

Developing the T-Scope (version 2.0) Program for a Statistical Approach to Business Metaphor Analysis

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Abstract

The main aim of this paper is to introduce a newly-developed computer program 'T-Scope version 2.0,' an original VBA (Visual Basic for Applications) program, which runs on Microsoft Excel. T-Scope, first developed in 2009, was designed as a quantifying tool for conducting a quantitative metaphor analysis in corpus linguistics. In this paper, an important 'Scope & Step' concept, applied in T-Scope, is explained. Detailed features of T-Scope 2.0 will also be explored with some actual demonstrations. While referring to the advantages, developments and future perspectives of the program, the significance of T-Scope in critical metaphor research is emphasized, especially for quantitative 'Mental Distance' analysis in business speech communication.

Keywords: Quantification, Corpus Linguistics, Metaphor Research, Mental Distance Analysis, Speech Communication

I. Background

1.1 Quantitative Metaphor Research

Analyzing metaphors in discourse requires an appropriate method to obtain the best desirable outcome. As for the quantitative metaphor analysis, it is highly important that we precisely quantify all the information about metaphorical expressions captured in the text. The first step is to identify which lexical units are 'metaphors,' and to prepare the data for the quantification process that follows next. In any type of metaphor research, a quantitative approach plays a significant role in clarifying the occurrence frequency of metaphorical expressions found in the text.

Corpus-based approaches to critical metaphor analysis enhance the beneficial quantitative aspect of metaphor research; e. g. Charteris-Black (2004, 2005), Deignan (1999, 2005, 2008a, 2008b), Koller (2004, 2008), Semino (2006), Stefanowitsch & Gries (2006), Tognini-Bonelli (2001) etc. Quantitative metaphor research seems to have an advantage in terms of its data processing performance, especially from a statistical point of view. 'WordSmith Tools (version 5.0)' by Lexical Analysis Software Ltd.¹⁾, for example, analyzes the electric text given and shows various kinds of data set, such as the exact location (word number), paragraph number,

1) Details available at: <http://www.lexically.net/wordsmith/index.html>

lexical co-occurrence, and dispersion plot. We should note, however, the data presented by a concordancer is still ‘raw-data,’ and enumerating these numerical and/or lexical results in discussions is not always persuasive enough to state the rhetorical roles of metaphors. As Gries (2009: p. 173) states, “Statistical analysis is an indispensable ingredient of corpus-linguistic work.” What is ideally required here is an additional statistical process to reexamine the data, so that we may mine some important findings out of it.

1.2 ‘Mental Distance’ Analysis and Its Chronological Perspective

‘Mental Distance’ analysis proposed by Shimizu (2010a) is a quantitative corpus-based approach to metaphor. It visually and statistically demonstrates the roles of metaphorical expressions uttered in a single business speech, from a chronological perspective. The distinctive feature of the mental distance analysis is that it focuses on the chronological flows of metaphorical expressions. Shimizu (2010b: p. 205) defines the mental distance analysis as follows:

‘Mental Distance’ analysis ... is designed to capture the chronological variations of the speaker’s conceptual viewpoints toward an issue, through investigating metaphorical expressions and the underlying ‘conceptual metaphors’ (Lakoff and Johnson, 1980) found in a business speech.

The important goals of the analysis are:

- (1) to visually depict the chronological flow of the mental distance within a single business speech.
- (2) to statistically show which conceptual metaphors share the highest positive and negative correlations between themselves.

A simplified image of the chronological mental distance flow is illustrated in Figure 1-2-1. This concept is derived from the idea, called ‘Elevation Model’ (Shimizu, 2009: pp. 147-148). In the elevation model, while the speaker’s expressions are literal, without any metaphorical expressions uttered along the timeline, the mental distance elevation stays at zero on the baseline. And when the expressions become metaphorical with one or more metaphorical expressions applied, the elevation increases. The distance between the point of elevation (the black dots on the line graph) and the baseline (the gray timeline arrow) is considered the mental distance at a certain time period in the speech.

In order to put this prototype into practice, Shimizu (2010a) conducted an experimental pilot study, which realized the actual demonstrative mental distance line graph (Figure 1-2-2). In

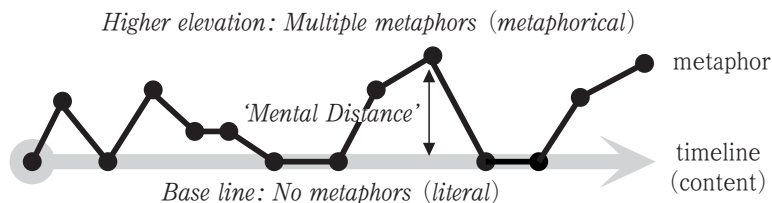


Fig. 1-2-1: Hypothetical elevation model structure (Prototype) —from Shimizu (2010a: p. 250)

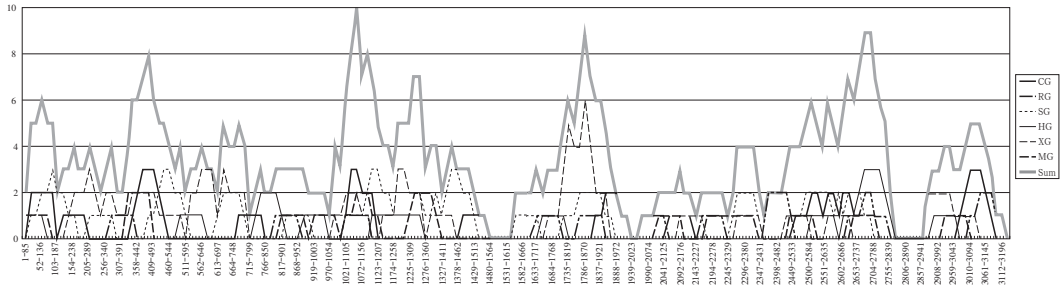


Fig. 1-2-2: ‘Mental Distance’ chronological elevation—from Shimizu (2010a: p. 259)

	CG	RG	SG	HG	XG	MG	Sum
CG	1						
RG	0.097771	1					
SG	0.131891	-0.20488	1				
HG	0.107929	0.099543	-0.0335	1			
XG	-0.07495	-0.11255	0.19938	-0.1318	1		
MG	0.177885	0.058872	0.074249	0.056536	-0.03686	1	
Sum	0.550275	0.216134	0.543811	0.31965	0.491273	0.41304	1

Table 1-2-3: Statistical correlation comparison—from Shimizu (2010a: p. 261)

the pilot study, the ‘Scope & Step’ concept was first proposed, and T-Scope (version 1.0) was also developed to calculate the quantitative numerical values captured in the ‘Scopes.’ Also, T-Scope 1.0 produced a statistic-friendly set of numerical data that works smoothly with Microsoft Excel. This first made the comparative statistical mental distance correlation analysis possible.

The correlation comparison table (Table 1-2-3) allows us to figure out which conceptual metaphor groups (CG, RG, SG, HG, XG and MG) had the higher positive and negative correlation patterns between their mental distance flows throughout a single business speech. From this table we could learn that the groups labeled SG & XG shared the highest positive correlation, and SG & RG shared the highest negative correlation. The highest correlation values shown on the “Sum” line on the bottom (CG: 0.55 and SG: 0.54) indicated that the groups labeled CG and SG should play the most influential part in governing the whole conceptual (metaphorical) image of the body in the speech.

II. T-Scope—Version 1.0

2.1 General Procedure of the First Pilot Study

As described in the previous section, T-Scope (version 1.0) was developed at the time of the first experimental pilot study, conducted in 2009. Before starting the actual mental distance analysis, it was necessary to set the “Conceptual Metaphor Groups” (Shimizu 2010a: pp. 251-252) in advance. In the pilot study, six Conceptual Metaphor Groups were set, and the sample speech texts were all manually checked, while extracting the metaphorical expressions appearing in the corpus. During the process, every one of the metaphorical expressions was securely

tagged in the electric text file, to identify the conceptual metaphor group they belonged to: <CG>, <RG>, <SG>, <HG>, <XG> and <MG>.

Next, the electric text file was set on the concordancing program, WordSmith Tools 5.0, to obtain the precise location and frequency information. When all the locations of the metaphorical expressions were identified, the exact word numbers were manually transcribed onto an Excel worksheet (Figure 2-1-1) for the quantification process employing the newly-developed program, 'T-Scope version 1.0.'

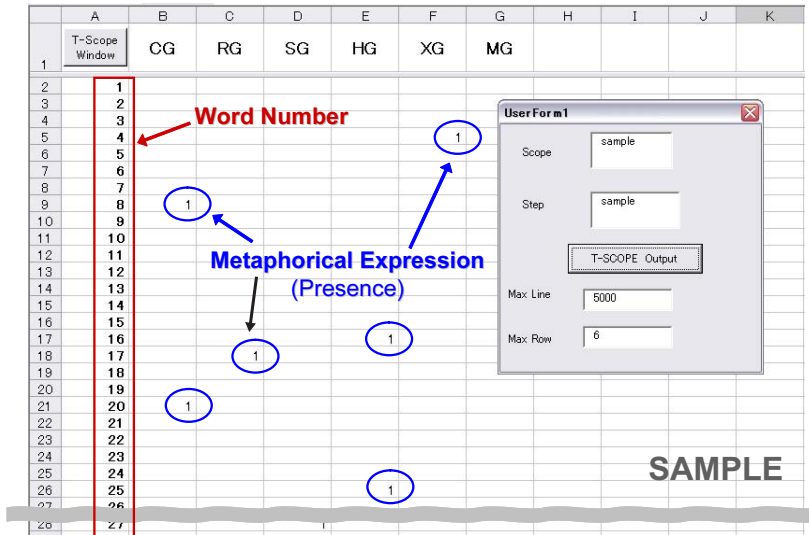


Fig. 2-1-1: Sample screenshot of T-Scope version 1.0—from Shimizu (2010a: p. 253)

2.2 'Scope & Step' Concept²⁾

One of the fundamental key concepts in the chronological mental distance analysis is the 'Scope & Step' concept. A 'Scope' parameter is the number of words, which determines the range of scope. In other words, a 'Scope' parameter indicates the number of words a single scope may capture at once. A 'Step' parameter indicates the number of words the scope proceeds to, to work on another scope. The fundamental idea of the 'Scope & Step' parameters is described in Figure 2-2-1.

This feature is like having a square-shaped magnifying glass moving on the Excel worksheet from the top to the bottom, searching for the cells in which there is a number "1" that identifies the presence of a metaphorical expression. While it is moving down to the end, T-Scope calculates the number of "1"s appearing in each vertical row of the conceptual metaphor groups. Figure 2-2-2 demonstrates the sample image of the T-Scope's calculating behavior with the 'Scope' value of 20 and the 'Step' value of 10.

When the calculation is completed, T-Scope will show the result on another worksheet. The

2) It should be noted that the meaning of the term 'scope' is thoroughly different from that of Kövecses (2000: pp. 80-81)

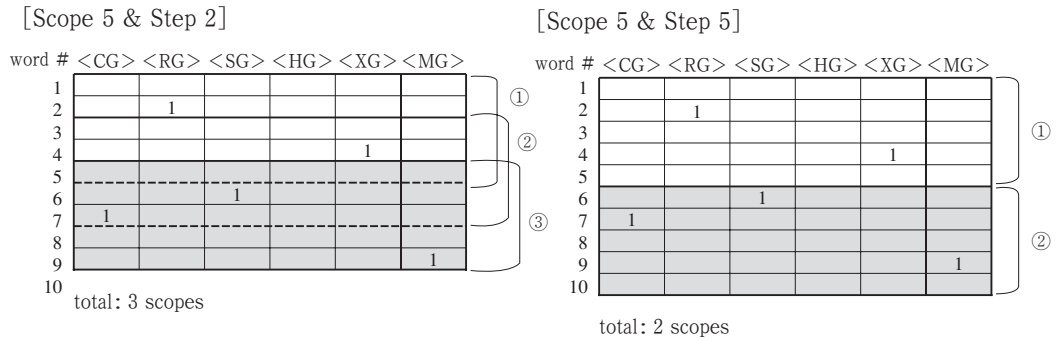


Fig. 2-2-1: 'Scope & Step' concept—from Shimizu (2010a: p. 254)

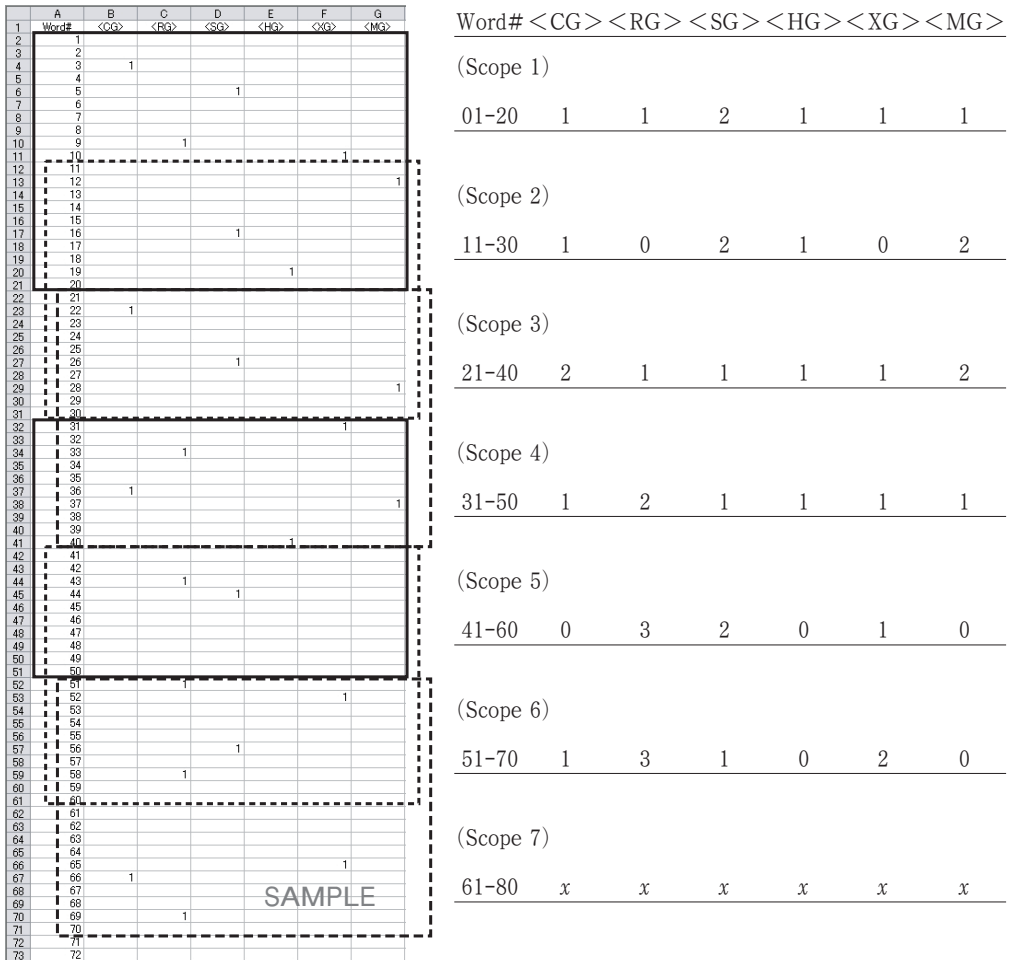


Fig. 2-2-2: Sample demonstration of the T-Scope's calculating behavior (Scope 20 & Step 10)

Scope	CG	RG	SG	HG	XG	MG	Sum								
1-85	0	0	0	1	0	1	2	477-561	0	0	2	0	1	0	3
18-102	2	0	1	1	0	1	5	494-578	0	0	2	1	1	0	4
35-119	2	0	1	1	0	1	5	511-595	0	0	1	1	0	0	2
52-136	2	0	2	1	0	1	6	528-612	0	0	0	1	2	0	3
69-153	2	0	2	0	0	1	5	545-629	0	0	0	1	2	0	3
86-170	2	0	3	0	0	0	5	562-646	0	0	0	1	3	0	4
103-187	0	0	2	0	0	0	2	579-663	0	0	0	0	3	0	3
120-204	1	0	2	0	0	0	3	596-680	0	0	0	0	3	0	3
137-221	1	0	1	0	1	0	3	613-697	0	0	1	0	1	0	2
154-238	1	0	1	0	2	0	4	630-714	0	0	2	0	3	0	5
171-255	1	0	0	0	2	0	3	647-731	0	0	2	0	2	0	4
188-272	1	0	0	0	2	0	3	664-748	0	0	2	0	2	0	4
205-289	0	0	1	0	3	0	4	681-765	1	0	2	0	2	0	5
222-306	0	0	1	0	2	0	3	698-782	1	0	1	0	2	0	4
239-323	0	0	1	0	1	0	2	715-799	1	0	0	0	0	0	1
256-340	0	0	1	0	2	0	3	732-816	1	0	0	1	0	0	2
273-357	0	1	1	0	2	0	4	749-833	1	0	0	2	0	0	3
290-374	0	1	0	0	1	0	2	766-850	0	0	0	2	0	0	2
307-391	0	1	0	0	1	0	2	783-867	0	0	0	2	0	0	2
324-408	0	1	0	0	1	2	4	800-884	0	1	0	2	0	0	3
341-425	1	1	0	0	2	2	6	817-901	0	1	0	1	0	1	3
358-442	2	0	0	0	2	2	6	834-918	0	1	1	0	0	1	3
375-459	3	0	0	0	2	2	7	851-935	0	1	1	0	0	1	3
392-476	3	0	1	0	2	2	8	868-952	0	1	1	0	0	1	3
409-493	3	0	1	0	2	0	6	885-969	0	0	1	1	0	1	3
426-510	2	0	2	0	1	0	5	902-986	0	0	1	1	0	0	2
443-527	1	0	3	0	1	0	5	919-1003	0	0	0	1	0	1	2
460-544	0	0	3	0	1	0	4	...							

Table 2-2-3: The first section of the outcome data (T-Scope 1.0/Scope 85 & Step 17)

first section of the outcome data in the pilot study is shown in Table 2-2-3. Once this list is successfully created, this data set can be used to draw line graphs or to conduct any statistical analyses required, such as a correlation analysis. Statistical correlation analysis between the conceptual metaphor groups was first made possible by T-Scope 1.0. The raw data in the worksheet, which we see in Figure 2-2-2 (left), is not an applicable data format for correlation analysis on Microsoft Excel because too many zeros occupy most cells in the worksheet. If conducted, the cells in the correlation table would be all filled with “#DIV/0!” errors.

By applying this ‘Scope & Step’ concept, we can capture the quantitative image of metaphorical expression occurrence within a certain timeframe. It is important to observe the occurrence and/or co-occurrence by timeframes, not by each individual expression. This is because frequent metaphorical expressions may seem to echo each other by recurring throughout a text (Koller, 2008: p. 111). The ‘Scope & Step’ concept, where each scope may overlap the other, supports this point of view. It is reasonable behavior to quantify the metaphorical expressions, because, from a chronological point of view, each timeframe can not be an isolated part in the speech. They actually do relate to each other, and they relay and accumulate the metaphorical impressions, while proceeding down to the end. This overlapping behavior of T-Scope makes it possible to quantify the smooth flow of the metaphorical impressions which have occurred in all timeframes. Needless to say, users can modify the ‘Scope & Step’ parameters freely in order to meet their own analysis needs.

III. T-Scope—Version 2.0

T-Scope has been improved and its version 2.0 is now available. Major improvements are described in each of the following sections. It is still necessary to pre-process the corpus data using WordSmith Tool in advance, to start working on mental distance analysis using T-Scope 2.0. Please note that the numerical values shown in the sample pictures of this section are deliberate larger numbers for a clearer demonstration of each feature.

3.1 Easier Operation for More Complex Quantification Tasks

A significant difference to be noticed in T-Scope version 2.0 is its easy-to-use operation interface. Four macro command buttons (Import, Extract, Calculate and CSV Export) are set in the top of the ‘Grouping’ worksheet (Figure 3-1-1); a main worksheet for all the operations on T-Scope 2.0. Detailed explanation of the new functions that can be controlled and modified on the Grouping worksheet shall be explained in Section 3.5.

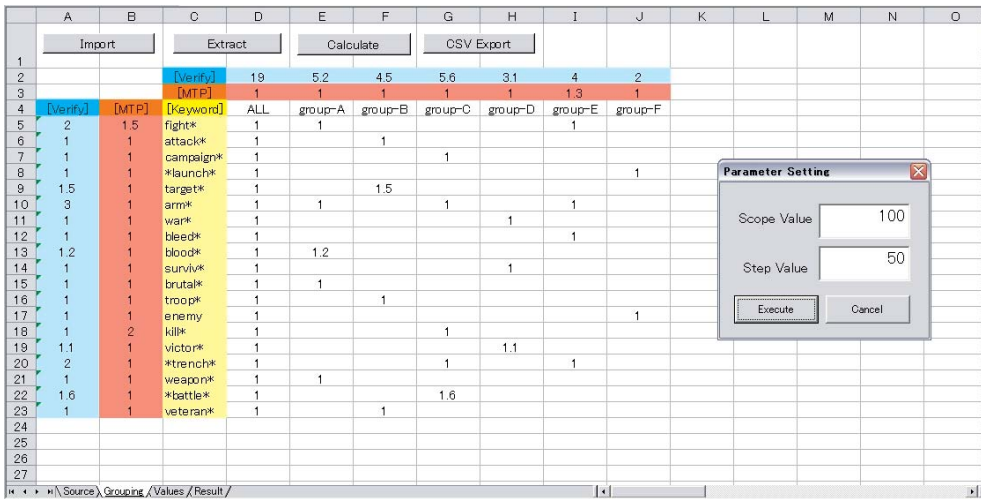


Fig. 3-1-1: Main operation window – ‘Grouping’ worksheet (T-Scope 2.0)

3.2 Prior Data Processing Using WordSmith Tools

Prior to the mental distance analysis using T-Scope 2.0, it is necessary to concordance the electric corpus texts beforehand, in order to obtain information about the exact metaphor locations, using WordSmith Tools. In the process, T-Scope (version 1.0) previously required that the user should decide the grouping policy for all the metaphorical expressions in advance to put the group tags in the texts. However, it is no longer necessary when using T-Scope 2.0. It is because the grouping process can be easily modified and done on the T-Scope 2.0 worksheets. Therefore, when concordancing the corpus at the first stage, we simply need to list the “candidate metaphors” (Charteris-black, 2004: pp. 35-39), as with the more typical type of corpus-based metaphor research (Figure 3-2-1). WordSmith tools will directly search for the keywords, instead of searching for the pre-fixed group tags that identify the associated conceptual

N	Concordance	Set	Tag	Word #	Sent. #	nt. #	Para. #	Para. Pos	Head. #	Head. Pos	Sect. #	Sect. Pos	File	%
1	... as the war with the Taliban and the fighting that goes on, it's pretty easy to	fight*		339	33	31%	0	1%			0	1%	sample.txt	1%
2	... by doing that process? we also began attacking our economic crisis on a	attack*		1,715	115	36%	0	4%			0	4%	sample.txt	4%
3	... with striking wages, we have kept a campaign promise to get a middle class	campaign*		2,071	139	50%	0	5%			0	5%	sample.txt	5%
4	... These are the kinds of projects being launched across the country? to rebuild	*launch*		2,710	179	75%	0	6%			0	6%	sample.txt	6%
5	... procedures a remedy that is specifically targeted at what ails the patient. If you	target*		10,372	528	80%	0	24%			0	24%	sample.txt	25%
6	... should remove your helmet, put your arm in a sling, and perform quadruple	arm*		10,399	529	74%	0	24%			0	24%	sample.txt	25%
7	... at the same way. We must specifically target reforms at what ails our system.	target*		10,442	532	25%	0	24%			0	24%	sample.txt	25%
8	... don't you agree that companies like Target are best suited to bring costs	target*		12,436	847	45%	0	28%			0	28%	sample.txt	29%
9	... Committee is unveiling a multi-platform campaign aimed at informing Americans	campaign*		13,222	695	37%	0	30%			0	30%	sample.txt	31%
10	... such as the TV ad that we are launching today so that they understand	*launch*		13,271	696	79%	0	30%			0	30%	sample.txt	31%
11	... year as ABA President, I will carry this fight forward. But first, let's like to share a	fight*		13,867	729	92%	0	31%			0	31%	sample.txt	33%
12	... the skills of snow and head south to a warmer place. In Texas I came of age	war*		14,168	750	92%	0	32%			0	32%	sample.txt	33%
13	... that 3 weeks ago he had a significant bleed from his bladder. His hemoglobin	bleed*		15,733	882	95%	0	36%			0	36%	sample.txt	37%
14	... carried by your hemoglobin in your blood, you are going to be short of	blood*		15,768	884	77%	0	36%			0	36%	sample.txt	37%
15	... toward the shores of a system that, to some needs to evolve. One necessary	suniv*		15,269	913	62%	0	37%			0	37%	sample.txt	38%
16	... or payers -- will force us into waiting lines. When control is	suniv*		17,230	981	96%	0	39%			0	39%	sample.txt	40%
17	... will force us into waiting lines. When control is threatened, those who	suniv*		17,233	982	38%	0	39%			0	39%	sample.txt	40%
18	... is threatened, those who change? suniv. The evolutionary game is not	suniv*		17,238	983	100%	0	39%			0	39%	sample.txt	40%
19	... markets, and this led to a simple but brutal assessment of the role of the	brutal*		18,271	1,055	76%	0	41%			0	41%	sample.txt	43%
20	... right-hand man. It's said, by credit? suniv in Papua? without Larry	suniv*		21,874	1,279	66%	0	50%			0	50%	sample.txt	50%
21	... were fortunate to have Senator Max Baucus (D-MT), Congressman Frank	war*		23,480	1,372	20%	0	53%			0	53%	sample.txt	54%
22	... we desperately looking for a line of attack to defeat the fiscal crisis. View that	attack*		23,540	1,374	89%	0	53%			0	53%	sample.txt	54%
23	... himself. We used the term for the Cold War, preparing for lights long had to	war*		23,737	1,384	18%	0	54%			0	54%	sample.txt	54%
24	... for light long health during the Cold War. He created the Big Brother	war*		23,779	1,384	100%	0	54%			0	54%	sample.txt	54%
25	... empire of the 1950s. Following World War II, the faculty feeble and	war*		23,855	1,389	14%	0	54%			0	54%	sample.txt	54%
26	... weak British economy to force British troops out of Egypt. A Call To Greatness	troop*		23,894	1,390	84%	0	54%			0	54%	sample.txt	55%
27	... character Prop. Ague have met the enemy and he is with? By and large, we	enemy*		24,345	1,418	79%	0	55%			0	55%	sample.txt	56%
28	... than any other country in the world, fighting the war which could have been	fight*		24,514	1,427	71%	0	56%			0	56%	sample.txt	56%
29	... other country in the world, fighting the war which could have been prevented.	war*		24,516	1,427	79%	0	56%			0	56%	sample.txt	56%
30	... we had during 1960 and the early Cold War. We need to encourage and	war*		24,597	1,430	100%	0	56%			0	56%	sample.txt	56%
31	... alternate strategies for winning the Cold War, but each had to be disciplined by	war*		25,049	1,452	55%	0	57%			0	57%	sample.txt	57%
32	... legislation. But even Democrats wanted of the loopholes and that we will	war*		25,145	1,458	24%	0	57%			0	57%	sample.txt	57%
33	... We should heed Thomas Jefferson who warned by... banking establishments	war*		26,712	1,543	16%	0	61%			0	61%	sample.txt	61%
34	... are more dangerous than standing armies, and the principle of spending	arm*		26,723	1,543	36%	0	61%			0	61%	sample.txt	61%
35	... prostate cancer. In fact, we have better survival in 13 of 16 cancers. Yet, the	suniv*		27,466	1,589	58%	0	62%			0	62%	sample.txt	63%
36	... the true measures of performance. As Warren Buffett was taught, Agence may	war*		26,371	1,657	8%	0	64%			0	64%	sample.txt	65%
37	... medical complex, not the ones that will come and go, and will	even*		26,437	1,659	20%	0	65%			0	65%	sample.txt	65%

Fig. 3-2-1: First concordancing process to search for metaphor keywords (WordSmith Tools 5.0)

N	File	Words	Hits	per 1,000	Dispersion	Plot
1	sample.txt arm*	44,087	6	0.14	0.644	
2	sample.txt attack*	44,087	3	0.07	0.478	
3	sample.txt battle*	44,087	14	0.32	0.015	
4	sample.txt blood*	44,087	1	0.02	-0.069	
5	sample.txt bleed*	44,087	1	0.02	-0.069	
6	sample.txt brutal*	44,087	1	0.02	-0.069	
7	sample.txt campaign*	44,087	5	0.11	0.359	
8	sample.txt enemy*	44,087	2	0.05	0.300	
9	sample.txt fight*	44,087	10	0.23	0.401	
10	sample.txt kill*	44,087	8	0.18	0.394	
11	sample.txt launch*	44,087	4	0.09	0.596	
12	sample.txt suniv*	44,087	7	0.16	0.514	
13	sample.txt target*	44,087	5	0.11	0.550	
14	sample.txt trench*	44,087	1	0.02	-0.069	
15	sample.txt troop*	44,087	1	0.02	-0.069	
16	sample.txt veteran*	44,087	1	0.02	-0.069	
17	sample.txt victor*	44,087	14	0.32	0.100	
18	sample.txt war*	44,087	16	0.36	0.447	
19	sample.txt weapon*	44,087	1	0.02	-0.069	

Fig. 3-2-2: Dispersion plots computed by captured metaphor keywords (WordSmith Tools 5.0)

metaphor groups. This flexible feature (no need of putting grouping tags in advance) also enables us to fully utilize all the corpus-based analysis features, offered by WordSmith Tools. Dispersion plots can also be processed, not by the conceptual metaphor groups, but by the metaphor keywords (Figure 3-2-2).

To demonstrate the sample concordance, a speech corpus of approximately 4,400 words was employed as the source text. For this demonstration, the keyword list related to the lexical field of “war,” proposed by Koller (2004: p. 66), was used.

Once the appropriate metaphor location information has been successfully obtained, the raw data, displaying the current concordance results, must be saved as an “Excel spreadsheet” for

	A	B	C	D	E	F	G	H
1								WordSmith Tools ..
2	Basic Statistics	Total Number of Words -->	45100					
3	Total	Number of Groups -->	6		3218874	185931	5971	
4	Max				44058	2507	100	
5	Min				339	33	8	
6	Mean				31870.84	1840.90	59.12	0.1
7	Sd.				11684.88	695.40	26.14	0.1
8								
9	1/8				3.75%	3.47%	13.44%	0.00
10	2/8	Reference value (Words)-->			8.27%	8.27%	14.06%	0.00
11	3/8	Reference value (Groups)-->			9.79%	9.85%	10.92%	0.00
12	4/8	Reference value (Keywords)-->			13.78%	14.00%	11.80%	0.00
13	5/8	Reference value (Result rows)-->			15.89%	15.93%	12.99%	0.00
14	6/8				15.34%	15.45%	12.45%	0.00
15	7/8				16.91%	16.93%	13.00%	0.00
16	8/8				16.28%	16.09%	11.35%	0.00
17								
18	N	Concordance	Set	Tag	Word #	Sent. #	Sent. Pos.	Para. #
19	1	hose and the lighting and the lightning that goes on, etc	fight*		339	33	50.56%	
20	2	ing that process?we also began attacking our economic crisis	attack*		1715	115	36.36%	
21	3	inking wages, we have kept a campaign promise to put a mid	campaign*		2071	139	50.00%	
22	4	is the kinds of projects being launched across the country?i	launch*		2710	179	75.00%	
23	5	a remedy that is specifically targeted at what ails the pat	target*		10372	528	80.00%	
24	6	remove your kidney, put your arm in a sling, and perform a	arm*		10399	529	74.19%	
25	7	same way. We must specifically target reforms at what ails a	target*		10442	532	25.00%	
26	8	you agree that companies like Target are best suited to be	target*		12436	647	45.45%	
27	9	is unveiling a multi-platform campaign aimed at informing A	campaign*		13222	695	36.67%	
28	10	such as the TV ad that we are launching today-so that they	launch*		13271	696	79.49%	
29	11	A President, I will carry this fight forward. But first, W	fight*		13867	729	92.31%	
30	12	is of snow and head south to a warmer place. In Texas I came	war*		14168	750	92.31%	
31	13	weeks ago he had a significant bleed from his bladder. His h	bleed*		15733	882	95.00%	
32	14	ed by your hemorrhage in your blood, you are going to be sh	blood*		15788	884	77.14%	
33	15	is reform of a system that, to survive needs to evolve. One	surviv*		16269	913	82.35%	
34	16	payers -- will force us into warring tribes. When survival	war*		17230	981	96.15%	
35	17	is us into warring tribes. When survival is threatened, those	surviv*		17233	982	37.50%	
36	18	s threatened, those who change?survive. The evolutionary gai	surviv*		17238	983	100.00%	
37	19	and this led to a simple but brutal assessment of the role	brutal*		18271	1055	75.86%	
38	20	if man?i I said, I? could? survive in Papua? without LA	surviv*		21874	1279	65.79%	
39	21	delicate to have Senator Mark Warner (D-VA), Congressman Fr	war*		23480	1372	20.00%	
40	22	erately looking for a line of attack to divert the social w	attack*		23540	1374	68.75%	
41	23	He used the term for the Cold War, preparing for fighte long	war*		23737	1384	17.65%	
42	24	he long health during the Cold War. He created the IgG?ans	war*		23779	1384	100.00%	
43	25	of the 1950s. Following World War II, the faculty feele a	war*		23855	1389	14.29%	
44	26	uch as countries in line. Potluck, tomato, out of context. C&T	troun*		73884	1389	84.21%	

Fig. 3-3-1: ‘Source’ worksheet – Imported raw data from WordSmith Tools (T-Scope 2.0)

the mental distance analysis that follows.

3.3 “Import” Button

When the Import button in the ‘Grouping’ worksheet (Figure 3-1-1) is clicked, T-Scope will automatically:

- (1) import the raw data, which has been already saved as an Excel spreadsheet by WordSmith Tools.
- (2) create the ‘Source’ worksheet in the T-Scope spreadsheet book as referential data storage for the related analysis.

Figure 3-3-1 is a sample screenshot of the ‘Source’ worksheet, which has been imported by T-Scope 2.0. In the C2 cell, the user may input the maximum number of words in the corpus. If there is no data inputted here, T-Scope will automatically read the E4 cell instead, which holds the word number at which the last metaphor keyword occurred. The user may specify the necessary number of groups in the C3 cell. This value should meet the analysis needs; the number of conceptual metaphor groups (or categories) that are necessary to conduct the comparative mental distance analysis desired.

3.4 “Extract” Button

When the user clicks the Extract button on the Grouping worksheet (Figure 3-1-1), T-Scope 2.0 will automatically:

- (1) clear up the existing values on the Grouping worksheet.
- (2) read and extract all the keywords from the Source worksheet, and list them vertically

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
1	Word#	fight*	attack*	campaign*	*launch*	target*	arm*	war*	bleed*	blood*	surviv*	brutal*	troop*	enemy	kill*	victor*	*trench*	weapon*	*battle*	veteran*	
2	1																				
3	2																				
4	3																				
5	4																				
6	5		1																		1
7	6																				
8	7																				
9	8																				
10	9																				
11	10																				
12	11															1					
13	12																				
14	13																				
15	14																				
16	15																				
17	16				1																
18	17																				
19	18																				
20	19																				
21	20																				
22	21									1											
23	22																				
24	23																				
25	24															1					
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62	61																				1
63	62																				
64	63																				
65	64									1											
66	65																				
67	66																				
68	67																				
69	68																				
70	69																				

Fig. 3-4-1: Metaphor keyword presence appearing in the ‘Values’ worksheet (T-Scope 2.0)

- in the “Keyword” row (stretching from the C5 cell to the Cx³) cell at the bottom).
- (3) extend the required number of rows of groups horizontally, located from the E4 cell to the x4 cell on the right.
 - (4) create the ‘Values’ worksheet (Figure 3-4-1).
 - (5) read and extract all the keywords from the Source worksheet, and list them horizontally in the first row of the Values worksheet (from the B1 cell to the x1 cell on the right), and complete the transcription of every metaphor presence with the default value of “1.” This process used to be a very painstaking manual task, before running T-Scope 1.0 (cf. Section 2.1).

This automatic process, completed with a single click, truly saves time and resources in the mental distance analysis. Not to mention, users may delete and/or add ‘presence,’ if needed, by modifying the numerical values appearing in the Values worksheet.

3) Variable number of rows or lines are represented by “x” to identify the final location of the associated cells.

3.5 Main Screen: ‘Grouping’ Worksheet—Figure 3-1-1

The Grouping worksheet is the main screen of T-Scope (version 2.0). As the name indicates, users can modify the grouping policy any time. This was previously a more laborious and time-consuming task, when it was necessary to change the grouping policy when using T-Scope 1.0. Detailed functions of the Grouping worksheet of T-Scope 2.0 are explained as follows.

3.5.1 Grouping Function

As explained in the previous section, all the keywords are automatically extracted and displayed in the Keyword row (stretching from the C5 cell to the Cx cell at the bottom). The group cells (stretching from the E4 cell to the x4 cell on the right) have also been created automatically. The number of group rows is already set, according to the user’s preference, specified in the C3 cell on the Source worksheet. The names of the groups written in the cells can be modified if necessary. If group names are changed, these new names will be automatically displayed in the Result worksheet,

In order to categorize a certain keyword into a certain group, double-click the cell, which is located at the intersection of the appropriate Keyword line and the Group row. If an empty cell is double-clicked, the default numerical value of “1” will appear. If the cell, in which an existing number is already shown, is double-clicked, the value will be cleared and returned to null again.

3.5.2 “MTP (MulTiPly)” Feature

The numerical values, which users set in the Grouping worksheet, represents the default mental distance index that will be applied to the specified metaphor keyword(s), when the final calculation is conducted on the Result worksheet. The default mental distance index for each presence of metaphorical expression was a fixed value of “1” with T-Scope 1.0. However, from the version 2.0, T-Scope has become capable of handling subtle differences in each parameter setting. If users wish to change the default mental distance index, they can modify the numerical values in the corresponding cells from 1 to any number of their preference, within the range of 0.1 to x .

The shaded MTP cells are the places to modify the default mental distance index, which affects: (1) all the keywords in the same single group—if set in a cell on the MTP line (from the E3 cell to the x3 cell on the right), or (2) a single keyword in all the groups—if set in a cell in the MTP row (from the B5 cell to the Bx cell at the bottom).

If a user wishes to modify the specific individual mental distance index for a specific metaphorical expression, he/she may modify it by directly changing the default value of “1,” which has already been transcribed onto the Values worksheet, to any number of the user’s choice.

The total mental distance value at a certain presence location of the metaphorical expression will be calculated by the following numerical expression: “Value = (a) × (b) × (c) × (d)” below.

- (a) The index set on the Values worksheet
- (b) The index set in the Keyword cells on the Grouping worksheet
- (c) The index set in the cells in the MTP row
- (d) The index set in the cells on the MTP line

For a demonstrative reason, the default values are modified in Figure 3-1-1, in order to clearly show the outline of the calculation process. It is not recommended, however, to modify the individual settings of the mental distance indexes, unless an advanced requirement is additionally desired.

3.5.3 “Verify” Feature

Verify cells on the Grouping worksheet are those which stretch vertically from the A5 cell to the Ax cell at the bottom, and which stretch horizontally from the D2 cell to the x2 cell on the right. Verify cells show the sums of the total mental distance indexes displayed in on the Grouping worksheet.

Each Verify cell located in the row A shows the total sum of the mental distance indexes set in each group located on the same horizontal line. As for the case in Figure 3-1-1, the numerical impression set in the A5 cell is: $A5 = \text{sum}(E5:J5)$. In the same way, the numerical impression in the E2 cell is: $E2 = \text{sum}(E5:E23)$.

Assuming that every individual mental distance index is “1,” all Verify cells display the number of items set in the corresponding rows or lines. This will help users to double-check that there is no keyword left un-categorized, or that there is no group without an associated keyword within. The parameters, pre-set in the Verify cells, can not be overwritten by users.

3.6 “Calculate” Button

When the Calculate button on the Grouping worksheet is clicked, T-Scope 2.0 will:

- (1) create the ‘Result’ worksheet.
- (2) open up a ‘Parameter Setting’ dialog box to ask for the ‘Scope & Step’ values to the user.
- (3) calculate all the mental distance values captured in each scope, and display the result in the Result worksheet (Figure 3-6-1).

The ‘Sum’ button, located in the A1 cell at the upper left corner of the worksheet, is used to calculate the sum of the values of all groups in each scope. It will also automatically create the

	A	B	C	D	E	F	G	H	I
1	Sum	ALL	group-A	group-B	group-C	group-D	group-E	group-F	Sum
2	1-100	11	1.2	4	3	1	1.3	2	12.5
3	51-150	8	3.2	2	2	1	2.6	1	11.8
4	101-200	11	5.2	3	2.6	1	1.3	1	14.1
5	151-250	21	3	2.5	22.2	1	2.6	1	32.3
6	201-300	19	3.2	1.5	21.6	0	2.6	1	29.9
7	251-350	8.5	3.7	1.5	1	2.1	1.95	1	11.25
8	301-400	21.5	3.9	3	13.6	2.1	16.25	1	39.85
9	351-450	24	4.6	1.5	19.2	0	15.6	1	41.9
10	401-500	12	2.2	2	7.6	0	1.3	1	14.1
11	451-550	11.5	1.5	3	6	0	4.55	0	15.05
12	501-600	14.5	3.5	3	7.6	0	8.45	0	22.55
13	551-650	18.5	6.5	5	9.2	0	8.45	1	30.15
14	601-700	15	6	3	7.2	0	6.5	2	24.7
15	651-750	6.5	1.5	2.5	2.6	0	3.25	1	10.85
16	701-800	6	1.2	2.5	2.6	0	1.3	1	8.6
17	751-850	7	2.2	0	2.6	2.1	0	1	7.9
18	801-900	10	1	1.5	6.2	2.1	0	1	11.8
19	851-950	10	1	2.5	5.2	0	0	3	11.7
20	901-1000	7	1	1	2	0	2.6	2	8.6

Fig. 3-6-1: Sample calculation result of the mental distance values (T-Scope 2.0/Scope 100 & Step 50)

‘Sum’ row on the right.

Once this result table is obtained, users may utilize it to draw line graphs to visually depict the mental distance flows. Or they may conduct various types of statistical analysis with this valuable set of data.

3.7 “CSV Export” Button

The CSV Export button is used when users need to export the ‘grouping policy’ of the keywords applied in the mental distance analysis, in the CSV file format. As for the sample demonstration displayed in Figure 3-1-1, the CSV data that is exported by clicking the CSV Export button is shown in table 3-7-1.

<pre> [Keyword], ALL, group-A, group-B, group-C, group-D, group-E, group-F fight*,1,1,,,1, attack*,1,1,,, campaign*,1,,1,, *launch*,1,,,,,1 target*,1,,1.5,,, arm*,1,1,,1,1, war*,1,,,1,, bleed*,1,,,,,1, blood*,1,1.2,,,,, surviv*,1,,,1,, brutal*,1,1,,,,, troop*,1,,1,,, enemy,1,,,,,1 kill*,1,,1,, victor*,1,,,1.1,, *trench*,1,,1,,1 weapon*,1,1,,, *battle*,1,,1.6,, veteran*,1,,1,,, </pre>

Table 3-7-1: CSV output for extended research (T-Scope 2.0)

Since the CSV is a flexible data format, it is expected that this exported file will be fully utilized in another application. An automatic tagging program is a feature under current development. It will automatically put group tags, such as <Group-A> and <Group-B>, back in the original electric texts, following the category information given in the CSV file. With this type of automatic tagging application, it will become much easier to interpret the dispersion plots on WordSmith Tools, especially divided by the groups—not by a lot of individual keywords. This automatic tagging program will expand the utility of the T-Scope application.

IV. Further Developments—Conclusion

In 2009, T-Scope 1.0 opened a new doorway to analyzing the chronological roles of metaphors by visually demonstrating the chronological variations of the mental distance flows captured in business speeches. Since then, the research methodology, as well as the T-Scope program

itself, has been developed to propose an insightful and persuasive solution to metaphor researchers.

What is necessary at this point, however, is to re-consider the fact that computers do not think. As Gries (2009: p. 173) argues, especially in corpus linguistics, it is necessary to explore the ways to fully utilize the ‘raw’ data computed by the concordancing application. T-Scope is designed as a tool to maximize the utilization of the data, but there remains a great deal of improvement. A corpus-based approach is inevitable in metaphor research, because “human beings are incapable of manually analyzing large collections of data in a limited time frame” (Tenorio, 2009: p. 118). Therefore, T-Scope has to be improved in order to undertake as many parts of hand-annotating work as possible in any type of metaphor analyses.

A metaphor identification process is, of course, one task which can be dealt with by T-Scope 3.0 or later versions in the near future. In order to overcome the “pre-set keyword” policy (Shimizu 2010b: p. 205) in corpus-based metaphor analysis, a practical next step is to improve T-Scope to be able to better handle the candidate metaphors at the beginning of each research. The automatic CSV output function, which T-Scope 2.0 offers in the spreadsheet, is one of the practical steps on the way to the goal. By accumulating and analyzing these metaphor keywords and categorization criteria in the simple CSV format, it is very important to conduct further research. Through this process, it is hoped that the metaphor researchers will present and share their own ‘personal’ technologies, such as T-Scope, in order to build up reliable metaphor identification programs.

For example, the T-Scope-compatible automatic tagging program, is currently being developed. As mentioned in the previous section, it is planned that the Extract & Grouping functions of T-Scope 2.0 will be used to categorize the metaphor keywords. These categorized keywords will help identify other metaphorical expressions in the wider business speech corpora. In tandem with the developing process of the new application, T-Scope will continue to be revised to be more capable of dealing with the metaphor identification issues, while refining the research quality of the original chronological mental distance analysis in speech communication. This challenge shall be a new quest requiring closer collaboration between specialized metaphor researchers and experienced computer scientists.

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