

Statistical Comparison of Metaphor Usage

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Author's Note

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### **Abstract**

This study is a statistical comparison of metaphor production and use among 60 mainly Māori who were interviewed in 2005 during a Fulbright Research Grant. The interviewees included 34 females and 26 males: Of these, 31 learned the Māori language as children and 29 learned it as adults. The youngest participant was age 8 and the oldest was 72. Interviewees were asked questions regarding their experiences with the Māori language, the role of community in the revitalization of this language, and the future of the language. The transcribed language samples were analyzed for metaphor usage.

This study follows previous analysis by King (2007) with newly fluent Māori language speakers and by Gregory (2010) with 2 male Māori leaders. The metaphors LANGUAGE IS WATER, LANGUAGE IS A PATH and LANGUAGE IS A CANOE (subsumed as metaphors related to motion), LANGUAGE LEARNING/LANGUAGE MAINTENANCE IS RESISTANCE, LANGUAGE IS FOOD/LANGUAGE IS GROWTH, and LANGUAGE IS TREASURE/AN OBJECT from the previous studies are explored more in-depth in this current study through the comparison of metaphor domain use between those who learned Māori as children and those who learned it as adults. Additional comparisons between men and women and among various ages are made for a few metaphor domains.

### Statistical Comparison of Metaphor Usage from Interviews with Māori Language Speakers

The exploration of metaphors as part of natural language use and manifestation of thought is relatively new as a linguistic study. This shift in understanding is attributed to Lakoff and Johnson's (1980) work that suggested the ubiquitous nature of metaphor usage in the English language. Their work generalized the term *metaphor* to cover a number of figures of speech, including *simile*, *personification*, and *metonymy*. Expanding on the earlier work, Lakoff (1992:1) posited metaphors as cross-domain mapping—the way each person conceptualizes ‘one mental domain in terms of another’, which supports the notion that the correct province for the study of metaphors is everyday language. To illustrate that novel and everyday metaphors originate from the same cross mapping, Lakoff (1999: 63-65) explored the metaphor domain of LOVE IS A JOURNEY with examples from both categories.

Cognitive grammarian Langacker (1987, 2013) described ‘cross-domain mapping’ as the features of one conceptual domain usually grounded in physical experience and projected onto another: ‘aspects of the **source domain**, pertaining to the manipulation of physical objects, are projected metaphorically onto the **target domain** of understanding and communicating ideas’ (Langacker, 2013: 36). This description is essentially the same as Lakoff's (1992) description of *sources* as sensorimotor. In the Langacker (1987, 2013) schema, a metaphor exists when there is a shift in similarity between **the source domain** and the **target domain** toward abstraction or extension from the physical reality. These metaphors may be a type of *blending* wherein ‘selected features of two conceptions are combined to create a third’ (Langacker, 2013: 36). Langacker's blending shares some characteristics to Lakoff's (1999: 49) *conceptual blending*: ‘Complex metaphors are formed from primary ones through conventional conceptual blending, that is, the fitting of small metaphorical ‘pieces’ into larger wholes’.

Following Lakoff and Johnson's (1980) research, Kövecses (2005:36-38) explored cultural and universal metaphors and argued that the presence of similar metaphors in different languages and cultures denote universal metaphors and that cultural variation in metaphors resides in a widened range of *source domain* (70) and the *scope of metaphor*: ‘The scope of metaphor means the set of target domains to which a particular source domain can apply’ (Kövecses, 2005:72). He demonstrates the scope of metaphor in several languages, including English, Japanese, Brazilian Portuguese, and Tunisian Arabic. While the source domain shows similarities in all four languages, the applications or target domains differ slightly.

Another source of cultural variation resides in the conceptualization of spatial relations that originate in ‘three basic schemata’: the ‘body only’ schema, the ‘body and environment’ schema, and the ‘extended body’ schema (Kövecses, 2005:80-81). Examples for each of these orientations include *head* is *UP* and the *foot/leg* are *DOWN* for “body only” schema, *sky/cloud* are *UP* and *earth* is *DOWN* for ‘body and environment’ schema, and *home, house* and *roof* as references for AT, TO, WITH, and UP for ‘extended body’ body schema. Oceania languages such as Māori use ‘body only’ schema as does English.

To achieve a statistical comparison of metaphor usage, an application of the metaphor identification procedure or MIP (Pragglejaz Group, 2007) was used. The purpose of MIP ‘is only to provide a research tool that is relatively simple to use and flexible for adaptation by scholars interested in the metaphorical content of natural discourse’ (Pragglejaz Group, 2007:2). The procedure for determining a metaphor is multi-stepped.

- a. For each lexical unit in the text, establish its meaning in context....Take into account what comes before and after the lexical unit.
- b. For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the one in the given context. For our purposes, basic meanings tend to be
  - More concrete [what they evoke is easier to imagine, see, hear, feel, smell, and taste];
  - Related to bodily action;
  - More precise (as opposed to vague); and
  - Historically older.

Basic meanings are not necessarily the most frequent meanings of the lexical unit.
- c. If the lexical unit has a more basic current-contemporary meaning other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it. (Pragglejaz Group, 2007: 3).

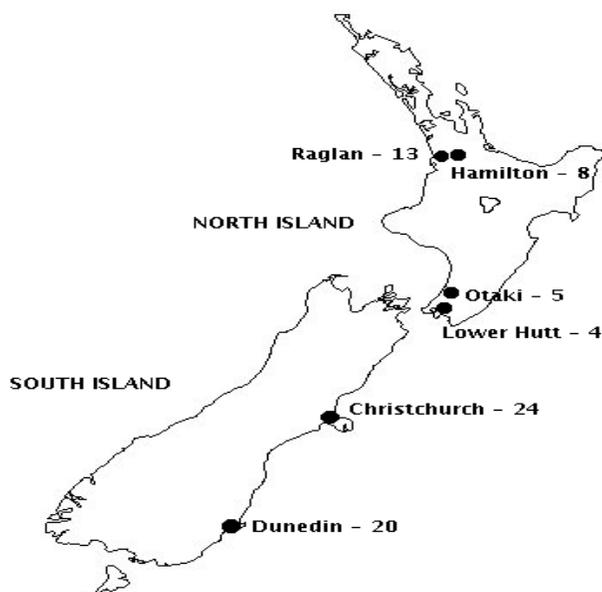
The Pragglejaz Group (2007) used multiple readers in the sample study that analyzed for all instances of metaphors in a news article. As might be predicted, not all the readers agreed on every lexical item. However, the results were deemed reliable using Cohen’s Kappa, a statistical method for determining the reliability of agreement among the raters. An important part of

understanding MIP is that making decisions about metaphors is ‘usually “theory neutral,” because they reflect analysts’ ideals about a wide variety of linguistic and cognitive matters that surely influence what words get marked as metaphorical’ (Pragglejaz Group, 2007:23). Finally, phrases may be counted instead of individual words, and MIP is deemed appropriate for all genres.

Examining metaphors in natural language has not been exhausted as a research topic. Nor is there a complete understanding of what are primary or universal metaphors in all languages and cultures. It is hoped that the comparisons made in this study may offer new insights into metaphor usage and expand the understanding of that topic generally as well as provide information about metaphor usage among the Māori.

### **Methodology**

The interviews analyzed in this study were collected in 2005 during a Senior Fulbright Research grant to New Zealand. The location of the interviews were Dunedin and the Otago region; Christchurch, including students at the Christchurch College of Education, students at the University of Canterbury School of Māori and Indigenous Studies, and parishioners from a Māori Anglican Church; Raglan, including teachers and students from the Raglan Area School and other local residents; Hamilton, including teachers from Te Kohunga Reo o Nga Kuaka; Otaki, including students and teachers from Te Wānanga o Raukawa; and the Wellington/Lower Hutt area.



All interviews were conducted in English. While originally, there were over 70 interviews, only 60 with complete demographic data were used for this study. These 60 interviews include 31 participants who learned Māori as children (before attending primary school) and 29 who learned Māori as adults. Five of the ‘as adult’ group were non-Māori and included three fluent speakers. One of the ‘as children’ group was non-Māori. The youngest person interviewed was 8 and the oldest was 72: Both learned Māori as children. There were 34 female and 26 male interviewees.

The interviews were transcribed by three people and then checked again by the author. The transcriptions were done in MS word with each transcribed interview in one document. To normalize the texts, repetitions, pauses, and false starts were eliminated. The total number of words was then calculated by using the Word Count function in MS Word. The size of each corpus is roughly equivalent: The ‘as children’ corpus contains 41,209 words, and the ‘as adult’ corpus contains 46,547 words for a total of 87,756 words. There is more variation in the range and average length of interview. The range for the ‘as children’ group is 137 words to 7424 words with the average length of each interview at 1353 words. The range for the ‘as adult’ group is 388 words to 4322 words with the average length of each interview at 1605 words.

#### Corpus, Range, and Average Word Length

	as children	as adult
Corpus	41,209 words	46,547 words
Range	137-7424 words	388-4322 words
avg length of interview	1353 words	1605 words

Each transcription was read several times and potential metaphors were identified and analyzed for meaning in context. A version of the *Oxford American Dictionary* that comes with MacBook Pro was the primary dictionary used to help understand the conceptual base of each metaphor. The identified metaphors were then categorized based upon common conceptual bases. Finally, only metaphors relating to language and previously identified categories were counted for this study. The notation system used in this study is potential SOURCE DOMAINS in all caps, TARGET DOMAINS in small caps, and instances in ‘small letters’.

Once metaphors were identified, each was assigned to a set of base meanings.

#### Metaphor Categories

LANGUAGE IS WATER

One large and important metaphorical group is LANGUAGE IS WATER. The physicality of these metaphors originates in the ideas of water as essential to life, water is life giving, and water begot life. The instantiations of this domain are dominated by variations of conventional metaphors of ‘fluent’, ‘immersion’, and ‘mainstream’, all metaphors associated with language revitalization. Since these metaphors are still in use, they are cognitively real and not dead (Lakoff & Johnson, 1999:124). ‘Fluent’ and ‘stream’ carry the meaning of flowing: In the case of ‘stream’, the idea is flowing water.

Discovering the SOURCE DOMAIN for the water metaphors is difficult for various reasons. Lakoff and Johnson (1999) discussed fluids as a special case in the **target domain** of EXTERNAL EVENTS ARE LARGE MOVING OBJECTS with examples of ‘we are in the *same boat*’ and ‘you gotta *go with the flow*’. One instance in this study fits this particular category: ‘And my father and my partner and myself are all on the same boat, rowing to the same beach’. The base meaning of fluent, flowing freely, is closely related to the base meaning of fluid, to flow. One instance from this study that might belong to this domain is ‘it’s [language is] quite fluent up there’. However, this use of fluent differs little from the more common usage represented by these phrases: ‘fluent native speaker’, ‘people who are completely fluent’, and [speak] ‘fluent Māori’, representing extensions of the physical realities of water.

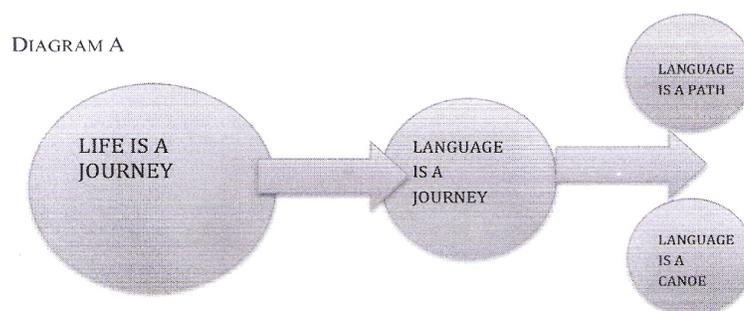
In terms of the use of immersion, King (2003) posited that these metaphors represent blending of traditional Māori and Christian beliefs. She argued that in both Māori and English, water represents change. For example, ‘being immersed in water conjures up the image of adult baptism’ (King, 2003:113) and water removes or confers *tapu*, religious restrictions (King, 2007:320). Certainly for Māori, these terms and their Māori language equivalents, e.g. *rumaki* for immersion, permeate Māori revitalization efforts. Additional metaphors represent language as a body of water: the language ‘stagnating’, ‘pool of speakers’, ‘thrown in the deep end’, ‘dire straits’, ‘ebbs and flows’, ‘sink or swim’, ‘te reo Māori blood is watering down’, and ‘mātāpuna—the spring from which culture emanates’. ‘Pool of speakers’ combines two **target domains** with the idea of language being a body of water composed of language speakers (King, personal communication, 8 Nov 2016). One of the ‘as children’ group originated ‘pool of speakers’. Interviewees in the ‘as adult’ group produced the remainder.

LIFE IS MOTION

Movement and motion are integral parts of life. In fact, how alive an organism is can be assumed from the amount of its movement or motion, and some animals like the opossum have used this to their advantage. The concept LIFE IS MOTION has been mapped into many other domains, including time—TIME IS MOTION, change—CHANGE IS MOTION, and action—ACTIONS ARE SELF-PROPELLED MOTIONS (Lakoff & Johnson, 1999). The current category is wider than King's (2007) original analysis, which consisted of journey metaphors: LANGUAGE IS A PATH and LANGUAGE IS A CANOE. LANGUAGE IS MOTION represents another **target domain** in which language substitutes for life (see King, 2009) and represents a blend of several **target domains**.

For purposes of this study, instances related to language and motion have cross-mapped into several new domains in addition to those identified by King (2007, 2009). A *path* is a way or track laid down for walking with an expanded meaning encompassing the direction of the movement (of the walker) whereas *canoe* is a means for reaching a destination by water. Essentially, both are modes for reaching a destination. According to Lakoff and Johnson (1980:90), journey defines a path and the SOURCE DOMAIN for these metaphors is LIFE IS A JOURNEY.

#### LIFE IS A JOURNEY Illustration



The elements of LIFE IS A JOURNEY have been applied to a new **target domain**, language, so that LANGUAGE IS A JOURNEY (King (2007)). This new metaphor has been instantiated in a variety of ways that include the cultural metaphors of LANGUAGE IS A CANOE and LANGUAGE IS A PATH (King, 2007), and both of these can be classified as ACTIONS ARE SELF-PROPELLED MOTIONS (see Lakoff & Johnson, 1999:187).

LANGUAGE IS A JOURNEY is realized in a variety of metaphors: ‘pathway’, ‘path’, ‘way’, ‘first steps’, ‘walking down that side’, ‘followed it’, ‘journey’, ‘drove it’, and ‘waka [canoe]’. Some metaphors of movement coexist with LANGUAGE IS AN OBJECT metaphors as in ‘it [the language] pushed me forward’, further illustrating the ubiquitousness nature of metaphors.

Another category of motion metaphors denotes UP IS GOOD/FRONT IS GOOD and DOWN IS BAD.

#### UP and DOWN/FRONT TABLE

Phrase	Lg Group
[language learning has] to go up another step and another step (up)	As Adult
It’s [language learning] a slow sort of progression forward (front)	As Adult
Drove it [language] underground (down)	
Moved ahead in leaps and bounds (front)	As Adult
To go to another level in te reo (up)	As Adult
I feel like my level is dropping (down)	As Adult
My level is dropping (down)	
I went up fast (up)	
I kind of feel like I’m on a slow decline (down)	
Been taking a decline (down)	As Adult
Their language was beginning to decline (down)	
Language has gone down (down)	As Adult
It’s definitely progressing (up)	
It’s [language] definitely going up (up)	As Child
It’s [language] starting from the bottom and coming up (up)	
They build it back up (up)	As Child

These orientational metaphors have their source domain in spatial relations through the body, such spatial relations being similar between Māori and English (Kövesces, 2005). As mentioned previously, they often combine with LANGUAGE IS AN OBJECT metaphors: ‘drove it [language] underground’. In some instances, language learning becomes a path: ‘it [language learning] has to go up another step and another step’. In other instances, LANGUAGE IS WATER: ‘my level

is dropping’. Additional LANGUAGE IS MOTION metaphors are the motion of the sea, such as ‘ebbs and flows’ that appears to be related to LANGUAGE IS WATER, and the motion of animals, such as ‘it’s starting to creep back’ although this latter metaphor is often used with water to describe the movement of water in flooding or the tide coming in. The metaphor [the Māori language is] ‘downloaded to you’ is related to TIME IS MOTION and CHANGE IS MOTION (See Lakoff & Johnson, 1999).

#### LANGUAGE LEARNING/LANGUAGE MAINTENANCE IS RESISTANCE

Metaphors in LANGUAGE LEARNING/LANGUAGE MAINTENANCE IS RESISTANCE share a common physicality of resistance that ranges from resistance to atmospheric pressure in the case of ‘hard’ to the resistance of one army against another in ‘battle’. The SOURCE DOMAIN for these metaphors has a wide scope and includes instantiations of ‘battle’, ‘struggle’, ‘challenge’, and ‘hard’. In each instance counted, the contextual meaning was metaphorical.

These metaphors are related to war metaphors (see Lakoff & Johnson, 1980) that contain the base idea of conflict and struggle, particularly between two sides. Gregory (2010) argued that the conceptual base for the use of battle metaphors exists in both the Māori and English languages. While on the surface it may appear that battle and hard are unrelated, both share similar base meanings requiring force and strength, suggesting the same source domain (see Langacker, 2013). Lakoff and Johnson (1999) place the domain for metaphors in sensorimotor experiences. In this case, both ‘hard’ and ‘battle’ share similar sensorimotor experiences with a primary difference being degree of resistance.

##### Sample Instances

- (a) I was resistant
- (b) I’m really struggling with it
- (c) It’s hard to learn
- (d) I will fight for language in my family
- (e) To actually speak it is a bit of a struggle
- (f) It’s been a real hard battle

One interviewee summed it up this way: ‘speaking Māori is a subversive activity’. This group of metaphors complements LANGUAGE IS MOTION and captures an important aspect of language revitalization efforts as well as the physics principle of overcoming inertia.

## LANGUAGE IS FOOD/GROWTH

Two groups with small counts were combined since GROWTH is the outcome of FOOD and the basic meanings seem to be related. LANGUAGE IS A SEED (see King, 2007) is another related concept. The relationship among these three concepts is that a seed is the first stage in plant growth and that food produces growth. The base meaning of growth is ‘the process of increasing in size’. This relates to a basic concept MORE IS BETTER, which is coherent with the orientation metaphors of GOOD IS UP and MORE IS UP (see Lakoff & Johnson, 1980:14-22). This cluster of metaphors may, therefore, share the same source domain inasmuch as these are based upon similar physical realities.

### Sample Instances

- (a) It was a course called *te kākano*, which was like the seed. I think next--there was the seed and then it was the young sapling and then, I think, it was the fully-grown tree.
- (b) [In regards to the future] it [Māori language]’ll grow.
- (c) [In regards to community involvement in language revitalization] you can only grow [in the Māori language] so far in your home.
- (d) I think it [the Māori language]’s holding its own, but it’s definitely not growing.
- (e) It [the Māori language]’s feeding their minds as well.

Example (a) may indicate that the seed metaphor already exists in the Māori language although King (2007) speculated that this concept is borrowed from English, possibly from Biblical metaphors. Example (e) shows the Māori language as a source of food. Examples (b) and (d) show the language growing whereas (c) shows that the language is the source of growth.

## LANGUAGE IS TREASURE

The meaning of the word *treasure* originates from the Greek *thesaurus*, meaning storehouse or treasure. King (2007) explained the extension of *taonga* (the Māori word for treasure) from physical objects to the Māori language being based in the promise in the Treaty of Waitangi to protect Māori treasures. In more recent times, the Maori language through extension has become part of this treasure. For purposes of this study, any metaphorical expression of the value of the Māori language was included. As in the King (2007) study, this metaphor group is one of the smallest.

In the ‘as adult’ group, two interviewees referred to the Māori language as *treasure* (as a noun) and/or *toanga* [Māori for treasure], and one referred to speakers of Māori as *treasures*.

One interviewee from the ‘as children’ group used *treasure* as a verb in the phrase ‘...we should just treasure it’. Māori was also ‘rewarding’ and ‘rich,’ had ‘value,’ added ‘richness’ to New Zealand, and people were ‘precious’ with it. One of the ‘as adult’ group used this phrase: ‘...language is the icing on the cake.’ Two original metaphors included ‘we’re going back to 1840 silver stock,’ and ‘it was class.’

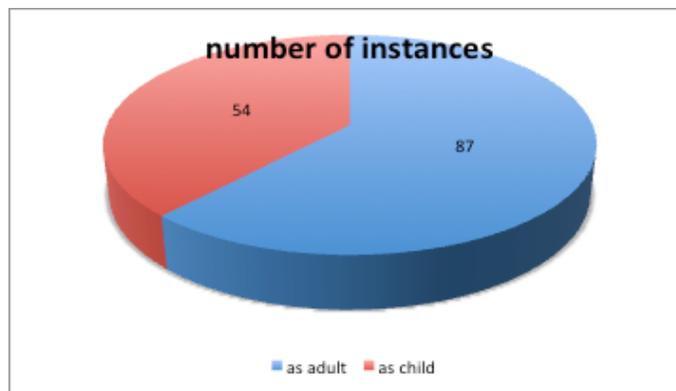
Since the base concept is that Māori language is valuable, two other phrases were included: ‘it’s such an ancient thing’ and the ‘intimate and sacred times I spend with my son, we speak in Māori.’ In the first expression, it can be assumed that something ancient is valuable. The second expression also falls in the same category inasmuch as sacred things are considered valuable. Both phrases seem to fit the original concept of ‘storehouse, treasure’. The construction here is a bit different because Māori language creates the sacredness or value. However, grammatical construction of metaphors is not considered in this study (see Pragglejaz Group, 2007). As King (2007) pointed out LANGUAGE IS TREASURE is a subset of LANGUAGE IS AN OBJECT. There were a variety of verbs used to convey this latter metaphor: ‘have’, ‘brought’, ‘pick up’, ‘carry’, ‘lost’, ‘stuck’, ‘take’, and ‘gave’.

#### Comparison of Metaphor Use Between the ‘As Children’ and ‘As Adult’ Group

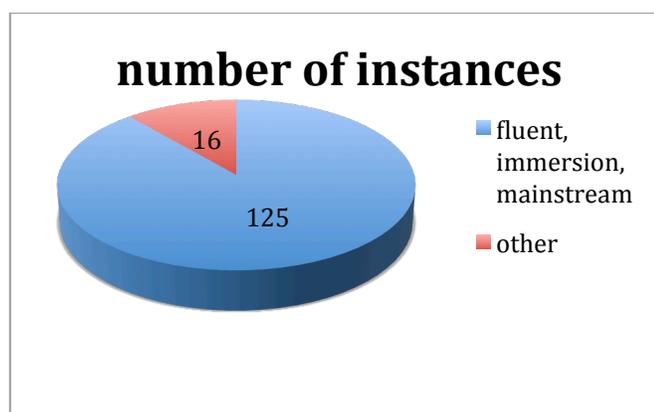
Because of the differences in the sizes of the two language corpora being compared, a statistical comparison of the two groups requires a comparison of proportions of usage. When comparing proportions, the null hypothesis states that there is no difference between the two populations. As a consequence, any difference must be tested for significance. In making this comparison, the *z* statistic represents a standard Normal distribution (Moore, 2007:520-522) and was calculated for each comparison. Online software provided by GraphPad Software, (2015) was used to test for significance.

#### LANGUAGE IS WATER

The use of water metaphors is a very large group that is dominated by variations of the conventional metaphors of *fluent*, *immersion*, and *mainstream*, all metaphors associated with language revitalization. The ratio of usage is 87 uses of water metaphors by ‘as adults’ to 54 uses by the ‘as children’ group.



The proportions are 0.0019 to 0.0013 respectively. The  $z$  score equals 3.08, and two-tailed  $P$  value equals 0.0021, making this difference very significant according to conventional criteria (GraphPad, 2015).

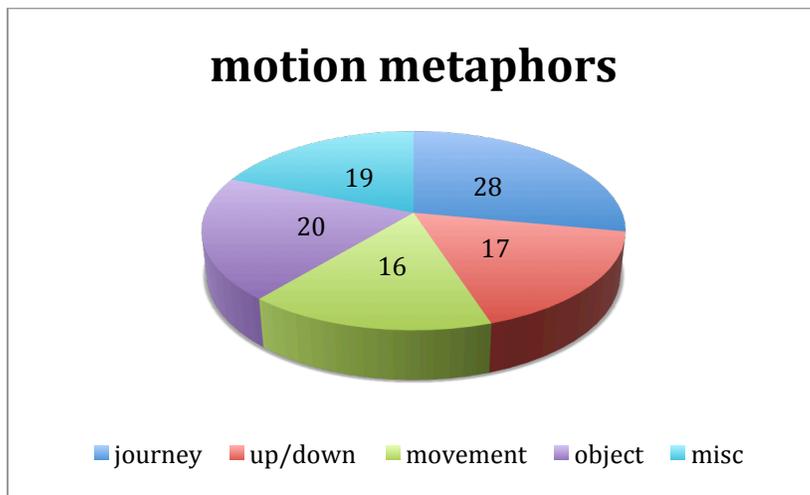


Of the 141 instances of water metaphors, 125 consist of metaphors reflecting ‘fluent’, ‘immersion’, and ‘mainstream’. In the LANGUAGE IS WATER metaphors that do not fit the previous metaphors, the ‘as adult’ group used these metaphors 2 to 1 to the ‘as children’ group. There is no significant difference between the use of water metaphors between males and females.

#### LANGUAGE IS MOTION

There are 12 instances of usage of journey metaphors from each group. The two proportions, 0.0003 once rounded, are roughly equivalent. Consequently, no statistical comparison was done. The category of motion metaphors that represents UP IS GOOD, FRONT IS GOOD, and DOWN IS BAD yielded a surprising difference: There are 13 instances of this metaphor used by the ‘as adult’ group with only 2 instances used by the ‘as children’ group. The  $z$  value equals 6.25, and the  $P$  value, being less than 0.0001, is “extremely statistically significant” (GraphPad, 2015).

Another group of language in motion metaphors include the motion of the sea—‘ebbs and flows’, the motion of animals—‘it’s starting to creep back’, and general movement—‘where Māori language is going’. There are 15 instances in this group. And as mentioned previously there are a host of motions associated with LANGUAGE IS AN OBJECT: ‘pass it on’, ‘kick start it’, and ‘driving it’, to name a few. There are 18 instances that fit into this category and an additional 19 instances of other uses that include personification of language. None of these proportions were compared statistically.



#### LANGUAGE LEARNING/MAINTENANCE IS RESISTENCE

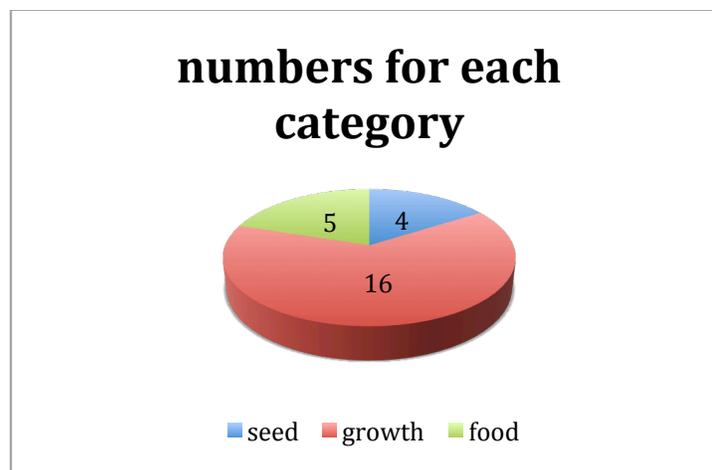
There are 34 instances of these metaphors with a ratio of 22 for the ‘as adult’ group to 12 for the ‘as children’ group. The proportion of usage by the “as adult” group is 0.0005, and the proportion of usage by the ‘as children’ group is 0.0003. The  $z$  value is 2.85, so the two-tailed  $P$  value equals 0.0044 and is considered very statistically significant (GraphPad, 2015).

The usage of these metaphors is split equally between men and women. The use of ‘hard’ dominates this metaphor with 18 instances and appears to be used to describe personal language learning. While ‘struggle’ is used in 4 instances to describe personal language learning, ‘struggle’ and ‘battle’ seem to be reserved to describe language maintenance in the majority of usages.



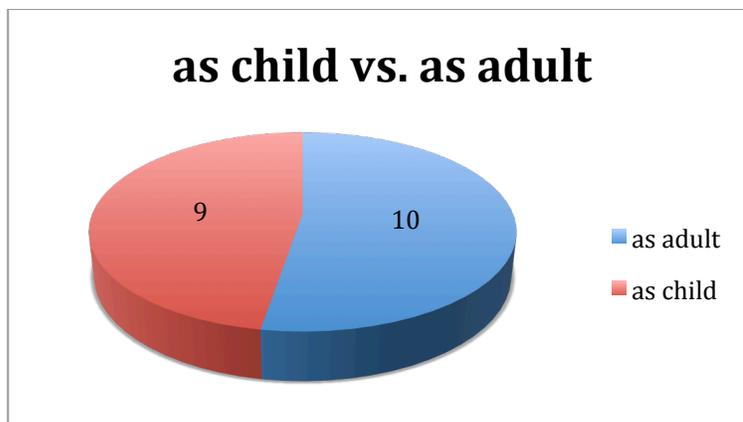
### LANGUAGE IS FOOD/GROWTH

Of the 25 instances of these metaphors, 12 instances are in the ‘as adult’ group and 13 instances in the ‘as children’ group. The  $z$  value is 1.09, and P value equals 0.2575. The difference between the two groups is not statistically significant (GraphPad, 2015). These metaphors are used 3 to 1 by the ‘as adult’ group compared to the ‘as children’ group. The ratio for the LANGUAGE IS FOOD category is 3 to 2 with the ‘as children’ group having a slightly higher usage. The ratio for LANGUAGE AS GROWTH is 9 to 7 with the ‘as children’ group having a slightly higher usage than the ‘as adult’ group.



### LANGUAGE IS TREASURE

The proportion of usage of these metaphors is very small: 10 instances or a proportion of 0.0002 for the ‘as adult’ group and 9 instances for a proportion of 0.0002 for the ‘as children’ group. Consequently, these two groups are roughly equivalent.



Since LANGUAGE IS TREASURE is a subset of LANGUAGE IS AN OBJECT, the latter was also counted. LANGUAGE IS AN OBJECT is a larger set of metaphors with a 135 uses. The proportion is 0.00014 for the ‘as children’ group and 0.0016 for the ‘as adult’ group:  $z = .77$ . The difference is not statistically significant (GraphPad, 2015).

#### Age and Gender Differences

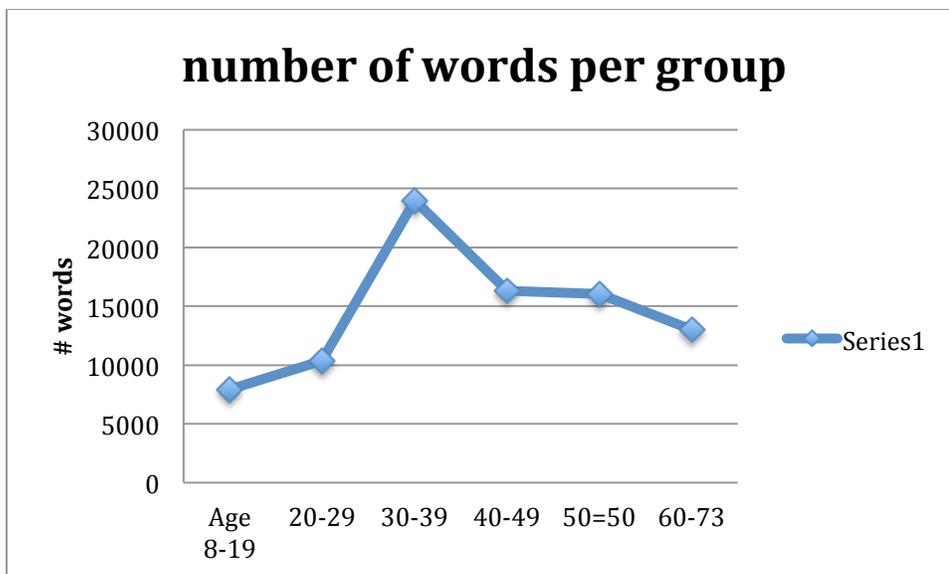
Only a few of the metaphor groups were chosen for additional comparisons. These include LANGUAGE IS TREASURE/LANGUAGE IS AN OBJECT, the metaphor cluster of LANGUAGE IS A SEED, LANGUAGE IS FOOD/ GROWTH, and LANGUAGE IS MOTION. The first three categories are compared across gender while the cluster of motion metaphors is compared across ages.

#### LANGUAGE IS MOTION

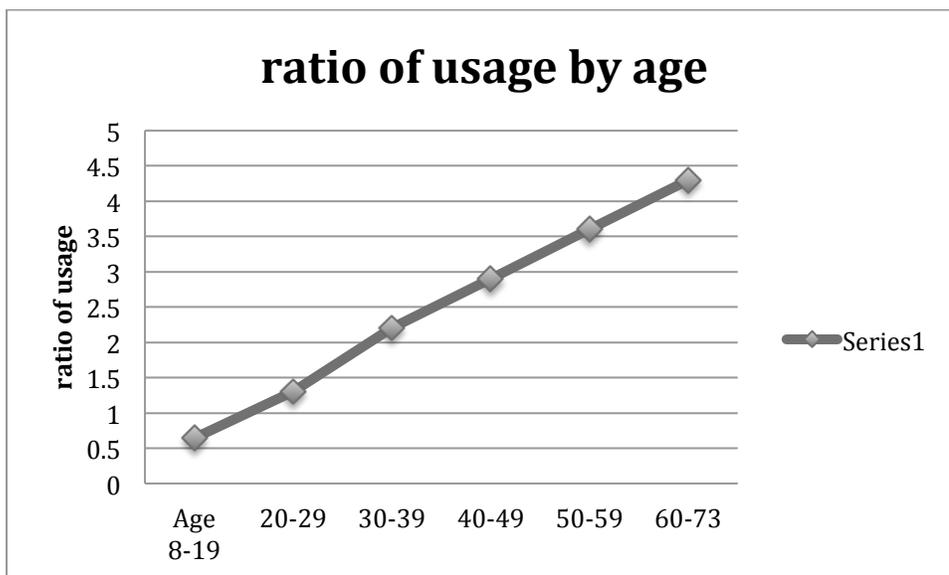
Because this is the largest metaphor cluster, it was examined for usage by different age groups: 8-19, 20-29, 30-39, 40-49, 50-59, and 60-73. These groupings are roughly based upon decades. Several comparisons were made among these groups.

#### Comparison by Age

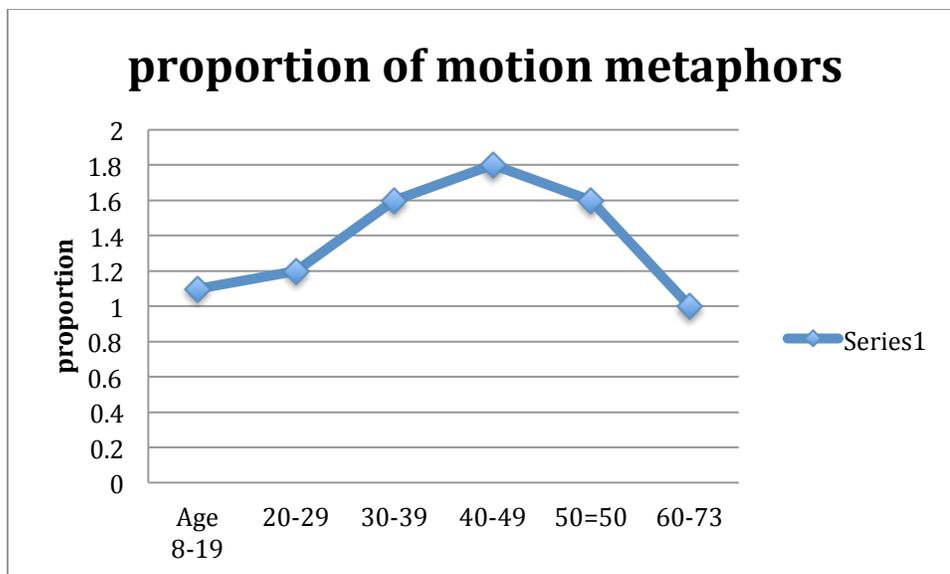
Age group	8-19	20-29	30-39	40-49	50=59	60-73
# of participants	14	9	17	10	7	3
# of words	7917	10370	24013	16311	16067	13032
Proportion of metaphor usage by speakers	.64	1.3	2.2	2.9	3.6	4.3
Proportion of metaphor usage per total number of words for group	1.1	1.2	1.6	1.8	1.6	1.0



The 30's group has the largest number of interviewees, 17, and the largest corpus, 24,013 words. The group consisting of children and teenagers, while having 14 interviewees, have the smallest corpus, 7,917 words. Although there are only 3 members of the 60-73 group, their corpus consists of 13,032 words.



When comparing the proportion of usage based upon the number of instances divided by the number of speakers who use these metaphors, the proportion increases with each age group.



The comparisons of the proportion per word count by age group found no significant differences among any of the groups. Another way to think of this is that the use of LANGUAGE IS MOTION metaphors is prevalent among all ages.

#### LANGUAGE IS FOOD(SEED)/GROWTH

King (2007) discussed all three of the metaphors in this set. She cited the Bible as one possible source for this metaphor and attributes its source as English, which may account for its usage by both men and women. Two males and one female used the LANGUAGE IS A SEED metaphor. However, only men used the LANGUAGE IS FOOD metaphor. This contrasts with the findings the King (2007) study that included examples by both men and women. Finally, men used the LANGUAGE IS GROWTH metaphor slightly more than women with 10 instances by males to 6 instances by female or a proportion of .38 to .18. In essence, men used this metaphor twice as frequently as women. Most of the metaphors describe the language growing.

#### LANGUAGE IS TREASURE/AN OBJECT

Fourteen people used treasure metaphors, six of whom were male producing ten metaphors, and eight of whom were female producing nine metaphors. As with the comparison between the 'as adult' and the "as children' groups, there is no statistical difference between the male and female usage of this metaphor set. However, statistical difference was found when comparing the use the LANGUAGE IS AN OBJECT between males and females: Women produced instances in this metaphor group at a proportion of .0019 to the usage of .0011 by

males. The  $z$  score is 2.5, making the two-tailed  $P$  value .0125: By conventional criteria, this difference is considered statistically significant (Graphpad, 2015)

### **Discussion of Results**

Some of the statistical differences between the two groups, ‘as children’ and ‘as adult’, can be explained by the contrasts in the experiences of the two groups. For example, the ‘as adult’ group understandably had more personal experiences involving immersion classes, the primary vehicle used for revitalizing the Māori language. It is likewise not surprising that the ‘as adult’ group had experienced more resistance in language learning. The fact that there is no statistical difference in the metaphor categories of UP IS GOOD, FRONT IS GOOD, and BAD IS DOWN can be attributed a common body orientation in Māori and English (Lakoff & Johnson, 1980, 1999; Kövecses, 2005).

The lack of statistical contrast between the two groups in the production of LANGUAGE IS TREASURE metaphors might be explained by the elevation of the Māori language as a *taonga* under the Treaty of Waitangi (cf. King’s discussion, 2007: 61-72). And, of course, this metaphor category is an extension of LANGUAGE IS AN OBJECT, just as the inclusion of language under the category of *taonga* is an extension from the physical treasures and cultural belongings of the Māori. In a similar manner, the LANGUAGE IS GROWTH set reflects common concepts in the language revitalization process as well as ideas present in print in the Māori language (see King, 2007).

The comparison of the gender differences in metaphor usage between men and women the LANGUAGE IS TREASURE again indicates that this idea is shared between both populations. The contrast between the female and male production of metaphors in the LANGUAGE IS AN OBJECT reflects differences in the experiences of these two groups. The larger female use of LANGUAGE IS AN OBJECT may indicate a more utilitarian viewpoint about the Māori language. Juanhong (2012:54), in a study of gender differences in the use of ‘touch’ metaphors, posited differences between men and women with women being more traditional and conservative in language use than men, suggesting that men might feel freer to use language in new ways.

#### Age Differences in Usage of LANGUAGE IS MOTION

The lack of statistical difference among any of these age groups may indicate that motion plays a significant role in metaphor use and that these metaphors originate from one SOURCE

DOMAIN. To support this supposition, Lakoff and Johnson's (1999) discussions indicate motion as part of several complex metaphors, including metaphors incorporating journey. This group involves orientational metaphors that appear to be universal between English and the Māori language. The ubiquitous use across the ages may also suggest that metaphors associated with motion may be acquired early.

#### LANGUAGE LEARNING/MAINTENANCE IS RESISTANCE

One area where gender difference appears qualitatively is in the LANGUAGE LEARNING/MAINTENANCE ENCOUNTERS RESISTANCE set. Males tended to use metaphors association with 'battle'. Some instances include 'to enarm ourselves,' 'it's [maintaning the language] been a really hard battle,' and 'still more battles to be fought.' These phrases were uttered by men who were active politically. Only one female used a similar phrase: 'I will fight for language in my family.' While in substance female usage reflects sentiments similar to those voiced by the men, the metaphor reflects a personal, or 'intimate,' perspective. Tenorio (2009) examined differences in metaphor usage, specifically in referencing the country of Ireland, among male and femal politicians. Tenorio's purpose was to try to identify a feminine voice via metaphor usage. She concluded that the female speaker embraced 'a more humane, intimate perspective' (Tenorio, 2009:133).

#### Conclusion

Although the corpus for this study is small, the results align with previous studies. Analyzing metaphors in natural language is a complicated process. Unlike consciously constructed metaphors found in literature, the universality of metaphors makes isolating specific metaphors more difficult. Metaphors of one type co-exist with metaphors of another type. Co-existence seems to exist with metaphors of LANGUAGE IS AN OBJECT, which were found with LANGUAGE IS A JOURNEY and orientational metaphors. These combinations appear to represent a kind of blending (Lakoff & Johnson, 1999; Langacker, 2013).

Kövecses' (2005) concept of expanded source domain describes the LANGUAGE IS MOTION set of metaphors. Although some differences in the 'as adult' and 'as children' groups may reflect differences in personal experiences, a study by Lai and Boroditsky (2013) suggests that bilinguals may adopt metaphors unlike the metaphors of monolingual speakers of either language. In researching spatial time concepts of Mandarin monolinguals, English monolinguals, and Mandarin/English bilinguals, they found that English and Mandarin monolinguals tend to

take different perspectives on time. Further, the Mandarin English bilinguals differed depending on what language the time metaphor was understood in. ‘...There are both effects of L1 on meaning-making in L2, and the reverse, effects of L2 on meaning-making in L1 (Lai & Boroditsky, 2012:9). One implication from the study may be that metaphors from one language may affect meaning in another language for bilinguals. King (2007) suggested something similar in her examination. Another explanation is the possible universality of the LANGUAGE IS MOTION metaphor.

The effect of one language on another may also account for the lack of statistical differences in the LANGUAGE IS TREASURE/AN OBJECT whereas the LANGUAGE IS A SEED/FOOD/GROWTH cluster may reflect influences from one language to another, which may in turn represent an expansion of the SOURCE DOMAINS for these metaphors (Kövecses, 2005). Those newly fluent in the Māori language as in the King (2007) study could likewise be expected to show cross language influences in their productions of metaphors. Additionally, members of the ‘as children’ group are not Māori monolinguals, but Māori-English bilinguals. Consequently, there likely are influences from one language to the other. Since there is no data from monolingual Māori or English speakers for comparison, it is impossible to do this comparison. The contrasts between the ‘as adult’ and the ‘as children’ groups, however, suggest that there may be significant differences in the influences of one language on the other language in LANGUAGE IS A SEED/FOOD/GROWTH.

Indigenous language revitalization efforts often involve speakers whose primary language is English (or some other major language group). Particularly for adult learners, first language interference can be suspected. Members of the ‘as children’ group also may lack formal education via the Māori language. Silva-Corvolán’s (2014) study confirms the importance of continued schooling in a language for a bilingual to gain complete fluency in the minority language. Conducting the interviews in English may have forced each interviewee into English metaphorical usage (see Lai & Boroditsky, 2012). English had the additional influence of being the language of schooling for most of the adult interviewees. Although many of the metaphors do exist in Māori literature, King (2007) felt that the origins of some metaphors were from English influences.

Since one purpose of the study was to expand understanding of metaphors in natural language, this study has done that. However, the corpus is probably too small to make any generalizations about the nature of metaphor usage among Māori.

## References

- GRAPHPAD SOFTWARE. 2015. *Quick Calcs*. Web. <http://graphpad.com/quickcalcs/PValue1.cfm>
- GREGORY, GEORGE ANN. 2010. Metaphors of land and sea; Narratives of two Māori leaders. *Southwest Journal of Linguistics*, 28,2: 83-97. (A version of this paper was published in University of Maryland University College Working Papers. [http://umuc.edu/library/research\\_pubs/research.shtml](http://umuc.edu/library/research_pubs/research.shtml) & <http://chaucer.umuc.edu/wp/>)
- JUANHONG, LU. 2012. The touch metaphors: A cognitive and corpus-based study. *Polyglossia*, v. 22, pp. 47-57.
- KING, JEANETTE. 2007. *Eke ki runga i te waka: The use of dominant metaphors by newly fluent Māori speakers in historical perspective*. (Unpublished doctoral thesis). University of Canterbury, Christchurch, NZ.
- KING, JEANETTE. 2009. Language is life: The worldview of second language speakers of Māori. In *Indigenous language revitalization: Encouragement, guidance & lessons learned*, ed. by Jon Reyhner and Louise Lockard, 97-108. Flagstaff, AZ: Northern Arizona University.
- KÖVECSES, ZOLTÁN. 2005. *Metaphor in culture: Universality and variation*. Cambridge: Cambridge University Press.
- LAI, VICKY TZUYIN & LERA BORODITSKY. 2013, April. The immediate and chronic influence of spatio-temporal metaphors in the mental representations in English, Mandarin, and Mandarin-English speakers. *Frontiers in Psychology*, 4, Article 143:1-10.
- LANGACKER, RONALD. 1980. *Foundations of cognitive grammar*. Stanford: Stanford University Press.
- LANGACKER, RONALD. 2013. *Essentials of cognitive grammar*. Oxford, UK: Oxford University Press.
- LAKOFF, GEORGE & MARK JOHNSON. 1980. *Metaphors we live by*. Chicago: University of Chicago Press.
- LAKOFF, GEORGE. 1992. *The contemporary theory of metaphor*. Online: <http://terpconnect.umd.edu/~israel/lakoff-ConTheorMetaphor.pdf>.
- LAKOFF, GEORGE & MARK JOHNSON. 1999. *Philosophy in the flesh*. New York: Basic Books.
- MOORE, DAVID S. 2007. *That basic practice of statistics*. New York: W.H. Freeman and Co.

- PRAGGLEJAZ GROUP. 2007. MIP: A method for identifying metaphorically used words in discourse. *Metaphor and Symbol*, 22,1:1-39.
- SILVA-CORVALÁN, CARMEN. 2014. *Bilingual language acquisition: Spanish and English in the first six years*. Cambridge, UK: Cambridge University Press.
- TENORIA, ENCARNACIÓN HIDALGO. 2009. The metaphorical construction of Ireland. In *Political, gender and conceptual metaphors* ed. by Kathleen Ahrens, 112-136. Basingstoke, UK: Palgrave Macmillan.