

Bilingualism and language dominance as factors in Maltese morphological variation

To Appear in *Coyote Papers*, proceedings of the Arizona Linguistics Circle

Author Information

Shiloh Drake

University of Arizona

sndrake@email.arizona.edu

Abstract

I report the results of a wug task to connect issues of bilingualism and language dominance to psycholinguistic methods, showing that language dominance plays a role in the morphological variation found in Maltese. Research on structural borrowing in language contact situations suggests that morphological borrowing occurs when bilinguals are in a situation where one language is dominant (Brown, 2003). In addition, psycholinguistics research suggests that bilinguals perform differently from monolinguals in metalinguistic tasks (Galambos & Hakuta, 1988; Campbell & Sais, 1995), particularly when they are dominant in one language. The results of the present study suggest that language dominance may be a reliable predictor of their responses.

Maltese, a Semitic language derived from Siculo-Arabic, has had extensive contact with Italian and English as reflected in its lexicon, where roughly half of the words are derived from Arabic and half from Italian and English (Mifsud, 1995). Maltese morphology exhibits both Semitic root-and-pattern word formations (vocalic patterns inserted around a triconsonantal root), as well as formations using concatenative morphology (Borg & Azzopardi-Alexander, 1997). Previous work showed differences in morphological productivity in root-and-pattern versus concatenative constructions (Twist, 2006; Spagnol, 2011), posing a challenge for the development of an accurate model of Maltese morphology.

Maltese speakers are bilingual, speaking both Maltese and English. Prior psycholinguistic research has found that bilinguals perform differently on metalinguistic tasks (Galambos & Hakuta, 1988; Campbell & Sais, 1995), and bilinguals who are dominant in one language also perform differently from monolinguals and balanced bilinguals (Galambos & Hakuta, 1988; Gathercole, 2007). In addition, sociolinguistic research on Maltese suggests that bilingualism and language contact in tandem with lexical innovation drives language change (Fabri, 2011), particularly in lexical items and novel applications of bound morphemes (e.g., English *nerd* 'nerd' → Maltese *tinnerdja* 'to behave like a nerd').

Keywords

bilingualism, language dominance, language variation, morphology, Maltese

Acknowledgements

Thanks to Lauren Ackerman and Mary-Caitlyn Valentinsson for discussion of the theories contributing to this paper as well as assistance with the statistical tests. This work was supported by a pre-doctoral research grant from the University of Arizona Social and Behavioral Science Research Institute and a travel grant from the University of Arizona Graduate and Professional Student Council.

1.0. Introduction

Maltese is a Semitic language descended from Siculo-Arabic, with significant influence from Sicilian Italian and recent influence from English. The ongoing contact has led to a blended lexicon where approximately half of the language is Semitic and half is Sicilian Italian and English (Mifsud, 1995). The language has approximately 500,000 speakers in the Republic of Malta, an archipelago of islands in the Mediterranean Sea, and several thousand more worldwide. All Maltese speakers are bilingual in the official languages of Malta, Maltese and English, though with varying degrees of proficiency in English. Maltese is the only Semitic language written with the Latin alphabet, and is known for employing both the root-and-pattern morphology common to Semitic languages as well as affixes that are descended from Sicilian Italian and English. The dual morphology has been the subject of substantial investigation, particularly with regards to whether both sets are productive (e.g., Hoberman & Aronoff, 2003; Twist, 2006; Fabri, 2009; Spagnol, 2011; Drake, under review) as well as visual (Twist, 2006; Galea, 2011) and auditory (Ussishkin et al., 2015) morphophonological processing and mental representation.

While it is widely acknowledged in this literature that Maltese speakers are primarily Maltese-dominant and many are also bilingual (e.g., Twist, 2006; Galea, 2011; Ussishkin et al., 2015, *inter alia*), little else is discussed about the participant population. In psycholinguistics, metalinguistic research is research in which participants tap into their unconscious knowledge about the form of language, and may involve identifying phonemes in a word (“What does ‘sun’ begin with?”), deletion of morphemes in compounds (“If you take away ‘rain’ in ‘rainbow’, what word is left?”), or inflecting or deriving nonsense words according to the rules of a language (“Here is a *wug*. This is a smaller one. What would you call it?”). The question of language use affecting morphological variation has come up in only one of the mentioned studies (Twist, 2006); what both Twist (2006) and I (Drake, under review) find is that the type of morphological variation found is not attributable solely to structural factors in the language or materials, but can be attributed to how frequently a particular language is used and in which contexts it is used.

In this paper, I discuss how bilingualism, language contact, and language dominance lead to morphological variation observed in a novel word elicitation task. The subsections that follow discuss psycholinguistic work where a difference between bilinguals and monolinguals has been found and issues of language contact and language dominance in sociolinguistic literature. Sections 2 and 3 discuss the methods of data collection and the results of data collection, and Section 4 provides an interpretation for the data to conclude the paper.

1.1. Bilingualism and metalinguistic task effects

Bilinguals show different effects in metalinguistic tasks when compared to monolinguals. While the notion of whether a “bilingual advantage” exists at all in terms of language processing or general cognition is debated, bilinguals do perform this type of task differently than monolinguals. Starting at around 7 months old, infants exposed to two languages are able to shift their attention more quickly to a new stimulus than infants exposed to one language (Kovács & Mehler, 2009). This suggests that even very young proto-bilinguals have better control over their executive functions (namely, the ability to shift attention and inhibit responses) than very young proto-monolinguals. Proto-bilinguals already have experience modulating and suppressing their

reactions to stimuli, much like adult bilinguals are proficient at suppressing whichever of their languages is not in use in conversation.

Further along in development, kindergarten-aged bilingual children (approximately age 5) perform more accurately than their monolingual peers when asked to determine the odd object out by meaning or by initial sound, when asked to delete either initial phonemes or morphemes, and in a letter detection task (“Is this a letter? Which letter is it?”) (Campbell & Sais, 1995). These results suggest that bilinguals have greater semantic and phonological metalinguistic awareness than their monolingual peers, in spite of the bilingual children having variable proficiency in their L2 and all being exposed primarily to English.

School-aged bilingual children (age 4;5-13;0, years;months) also exhibit differences in metalinguistic tasks when they are more balanced bilinguals—that is, when their proficiency in both languages is close to equivalent. Bilingual children, regardless of proficiency, are able to track formal errors in utterances (such as number-verb agreement) at an earlier age than their monolingual peers (Galambos & Goldin-Meadow, 1990), and they also find more errors overall than their monolingual peers (Galambos & Goldin-Meadow, 1990). Older bilingual children have been found to perform more accurately in similar error-finding tasks in both of their languages when they are more balanced bilinguals rather than when they are more proficient in one of their languages, even as old as 12;6 (Galambos & Hakuta, 1988).

Together, these studies suggest that bilingualism is an important variable to consider when a task requires participants to consider patterns in the form of language, whether bilinguals are proficient and balanced bilinguals, or if bilinguals simply have some knowledge of and exposure to more than one language.

1.2. Language contact and language dominance

When examining bilinguals in any population, the role of language contact and language dominance must be discussed in how it may affect performance on a linguistic task. Again, Maltese speakers are bilingual in Maltese and English, and frequently speak more languages in addition (typically Italian, French, and German, according to responses on the language background questionnaires discussed below). They also come into contact with Maltese and English on a daily basis, not only because these are the two official languages of Malta, but also because the college-aged subject population includes students in training to be English teachers, students who study Maltese and Maltese linguistics, and students who study foreign languages to a high degree of proficiency for business and other professions. While the Maltese population studies English in school, English may be used to varying degrees in the home and in other aspects of their life. Therefore, it is expected that this population is not homogenous in their proficiency in Maltese or English, and also is not homogenous in their language dominance, or the language that a multilingual speaker uses the most frequently.

Intuitively, higher proficiency in a language leads to better performance in detecting errors in that language, even if that language is not the dominant language for the speaker or the community. This is in fact borne out in psycholinguistic research, as outlined above: school-aged children who were more proficient in Spanish were able to detect more complex errors and a greater number of errors overall than their peers who were less proficient in Spanish according to

standardized tests (Galambos & Hakuta, 1988). Performance in phonological and semantic metalinguistic tasks is also different in school-aged monolinguals and bilinguals, where though bilingual children were slightly younger than the monolinguals tested, they performed more accurately (Campbell & Sais, 1995).

Similarly, it is also intuitive that one of a bilingual's languages might influence the other. This can be seen in fossilization errors in late-learning L2 speakers, where errors in the L2 can be traced back to licit structures in the L1 (e.g., Han, 2004:69-77; Schwartz & Sprouse, 1996; Sorace, 2011). It can also be observed in the other direction, where utterances in an L1 are affected by experience in the L2. Argyri and Sorace (2007) find that 8-year-olds' production of Greek subject pronouns in various contexts was affected by the amount of exposure the children had in English. Where children were Greek-dominant, there was no effect; where the children were English-dominant, their Greek utterances in certain syntactic contexts mirrored grammatical English constructions that were infelicitous (though not ungrammatical) in Greek.

Given these examples, the amount that bilinguals use each of their languages should be taken into consideration and is potentially something that could affect experimental results, particularly in metalinguistic tasks, and particularly in populations with heterogenous language use. The studies outlined above have found effects not only from how language is used in the community as a whole, but also within family structures (Argyri & Sorace, 2007), where even limited schooling in the L2 and L2 use only within the immediate family can affect the felicity of language structures in the L1.

Language contact leads not only to lexical borrowing, but can also lead to structural borrowing as well (Myers-Scotton, 1998; Brown, 2003). Structural borrowing takes the form of morphosyntactic borrowing, either in terms of sentence structure or in terms of morphological structure, incorporating such features as double-marking plural morphemes from both languages in an utterance that is otherwise in the matrix language (Brown, 2003). While structural borrowing is typically associated with languages in the process of dying, languages may also simply adopt structures from other languages that its speakers are proficient in and come into contact with while remaining robust and living languages (Myers-Scotton, 1998, Brown, 2003). Arguments for morphological parsimony may come into question when morphological double-marking occurs; for example, an utterance in Louisiana French shows a plural marked in both French and English (Brown, 2003:16):

“Il y avait deux familles de Breaux” → /j-ave dø famij dø bro-z/; not /j-ave dø famij dø bro/ as would be expected in typical French plural marking

Similarly, utterances in Lingala-French bilingual communities may contain double morphological marking (Myers-Scotton, 1993):

Ko-	comprend	-re
Li.inf-	understand	-Fr.inf
Ba-	jeune	-s
Li.pl-	youth	-Fr.pl

In both language contact cases, speakers are proficient in both community languages, and the two morphemes are phonetically realized in the correct liaison environment despite their redundancy.

In the case of Maltese, speakers use two morphological systems due to the significant amount of contact from Indo-European languages: one morphological system is distinctly Semitic and employs templatic morphology, while the other is distinctly Indo-European and employs affixes. The Semitic system applies mostly to words in the original Semitic lexicon, while the Indo-European system is applied both to Indo-European borrowings as well as to loanwords (which are frequently Indo-European in nature). The Semitic system is said to be anywhere from lexically frozen and unproductive (Hoberman & Aronoff, 2003; Spagnol, 2011) to moderately productive, but not the default by any means (Twist, 2006; Drake, under review). This means that even hypothetical loanwords coming from another Semitic language may not be incorporated into the lexicon using templatic morphology and speakers would instead use concatenative affixes. This is similar to the process that happens with Arabic loanwords in English. The word ‘ghoul’, from Arabic غول ‘ghul’, receives the standard English plural ‘ghouls’ and nothing similar to the Arabic plural أَغْوَال ‘aghwaal’, since English does not employ root-and-pattern morphology, even though suppletive and umlaut plurals do exist.

Fabri (2011) argues that not only do young people drive language change and lexical innovation, which is not a controversial position in the sociolinguistic literature, but also that language contact drives lexical innovation, which drives language change. For example, morphological derivation points to increased affixal productivity as phrases become lexicalized (for example, the nominalizing affix *-aġni* applied to the phrase *bla sens* ‘senseless’ to result in *blasensaġni* ‘senselessness’) or in spite of a different but non-concatenative nominal (e.g., *kiesaħ* ‘arrogant’ → *ksuħaġni* instead of *ksuħat* ‘arrogance’ (Fabri, 2011:100-101). This is in addition to loans directly from other languages (such as *towtalloss* ‘total loss’). Since Maltese is borrowing from Indo-European languages, this leads to a more Indo-European linguistic structure in standard Maltese, but could lead to additional change given the performance differences between monolinguals and bilinguals as well as bilinguals who are dominant in one of their languages.

Given both psycholinguistic and sociolinguistic evidence, it is possible that a Maltese speaker with significant exposure to English could have either their Maltese influenced by their English (following Argyri & Sorace, 2007), or their English influenced by their Maltese (following Han, 2004 and other studies). The data that follow are analyzed with respect to participants’ language background and dominance to examine whether increased exposure to a Semitic (i.e., Maltese) or Indo-European (i.e., English) language affects participants’ willingness to use root-and-pattern or concatenative morphology in a word elicitation task.

2.0. Methods

2.1. Participants

34 participants between the ages of 18-69 took part in the study, with a median age of 21 years. All participants were paid €5 for completing the study, comprising both a language background questionnaire and a novel word elicitation task (following Berko, 1958). The results from the

novel word elicitation task are discussed further in Drake (under review) and only the results as they relate to the language background questionnaire are discussed in this paper.

2.1. Materials

After completing a novel word elicitation task (see Drake, under review), participants filled out a language background questionnaire (Appendix 1) presented in English. This questionnaire requests basic demographic information such as age, gender, handedness, and the city they live in, as well as information about where they grew up, what kind of schooling they had, and which languages they use when speaking to friends, family members from various generations, or coworkers, and when consuming media. The responses collected allow us to find which language or languages are used the most frequently in different social situations, and more importantly for the purposes of this study, which language each participant is dominant in. A participant's dominant language is defined somewhat impressionistically for this study, where a participant was defined as being dominant in a language if they used it more often while consuming media, while talking to friends and family members, and, if applicable, if their degree program was in either Maltese or English studies. More specifically, if a participant had their schooling in Maltese or English 80% of the time, they were classed as dominant in that language. If a participant had their schooling in Maltese or English 60% of the time, but used the same language most of the time while talking to most people and reading or watching television, they were classed as dominant in that language. If a participant had their schooling in Maltese or English 60% of the time, but used the other language most of the time while talking to most people and consuming media, they were classed as "slightly" dominant in the language of their schooling. For example, if a participant had 60% of their schooling in English, but primarily used Maltese with their friends and family members, and read and watched television in Maltese, they were classed as slightly English dominant. Alternately, if a participant had 60% of their schooling in English and used Maltese with their friends and family members, but read and watched television in English, they were classed as English dominant. The four groups were English dominant ($n = 3$), slightly English dominant ($n = 2$), slightly Maltese dominant ($n = 10$), and Maltese dominant ($n = 18$). One participant was a speaker of the dialect of Maltese spoken on Gozo. Due to this dialect's substantial differences from standard Maltese (Borg, 1996), the participant was excluded from analyses. The fine-grained separation into "slightly" dominant in Maltese or English did not provide enough statistical power for the English dominant group, therefore all groups were collapsed into either Maltese dominant or English dominant.

3.0. Analysis and Results

To analyze the data, the proportion of Indo-European and Semitic responses for each speaker group were collected and compared to each other using `prop.test` (R Core Team, 2016). The `prop.test` function tests the observed proportion of some type of answer (in this case, whether participants responded using Indo-European or Semitic morphology) versus the expected proportion of the same type of answer. The expected proportion of responses of each type was 50%, assuming the speakers would use Indo-European affixes with the stimuli similar to other Indo-European-origin words in the Maltese lexicon, and Semitic templates with the stimuli similar to other Semitic-origin words in the Maltese lexicon. Neither group fit this expected proportion of responses: Participants tended to use an Indo-European suffix regardless of word origin (English dominant: $\chi^2 = 12.95(1)$, $p < 0.0005$; Maltese dominant: $\chi^2 = 289.64(1)$, $p < 0.00001$). The different proportions for each response type were then compared across speaker

groups using linear mixed effects models (lme4 package; Bates, Maechler, Bolker, & Walker, 2015) and comparing them using the anova function (R Core Team, 2016) to find whether a speaker group used either type of morphology more often. While the difference is not significant, English dominant participants tended to use Semitic patterns more often than Maltese dominant participants ($p < 0.1$).

4.0. Discussion

The results show that there is a non-significant trend for English-dominant Maltese speakers to use a Semitic morpheme rather than an Indo-European morpheme when forming a morphological diminutive. This is unexpected, as intuitively, participants who are more dominant in a Semitic language (i.e., Maltese) should be more likely to use the type of morphology used in the language that they use the most often. Why, then, do English dominant participants use Semitic patterns when forming diminutives more often than Maltese dominant participants? To situate this finding, I use Gathercole's (2007) model of bilingual language development.

Gathercole's (2007) model is a constructivist or usage-based framework that suggests that a bilingual child requires a substantial amount of input in their languages to become competent. This is supported by the lag that bilinguals seem to have when compared to monolingual peers; this lag disappears when bilinguals are tested in both of their languages. Gathercole suggests that bilingual children need a "critical mass" of linguistic input to generalize morphosyntactic structures across either of their languages. That "critical mass" is composed of a collection of utterances that the child hears. They may also hear certain types of words (e.g., "shopping" words or "cooking" words) in one of their languages, but not in both of their languages, which can lead to this supposed delay.

The psycholinguistics research outlined in section 1 also tells us that bilinguals perform more accurately on metalinguistic tasks, even with as little exposure to multiple languages as 7 months outside the womb (Kovács & Mehler, 2009). Bilinguals therefore may be faster at picking up on language-based patterns, such as those found in morphosyntax. A simple rule-based example is that every verb in the past tense must end with *-ed*, but some will change the vowel in the middle, as in *ring/rang*. Given a novel word like *spling*, would a bilingual child be more likely to adhere to the most productive rule and produce *splinged*, or would they be more likely to use an analogous past tense like *splang*? There is no correct answer, but an English-dominant child who has heard *rang* frequently and never *ringed* may opt to use *splang*, while a Spanish-dominant child accustomed to extremely regular and productive past tense morphology might opt for *splinged*.

This pattern recognition may come into play when interpreting the trend for English-dominant speakers to use Semitic morphology more frequently than the Maltese-dominant speakers. The English-dominant participants in the sample were typically either in training to be English teachers, or were English literature or business majors. This meant that not only are they expected to perform at a high level in English speaking and reading skills, but they may also have to spend time in heavily bilingual environments. Codeswitching between Maltese and English is the norm in Malta, and from a psycholinguistic perspective, codeswitching requires the continual activation and suppression of one language's grammar at all times. This subconscious suppression is exercising the speaker's executive functioning skills, which have to

do with initiating and inhibiting responses, selecting appropriate responses, focusing and shifting attention, working memory, and other neurocognitive processes and skills (Suchy, 2009). Some executive functions can be improved with practice, or until the processes become routinized and automatic (and therefore no longer dependent on executive functioning for conscious decision-making) (Suchy, 2009; Cicerone et al., 2006). As a conscious process, codeswitching requires the inhibition of inappropriate responses (either ungrammatical in a codeswitching context or socially inappropriate) and the selection of appropriate and relevant responses, and while this process is more automatic than, say, planning a trip, it is still not completely automatic. If bilinguals do have exceptional executive function skills, and if executive functioning may be improved with practice and use, then it follows that bilinguals who engage in frequent codeswitching and who are in areas of heavy language contact may have improved executive functions over bilinguals who codeswitch less frequently. Improved executive functioning may lead to a better ability to pick up on metalinguistic patterns, both in the somewhat artificial laboratory setting as well as out in the world. If these “super bilinguals” pick up on the pattern of using root-and-pattern morphology whenever a word fits the requirement of seeming like it fits in the Semitic sub-lexicon of Maltese and the “ordinary bilinguals” do not, this could provide an explanation as to why the English-dominant bilinguals perform like this. For Maltese-dominant bilinguals, the rule that tends to be more productive is to add an affix. If they are slightly less sensitive to the sublexical patterns governing whether words take root-and-pattern morphology, then they will opt for the default, productive word formation rule.

Coming back to Gathercole’s (2007) framework, with the more input from a language a speaker has, the better that speaker will be able to perform morphosyntactic generalizations and extrapolate from the input received. This seems to be at odds with the data as described; however, if the input is not necessarily overtly morphosyntactic and is based more on general patterns, this may fall out from the theory. Speakers with more exposure to a language employing a variety of morphological derivations and inflections for content words may have the correct type of exposure to exceptional or irregular morphology to allow them to use nonstandard word formation processes felicitously. This mirrors what Argyri and Sorace (2007) find in bilingual Greek speakers and their use of nonstandard but grammatical pronominal referents. This is also reflected in the double-marking evidence from Brown (2003) and Myers-Scotton (1998) shown in Section 1, which is not ungrammatical in the heavily bilingual communities with substantial language contact.

One of the ways to test this prediction would be to follow speakers over time as they become more or less dominant in a particular language. If a Maltese-speaking English teacher changes careers later in life, or becomes involved in the various language maintenance efforts in Malta, and becomes more Maltese-dominant than English-dominant, their morphological use may change over time to match other Maltese-dominant speakers. Similarly, if a Maltese-dominant speaker becomes more English-dominant, their morphological use may also change over time. However, such a study would require a significant amount of time and resources to carry out, so may not be entirely feasible.

Language contact and language dominance are key factors in sociolinguistic research, and are pertinent in interpreting psycholinguistic research results as well. Bilingualism and language proficiency have an effect on how participants perform in tasks requiring them to use their

internal grammar and native speaker judgments; it stands to reason that the amount of time they spend engaging with the languages that they speak would also affect how they perform on tasks. In this novel word elicitation task, I find that while all participants were bilingual and highly proficient in both Maltese and English, speakers that used English more frequently in everyday contexts used different morphological constructions than speakers that used Maltese more frequently. I extend Gathercole's (2007) framework to include other usage-based input types such as frequent patterns as well as neurocognitive research to account for this.

References

- Argyri, Efrosyni & Antonella Sorace. 2007. Crosslinguistic influence and language dominance in older bilingual children. *Bilingualism: Language and Cognition*, 10(1). 79-99.
- Bates, Douglas, Martin Maechler, Ben Bolker, & Steve Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1). 1-48.
- Berko, Jean. 1958. The child's learning of English morphology. *Word*, (14). 150-177.
- Borg, Albert. 1996. The Structure of the Noun Phrase in Maltese. *Rivista di Linguistica*, 8. 5-28.
- Brown, Becky. 2003. Code-convergent borrowing in Louisiana French. *Journal of Sociolinguistics*, 7(1). 3-23.
- Campbell, Ruth & Efsia Sais. 1995. Accelerated metalinguistic (phonological) awareness in bilingual children. *British Journal of Developmental Psychology*, 13(1). 61-68.
- Cicerone, Keith, Harvey Levin, James Malec, Donald Stuss, & John Whyte. 2006. Cognitive rehabilitation interventions for executive function: Moving from bench to bedside in patients with traumatic brain injury. *Journal of Cognitive Neuroscience*, 18(7). 1212-1222.
- Drake, Shiloh. 2017. The form and productivity of the Maltese morphological diminutive. Manuscript accepted pending revisions. *Morphology*.
- Fabri, Ray. 2009. Stem allomorphy in the Maltese verb. *Il-Sienna I*. 1-20.
- Fabri, Ray. 2011. The language of young people and language change in Maltese. In Sandro Caruana, Ray Fabri, and Thomas Stolz (eds.), *Variation and Change: The Dynamics of Maltese in Space, Time, and Society*, 89-108. Berlin: Akademie Verlag GmbH.
- Galambos, Sylvia Joseph & Susan Goldin-Meadow. 1990. The effects of learning two languages on levels of metalinguistic awareness. *Cognition*, 34. 1-56.
- Galambos, Sylvia Joseph & Kenji Hakuta. 1988. Subject-specific and task-specific characteristics of metalinguistic awareness in bilingual children. *Applied Psycholinguistics*, 9. 141-162.
- Galea, Luke. 2011. *Mental Representation of Maltese Semitic Verbs*. Essex, England: University of Essex thesis.
- Gathercole, Virginia C. Mueller. 2007. Miami and North Wales, so far and yet so near: A constructivist account of morphosyntactic development in bilingual children. *International Journal of Bilingual Education and Bilingualism*, 10(3). 224-247.
- Han, Zaohong. 2004. *Fossilization in Adult Second Language Acquisition*. Clevedon: Multilingual Matters Ltd.
- Hoberman, Robert D. & Mark Aronoff. 2003. The verbal morphology of Maltese: From Semitic to Romance. *Language Acquisition and Language Disorders*, 28. 61-78.
- Kovács, Ágnes M. & Jacques Mehler. 2009. Cognitive gains in 7-month-old bilingual infants. *Proceedings of the National Academy of Sciences*, 106(16). 6556-6560.
- Mifsud, Manwel. 1995. *Loan Verbs in Maltese*. Leiden: Brill.
- Myers-Scotton, Carol. 1993. *Duelling Languages: Grammatical Structure in Codeswitching*. Oxford: Oxford University Press.
- Myers-Scotton, Carol. 1998. A way to dusty death: The Matrix Language turnover hypothesis. *Endangered Languages: Language Loss and Community Response*.
- R Core Team. 2015. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <<http://www.R-project.org/>>
- Schwartz, Bonnie D. & Rex A. Sprouse. 1996. L2 cognitive states and the Full Transfer/Full Access model. *Second Language Research*, 12(1). 40-72.

- Sorace, Antonella. (2011). Pinning down the concept of “interface” in bilingualism. *Linguistic Approaches to Bilingualism*, 1(1). 1-33.
- Spagnol, Michael. 2011. *A tale of two morphologies: Verb structure and argument alternations in Maltese*. Konstanz, Germany: University of Konstanz dissertation.
- Suchy, Yana. 2009. Executive functioning: Overview, assessment, and research issues for non-neuropsychologists. *Annals of Behavioral Medicine*, 37(2). 106-116.
- Twist, Alina Evelyn. (2006). *A psycholinguistic investigation of the verbal morphology of Maltese*. Tucson, AZ: University of Arizona dissertation.
- Ussishkin, Adam, Colin Reimer Dawson, Andrew Wedel, & Kevin Schluter. 2015. Auditory masked priming in Maltese spoken word recognition. *Language, Cognition, and Neuroscience*. doi: 10.1080/23273798.2015.1005635