10.1177/107769908306000306

Kayser J (1953) *One Week's News: Comparative Study of 17 Major Dailies for a Seven-Day Period*. Paris: UNESCO.

Kim K and Barnett GA (1996) The determinants of international news flow: A network analysis. *Communication Research* 23(3): 323–352. DOI: 10.1177/009365096023003004

Moisy C (1996) The foreign news flow in the information age. Discussion paper D-23, *Harvard University Kennedy School of Government*, November 1996. Available at: http://shorensteincenter.org/wp-content/uploads/2012/03/d23_moisy.pdf (accessed 12 April 2015).

Ostgaard E (1965) Factors influencing the flow of news. *Journal of Peace Research* 2(1): 39–64. DOI: 10.1177/002234336500200103

Pantti M, Wahl-Jorgensen K and Cottle S (2012) *Disasters and the Media*. London and New York: Peter Lang.

Pritchard D and Hughes KD (2006) Patterns of deviance in crime news. *Journal of Communication* 47(3): 49–67. DOI: 10.1111/j.1460-2466.1997.tb02716.x

Robinson GJ and Sparkes VM (1976) International news in the Canadian and American press: Comparative news flow study. *International Communication Gazette* 22: 203–218. DOI: 10.1177/001654927602200401

Rosengren KE (1970) International news: Intra and extra media data. *Acta Sociologica* 8(2): 96–109. DOI: 10.1177/000169937001300202

Rosengren KE (1977) Four types of tables. *Journal of Communication* 27: 67–75. DOI: 10.1111/j.1460-2466.1977.tb01798.x

Segev E (2010) Mapping the international: Global and local salience and news-links between countries in popular news sites worldwide. *International Journal of Internet Science* 5(1): 48–71.

Segev E (2015) Visible and invisible countries: News flow theory revised. *Journalism* 16(3): 412–428. DOI: 10.1177/1464884914521579

Segev E and Hills T (2013) When news and memory come apart: A cross-national comparison of countries' mentions. *International Communication Gazette*, 76(1): 67–85. DOI: 10.1177/1748048513504159

Segev E, Sheafer T and Shenhav SR (2013) Is the world getting flatter? A new method for examining structural trends in the news. *Journal of the American Society for Information Science and Technology* 64(12): 2537–2547. DOI: 10.1002/asi.22932

Segev E and Blondheim M (2013a) america's global standing according to popular

    news sites from around the world. *Political Communication* 30(1): 139–161.

    DOI: 10.1080/10584609.2012.737418

Segev E and Blondheim M (2013b) Online news about Israel and Palestine: A cross-

    national comparison of prominence and trends. *Digital Journalism* 1(3): 1–13.

    DOI: 10.1080/21670811.2012.744560

Sheafer T, Ben Nun P, Shenhav SR and Segev E (2013) The conditional nature of

    value-based proximity between countries: Strategic implications for mediated

    public diplomacy. *American Behavioral Scientist (ABS)* 57(9): 1256–1276.

    DOI: 10.1177/0002764213487732

Shenhav SR, Rahat G and Sheafer T (2012) Testing the language-power assumption

    of critical discourse analysis: The case of Israel's legislative discourse.

    Canadian Journal of Political Science 45(1): 207–222. DOI:

    10.1017/S0008423911000965

Shoemaker PJ, Chang TK and Brendlinger N (1986) Deviance as a predictor of

    newsworthiness: Coverage of international events in the US media.

    Communication Yearbook 10: 348–365.

Shoemaker PJ, Danielian LH and Brendlinger N (1991) Deviant acts, risky business

    and US interests: The newsworthiness of world events. *Journalism Quarterly*

    68: 781–795. DOI: 10.1177/107769909106800419

Singer JD, Bremer S and Stuckey J (1972) capability distribution, uncertainty, and

    major power war, 1820-1965. In: Russett B (ed) *Peace, War, and Numbers*.

    Beverly Hills: Sage, pp.19–48.

Tunstall J (2008) *The Media Were American: US Mass Media in Decline*. Oxford:

    Oxford University Press. DOI: 10.1111/j.1460-2466.2008.00391_4.x

UNESCO (1954) *How Nations See Each Other?* Paris: UNESCO Publications.

Wallerstein I (1974) *The Modern World-System*. New York: Academic Press.

Wanta W, Golan G and Cheolhan L (2004) Agenda setting and international news:

>   Media influence on public perceptions of foreign nations. *Journalism and*

>   *Mass Communication* 81(2): 364–377. DOI: 10.1177/107769900408100209

Wilke J, Heimprecht C and Cohen A (2012) The geography of foreign news on

>   television: A comparative study of 17 countries. *International Communication*

>   *Gazette* 74(4): 301–322. DOI: 10.1177/1748048512439812

Wu DH (2000) Systematic determinants of international news coverage. *Journal of*

>   *Communication* 50(2): 113–30. DOI: 10.1111/j.1460-2466.2000.tb02844.x

Wu DH (2007) A brave new world for international news? Exploring the determinants

>   of the coverage of foreign news on US websites. *International Communication*

>   *Gazette* 69: 539–551. DOI: 10.1177/1748048507082841

Table 1

Methods employed for studying international news flow

Study	Sample	News-flow variable	Determinants	Method	Results
Robinson and Sparkes (1976)	3 months of news published in 39 newspapers in the US and Canada. N = ~18,000	Manually coding the country mentions in each news item	**National Trait:** Economic power (GNP), population **Relatedness:** Bilateral trade	Correlation tests. Only about 20 countries were included	Trade moderately correlated with county mentions in Canadian news only.
Ishii (1998)	All news items in Asahi newspaper in 1987, 1990, and 1993. N = ~800,000	Using the newspaper database to count country mentions in each news item	**National Trait:** Economic power (GDP), population **Relatedness:** Bilateral trade (imports and exports), geographic proximity, foreign residents, foreign visitors, foreign students, and diplomats in Japan, Asahi correspondents	Multiple linear regressions for the news in 1987 and 1993. Only 39 to 48 countries were included in the regression analyses	GDP, population and foreigners were the most significant factors.
Wu (2000)	14 days of international news published or broadcast in 38 countries. N = ~34,000	Manually coding the most important country mentioned in each news item	**National Trait:** Economic power (GDP), population, area, press freedom, presence of int. news agencies **Relatedness:** Bilateral trade, geographic proximity, shared language, colonial group	Multiple linear regressions for the news of each country individually	Bilateral trade, presence of news agencies, and distance were the most significant factors. Adjusted R^2 = .255 in average, ranging between .106 in Benin and .548 in Slovenia.
Segev (2015)	3 years of international news in 35 popular news sites in 11 countries. N = 1,041,283	Automatically counting the country mentions in the news items of all news sites together	**National traits:** GDP, population, CINC (composite index of national capability), area, military capability **Relatedness:** Bilateral trade, foreign population, border, region **Events:** Conflict intensity, death/disaster, GPI (global peace index), GDP change, unemployment	Best fit multiple linear regression to explain the country mentions in the news of all countries together	GDP, foreign population, and conflict intensity were the most significant factors. Adjusted R^2 = .714

Table 2

Countries, news sites, and the number of news items collected for analysis

Country	News Site	News Items	Country	News Site	News Items
China	Google News	30,903	Japan	NHK	38,435
China	Sina	26,633	Japan	Yomiuri	2,650
China	People Daily	95,697	Japan	Yahoo	15,518
Egypt	Al Ahram	3,340	Russia	Google News	22,914
Egypt	Al Masry Alyoum	9,700	Russia	Gazeta	117,125
France	Google News	21,304	Russia	Pravda	30,989
France	Le Monde	26,770	Spain	Google News	21,574
France	Le Figaro	22,669	Spain	El Mundo	25,752
Germany	Google News	21,541	Spain	El Pais	30,856
Germany	Bild	29,300	UK	Google News	36,995
Germany	Spiegel	29,294	UK	BBC	57,922
Germany	Welt	4,453	UK	Guardian	42,221
Iran	PressTV	2,441	USA	Google News	21,542
Iran	Tabnak	71,446	USA	CNN	15,240
Iran	Aftab	16,768	USA	NY Times	36,269
Israel	Google News	22,536			
Israel	Ynet	24,447			
Israel	Haaretz	8,497			
			Total News Items		**983,741**

Table 3

Pearson correlations of country characteristics with its news prominence (by reporting country)

		China	Egypt	France	Germany	Iran	Israel	Japan	Russia	Spain	UK	USA	AVG	Avg. N
National Traits	GDP	0.797	0.158	0.597	0.707	0.71	0.669	0.703	0.642	0.633	0.81	0.68	0.79	153
	External debt	0.716	0.152	0.584	0.678	0.66	0.651	0.627	0.598	0.594	0.79	0.6	0.76	149
	CINC	0.784	0.33	0.586	0.636	0.68	0.62	0.674	0.628	0.554	0.78	0.73	0.75	152
	Military capability	0.346	0.171	0.292	0.308	0.47	0.347	0.357	0.383	0.198	0.37	0.29	0.4	131
	Population	0.726	0.178	0.489	0.5	0.56	0.485	0.602	0.482	0.464	0.69	0.64	0.65	155
	Area	0.555	0.161	0.303	0.355	0.44	0.369	0.433	0.365	0.34	0.53	0.46	0.49	153
	Christians	0.422	-0.1	0.298	0.387	0.31	0.355	0.322	0.3	0.369	0.51	0.43	0.42	144
	Muslims	0.371	0.474	0.343	0.266	0.49	0.297	0.285	0.318	0.142	0.45	0.36	0.43	150
	Buddhists	0.265	0.017	0.208	0.196	0.14	0.159	0.284	0.151	0.182	0.21	0.24	0.22	186
	Jewish	0.519	0.519	0.563	0.611	0.54	0.501	0.486	0.481	0.503	0.54	0.44	0.6	75
Relatedness	Trade	0.83	0.472	0.626	0.661	0.67	0.686	0.785	0.601	0.605	0.69	0.64	0.73	82
	Foreign population	0.251	0.232	0.466	0.386	0.29	0.544	0.318	0.388	0.458	0.54	0.44	0.65	160
	Border	0.241	0.386	0.208	0.228	0.25	0.318		0.267	0.112	0.12	0.13	0.41	147
	Region	0.338	0.341	0.118	0.235	0.05	0.102	0.333	0.248	0.142	0.17	0.07	-0.06	159
	Conflict			0.137	0.247		0			0.184	0.33	0.18	0.33	177
Events	Conflict intensity	0.341	0.313	0.326	0.362	0.26	0.322	0.369	0.295	0.299	0.35	0.36	0.36	159
	Global terrorism	0.326	0.47	0.447	0.436	0.39	0.381	0.448	0.31	0.348	0.41	0.46	0.45	137
	GPI	0.081	0.409	0.137	0.128	0.06	0.02	0.105	0.067	0.105	0.05	0.24	0.13	129
	Death disaster	0.339	0.015	0.291	0.348	0.2	0.281	0.335	0.227	0.279	0.41	0.36	0.34	107
	GDP change	0.172	0.123	0.024	0.027	0.07	0.001	0.137	-0.018	0.017	0.03	0.16	0.05	146
	Unemployment	-0.106	0.238	-0.043	-0.014	-0.05	0.046	-0.14	0.023	-0.058	0.04	0	-0.03	125
	Avg. N	154	57	147	146	143	135	127	149	146	161	154	164	141

Note: Correlations marked in gray shade are for n > 130, r > .2, and $p < .01$ (2-tailed). The column labeled 'AVG' refers to the aggregated news from all countries together.

Table 4

Best-fit regression model for each country

	Best Fit Model	Adj. R^2	Groups	Wu's (2000) Best Fit Model	Adj. R^2	Groups
China	GDP, Region (CN), CI*Muslims	0.727	3	N.A.		
France	GDP, FP (FR), GPI	0.561	3	N.A.		
Germany	GDP, FP (DE), CI*Muslims	0.589	3	GDP, Population, Agency	0.312	1
Iran	GDP, Borders (IR), Muslims	0.638	2	Trade, Distance, Agency	0.36	2
Israel	GDP, Borders (IL), FP (IL), CI*Muslims	0.641	3	Trade	0.285	
Japan	GDP, Region (JP), GPI	0.658	3	Trade, Agency	0.175	2
Russia	GDP, FP (RU), Borders (RU), GPI	0.497	3	Trade	0.256	1
UK	GDP, FP (UK), CI*Muslims	0.723	3	GDP, Population, Agency	0.214	1
Spain	GDP, FP (SP), GPI	0.495	3	Trade, Agency	0.223	2
USA	GDP, FP (US), GPI	0.617	3	Agency	0.172	1
AVG	GDP, GPI	0.718	2	N.A.		

Note: All models include n > 130 with variable significance of *p* < .05. AGV- Average country prominence of all news sites, GDP – Gross Domestic Product, GPI – Global Peace Index, FP – Foreign Population, CI – Conflict Intensity, CINC – Composite Index of National Capacity. Taken from Wu's (2000) study: Trade – bilateral trade, Agency – the presence of international news agencies. Due to the relatively small number of reported countries in Egyptian news (n = 61), it was not included in the multiple regression analysis.

Table 5
The group-sphere model of international news flow

		Group		
		National-Trait	Relatedness	Event
Sphere	Economic	X		
	Social		X	
	Religious		X	X
	Political			X

Note: The combinations marked are those found to be explaining the greatest variance of country news prominence. For many countries, the number of Muslims (religious sphere) was in interaction with conflict intensity (event group). In Iranian news it was a significant independent variable, emphasizing its relatedness dimension.

Endnotes

i http://www.wan-press.org

ii http://www.stateofthenewsmedia.org

iii http://www.nielsen-online.com

iv Based on the most complete list of country names available from ISO (International Organization for Standardization). This list was translated into the following languages: Arabic, Chinese (Mandarin), English, French, German, Hebrew, Japanese, Persian, Russian, and Spanish.

v Relatedness variables were constructed separately for each of the 11 reporting countries. For example, US trade measured the US bilateral trade with other countries. It was therefore tested for correlation with the country prominence in US news.

When looking at the aggregated news prominence of countries based on all news sites together, the relatedness variables were also built as an aggregation of the total relations of a country with the outside world. For example, the bilateral trade variable represented the total imports and exports of each country with all other countries.