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On Possessing a Second Soul

Differential Affective Connotation Activation Automaticity
in Unbalanced Early-to-Simultaneous Bilinguals

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Abstract in English

Recent research suggests that a bilingual's various languages can be differentially embodied, which is associated with different affective processing performances across their language repertoire (Pavlenko, 2012). The present study aims to explore the debate regarding the role of maturation versus context-of-use accounts in explaining the language embodiment lag. While most existing studies have focused on sequential bilinguals (e.g., Degner et al., 2012), here attention is turned to the early-to-simultaneous bilingual population of Malta. As Maltese people generally acquire both Maltese and English from birth or a very young age, yet display variation in dominance, this allows for the control of age of acquisition while focusing on language dominance (i.e., context of use) as a variable of study. Maltese–English dominance degrees were measured for each participant (n = 48) via the BLP (Birdsong et al., 2012). The four experimental tasks investigated affective priming within both languages and compared it with semantic priming performance, thereby replicating Degner et al.'s (2012) design. While absolute RTs and accuracy rates were in line with other published works, this study failed to replicate Degner et al.'s (2012) sequential bilingualism results with early-to-simultaneous bilinguals. A number of factors that might have contributed to this outcome are discussed, including limited sample and stimulus set sizes, language-specific issues such as code-mixing, and limitations inherent to the use of the cognitive paradigm in the study of affective processing. More research is required to understand the role of dominance as a variable in its own right, complementing proficiency and age of acquisition.

Keywords: bilingualism, affective processing, priming, maltese, psycholinguistics

Abstract in Italian

Studi recenti suggeriscono che le lingue parlate da un bilingue possono essere incarnate (*embodied*) in misura differente, e che ciò si riflette in diverse prestazioni di elaborazione affettiva (Pavlenko, 2012). Questo studio esplora il dibattito sul ruolo della maturazione e del contesto d'uso nella spiegazione del *language embodiment lag*. Mentre la letteratura esistente si è focalizzata sui bilingui sequenziali (ad esempio, Degner et al., 2012), l'attenzione è qui rivolta ai bilingui precoci-simultanei maltesi. Questi, generalmente bilingui in maltese e inglese sin dalla nascita o dalla prima infanzia, presentano variazioni significative nella dominanza linguistica: ciò consente di controllare l'età di acquisizione e di indagare la dominanza (ovvero il contesto d'uso) come variabile principale, misurata per ogni partecipante (n = 48) mediante il BLP (Birdsong et al., 2012). Attraverso quattro task sperimentali, sono stati esaminati gli effetti di *priming* affettivo in entrambe le lingue e confrontati con quelli di *priming* semantico, dunque replicando il disegno sperimentale di Degner et al. (2012). Nonostante i RT assoluti e i tassi di precisione siano in linea con gli altri studi, non sono stati replicati i risultati dei bilingui sequenziali di Degner et al. (2012). Vengono discussi diversi fattori che potrebbero aver contribuito a questo risultato, tra cui le dimensioni limitate di campione e set di stimoli, questioni specifiche alla lingua come il *code-mixing*, e limitazioni inerenti all'uso del paradigma cognitivo nello studio dell'elaborazione affettiva. Sono necessari ulteriori studi per comprendere il ruolo della dominanza come variabile a sé stante, a complemento della *proficiency* e dell'età di acquisizione.

Parole chiave: bilinguismo, affective processing, priming, maltese, psicolinguistica

Table of Contents

List of Tables and Figures

Introduction

In a famous quote, Charlemagne (AD 742–814) equates possessing a second language with possessing a second soul, thereby capturing the intricate and multifaceted nature of multilingualism. Most multilinguals will agree that analyzing this phenomenon through the mere lenses of comprehension and production skills is rather limiting: Different languages are acquired for different purposes, with different people and social groups, as well as in different domains of personal and/or social life (Grosjean, 1997/2016, as cited in Grosjean, 2022, p. 13). This complementary view of the multilingual's language inventory breaks away from the previous fractional view of multilingualism, which conceptualized multilingualism as a sum of monolingual competences (Grosjean, 2008), and provides room for the study of external (contextual) factors in the field of multilingualism. Pavlenko (2012) argues that within multilingual competence languages can be differentially embodied, as reflected by differences in affective processing performance. She identifies two main alternative explanations of the language embodiment lag: maturation (age effects) and context-of-use (frequency of language use and context emotionality) accounts. In the field of multilingual language acquisition, variables traditionally considered of interest include age of acquisition, amount of input, order of learning, and frequency of items in each language (Li & Xu, 2022). While there are studies on the role of socialization and language immersion, these have mainly examined sequential bilingual populations (e.g., Degner et al., 2012). The aim of the present work is to extend the debate to the early-to-simultaneous bilingual population of Malta, so as to isolate the role of language dominance and test the context-of-use account. In other words, is the embodiment lag together with its implications on affective processing an issue of age or context of use (as reflected by language dominance)?

Chapter 1 will introduce the theoretical framework of (dis)embodied bilingual cognition, providing some basic definitions of the complementarity principle, wholistic bilingualism, and language dominance. Attention will then be turned to different emotion theories attempting to distinguish affective processing from general cognitive processing, as well as to a selection of introspective and cognitive studies on the subject. Then, Chapter 2 will compare foreignness and dominance, and introduce the Maltese case. Finally, Chapter 3 will present and discuss the study, which was based on Degner et al.'s (2012) design comparing affective and semantic priming.

1. Bilingual Affective Processing

The aim of this chapter is to introduce the concepts of bilingualism and affective processing as defined within the frameworks of recent psycholinguistic research. A number of methodological issues and approaches will also be addressed. Furthermore, research results on bilinguals' attitudes toward their language inventory will be brought into focus through a selection of introspective and cognitive studies.

1.1. (Dis)embodied Bilingual Cognition: Definitions & Approaches

Through a comprehensive examination of various studies and methodologies, Pavlenko (2012) critically assesses the assertion made by Keysar et al. that using a foreign language may increase emotional distance and reduce decision biases—that is, it may lead to "disembodied cognition"—as compared to one's native tongue. She identifies two related processing effects: the L1 and the L2 advantage (Table 1), whereby automaticity in affective processing tends to be increased in first languages (L1 advantage) and decreased in second languages (L2 advantage). From a psychophysiological perspective, this translates to heightened electrodermal reactivity to emotion-laden words (L1 advantage) vs. lowered reactivity to negative emotional stimuli (L2 advantage). She argues that "in some bilingual speakers, in particular late bilinguals and foreign language users, respective languages may be differentially embodied, with the later learned language processed semantically but not affectively" (Pavlenko, 2012, p. 405). However, as indicated by previous research by Deweaele (2006, 2008) and Pavlenko (2004) herself which will be analyzed in more detail in §1.2, prolonged adult L2 socialization in emotion-rich naturalistic contexts may lead to a shift in language preference for conveying emotions.

Table 1

First and Second Language Advantages

L1 Advantage	*L2 Advantage*
increased automaticity of affective processing	decreased automaticity of affective processing
heightened electrodermal reactivity to emotion-laden words	lower electrodermal reactivity to negative emotional stimuli

Note. Adapted from Pavlenko (2012).

Pavlenko points to two competing explanations for the language embodiment lag at the root of the L1 and L2 advantages seen above: *maturation* (evolutionary adaptation) vs. *context* (frequency) effects. The former, drawing from Lenneberg's critical period hypothesis (1967), gives prominence to age as a determining factor in the declining chances of native-like L2 acquisition: Maturational effects are here seen as an evolutionary adaptation that supports the preservation of group boundaries to accelerate friend-foe recognition processes through linguistic markers of in-group membership. Alternatively, they could reflect the "lack of natural selection for a trait [bilingualism] that did not, until relatively recently, provide a clear advantage" (Pavlenko, 2012, p. 424). On the other hand, context effects (Caldwell-Harris et al., 2012; Degner et al., 2012) place more importance on the frequency of language use. Pavlenko acknowledged two possible underlying mechanisms here: the mere-exposure effect, based solely on frequency of language use (e.g., Winkielman & Cacioppo, 2001), and the emotionality level of the context of use. From this latter perspective, emotionality is seen as an intrinsic property in L1 acquisition and a variable one in L2 acquisition, where it is contingent on the emotionality of interactions in the L2 (Pavlenko, 2012). This is consistent with Altarriba's claim that, typically, "emotion words in a first language [...] are stored at a deeper level of representation than their second language counterparts" (2003, p. 310) given that they are processed in a variety of context and ways, whereas L2 emotion words may not be experienced in as many different contexts. As a result of such variety in processing modalities, she continues, the multiple traces created in memory thus strengthen their semantic representation.

The aim of the present research is to test these hypotheses with an early-to-simultaneous bilingual population, which allows for the control of age of acquisition. For these purposes, it is paramount to identify a clear definition of bilingualism and language proficiency vs. dominance (§1.1.1), as well as to distinguish between affective and cognitive processing (§1.1.2).

1.1.1. Wholistic Bilingualism: Complementarity Principle and Dominance

In general, non-specialized discourse, the term *bilingualism* lacks a clear, unanimous definition and often evokes various myths associated with the ability to process two or more languages (Grosjean, 2010). For this reason, an effective way to arrive at a clear

definition is to examine what bilingualism is not by challenging such erroneous assumptions. Among many others identified by Grosjean (2010), three crucial myths may lead to basic conceptual errors if applied in bilingualism research (Pavlenko, 2012). First and most notably, perfect and balanced knowledge of both languages is commonly believed to be a prerequisite for being considered bilingual. The current consensus in bilingualism research (e.g., Dewaele, 2008; Pavlenko, 2012) is that such a claim is fundamentally inconsistent with the diverse reality of the situation: Different speakers may need the same languages for different purposes and contexts, as well as to different degrees. Second, bilingualism is still widely perceived by the general public as a phenomenon that only emerges during childhood. As a matter of fact, it is not uncommon for adults to *become bilingual* as a result of migration. Third, an equivalence between bilingualism and biculturalism is also often assumed without question. However, this is not the case, since in countries such as Switzerland it is common to grow up speaking several languages while being exposed to an essentially monocultural environment (Grosjean, 2010).

Taken together, these myths may result in what Pavlenko defines as the "three basic errors" (2012, p. 408). She observes that in some studies (i) bilinguals are treated as equivalent to monolingual native speakers of their L1, and/or (ii) as one homogenous population regardless of the differences in their language histories. The consequence of these misconceptions is that (iii) it is not uncommon for findings with a specific bilingual population to be overgeneralized to all bilinguals. The connection between Grosjean's myths and Pavlenko's basic errors is self-evident: bilinguals are often perceived as a uniform population of balanced language users. In contrast to this view, the definition of bilingualism adopted in the context of the present research draws on both Grosjean's (2008, 2010) and Pavlenko's (2012) work in acknowledging the diversity of language experience associated with bilingualism. In Pavlenko's words:

> A layperson definition assumes that bilinguals are people who have similar levels of proficiency in two languages, typically learned from birth. In contrast, bilingualism researchers commonly adopt a use-based definition of bilinguals and multilinguals as speakers who use two or more languages in their everyday lives, be it simultaneously (e.g., in bilingual families) or sequentially (e.g., in the context of immigration or study abroad). (2012, p. 406)

The rapid emergence of literature challenging these myths reflects a clear academic effort in transitioning from a *fractional* to a *wholistic* view of bilingualism, thus abandoning the monolingual ideal and discrete view of a bilingual's language inventory as a sum of monolingual competences (Grosjean, 2008). Crucially, from a fractional perspective, bilinguals who lack perfect command of both their languages are deemed "deficient". On the other hand, wholistic bilingualism adopts a broader and more inclusive view of the matter where the *complementarity principle* is accepted as a key factor in shaping bilinguals' differential language experiences: "Bilinguals usually acquire and use their languages for different purposes, in different domains of life, with different people. Different aspects of life require different languages" (Grosjean, 1997/2016, as cited in Grosjean, 2022, p. 13). In essence, the transition to a wholistic bilingualism perspective enables the researcher to study *real* bilinguals as opposed to *true* bilinguals (Grosjean, 2008).

At this point, two crucial implications need to be addressed. First, the concept of native speaker, which is nebulous in itself as noted by Davies (2003) and an abstraction in its monolingual conceptualization according to Cook and Singleton (2014), needs to be problematized and distinguished from that of dominant speaker. As a matter of fact, in line with the complementarity principle, an individual's given language will become more developed as it is used in more domains and among a wider range of people (Grosjean, 2022). This is where the significance of the concept of language dominance becomes all the more important. Silva-Corvalán and Treffers-Daller (2012, as cited in Grosjean, 2022, p. 13) define a dominant language as "that in which a bilingual has attained an overall higher level of proficiency at a given age, and/or the language which s/he uses more frequently, and across a wider range of domains". Crucially, no automatic overlap should be assumed between the concepts of *dominant* and *native* language: This is due both to the fact that dominance may shift at different stages of a bilingual's life (Grosjean, 2022), and to language attrition, that is, the phenomenon whereby L1 proficiency may be eroded over prolonged periods of inactivity (Schmid, 2011). Not only that, but an overlap between *dominant* and *proficient* language cannot be presumed either. As a matter of fact, Pavlenko (2012, p. 408) notes that "the dominant language may also be more proficient, but [...] this is not always the case; dominance and proficiency may also vary across areas of language use", thus indicating full alignment with the complementarity principle. In her view,

dominance thus reflects "perception of greater ease of use and lexical access, which comes from daily usage and higher levels of activation of the language" (Pavlenko, 2012, p. 408), while proficiency is better framed as the overall language skill level. In this regard, *balanced bilingual* contrasts with *dominant bilingual*, where the different languages are associated with varying levels of domain-specific ease of use (Pavlenko, 2012). Incidentally, she continued, using the term *bilinguals* to include *multilinguals* has developed into a convention in the field, although some scholars opt to refrain from this use unless the focus is on two languages of the speakers, "who may in fact speak more" (Pavlenko, 2012, p. 408).

A second critical point of clarification is that, as expressed by Dewaele (2017, p. 236), "the use of the term 'non-native speaker' does reveal a strong monolingual bias": This is especially evident when considering that its counterpart "non-native speaker" is defined in negative terms, that is, by what they are not rather than by what they are. Given that "monolingualism is neither the typical condition nor the gold standard" (Mauranen, 2012, as cited in Dewaele, 2017, p. 236), he further asserts that such a perspective is inadequate and thus needs a reconceptualization of terms. When Cook (1999) proposed a shift to "L2 users" in foreign language teaching, the field applauded the initiative as an important step away from the deficiency undertone intrinsic to the term "non-native speaker"; however, in light of the emergent interest in trilingualism and quadrilingualism, the term "L2" does not seem to suffice anymore (Dewaele, 2017). This is why Dewaele (2017) proposed the label "LX (users)" to refer to any foreign language acquired after the age of 3 years, and of "L1" in place of "native speakers", more compatible with the significant variation in terms of education and proficiency within native speakers, as well as with the idea of first language attrition (Schmid, 2011). Importantly, "the term 'LX user' does not imply any level of proficiency, which means it could range from minimal to maximal and could very well be equal or superior to that of L1 users in certain domains" (Dewaele, 2017, p. 238).

1.1.2. Affective vs. Cognitive Processing: Emotion Theories

Pavlenko (2012) argues that although a lay definition of affective processing capturing its essence as stimulus-induced increased arousal levels is not uncommon in everyday interaction, establishing an academic definition is a much more complex quest, since cognitive and affective processing have traditionally been difficult to disentangle for

researchers. She cites three types of theories concerned with the relationship between affect and cognition: basic emotion theories, appraisal theories, and constructionist theories. As can be seen in Table 2, these three perspectives tend to cluster together, although in different patterns, along two criteria: differentiation vs. congruence between affect and cognition, and innateness vs. subjectivity of affective processing. Both basic emotion and appraisal theories distinguish between affective and cognitive processing, but only the former sees (primary) affective processing as automatic, innate, pre-cognitive and independent of language. On the contrary, both appraisal and constructivist theories see it as a "subjective process driven by individual's needs, goals and linguistic and cultural categories" (Pavlenko, 2012, p. 409), while only the latter deny the existence of "non-affective" thought (Duncan & Barrett, 2007, as cited in Pavlenko, 2012, p. 408).

Table 2

Types of Theories on Affect and Cognition

<table>
<tr><th>Basic Emotion Theories</th><th>Appraisal Theories</th><th>Constructivist Theories</th></tr>
<tr><td colspan="2">Affective ≠ cognitive processing</td><td>Affective = cognitive proc.</td></tr>
<tr><td>Affective processing as automatic, innate, and independent of language</td><td colspan="2">Affective processing as a subjective process driven by individual's needs, goals and linguistic/cultural categories</td></tr>
</table>

Note. Adapted from Pavlenko (2012, pp. 408-409).

Crucially, in her review of clinical, introspective, cognitive, psychophysiological, and neuroimaging studies, Pavlenko opts to define *affective processing* as "somatovisceral responses triggered by automatic appraisal of verbal stimuli, which may or may not register as subjective feelings at the level of higher cognition" (2012, p. 409), thus aligning with appraisal theories. The underlying argument is that such a stance enables the researcher to compare processing in the bilingual's different languages by acknowledging a separation between affective and cognitive processing, while at the same time appreciating the variation in the language emotionality experienced by bilinguals by recognizing its subjective nature (Pavlenko, 2012). However, as will be discussed in §1.3, this automatically introduces an important

intrinsic limitation to the cognitive paradigm, which appears to fail to disentangle affective processing from processing of valence. As a result, Pavlenko attributes greater significance to psychophysiological approaches, in that they are able to detect the somatovisceral responses central to her definition of affective processing.

Dewaele (2006) offers an overview of three approaches to emotion research (in his case, specifically to anger): the neurophysiological approach, the cognitive linguistic approach, and the socioconstructivist approach. In defining the concept of *emotion*, neuroscientists emphasize its neurobiological basis and suggest that "the neurobiological systems that mediate the basic emotions [...] are constituted of genetically coded, but experientially refined executive circuits situated in subcortical areas of the brain" (Panksepp, 2000, as cited in Dewaele, 2006, p. 120). Therefore, research based on the neurophysiological approach aims to explore emotional experience through physiological changes, such as autonomic and somatic activity. On the other hand, cognitive linguists like Wierzbicka and Harkins (2001) underscore the interplay between language, culture, and emotional experience, claiming that emotion concepts arise within a specific linguistic and cultural context. Seeing the trends in neurophysiological research, they caution against the risks of absolutizing Anglo-specific emotional concepts, as this is where much of the research is conducted. They do not deny the existence of a basic human experience of emotions such as anger, but at the same time, they draw attention to "the inherent variability in emotional responses between people in similar contexts; what one person might find harmless could be perceived as offensive by another person. Even a single individual might react differently at different moments in time" (Wierzbicka and Harkins, 2001, as cited in Dewaele, 2006, p. 121). Furthermore, Markus and Kitayama (1991) argue that whether an individual is culturally viewed as independent or interdependent determines whether emotions are seen as reflecting inner states or functioning as a social tool. Lastly, the socioconstructivist approach views emotions as "socially constituted syndromes [...] which include an individual's appraisal of the situation and which are interpreted as passions, rather than as actions" (Averill, 1982, as cited in Dewaele, 2006, p. 122). The focus here is, therefore, on the influence of social norms as a reflection of a particular cultural and historical context. Together, these three approaches reveal the interplay of biology, language and society in shaping the complex nature of emotions.

In another paper, Pavlenko (2008) presents a number of key arguments with regard to emotion and emotion-laden words. First, she delineates the distinction between the two by stating that emotion words refer directly to the affective state which they describe, either as a noun, adjective, or as a verb denoting a process (e.g., "anger", "happy", "to worry"); on the other hand, emotion-laden words evoke or elicit emotions form the interlocutors without referring to them explicitly (e.g., "loser", "cancer"). Interestingly, here Pavlenko embraces a script-based definition of emotion concepts so as to be able to remain neutral in the universalist vs. relativist debate about basic emotions. By defining *emotion concepts* as "prototypical scripts that are formed as a result of repeated experiences and involve causal antecedents, appraisals, physiological reactions, consequences, and means of regulation and display" (Pavlenko, 2008, p. 150), the focus is indeed shifted from the experience of a given emotion to its conceptualization. No assumptions are thus made with regard to the existence or absence of certain universally experienced emotions, nor on the nature of the emotion in itself. The notions of *emotion*, *emotion concept* and *emotion word* are thereby kept separate. In other words, what is of interest from this perspective is the "linguistic, cognitive, and cultural categorization of emotion-related events, behaviors and phenomena, and not emotions per se" (Pavlenko, 2008, p. 150). Second, unlike traditional psycholinguistic theories of mental lexicon, she draws from work by Altarriba and associates to state that emotion and emotion-laden words differ in their representation and processing not only from concrete words, but also from other abstract words (Altarriba, Bauer and Benvenuto, 1999; Altarriba, 2003, 2006; Altarriba and Bauer, 2004; Altarriba and Canary, 2004, as cited in Pavlenko, 2008, p. 149). For example, Altarriba's (2003) Spanish–English bilingual participants rated Spanish emotion words as less concrete than abstract words.

Importantly, she continues, these prototypical, script-based emotion concepts may or may not overlap across different languages in terms of function, encoding and salience (Pavlenko, 2008). In her words,

> To say that emotion concepts vary does not imply that speakers of different languages have distinct physiological experiences. Rather, it means that they may have somewhat different vantage points from which to evaluate and interpret their own and others' emotional experiences. (p. 150)

According to Marian (2023), this is not much different from the way in which distinct languages describe color or time: "the different words people use to talk about sex and love can both reflect and contribute to differences in how people think about their most intimate behaviours and relationships" (p. 109). Pavlenko identifies four loci of cross-linguistic difference in emotion concepts (2008, p. 151): causal antecedents of emotions (i.e., judgments about the causes of emotions, whether in general or specific terms); appraisals (i.e., evaluations of the events which cause a certain emotion and of their consequences); physiological reactions (i.e., somatic states linked to specific emotions); consequences and means of emotion regulation and display (i.e., social norms regarding what types of emotional behavior are deemed appropriate). She further argues that emotion scripts are dynamic in nature and may adapt to the changes in the bilingual's speaking contexts. As a result, multilinguals may develop emotion concepts that differ from those held by monolingual speakers of the same languages (Pavlenko, 2008). Not only can these scripts vary across cultures, but they may also vary from person to person. Kerstin, a participant in Dewaele's (2008) introspective study on the perception of the emotional weight of the phrase *I love you*, which will be discussed in the §1.2, stated the following: "As I use the phrase in all three languages to different people (partner, son, mother) the different expressions are tied to these different kinds of relationships with their respective emotional values" (p. 1766). Notably, 4.4% of his sample indicated that emotional weight was not tied to a particular language; rather, it was reported to be person-specific.

Lastly, Pavlenko (2008) concludes that emotionality should be given more prominence in models of bilingual representation and processing, as it is a crucial aspect of the bilingual lexicon that also influences code-switching behavior. She criticizes the fact that models of bilingual processing are often based on monolingual functioning, inspired by, for instance, Levelt's (1989) model. As a matter of fact, "language emotionality is undoubtedly present in monolingual speakers [...], but differential language emotionality and its impact on language choice are best studied with bidialectal, bilingual, and multilingual speakers" (Pavlenko, 2008, p. 160).

The following sections will explore two of Pavlenko's (2012) approaches to the investigation of disembodied bilingual cognition: the introspective approach (§1.2) and the cognitive approach (§1.3).

1.2. The Introspective Approach: Love, Anger, and Taboo Words

The aim of this section is to present a number of introspective studies based on Dewaele and Pavlenko's (2001) web questionnaire *Bilingualism and Emotions* (BEQ) and its database. Attention will mainly be directed to research focusing on love (Dewaele, 2008), anger (Dewaele, 2006), and taboo words (Dewaele, 2004).

Drawing on the BEQ database, Dewaele (2008) investigated the emotional weight of the phrase *I love you* in relation to a total of nine independent variables: four related to sociobiographical and psychological factors (i.e., gender, education, self-perceived language dominance and trait emotional intelligence); two to the L2 learning history (i.e., context and age of acquisition); two to the socio-linguistic context (i.e., degree of L2 socialization as well as nature and size of L2 interlocutor network); one to the self-perceived degree of L2 oral proficiency (Table 3). Love constitutes a critical testing ground for multilingual affective processing, as it is "one of a series of emotions that all humans share but [which] may resist exact linguistic translation because of the uniqueness of the specific verbal and non-verbal manifestations and expressions across languages and cultures" (Altarriba, 2003; Derné, 1994, as cited in Dewaele, 2008, p. 1754).

Table 3

Dewaele's (2008) Eight Independent Variables

Sociobiographical and Psychological	*L2 Learning History*	*Socio-linguistic Context*	*L2 Proficiency*
(1) gender			
(2) education level	(5) L2 acquisition context	(7) degree of L2 socialization	(9) self-perceived L2 oral proficiency
(3) self-perceived lang. dominance	(6) age of onset of L2 learning	(8) L2 interlocutor network size	
(4) trait emotional intelligence			

In his sample of 1459 multilinguals (of which 221 were bilingual, 362 trilingual, 390 quadrilingual and 486 pentalingual, with a total of 77 L1s represented), 45% reported greater emotional weight in their L1 and 25% in an LX, while 30% reported similar

weights in their L1 and an LX (Dewaele, 2008). Importantly, the significance of socialization was consistently recognized by participants across the board: Guillermo (greater weight in L1) justified his judgment in terms of the fact that "[his] sentimental experience was mostly in Spanish [his L1]" (p. 1767); David (equal weight in L1 and an LX) linked it to his linguistic history, addressee, and, interestingly, the country where it is uttered; BE (greater weight in an LX) explained her judgment in terms of her "long-time relationship with her Spanish-speaking husband" (p. 1770). Interestingly, Maya (greater weight in an LX) even linked her judgment to her habit of watching romantic movies in Hindi, the LX in which she perceives *I love you* to be more emotional, thus suggesting that even passive processing of emotional socialization may contribute to the development of emotional connotation. Nevertheless, some participants reported greater emotional weight in their L1 despite strong emotional socialization in their LX: VV (Estonian L1, dominant in L2 English acquired at age 2) attributed her feeling "as if an inner secret part of [herself] had been unlocked" the first time she heard the Estonian *I love you* to the fact that "[Estonian] had always been a language of my 'inner circle', the family" (p. 1769). Another set of answers highlighted the role of the different emotion scripts of love across cultures (i.e., the cultural blueprint for how the emotion is understood and communicated), so much so that XX (both English and Japanese L1), judged it as stronger in Japanese because "it has such a strrooooong meaning that people rarely use it" (p. 1768). This is consistent with YT (Japanese L1, English L2), who argued against the actual existence of a Japanese *I love you* beyond some approximate translations: "The feeling is there. Why should we have to say that? It seems that you have a doubt in love. […] Sounds sweet but this is just a word" (p. 1768). Maggie (Cantonese Chinese L1, English L2, Japanese L3) would even interpret its overt expression as "let's register for our marriage" (p. 1770), due to its being too factual. Japanese appears to be a highly useful means of comparison, given the substantial, almost diametric differences in its emotion script for love compared to English. However, other languages such as Italian also offer valuable insights, with two phrases differentiated by the degree of romantic connotation: According to AP (Italian L1, English L2), ""I love you" is stronger than "ti voglio bene" [not romantic] and weaker […] than "ti amo" [romantic]" (p. 1769). Therefore, an analysis of the picture emerging from these personal narratives suggests that no automatic link exists between greater perceived emotional weight and neither language dominance nor the language of partners and family (Dewaele, 2008).

Nevertheless, the statistical analyses performed in the study showed a significant association between current linguistic practices (i.e., language dominance, $\chi^2 = 76.0$; nature of L2 interlocutor network, $\chi^2 = 44.1$; self-perceived proficiency, $\chi^2 = 37.2$; degree of L2 socialization, $\chi^2 = 34.9$) and the perception of the emotional weight of *I love you*. Weaker associations were found with variables related to the respondents' language learning history (i.e., age and context of acquisition, respectively with $\chi^2 = 10.8$ and $\chi^2 = 9.5$), thus suggesting that "the perception of emotional force of *I love you* is more strongly determined by recent practice rather than the more distant past" (Dewaele, 2008, p. 1774). Instead, no significant effect of sociobiographical variables (i.e., gender, $\chi^2 = 2.5$; education, $\chi^2 = 9.2$; and trait emotional intelligence, $\chi^2 = 0.8$) was found. Dewaele concludes that prolonged periods of L2 socialization in the LX are a requirement for the ability to perceive the subtle differences in the emotional weight of *I love you* across the multilingual's language inventory, and to trigger a "conceptual shift towards the LX for this particular emotion script" (2008, p. 1777). From this perspective, oral proficiency seems to constitute a pre-requirement, as Dewaele lucidly explains:

> In emotional NS/NS exchanges at least participants do not have to worry about the language processing (production and reception) which is largely automatic and can therefore focus on the content of the interaction (cf. Paradis, 2004). However, in emotional NS/NNS exchanges, L2/LX users will typically rely more on controlled processing, involving searches for words, expressions, grammar rules, pragmatic rules, idioms and metaphors. This will involve a considerable demand on working memory, and limit the amount of attention L2/LX users can pay to content and to observation of the interlocutor (Dewaele, 2008, p. 1759)

Overall, these results underscore the role of active and dynamic language use in social settings. Far from being a merely formal matter of mastering grammatical structures, multilingual affective processing appears to emerge only when a given LX is used to build relationships and express oneself authentically. This may be suggested as an explanation for the fact that nearly half of the respondents reported greater emotional weight in their L1: "they may have grasped the meaning of the phrase in the LX, but [...] the full conceptual representation remained elusive" (Dewaele, 2008, p. 1775). In other words, developing a complete semantic understanding of the meaning of the LX phrase and its illocutionary effect in an array of situations is only the penultimate state of acquisition, with the final step being the development of an emotional weight of its

own, capable of making the multilingual "shiver or cry" (p. 1774); a similar trajectory was found for LX humor (Vaid, 2006). In this context, proficiency can be viewed as the key to unlocking the emotional potential of an LX, facilitating the shift from L1 translation to authentic LX communication of emotions. Furthermore, this highlights how language learning encompasses the acquisition of various cultural and extra-linguistic factors, such as emotion scripts.

In another similar study based on the BEQ database, Dewaele (2006) investigated the effect of two sociobiographical variables (i.e., gender and education) and four language-specific variables (i.e., LX socialization degree, acquisition context, age of onset of learning, and self-perceived oral proficiency) on the language choice for the expression of anger. The underlying assumption was that "anger, a neurologically based emotion, originates in social interaction and that its expression is shaped by a wide variety of cultural, linguistic, and individual variables" (Dewaele, 2006, p. 126), which again suggests the presence of distinct emotional scripts across cultures. The results (n = 1454) closely aligned with those of the 2008 study on the emotional weight of the phrase *I love you*: Of the six hypotheses, four concerning language-specific independent variables were fully supported, one related to the role of the age of onset of learning was only partially supported, while insufficient data prevented the acceptance of the hypothesis regarding the role of gender and education. As expected, L1 was the overall preferred language, with a progressive decline in preference for the multilingual's subsequent LXs; however, statistical results as well as participant reports showed that prolonged and intense LX socialization may enable a gradual shift toward the LX, especially in the context of partners and relationships. Furthermore, higher self-perceived oral proficiency and naturalistic (or at least mixed) learning contexts of acquisition also yielded highly significant effects. On the other hand, while age of onset of learning had a quite robust effect for L2s and L3s, this was weaker with respect to L4s, and not significant in the context of L5s. It was thus shown that "events at the beginning (age of onset) and during the language learning process (context of acquisition) reverberate for years in multilinguals' linguistic behavior" (Dewaele, 2006, p. 147), although the former with a weaker effect. Harris et al. (2006) proposed an explanation in terms of the fact that emotional regulation systems develop in parallel with language in childhood, but they also discussed cases where LXs learned later in life were associated with strong emotional reactions. Taken together, these findings

seem to suggest that the varying emotional weight within a multilingual's language repertoire, at least as far as anger (Dewaele, 2006) and love (Dewaele, 2008) are concerned, is more grounded in their social environment than their psychology or sociobiographical coordinates.

Similar patterns were also observed in a previous study on swearwords and taboo words [S-T words], where Dewaele (2004) found weaker effects associated with sociodemographic variables compared to those related to the individual's linguistic history in his BEQ sample of 1039 multilinguals. Unlike the 2006 and 2008 studies on the expression of anger and love, a significant gender effect was observed in the L1, with female participants tending to rate the perceived strength of S-T words higher; however, this effect was very weak and became progressively less significant for LXs. Education level and participant age produced no significant effects in any of the five languages investigated. On the other hand, the results confirmed the hypothesis that the perceived emotional force of S-T words would be generally higher in the L1 and gradually lower in subsequently learned LXs, consistent with the findings on the expression of anger (Dewaele, 2006). Such greater emotional force was shown to either promote or restrain their use, depending on the speaker's communicative purpose. Full support was also provided for the hypotheses regarding the role of language dominance, with L1 attrition eroding the perceived emotional force of L1 S-T words when this is no longer the speaker's dominant language, as well as that of the context of acquisition, with the instructed group giving lower emotional force ratings than the naturalistic or mixed group. The hypothesis concerning the role of age of acquisition, self-rated oral proficiency and frequency of use was only partially supported: This is because age of acquisition ceased to be a significant predictor from L3 onward, with proficiency and frequency of use emerging as the strongest predictors. Again, as was the case with love and anger, "scripts for swearing differ between languages, not only in the metaphors used but also in what is deemed acceptable. In other words, multilinguals do not simply use translation equivalents of S-T words in their different languages" (Dewaele, 2004, p. 214). It thus comes as no surprise that variables pertaining to the social context produced the most significant effects, as "sociopragmatic competence can only develop through actual use of the language in authentic interactions" (Dewaele, 2004, p. 220).

In summary, a number of questionnaire-based introspective studies found similar effects for the same independent variables on the perceived emotional weight of *I love you* (Dewaele, 2008), on the language choice for the expression of anger (Dewaele, 2006), and on the perceived emotional force of swearwords and taboo words (Dewaele, 2004): Only language-specific variables were strongly associated with the perception of emotional weight, with a greater role played by recent language practices. Dewaele considers language dominance, and consequently language socialization, to be the primary driving force behind the mechanism:

> Strong socialization in the LX, which implies frequent use of the LX over a prolonged period with multiple interlocutors, which in turn is linked to a high level of (self-perceived) proficiency, will most likely enhance the familiarity with this particular emotion script and as a consequence, the phrase [...] will acquire strong emotional connotations. (2008, p. 1775)

This is consistent with Pavlenko's conclusion that "adult second language socialisation in the private space of the family may make other languages seem equally—if not more—emotional than the first" (2004, p. 200). In her study of language choice and emotion in parent-child communication, she indeed found that although a majority of parents reported a preference for the L1 for praising and disciplining their children, some noted that their LX had developed strong affective connotations as a result of socialization, even in the case of late bilingualism (Pavlenko, 2004). As she lucidly explains, "the discourse of first language primacy oversimplifies the reality of multilingual existence, where additional language socialisation may change speakers' perceptions of language emotionality and allow them to invent new emotional personae" (Pavlenko, 2004, p. 201). The conclusion, therefore, is that "there is nothing intrinsically different between the L1(s) and the LXs" (Dewaele, 2006, p. 148), except that the former are more likely to serve as the means of early socialization, leading to the development of rich networks of emotional connotations. Nevertheless, subsequent LX socialization was widely shown to be able to trigger shifts in language preference for emotional expression and in perceived language emotionality (Dewaele, 2004, 2006, 2008; Pavlenko, 2004), thus constituting strong evidence against the "popular and oversimplified assumption that in late bilingualism, L1 is always the language of emotions and LX the language of distance or detachment" (Pavlenko, 2004). This supports the view of emotionality as an intrinsic property of L1s and a variable one in L2s (Pavlenko, 2012).

1.3. The Cognitive Approach: Affective Priming and Interference

Whereas Pavlenko offers an analysis of three perceptual prioritization effects, that is, facilitation through valence congruency (affective priming tasks), interference (Emotional Stroop Tasks), and enhanced recall, only the first two of these will be given prominence in the present section.

The term *affective priming* refers to the experimental paradigm whereby congruence in affective valence between prime and target stimuli is manipulated to test the expectation that congruent conditions (e.g., positive–positive or negative–negative prime and target trials) would produce faster reaction times, for instance, in lexical decision tasks (Pavlenko, 2012). That is to say, "positive primes facilitate responses to positive targets, and negative primes facilitate responses to negative targets", even with stimulus onset asynchrony (SOA) 300 ms or less, and with participants asked to ignore the prime, thus making it a fast, automatic (i.e., involuntary), and goal independent effect modulated primarily by valence (Altarriba & Basnight-Brown, 2011, pp. 310-311). This offers fertile grounds for research in multilingualism.

Consistent with Pavlenko's aforementioned L1 and L2 advantages, in their sample of English–French Montreal bilinguals (English L1, French L2) Segalowitz et al. (2008) found greater processing automaticity for affectively valenced words in their participants' L1 compared to their weaker L2. They used an Implicit Affect Association Task in which the categorization of three stimulus types alternated: noun phrases (as "positive" or "negative"), facial expressions (as "happy" or "sad"), and objects (as "whole" or "broken"). Two conditions were devised: congruent (e.g., "positive", "happy", "whole") and incongruent (e.g., "positive", "sad", "broken"). Crucially, a speeded semantic classification task involving animacy judgments in both the participants' L1 and L2 was also administered: The comparison of the reaction times across their two languages allowed for the production of an individual index of general efficiency in L2 lexical access. This enabled the researchers to isolate the differential affective congruence effect from general L2 word recognition abilities, as no correlation between the two measures was found. They thus concluded that the processing of affective valence was more automatic in the participants' L1 than in their weaker L2, as a significantly smaller L2 interference effect for affectively valenced

words was observed, and that these skills may be separate from general L2 word recognition abilities.

In a similar vein, Degner et al. (2012) carried out a four-task experiment requiring their proficient, unbalanced and sequential German–French and French–German bilingual participants to complete two sets of affective and semantic priming tasks, one in each language. They observed similar semantic priming effects in both groups and both languages; however, affective priming was found to be a function of frequency of language use, as only participants with frequent and intense everyday L2 usage in naturalistic contexts exhibited significant affective priming effects. This relationship persisted even after controlling for language proficiency and semantic priming effects. The researchers thus concluded that not only language, but also cultural immersion is a key factor in informing bilingual emotional language processing:

> Bilinguals immersed in the L2 culture use their second language frequently in daily life, that is, in action contexts that certainly lead to a higher weighting of affective connotations. When bilinguals are involved in social interactions in L2, perceiving and expressing subtle nuances of what is typically seen as positive and negative become highly relevant and well practised. It is one thing to learn that a given word is a taboo word in an L2, but quite another to experience the reaction of native speakers of L2 if one uses this word. (Degner et al., 2012, p. 187)

In other words, the interaction in bilingualism between cognitive and affective language processing and social factors can be described as complex and dynamic (Degner et al., 2012). Such a view was corroborated by Sianipar et al. (2015), who carried out a longitudinal study examining the interaction between semantic and affective priming over a period of 6 months of standard classroom teaching practice, implementing both behavioral and event-related potential (ERP) measurements. They in fact critiqued Degner et al.'s (2012) work for the variation in age of acquisition within their sample and for failing to account for whether word valence effects emerge in the early stages of learning. Hence, they selected a sample of L1 German participants with no prior Dutch learning experience and examined their development of L2 semantic and affective meaning over the course of 6 months of early L2 learning. They found evidence of non-interacting semantic and affective priming effects at early stages of learning, suggesting the existence of "relatively separate [semantic and affective] channels that are more and more linked contingent on L2 exposure"

(Sianipar et al., 2015, p. 1). This was evidenced by the gradual alignment of cross-language affective and semantic processing across the experimental sessions. Crucially, the researchers did not find signs of a mutual modulation of affective and semantic priming in the accuracy rates or reaction times, but this was reflected in the ERP measurements, and only in the last session, thus pointing to the presence of "learning-related changes in the link between semantic and affective representations, established when the learners have already been immersed in L2 environment" (p. 25). Interestingly, this developmental trajectory somewhat reflects the process of progressive integration of L1 and L2 combinatorial nodes identified by Bernolet et al. (2013) with regard to syntactic development (although they found the primary driver to be proficiency, rather than frequency of language use or exposure).

Alongside affective priming, another widely used experimental tool for the investigation of affective processing is the *Emotional Stroop Task*, which explores how task-irrelevant but emotionally salient stimulus features interfere with task performance. These studies offer valuable insights into emotional word salience and its impact on selective attention (Altarriba & Basnight-Brown, 2011; Eilola et al., 2007; Pavlenko, 2012; Sutton et al., 2007). Two similar studies by Eilola et al. (2007) and Sutton et al. (2007) carried out with different populations of bilinguals found interesting results with regard to color identification tasks. While the former examined a sample of late Finnish–English bilinguals with good knowledge of both languages yet no immersion in L2 English, the latter studied a group of highly proficient Spanish–English bilinguals from the State University of New York, who reported substantially greater dominance in their L2. Both experiments found a significant main effect of word type, with considerably longer latencies (i.e., greater interference effects) for negative emotion words compared to neutral words[1]. They also both found similar patterns across the two languages of the two bilingual samples, thus indicating that L2 proficiency—regardless of age of acquisition—may be enough to interfere with the cognitive processes involved in the experimental task by triggering an emotional response to words representing threat (Eilola et al., 2007). However, Sutton et al. also found a significant main effect of language, with overall shorter reaction times for the

[1] While Eilola et al. worked with positive, negative, and taboo words vs. neutral words, Sutton et al. only utilized negative vs. neutral words. This enabled the former to exclude any effect of positive words, as no significant difference in latency was observed with the other three classes of stimuli.

L2 English, as well as a greater L2 interference effect; according to the authors, "this was not surprising as English was the more dominant language for this particular population of Spanish–English bilinguals" (Sutton et al., 2007, p. 1085). Importantly, Degner et al.'s (2012) results seem to contradict Eilola et al.'s (2007) findings, as the former concluded that L2 affective processing is grounded in frequent language use and immersion, while the latter found significant emotional interference effects in a sample of L2 speakers of English living in Helsinki. However, Degner et al. attribute this to the lack of information regarding the level of L2 immersion of the Finnish sample: They speculate that English in Helsinki might be used more extensively than French in Germany (i.e., the context of their sample).

Unlike Emotional Stroop tasks, *Affective Simon tasks* are not used to study the mechanism of selective attention interference caused by task-irrelevant emotional features of the stimuli, but rather to examine response compatibility effects. As an affective variation of the Spatial Simon task, it focuses on how task-irrelevant emotional features of the stimulus facilitate task performance when congruent with the response label assigned. Altarriba and Basnight-Brown (2011) used this paradigm to explore the differences in the processing of emotion (e.g., "happy", "anxious") and emotion-laden words (e.g., "dream", "shark"). Participants were shown two sets of stimuli: either words in white, which they had to rate on valence (as "positive" or "negative", corresponding to "P" and "Q" on the computer keyboard), or words in blue or green, which they had to classify on the basis of color (the color–key assignments were counterbalanced across participants, e.g., with half using the "P" key for blue and the other half using the "Q" key). The issue under investigation was whether congruency effects facilitated task performance, that is, whether they reduced reaction times, for instance with positive words shown in blue (for the participant condition in which both corresponded to the "P" key). Their sample comprised English monolinguals and Spanish–English bilinguals who, despite having Spanish as their L1, were likely dominant in their L2, especially with regard to the skill of reading. They found that Affective Simon effects were moderated by both emotion word type, with emotion-laden words more readily producing them compared to emotion words, and language dominance. As a matter of fact, while only negative emotion words facilitated color word performance when the correct response was also the one assigned to negative white words, both negative and positive emotion-laden words produced

congruency effects. Furthermore, both monolingual and bilingual participants showed evidence of the congruency effect in English, that is, the dominant language for both groups, suggesting that language dominance, rather than first language status, plays a key role in the processing of emotion words in bilinguals. In other words,

> Though accounts of emotion word processing have indicated that these words carry more emotional 'weight' in the native language, or the first-learned language (cf. Altarriba, 2003), this statement must be qualified such that dominance may actually be more predictive of behavior using emotion word stimuli than age of acquisition (Dewaele, 2008). (Altarriba & Basnight-Brown, 2011, p. 324)

In an ingenious subsequent study, Eilola and Havelka (2011) combined cognitive and psychophysiological measures by pairing emotional Stroop tasks with skin conductance level (SCL) measurements, which were assumed to reflect overall emotional arousal levels. On the one hand, they observed similar interference levels in English Stroop tasks across their sample of English and Greek–English bilinguals, thus confirming previous results which reported similar interference effects for negative and taboo words in both languages but no effect for positive words. On the other hand, whereas they found significantly higher SCL responses to negative and taboo words compared to neutral and positive words in L1 English speakers, this trend was not observed in L2 English speakers (who still showed statistically insignificant greater SCL responses to taboo words than to positive words). Hence, the two groups exhibited similar performances at the behavioral level, but differed in terms of physiological arousal reactions.

Taken together, the findings from the affective priming, Emotional Stroop and Affective Simon tasks analyzed thus far seem to converge, suggesting that sufficient levels of language use and exposure, especially in naturalistic contexts, and of language proficiency may lead to the automatization of L2 affective valence processing (Degner et al., 2012; Eilola et al., 2007; Eilola & Havelka, 2011; Sianipar et al., 2015; Sutton et al., 2007), or even to stronger L2 effects as a result of a shift in dominance which may override the L1 advantage (Altarriba & Basnight-Brown, 2011; Sutton et al., 2007). This is consistent with the considerations made in §1.1.1 regarding the shift from fractional to wholistic bilingualism, which highlights the relevance of language dominance over first language status (Grosjean, 2008, 2022), as well as with the

findings of the introspective studies outlined in §1.2. However, Eilola and Havelka's conclusions carry an important methodological implication for cognitive approaches:

> Bilinguals appear to access the semantics of emotional words fast and automatically even when they have started learning the second language after early childhood. Yet, the semantic activation of L2 word meanings does not seem to lead to similar increases in autonomic [physiological] activation as is the case in L1. (2011, p. 367)

In essence, they identify two distinct subprocesses: "automatic access of affective valence information (semantic processing) and automatic triggering of heightened levels of autonomic arousal (affective processing)" (as cited in Pavlenko, 2012, p. 416). This view introduces a fundamental limitation with regard to a purely cognitive approach, "which often equates affective processing with processing of valence and does not allow us to determine whether valence actually triggers heightened arousal or is simply part of semantic meaning" (Pavlenko, 2012, p. 417). Studies employing such an approach must therefore consider this inherent limitation.

2. A Wholistic Shift? Untangling Foreignness vs. Dominance

This chapter seeks to examine recent developments in bilingualism studies through the lens of the complementarity principle and wholistic bilingualism, as opposed to fractional bilingualism (Grosjean, 2008, 2022). This will serve to illustrate the growing emphasis on dominance over foreignness in the literature, thereby contextualizing the choice of Malta as the study population for the present research. The first section will concentrate on recent advancements in the study of the foreign language effect on moral decision-making and risk-aversion (§2.1). Although the causal role of emotional distance in this effect is debated (for a meta-analysis, see Circi et al., 2021), the recent "wholistic shift" from foreignness to dominance (e.g., Wong & Ng, 2018) nevertheless makes it possible to draw parallels with the issue under study in this thesis. In other words, if one adopts emotion-based accounts, FLE research offers valuable insights into bilingual affective processing; nevertheless, irrespective of the causal role of emotions, this research underscores the increasing significance of language dominance as a variable, alongside the growing focus on early bilinguals within bilingualism research. This will therefore lay the foundation for the second section, which will provide a rationale for Malta's suitability as a study population in the context of this thesis (§2.2).

2.1. The Case of the FLE on Moral Decision-Making

The term *foreign language effect* (FLE) refers to the phenomenon whereby the language context (i.e., foreign vs. native language) affects several aspects of decision-making including framing effects, risk aversion, and a number of biases such as the truth and self-serving biases (Circi et al., 2021). It was first identified and described by Keysar et al. (2012), who found significantly lower framing effects in moral decision-making with dilemmas presented in an FL context. To be able to assess this, they used a variation of Kahneman and Tversky's (1979) original Asian disease problem, where a catastrophic epidemic scenario was presented along with a choice between a safer and a riskier medicine option which could, however, lead to the saving of more people. Two conditions determined whether the participants would be presented these options in a gain frame[2] (which highlighted how many people would be saved with the two

[2] "If you choose Medicine A, 200,000 people will be saved. If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved."

medicine options) or in a loss frame[3] (which highlighted how many people would die). In the original experiment, participants' judgments were found to be influenced by the frame condition where they saw the dilemma: The safer option tended to be the preferred choice in the gain frame condition, whereas participants in the loss condition tended to choose the riskier option (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981). In their experiment, Keysar et al. (2012) found that the participants who were asked to make a judgement in an FL context exhibited considerably lower framing effects, suggesting that "people rely more on systematic processes that respect normative rules when making decisions in a foreign language than when making decisions in their native tongue" (p. 666). They considered these results to be surprising in view of the expectation that the increased cognitive load caused by FL processing would undermine systematic thinking. The researchers ultimately attributed their findings to the "reduction in emotional resonance that is associated with using a foreign language" (pp. 666-667), thus suggesting that an FL could reduce bias by reducing automatic emotional reactions.

Such findings align with those of a later study by Costa et al. (2014), who used the *footbridge* and less emotional *switch* versions of the famous trolley dilemma to test whether the language of presentation would impact moral decision-making. Participants were asked whether they would sacrifice one man to save five, by either pushing a heavy man off a footbridge to stop the oncoming trolley (footbridge version), or by pulling a switch to redirect it (switch version). When presented with the footbridge version of the dilemma in an FL context, participants made significantly more utilitarian decisions and showed greater willingness to accept harm to maximize outcomes compared to participants in the NL condition. On the contrary, no such gap between NL and FL contexts of presentation was observed with regard to the less emotional switch version of the dilemma, thus indicating that the FLE did lead to increased utilitarianism as a result of increased emotional distance. Besides the remarks on FLs promoting psychological distance and resulting in more abstract situation construals, however, the authors also referred to cognitive fluency as a possible underlying driver of this effect. Given that using an FL could interfere with cognitive fluency (Segalowitz, 2010), and that such disruption prompts individuals to

[3] "If you choose Medicine A, 400,000 people will die. If you choose Medicine B, there is a 33.3% chance that no one will die and a 66.6% chance that 600,000 people will die."

employ a more careful mode of processing thus reducing decision biases (Alter et al., 2007), they argued that using an FL "might diminish the impact of intuitive processes on moral judgment" (Costa et al., 2014, p. 6).

Three main classes of explanatory hypotheses have been proposed to account for the FLE, respectively based on the roles of cognitive control, emotions, and social norms and linguistic similarity (Circi et al., 2021). Several cognitive scientists have advanced the idea that decision-making processes rely on two systems: System 1, which is fast, automatic and affective, and System 2, which is deliberate and rational, but more effortful (Greene et al., 2008; Kahneman, 2003; Stanovich & West, 2002). From this perspective, the increased cognitive burden caused by FL processing would result in greater reliance on System 2 at the expense of System 1, thereby enhancing cognitive control and reducing the influence of cognitive biases (Kahneman, 2011). In other words, FL processing would lead to less instinctive, more calculated decisions. However, studies based on this approach have produced heterogeneous results (Circi et al., 2021). The other two sets of theories are centered on the idea that the FLE is grounded in a sort of filtering effect associated with FLs. According to a large body of research, the increased emotional response often experienced through an L1—and hence the dampened emotional perception of LXs—is best explained by the emotional richness featured in its (naturalistic) context of acquisition, whereas LXs can also be acquired in more emotionally neutral, "clinical" instructed contexts (Pavlenko, 2004, 2008, 2012; Dewaele, 2004, 2006, 2008; Marian, 2023). Consistent with this view, it was suggested that reduced FL emotionality might mainly concern negatively connotated words, as classroom exchanges are generally based on emotionally positive content (Boucher & Osgood, 1969; Dewaele, 2004, 2006). Some scholars have taken a step further and argued that processing a moral dilemma in an FL could "limit the access to relevant autobiographical memories (including normative knowledge) that keep traces of the linguistic context in which they were learned (i.e., the NL)" (Circi et al., 2021, p. 3), thus attributing the basis of the FLE to a reduced activation of social norms (Geipel et al., 2015). According to this view, FL users would therefore be able to consider a situation more objectively as they feel less bound to social norms and expectations. Recent studies have indeed pointed to the role of NL–FL similarity: The FLE is inhibited when the FL has a strong cultural influence and when the two languages are linguistically similar (Dylman & Champoux-Larsson, 2020).

Among those who have highlighted the role of NL–FL similarity, Circi et al. (2021) conducted a meta-analysis of 47 experiments across 17 studies aiming to evaluate foreign language effects in literature on moral decision-making and risk-aversion. They found similar and robust effects in both domains, with more utilitarian decisions and less risk-aversion in FL conditions, suggesting that they might be attributable to similar or identical cognitive mechanisms. Nevertheless, they found more heterogeneity in moral decision-making results as compared to risk-aversion, possibly reflecting the linguistically based, more variable nature of tasks in the former domain as opposed to the largely mathematically based tasks in the latter. Such heterogeneity was modulated by NL–FL similarity: "when the NL and FL belonged to different linguistic branches [...] the effect size was significantly different from zero, and when the NL and FL belonged to the same linguistic branch [...], the effect was null" (Circi et al., 2021, p. 7). In line with Geipel et al. (2015), this was attributed to the reduced access experienced through FLs to the social and moral normative knowledge encoded in NLs. On the other hand, no significant effect of proficiency was observed, thereby seemingly contradicting a consistent body of literature (e.g., Pavlenko, 2012). However, since they computed proficiency as a global average (i.e., intra-sample variation was reduced to one mean value for each sample in each experiment), the authors themselves recognize that their approach was likely underpowered in this regard. Crucially, Costa et al. (2014) did find an effect of proficiency: They observed a positive correlation between self-rated FL proficiency and the resemblance of participant judgments to those of native speakers. They concluded by pointing to language proficiency as one of the main drivers of FL emotional grounding, and stated that high FL proficiency may "elicit similar emotional reactions to that of a native language" (Costa et al., 2014, p. 6).

Interestingly, such a foreignness-centered view of LX affective processing seems to clash with the literature analyzed in the previous sections, which identifies language dominance, socialization, and recent language practices as the core components of the emotional grounding mechanism, seeing proficiency as a "prerequisite", and rejecting the myth of the LX as the language of emotional distance (Dewaele, 2004, 2008; Pavlenko, 2004, 2012). As noted by Marian, "even when the content of a message is fully understood, receiving a reprimand, discussing a distressing experience or reading an emotional passage are likely to be more evocative in a native language"; however,

she continues, “that different words or different ways of saying a word can elicit distinct emotions is something that happens within a single language as well” (2023, p. 108). To exemplify this point, she cites her student, who asked her to use an abbreviated version of her name because her parents only used her full name when angry with her. It is thus reasonable to start questioning the extent to which the foreign language effect, as explained in terms of emotional distance (Costa et al., 2014; Keysar et al., 2012), is indeed *foreign*. It is therefore necessary to turn to populations of early (Wong & Ng, 2018) and simultaneous (Miozzo et al., 2020) bilinguals.

Crucially, Wong and Ng (2018) noted that most FLE research on moral decision-making up to that point had focused on late bilinguals (e.g., Costa et al., 2014; Geipel et al., 2015; Keysar et al., 2012), emphasizing age of acquisition as the primary differentiator between a speaker’s two languages and the main driver of the effect. However, they deem this problematic because age of acquisition is not an accurate indicator of the complex reality that is the bilingual experience, which is reflected in varying degrees of dominance (e.g., balanced vs. dominant bilinguals). This is due to the fact that “language experiences can differ across bilingual speakers and their exposures to each of the two languages are unlikely to be equivalent” (Wong & Ng, 2018, p. 3). The researchers thus align with Grosjean’s (2008) view of bilingualism as a wholistic phenomenon, where bilingual competence is recognized as more complex than a mere sum of perfect monolingual competences. In fact, Costa et al.’s (2014) finding that higher L2 proficiency resulted in similar performance to NL users seemingly paved the way for considering proficiency and dominance as variables in the FLE. However, Wong and Ng (2018) argue that in this type of study it is difficult to tease apart the effects of age of acquisition and proficiency, because late bilinguals might have weaker proficiency caused by lower frequency of use due to having begun its acquisition later in life. Therefore, they set out to study moral decision-making across 10 different scenarios among a population of early English–Chinese bilinguals from Singapore, all of whom had begun learning both languages before the age of 3. These scenarios were based on the choice of either a personal or impersonal action. While foreignness-based accounts for the FLE would predict no significant language effect provided that both languages are native, Wong and Ng (2018) did find that the greater the dominance in the tested language, the larger the difference between personal and impersonal dilemma action choices. In other words, dominance

produced a language effect, which they reframed as *language dominance effect* (LDE) due to its incompatibility with prior FLE conclusions. Contrary to predictions, they also found that moral dilemmas with stronger emotional arousal correlated with more utilitarian responses. These results are consistent with those obtained by Chan et al. (2016) with their sample of Chinese–English bilinguals from Hong Kong, which suggests that there may have been similar cultural influences at play regarding their moral decisions. This possibility indicates that although emotional arousal might be associated with language dominance and moral decision-making, it may not necessarily serve as such a direct mediating factor between the two, contrary to initial beliefs (Wong & Ng, 2018). The authors conclude by establishing language dominance as a more appropriate predictor of the FLE (and LDE) phenomenon.

In Miozzo et al.'s (2020) investigation, moral decision-making tasks based on the Asian Disease Problem and the Footbridge Dilemma were administered to two groups of proficient, native bilingual speakers of Italian and either Venetian or Bergamasque, two dialects of Northern Italy. Most participants reported using their dialect in their native families (> 80%), as well as using it with friends and in the household (40–80%), that is, "the informal contexts where these languages can be spoken" (Miozzo et al., 2020, p. 8). Unsurprisingly, their affective ratings showed equally intense emotional responses in both their languages (i.e., Italian and one of the two dialects), thus supporting the idea that proficiency and frequent use may result in similar levels of emotional intensity across the bilingual's language repertoire (Dewaele, 2008; Pavlenko, 2012, 2017). What was surprising is that, despite the similarities in emotion responses elicited by Italian and the respective dialect, different decision patterns were observed: Decisions made in Italian patterned with previous findings on native languages, whereas decisions made in Venetian or Bergamasque aligned with those on foreign languages. In fact, dialect-based decisions were generally found to be less susceptible to framing biases and more utilitarian. The authors argue that these results seem to constrain emotion-based accounts of the FLE (e.g., Chan et al., 2016; Geipel et al., 2015), or, alternatively, that there might be different mechanisms at play in the effects induced by foreign versus multiple native languages (Miozzo et al., 2020). They instead attribute their findings to the differences in the contexts of use between Italian, the "official and literally codified language" which can be used in both formal and informal contexts, and the two dialects, which are "confined to domestic and informal

settings" (Ferguson, 2007; Muljačić, 1997, as cited in Miozzo et al., 2020, p. 9). Based on findings that the information available during decision-making affects its outcomes (Johnson et al., 2007; Weber et al., 2007), Miozzo et al. (2020) thus suggest that these environmental differences between Italian and the two dialects influenced the decisions made in the different languages. They conclude that the foreign language effect is not just foreign, and that "the contexts in which bilinguals use a language—either native, regional or foreign—could affect decisions" (Miozzo et al., 2020, p. 1).

In conclusion, the present section provided an overview of recent developments in the study of the foreign language effect. Initial explanations of the effect attributed it to the weaker emotional resonance and increased processing difficulty associated with L2s, which were thought to encourage greater reliance on the more rational and less affective System 2 over System 1 for decision-making (Costa et al., 2014; Keysar et al., 2012). That of Keysar et al. (2012) was, in particular, a largely foreignness-based view of the phenomenon, as languages were dichotomously categorized as either native or foreign, with only the latter seen as an effect trigger. On the other hand, Costa et al. (2014) began to recognize the role of proficiency in modulating the similarity between native and non-native participant responses, thus indirectly suggesting that the notions of nativeness vs. foreignness are not enough to account for the phenomenon. Crucially, Wong and Ng (2018) found that language dominance produced an effect on the moral decisions of their sample of early bilinguals, challenging previous FLE theories and reframing it as a "language dominance effect". Miozzo et al. (2020), in a similar vein, highlighted the role of the contexts of use of the two languages in modulating the effect. Lastly, Circi et al. (2021), in line with Geipel et al. (2015), emphasized the role of the reduced FL access to social and moral normative knowledge encoded in NLs, and consequently pointed out that NL–FL linguistic similarity might prevent the FLE. Taken together, these studies seem to point to a complex interplay of reduced FL emotional resonance, interference from reduced cognitive fluency in FL processing, and diminished influence of the social norms encoded in NLs (Table 4). Whereas a number of studies have questioned or rejected emotion-based accounts for the FLE (Chan et al., 2016; Geipel et al., 2015; Miozzo et al., 2020), others have either proposed it as a root factor (Costa et al., 2014; Keysar et al., 2012) or adopted a more cautious perspective, suggesting a weaker link between the two and highlighting the need for further research (Circi et al., 2021; Wong & Ng, 2018). While the aim of this

thesis is not to examine the FLE per se, there are two reasons why it is deemed to be of relevance. First, provided that emotion resonance is accepted as one of the variables, FLE studies offer valuable insights into the encoding and processing of emotions and social norms across a bilingual's language repertoire, thus offering clues about their affective processing as well. Second, irrespective of the role of emotions in the effect, the transition from a foreignness-based to a dominance-based perspective on the phenomenon runs parallel to the research analyzed in the previous chapter, which emphasizes recent language practices—such as socialization, frequency of use, and proficiency—as central to the FL emotional grounding mechanism, as compared to the more remote past (Dewaele, 2008). In light of this, the next section will explore why Malta's bilingual population constitutes a fruitful testing ground for this thesis.

Table 4

Summary of the Main FLE Literature Analyzed in §2.1

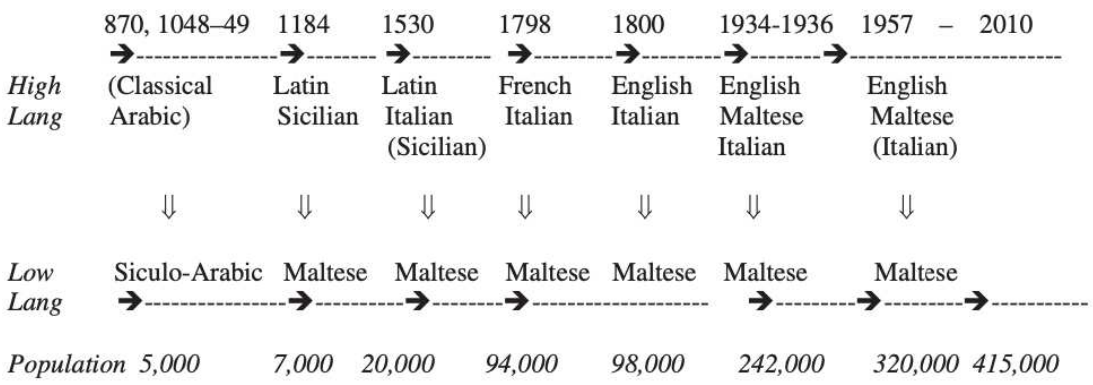
Study	*Effect Found*	*Explanatory Account*
Keysar et al., 2012	Foreignness	Emotional distance
Costa et al., 2014	Foreignness; proficiency	Emotional distance; disrupted cognitive fluency
Wong & Ng, 2018	Dominance (early bil.)	Language dominance effect
Miozzo et al., 2020	Contexts of use (two NLs)	Contexts of use
Circi et al., 2021	NL–FL similarity	Reduced access to NL social and moral norms

2.2. Malta: A Case of Historical Multilingualism

The Maltese archipelago, located about 90 kilometers south of the Italian coast of Sicily, is regarded by many as the "crossroads between East and West" (Vella, 2013, p. 533), and as a synthesis of Arabic and European cultures (Cassar Pullicino, 1979). Due to its strategic location in the heart of the Mediterranean Sea, throughout its history Malta has consistently been a target of foreign domination at the hands of "Phoenicians, Carthaginians, Romans, Byzantines, Arabs, Normans, Angevins, Aragonese, Castilians and the Order of the Knights of St. John" (Vella, 2013, p. 533). In recent history, the most significant mark on current Maltese culture and identity was left by the British rule, which spanned from 1800 to 1964, following a brief two-year French dominion and preceding its independence. Given this background, it is no wonder that bilingualism is recognized as a historically established condition intrinsic to Maltese society (Brincat, 2011; Vella, 2013). In present-day Malta, this situation involves mainly English and Maltese, and to a lesser extent Italian, although it is losing relevance to English among younger generations (Vella, 2013). However, even well before British rule, Malta was already characterized by a rather intricate diglossic situation, with high languages such as Classical Arabic, Latin, Sicilian, and French; despite such strong linguistic competition, Maltese has managed to survive both as a low and more recently as a high language variety (Figure 1). Vella goes so far as to argue that "monolingualism is virtually impossible in Malta as not only are speakers usually bilingual to some degree, even if only passively so in some cases, many speakers also have access to a dialect over and above Standard Maltese" (2013, p. 548).

Figure 1

Diglossia in Malta



Note. Reprinted from Brincat (2011, as reproduced in Vella, 2013, p. 535).

The Maltese language, which shares its Constitution-granted official status with English, is in itself a reflection of the culturally diverse history of the islands. Brincat refers to "survival through change" (2011, p. xxxviii) to explain why it has not been overtaken by its language competitors. Notably, this resulted in a degree of linguistic heterogeneity such that Maltese was referred to as a "mixed language" (Aquilina, 1958). Maltese is the only EU language of Arabic descent: Its origin is disputed between Siculo-Arabic (Mifsud, 1995) and the Maghreb (North African) Arabic dialects (Borg, 1978). Nevertheless, Mifsud (1995) identifies three linguistic strata: a Semitic base and two superimposed layers of borrowings from the Romance languages, mainly Sicilian and Italian, and from English. He further points out that the integration of earlier loans into Maltese is more complete compared to later ones. In another analysis, Brincat (2011) sees Maltese as a substratum, with Sicilian as a superstratum to it and both Italian and English as adstrata. Again, Cassar Pullicino sees the language as a reflection of the aforementioned cultural synthesis:

> In so far as Malta is concerned, the language is an excellent example of synthesis resulting in a flexible speech-medium made up of a Semitic (Arabic) foundation and a Romance superstructure drawn mainly from Sicilian and Italian, to which numerous accretions from English are now being continually added. (1979, p. 20)

As Vella (2013) notes, what these interpretations have in common is that they all recognize the presence of an underlying stratum of Semitic origin, which defines "the basis of the phonology, morphology and to a lesser extent the syntax of Maltese, while the lexis of Semitic origin constitutes a nucleus of basic concepts, with more culturally sophisticated terms generally being of Romance or English origin" (Mifsud, 1995, p. 27). This picture connects back to Brincat's point about survival through change:

> Every new conqueror brought a new language, which was usually endowed with the prestige of power and/or culture, and since the outsiders also brought with them technical, social and cultural innovations, new objects and concepts were usually accepted together with their original names. This is how society kept pace with new developments, and so the language kept pace with social developments. Society could not remain fossilized in old habits and, if the local language had not managed to keep pace with innovation in all fields and activities, it would have been abandoned and replaced by the new one. (2011, p. xxxviii)

Such an intricate picture of adaptability and heterogeneity is reflected at various levels of the language structure. From a lexical perspective, an emblematic example is that of the coexistence of *tejjeb*, *immiljora*, and *impruvja*, three near-synonyms of respectively Arabic, Romance and English origin that roughly translate to "he made better/improved" (Vella, 2013). While lexis is known to readily reflect language contact phenomena, a somewhat unexpected manifestation is that of *double-sided morphology* (Spagnol, 2011). In their constant interaction, Semitic and Romance structures have resulted in the coexistence of productive root-and-pattern morphology, typical of Semitic languages, and concatenative morphology, more common in European languages. Not only this, but items of one origin can also be patterned according to the morphological rules of the other (Mifsud, 1995; Spagnol, 2011), such as the nativization of the English plural morpheme "-s" which can also be applied to words of Semitic origin (Camilleri & Borg, 1992, as cited in Vella, 2013, p. 536). Lastly, instances of "Englishization" are also registered at the syntactic level, where topicalized structures seem to be in decline in spite of Maltese being a topic-oriented language (Fabri, 2011, as cited in Vella, 2013, p. 536). The implication here is that, hypothetically, even a monolingual Maltese speaker would be accustomed to the effects of multilingualism in their everyday social and linguistic life, although Vella notes that "regardless of what the dominant home language is, it is practically impossible for a child to grow up in a strictly monolingual environment" (2013, p. 542).

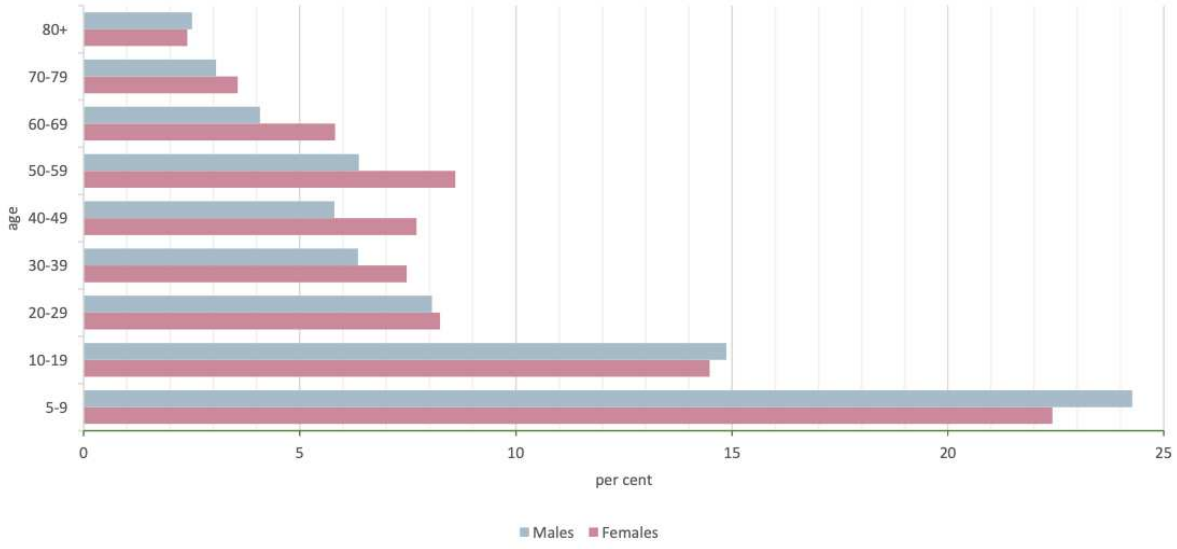
Vella (2013) goes on to provide an overview of the domains in which the two languages are used in the country. As for the media, the ones dependent on the written mode such as books, especially reference material, and the Internet tend to be predominantly in English, whereas those based on the spoken mode such as the radio and television tend to be in Maltese. However, it needs to be noted that many music radio stations mainly transmit music in English or other European languages such as Italian, even when the songs are presented in Maltese. In the context of television broadcasting, Maltese similarly faces strong competition from Italian and, especially, English, as even local stations frequently transmit English-language programs. Newspapers more closely reflect the country's bilingualism, with an approximately equal distribution of the two languages. With regard to public administration, Maltese citizens have the right to use either Maltese or English when communicating with administrative bodies, although Maltese is given precedence by the Constitution in

domains such as courts of law and the Parliament. When it comes to written communication, English again appears to be used more extensively, although efforts are being made to promote the use of Maltese as well (Brincat, 2011).

In light of such a multifaceted linguistic landscape, it follows that Malta boasts a rather complex sociolinguistic situation regarding the language used in the home. According to the latest Population Census of 2021, Maltese is the main spoken language for 91% of the 386,091 Maltese citizens surveyed, while English accounts for around 8%, with the remaining 1% being other languages such as Italian and Arabic (National Statistics Office, Malta, 2024). Two important variables influenced the distribution of the data: locality and age. English was more common for Maltese nationals residing in certain areas of the Northern Harbour, that is, Swieqi (37.7%), Sliema (25.9%) and St. Julian's (25.6%), which are generally recognized to house more foreigners and to be more anglicized overall, as well as Mdina (24.1%). In addition, "nearly one-fourth [23.4%] of children under 10 years and around 15 per cent [14.7%] of individuals between 10–19 years considered English as their primary language from early childhood" (National Statistics Office, Malta, 2024, p. 8).

Figure 2

Maltese Population with English as Their Main Spoken Language



Note. Data from Census of Population and Housing 2021 (National Statistics Office, Malta, 2024, p. 18).

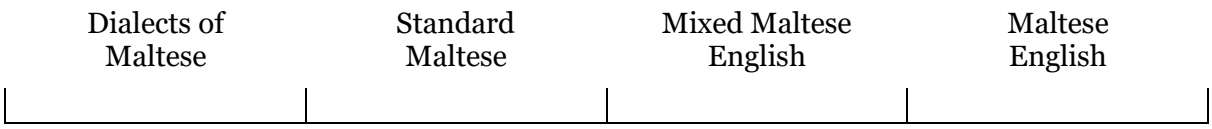
As shown in Figure 2, There is indeed a significant generational gap regarding language dominance in Maltese society. It needs to be pointed out that these data were gathered in relation to *spoken* language, and are thus compatible with Vella's (2013) remarks on Maltese being more widely used in spoken contexts, for example, in the media. Since, surprisingly, no data were gathered with respect to bilingualism, dominance or command of the English language, it is necessary to turn to the 2011 Census of Population and Housing, which reported that 62% of population aged 10 years and over had good command of spoken English (as cited in Gatt, 2017, p. 165). Preference for English has been associated with elevated perceived levels of prestige (Caruana, 2006), although Gatt (2017) found 21.5% of mothers and 12.3% of fathers from Maltese-dominant households in her study to hold tertiary education qualifications.

Camilleri (1995) identifies four types of bilingual families in Malta: type A (learning a Maltese dialect first, then standard Maltese, and only afterwards English); type B (standard Maltese first, then English); type C (standard Maltese and English at the same time); and type D (English first, then standard Maltese). Although Camilleri believes type C to be a more likely scenario than type D, Vella (2013) observes the presence of some Maltese families where parents might speak to each other in Maltese but use only English with their children, possibly in the hope of offering them better opportunities for the future. As a matter of fact, the aforementioned 2021 Census of Population and Housing data seem to confirm this possibility (Figure 2), potentially reflecting the significant changes that have occurred over nearly 20 years since Camilleri's 1995 analysis. Interestingly, this model lends itself well to the distinction between two similar yet distinct varieties, that of *Mixed Maltese English* (Borg, 1980) vs. *Maltese English*. The former is seen as resulting from the absence of a strict separation between Maltese and English, which are thereby acquired as though they were one "first language" (i.e., what happens in family type C), whereas the latter refers to a more articulated view of the bilingual's language repertoire (i.e., in family type D). Mixed Maltese English is therefore strongly connected to *code-mixing*, a practice which is very widely recognized to be the norm among the Maltese when they are aware of their interlocutor as another bilingual (Vella, 2013). A metric for the distinction between Mixed Maltese English and Maltese English is, indeed, respectively the presence or absence of Maltese vocabulary in a segment of speech that primarily

consists of English[4]. It follows that "while Maltese and English are both present in most family environments, English is often present in the form of the mixed variety Mixed Maltese English (Family Type C), rather than as a discrete entity (Family Type D)" (Vella, 2013, p. 543). Incidentally, such a mixed situation has sparked pedagogical concern with regard to issues of correctness in the use of the two languages, although speakers appear to possess the pragmatic competence to determine which variety is appropriate in different contexts and for different functions (Vella, 2013). Borg (1988a, as cited in Vella, 2013, pp. 543-545) maps out a continuum of language use (Figure 3), ranging from dialects of Maltese to Maltese English, along which speakers shift based on different contexts and functions of use. The benefit is twofold: on the one hand, it accounts not only for bilingual but also for bidialectal speakers; on the other hand, it provides a schematization of the mutual influence of the four varieties discussed thus far, which decreases in function of their reciprocal distance along the continuum. Hence, it is clear that Maltese exerts a greater influence on Mixed Maltese English compared to Maltese English.

Figure 3

Continuum of Language Use Model



Note. Adapted from Vella (2013, p. 544).

In summary, Malta provides a fruitful testing ground for research on bilingual affective processing. First, the stratification of the Maltese language itself reflects the complex sociolinguistic and historical conditions of the society that speaks it. Second, it is reasonable to argue that the Maltese population is overall "bilingual, albeit to varying degrees, with a minority of children even having English as their first language" (Gatt, 2017, p. 165). Vella (2013, pp. 542-543) claimed that "it is unclear whether this type [type C, i.e., Maltese and English acquired at the same time] of bilingualism can be said to qualify as an example of 'simultaneous bilingualism'" due to the

[4] Although transfer phenomena from Maltese should also be considered in terms of syntax and intonation in sentences that seemingly just use English (Vella, 2013).

aforementioned remarks on Mixed Maltese English. However, by establishing that there is no space for monolingualism in the Maltese family, and that speakers are able to use each variety in different contexts appropriately, thereby controlling code-mixing, she also agrees that the Maltese are bilingual to varying degrees (i.e., unbalanced), and finds an accurate representation of the country's situation in the continuum of language use model (Figure 3). As a consequence, Malta is well-suited for studying language dominance as a variable, in line with the recent developments in bilingualism research outlined in the previous sections, as it allows for the control of the variable of age of acquisition.

3. The Study: Differential Affective Connotation Automaticity

3.1. Rationale for the Present Study

Chapters 1 and 2 provided a comprehensive overview of the recent developments in the field of bilingualism studies. On the one hand, the former established a definition of wholistic bilingualism based on Grosjean's Complementarity Principle—one able to acknowledge the complex nuances of the phenomenon by focusing on dominance rather than nativeness vs. foreignness. Several introspective and cognitive studies were also examined, pointing to language-specific variables—among which language use and exposure, especially in naturalistic contexts, as well as language dominance—as strongly associated with the perception of emotional weight, and as capable of leading to the automatization of L2 affective valence. On the other hand, Chapter 2 drew parallels with the Foreign Language Effect—another widely studied phenomenon whose explanatory accounts have also gradually shifted from a foreignness-based to a dominance-based theoretical framework. Lastly, the relevance of the (overall) early-to-simultaneous bilingual context of Malta was considered.

However, most of the studies examined above have focused on sequential bilinguals, leaving open the question of how differing levels of language dominance influence bilingual affective processing with age of acquisition virtually kept at zero, as in the case of simultaneous bilinguals. As Sharif and Mahmood recommended, "future research should examine questions such as whether overall language dominance matters in emotional processing, overcoming the differences in simultaneous and sequential bilinguals" (2023, p. 10). Furthermore, while their focus was on research in neurolinguistics, their claim that future studies should look at language dominance rather than L1s—given that one can be dominant in their L2 and not their L1—is also deemed to be of relevance in the context of affective processing.

The aim of the present study is to test the two alternative accounts for the embodiment lag between L1 and L2, that is, *maturation* vs. *context effects* (Pavlenko, 2012), with the early-to-simultaneous bilingual population of Malta. To this end, an adaptation of Degner et al.'s (2012) original framework comparing affective and semantic priming performance was developed. Their main aim was to test for L2 affective priming effects (Fazio et al., 1986) as a function of the participants' degree of language immersion. Crucially, the semantic priming task was implemented to

provide a reference point so as to establish that, from a purely semantic perspective, the processing of the L1 and L2 occurred with comparable degrees of automaticity, despite expected differences in affective priming performance across the two languages. To be able to test this, their sample (n = 41) comprised 20 French–German bilinguals (14 males, 7 females; ages 20 to 31) and 21 German–French bilinguals (10 males, 10 females; ages 19 to 29). Based on a language history questionnaire, all participants were identified as sequential and unbalanced bilinguals with proficient knowledge of their L2. The mean age of L2 acquisition was 11.5 (*SD* = 5.3); all participants had spent at least one period of three months or more, and a total of at least 12 months, in a country where their L2 is spoken. Importantly, all participants were students recruited at a German university, meaning that the French–German bilinguals, compared to their German–French counterparts, exhibited higher degrees of L2 immersion and greater intensity of L2 use in daily life (on a scale from 1 to 7, the mean ratings were 4.8 and 3.4, respectively), as well as longer average stays in an L2 country (43.9 months, *SD* = 41.0, compared with 29.2 months, *SD* = 28.3). Their self-rated L2 proficiency scores did not differ significantly: On a 0–100 scale, the French participants had a mean score of 72.4 (*SD* = 18.6), while the German participants had a mean score of 74.5 (*SD* = 10.1). All participants completed both the affective and semantic priming tasks in both languages, for a total of four tasks per participant. Task order was kept constant, while language order was counterbalanced.

Table 5

Semantic and Affective Priming Magnitudes (and SE) from Degner et al. (2012)

	French Participants	*German Participants*
Semantic Priming		
French Task	12 (9)	12 (7)
German Task	10 (5)	9 (10)
Affective Priming		
French Task	19 (7)	-5 (9)
German Task	20 (12)	21 (12)

Note. Magnitudes calculated as the RT (ms) difference between unrelated/incongruent and related/congruent stimulus pairs. L1 results in light gray, L2 results in dark grey.

Degner et al.'s (2012) results are summarized in Table 5. Overall, for both the semantic and the affective priming tasks, the researchers found (i) a *significant interaction between task language and participant L1*, and (ii) a *significant main effect of relatedness and congruence*, respectively, although the latter was qualified by a further significant interaction in the case of affective priming. In other words, participants' responses were, in absolute terms, faster in their L1 compared to their L2 across the board. Furthermore, while semantic priming effects were observed to the same degree in both L1 and L2 (12 ms and 10 ms for French participants, and 9 ms and 12 ms for German participants, respectively), a (iii) *significant three-way interaction among task language, participant L1 and congruence* was found with regard to affective priming. Specifically, whereas French participants' affective priming effects were comparable in size between their L1 and L2 (19 ms and 20 ms, respectively), German participants only exhibited such effect in their L1 (21 ms, compared with a difference of -5 ms in their L2). As a matter of fact, affective priming magnitudes were generally greater than semantic ones, with the sole exception of German participants' L2 performance, which did not produce any priming effect. Since the only significant difference between the two groups was the frequency of L2 use in daily life, the researchers concluded that, unlike semantic priming, affective priming effects were significantly related to the intensity of language use. Thus, they continue, language and cultural immersion are important factors in the emotional grounding mechanism:

> Bilinguals immersed in the L2 culture use their second language frequently in daily life, that is, in action contexts that certainly lead to a higher weighting of affective connotations. When bilinguals are involved in social interactions in L2, perceiving and expressing subtle nuances of what is typically seen as positive and negative become highly relevant and well practised. It is one thing to learn that a given word is a taboo word in an L2, but quite another to experience the reaction of native speakers of L2 if one uses this word. Similar effects occur for bilinguals currently not immersed in an L2 culture but using L2 frequently in daily life. (p. 187)

However, as Sianipar et al. (2015, pp. 3-4) noted, age of acquisition was not kept constant in Degner et al.'s (2012) original sample. This limitation can be addressed by examining a sample of early-to-simultaneous bilinguals. Malta constitutes an ideal testing ground for such purpose: An early-to-simultaneous Maltese–English bilingual sample allows for the control of age of acquisition while also enabling language dominance to be isolated as a variable distinct from others such as proficiency.

3.2. The Study

3.2.1. Research Question

In view of the literature presented above, the present study seeks to answer the following research question:

> *How does language dominance—as an isolated variable, with age of acquisition and proficiency held constant—affect the emotional grounding of language, that is, the perceived emotional weight of each language in a bilingual, as measured by differential affective connotation automaticity (i.e., affective priming)?*

A hypothesis was formulated based on Pavlenko (2012):

H. *Context Effect Hypothesis*: In line with Degner et al.'s (2012) findings regarding frequency of language use, language dominance significantly influences affective priming but does not produce a similar effect in semantic priming.

Thus, in this study language dominance is treated as an independent variable, with differential semantic and affective priming effects (i.e., mean response latencies) as its dependent variable.

3.2.2. Method: Participants, Materials and Procedure

Participants

51 participants were recruited online. Of these, 2 were discarded due to accuracy rates below 55% in one or more tasks, and another participant was disregarded due to dubious questionnaire responses. The demographics of the selected 48 participants are illustrated in Table 6: 26 were English-dominant (6 males, 19 females, 1 other; ages 18 to 69, M = 31.19) and 22 were Maltese-dominant (8 males, 14 females; ages 21 to 74, M = 37.18). To determine their language dominance, participants were asked for their language preference between English and Maltese in the initial demographic questionnaire and filled out the BLP Questionnaire (see next section for further details) after the experimental tasks. Since, interestingly, in five cases these answers did not correspond, the figures presented here are based on the BLP. Overall, the mean age was 33.94 years (SD = 14.38), with a slightly older Maltese-dominant group (MD = 5.99). The BLP Questionnaire revealed that dominance scores were somewhat more

elevated for the Maltese-dominant group (*M* = -66.03 vs. *M* = 51.72, with negative and positive values indicating Maltese and English dominance, respectively). This was reflected by the mean difference in the age of acquisition of the more and less dominant language (*MD* = 2.77 for Maltese-dominant participants vs. *MD* = 1.46 for English-dominant participants). Overall, 19 participants reported to be simultaneous bilinguals from birth. As for the age when participants gained confidence in their dominant language, interestingly, almost all the participants in the English-dominant group reported being comfortable using English for as long as they can remember, whereas only 16 out of 22 Maltese-dominant participants reported the same for Maltese, with just under a quarter gaining confidence between the ages of 4 and 10. Despite the limited difference observed in ages of acquisition, the situation concerning non-dominant languages presents a more intricate scenario. Here participants who reported having always felt comfortable drop to 38.46% and 27.27% (English-dominant and Maltese-dominant participants, respectively). Crucially, 3 English-dominant participants admitted to not yet feeling comfortable with Maltese. On the other hand, education levels, reported in terms of the European Qualification Framework (EQF) [5], showed minimal variation between the two groups. All participants declared to be Maltese nationals, with 3 English-dominant participants reporting dual nationality (Maltese-Australian, Maltese-Irish, and Maltese-Romanian). Therefore, in light of the demographic and BLP questionnaires, the participants in this study can overall be regarded as early[6] and unbalanced bilinguals.

[5] https://europass.europa.eu/en/europass-digital-tools/european-qualifications-framework

[6] While mean age of acquisition of both languages was within the threshold of 3 years of age (e.g., Wong & Ng, 2018), ranges varied, with one participant even reporting 12 years. Nevertheless, median values were all 0, with the sole exception of Maltese-dominant participants' age of acquisition of English (Md = 3).

Table 6

Participant Demographics

	English-dominant (n = 26)	Maltese-dominant (n = 22)
Mean age (years)	31.19 (14.07)	37.18 (14.37)
Range	18 to 69	21 to 74
Mean BLP dominance	51.72 (34.75)	-66.03 (30.41)
Median	40.96	-58.39
Range	2.18 to 132.59	-17.33 to -108.06
Mean AoA of English (years)	0.39 (1.17)	3.05 (1.91)
Median	0	3
Range	0 to 5	0 to 12
Mean AoA of Maltese (years)	1.85 (3.17)	0.27 (1.08)
Median	0	0
Range	0 to 6	0 to 5
Age of Confidence in English (years)	Always: 25 (96.15%) 1–3 years: 0 4–10 years: 0 11–20+ years: 1 (3.85%) Not yet: 0	Always: 6 (27.27%) 1–3 years: 0 4–10 years: 8 (36.36%) 11–20+ years: 8 (36.36%) Not yet: 0
Age of Confidence in Maltese (years)	Always: 10 (38.46%) 1–3 years: 0 4–10 years: 6 (23.08%) 11–20+ years: 7 (26.92%) Not yet: 3 (11.54%)	Always: 16 (72.73%) 1–3 years: 1 (4.55%) 4–10 years: 5 (22.73%) 11–20+ years: 0 Not yet: 0
Gender	6 males; 19 females; 1 other	8 males; 14 females
Education (EQF levels)	Lv. 2 (lower secondary): 1 Lv.3–4 (upper sec.): 3 Lv.5 (short cycle higher): 2 Lv.6 (bachelor): 9 Lv.7 (master): 9 Lv.8 (doctorate): 2	Lv.2 (lower secondary): 1 Lv.3–4 (upper sec.): 3 Lv.5 (short cycle higher): 1 Lv.6 (bachelor): 7 Lv.7 (master): 5 Lv.8 (doctorate): 5

Note. Standard deviations in brackets.

Materials

Following Degner et al. (2012), the experiment comprised four experimental tasks—two affective priming and two semantic priming ones—such that each task type was carried out once in Maltese and once in English. Two stimulus datasets (A and B) were designed per task type to avoid the presentation of translation equivalents, so that no stimulus would be presented in both languages to the same participant. Words which were the same across the two languages were overall disregarded. However, due to a lack of suitable normed stimuli, occasional instances of words which are either the same in English and Maltese (e.g., STRESS) or that share the same spelling yet differ in pronunciation (e.g., IDEA) were included in the practice blocks, that is, outside the scope of the data analysis.

For the *affective priming* tasks, all stimuli were selected from the Affective Norms for English Words (ANEW, Bradley & Lang, 1999)[7] and then translated into Maltese with the help of three native-speaker informants (Appendix C), as no valence-normed data were available for this language at the time of the research. Only nouns were selected. English–Maltese equivalents were matched according to word length, as well as valence and frequency of use based on native-speaker judgements. Each of the two datasets, A and B, included 99 stimulus pairs (i.e., 99 prime–target pairs—9 practice trials and 90 experimental trials). Prime valence was *positive* (e.g., PEACE–PAĊI, $ANEW_{pleasure}$ = 87.53), *neutral* (e.g., GLASS–ĦĠIEĠ, $ANEW_{pleasure}$ = 53.85), or *negative* (e.g., TRASH–ŻIBEL, $ANEW_{pleasure}$ = 30.27), whereas target valence was either *positive* (e.g., KISS–BEWSA, $ANEW_{pleasure}$ = 93.65) or *negative* (e.g., SIN–DNUB, $ANEW_{pleasure}$ = 31.75); each prime word was presented twice, once per target type. Therefore, each dataset was composed of 51 primes (6 practice stimuli, 45 experimental stimuli) and 99 targets (9 practice stimuli, 90 experimental stimuli).

For the *semantic priming* tasks, the stimulus sets were created with the help of the three native-speaker informants based on five semantic categories from Fernandino and Conant (2024): *animal*, *body_part*, *food*, *profession*, and *tool* (Appendix D). This was decided to ensure a minimum number of stimuli per category. Only categorical similarity was considered, thereby disregarding associative similarity,

[7] As standardized by Micah Iserman (2020). Retrieved from OSF Standardized English Dictionaries Repository: https://osf.io/y6g5b/wiki/anew/.

and only nouns, mostly concrete, were used as stimuli. Lexical items which could be interpreted both as nouns and verbs were generally discarded, despite sporadic instances of syntactic category ambiguity in the English word (e.g., SHOVEL–PALA), especially regarding the *tool* category. Each prime word (e.g., RABBIT–FENEK) appeared four times: once with a related word target (e.g., SHEEP–NAGĦĠA, congruent trial), once with a related non-word target (e.g., SHAEP–NAŻĦĠA, filler trial), once with an unrelated word target (e.g., BOTTLE–FLIXKUN, incongruent trial), and once with an unrelated non-word target (e.g., BOTDLE–FKIXKUN, filler trial). Non-word targets were obtained by exchanging one letter in the corresponding word targets. Hence, each dataset was composed of 27 primes (2 practice, 25 experimental stimuli) and 108 targets (8 practice, 100 experimental stimuli; of these, 25 were related words, 25 were unrelated words, and 50 were their corresponding non-words). Again, English–Maltese equivalents were matched according to word length and frequency of use based on native-speaker judgements.

The experimental tasks were accompanied by two questionnaires: a demographic questionnaire (Appendix B) and the Bilingual Language Profile (BLP, Birdsong et al., 2012)—with the former being administered only in English and latter being available in both English and Maltese, depending on the participant's expressed language preference. The Maltese translation of the BLP was, again, produced with the help of the three native-speaker informants. Given Vella's (2013) hesitation in defining the Maltese situation as one of simultaneous bilingualism, the BLP (Appendices E and F) constituted a crucial tool in determining whether the participants in this study fell at least within the age-of-acquisition threshold of 3 years to be considered early bilinguals (as established by, e.g., Wong & Ng, 2018)[8], as well as their dominance degree. The questionnaire included four classes of questions: (i) language history, (ii) language use, (iii) language proficiency, (iv) language attitudes. This also helped address Pavlenko's (2012) three basic errors (see §1.1.1): By providing a detailed picture of the factors contributing to the development of language dominance, it reduced the likelihood of treating bilinguals as monolingual native speakers and of overgeneralizing results due to viewing bilinguals as a single homogeneous population.

[8] However, it should be noted that there is no clear consensus on this threshold: According to different researchers, it ranges from simultaneous acquisition from birth (De Houwer, 1995), to 12 months (Ng & Wigglesworth, 2007), and up to 3 years of age (McLaughlin, 1984).

Procedure

The experiment was conducted online via Gorilla[9] (Anwyl-Irvine et al., 2020). First, following the *information letter and informed consent* (Appendix A), a *demographic questionnaire* (Appendix B) was administered in English, where participants had to respond to a few personal background questions and select their language preference between Maltese and English. They then proceeded to the four experimental tasks. Importantly, participants were randomly assigned to one of eight counterbalanced lists to control for (i) task order, (ii) language order, and (iii) keyboard response mapping (i.e., the use of the "Z" and "M" keys for *positive/word* and *negative/non-word*)[10]. Task order was counterbalanced in pairs, that is, both affective priming tasks were presented together, either first or last, with the same language order applied to the semantic tasks. The procedure here described is illustrated in Figure 4.

At the beginning of each *affective priming task*, participants were informed in English that in each trial they would see two words in rapid succession, with a positive or negative meaning (see Appendix C for the list of materials). They were instructed to ignore the first word (the prime), and to quickly categorize the second word (the target) as *positive* or *negative*, by pressing either the "Z" or the "M" key, depending on the mapping condition. They were further informed that wrong or late answers would prompt a red cross on screen. As shown in Figure 5, participants first worked through a brief practice block containing 9 trials to familiarize with the task, then completed three experimental blocks of 30 trials each in a random sequence, for a total of 90 experimental trials per task. Each block comprised 30 congruent trials (*pos_PRM* > *pos_TGT* or *neg_PRM* > *neg_TGT*), 30 incongruent trials (*pos_PRM* > *neg_TGT* or *neg_PRM* > *pos_TGT*), and 30 filler trials (*neutral_PRM*). Each prime (*positive*, *negative* or *neutral*) was presented twice: once with a positive target and once with a negative target. Trials began with the presentation of a fixation cross in the middle of the screen which was directly overwritten by the prime word after 200 ms. This remained on screen for 150 ms and was then replaced by the target word (SOA = 150 ms). Unlike Degner et al. (2012), a time limit of 2000 ms was set to perform the valence

[9] https://gorilla.sc

[10] It should be noted that Degner et al. (2012) only counterbalanced language order, thus keeping task order (affective priming first, semantic priming second) and keyboard response mapping ("5" and "A" for *positive/word* and *negative/non-word*, respectively) constant throughout the experiment.

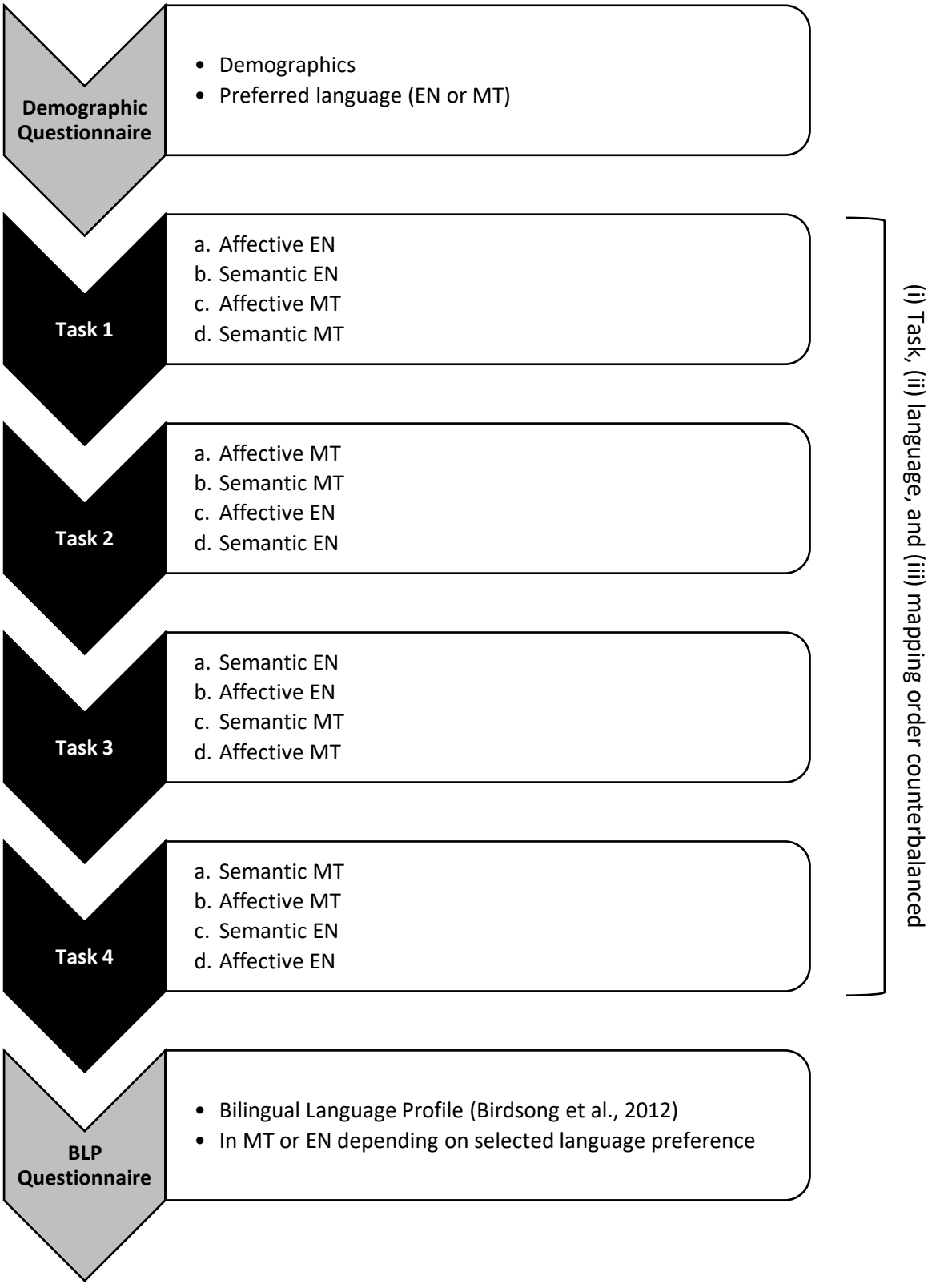
judgment on the target word, such that a red cross would be displayed for 200 ms both in the case of an incorrect and a late response. As the data were collected online, this time limit was established to minimize potential distractions and to maintain participants' focus. The next trial began after an interval of 1000 ms. In the experimental phase, a break screen appeared at the end of every experimental block (i.e., every 30 trials), requiring the participant to press the space bar when ready to proceed.

Similarly, at the beginning of each *semantic priming task* participants were informed in English that in each trial they would see two words in rapid succession, and were instructed to ignore the first word (the prime), while quickly categorizing the second word (the target) as a *real word* or a *(made-up) non-word*, by pressing either the "Z" or the "M" key (see Appendix D for the list of materials). Again, they were further informed that wrong or late answers would prompt a red cross on screen. As illustrated in Figure 6, the practice block consisted of 8 trials, while there was a single dataset of 100 trials in a random sequence per task comprising 25 related trials (same semantic category), 25 unrelated trials (different semantic categories), and 50 filler trials (*nonword_TGT*). Each prime was presented four times: (i) with a related word, (ii) with a non-word obtained from the related word, (iii) with an unrelated word, (iv) with a non-word obtained from the unrelated word (e.g., MOUSE was presented with ANT, AMT, TABLE, and TAWLE). Trials unfolded as in the affective priming task: A fixation cross was replaced by the prime word after 200 ms, which remained on screen for 150 ms. Participants were then shown the target word (SOA = 150 ms) and had 2000 ms to perform the lexical judgment task, with a red cross displayed for 200 ms in the case of an incorrect or a late response. An interval of 1000 ms separated the trials, and a break screen appeared every 50 trials.

After the experimental tasks, participants completed the Bilingual Language Profile questionnaire (Birdsong et al., 2012), with the language of presentation determined by their language preference as expressed in the demographic questionnaire. To conclude, participants were asked to confirm that they had completed the task seriously by means of a seriousness check.

Figure 4

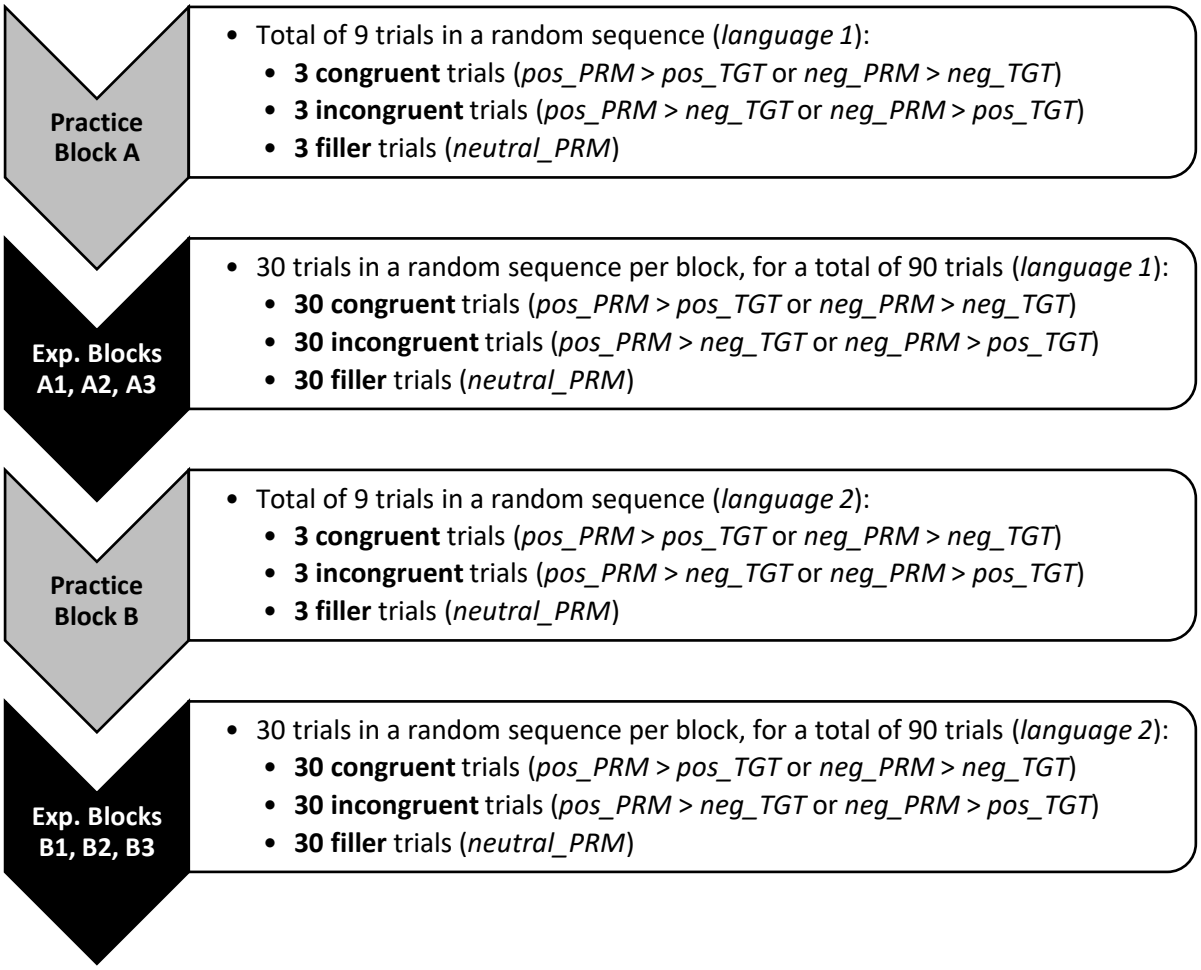
Structure of the Experiment



Note. Due to counterbalancing of task and language order, only one letter per task was delivered (e.g., all 'a'-items: aff-EN, aff-MT, sem-EN, sem-MT). Counterbalancing of keyboard mapping was omitted for simplicity.

Figure 5

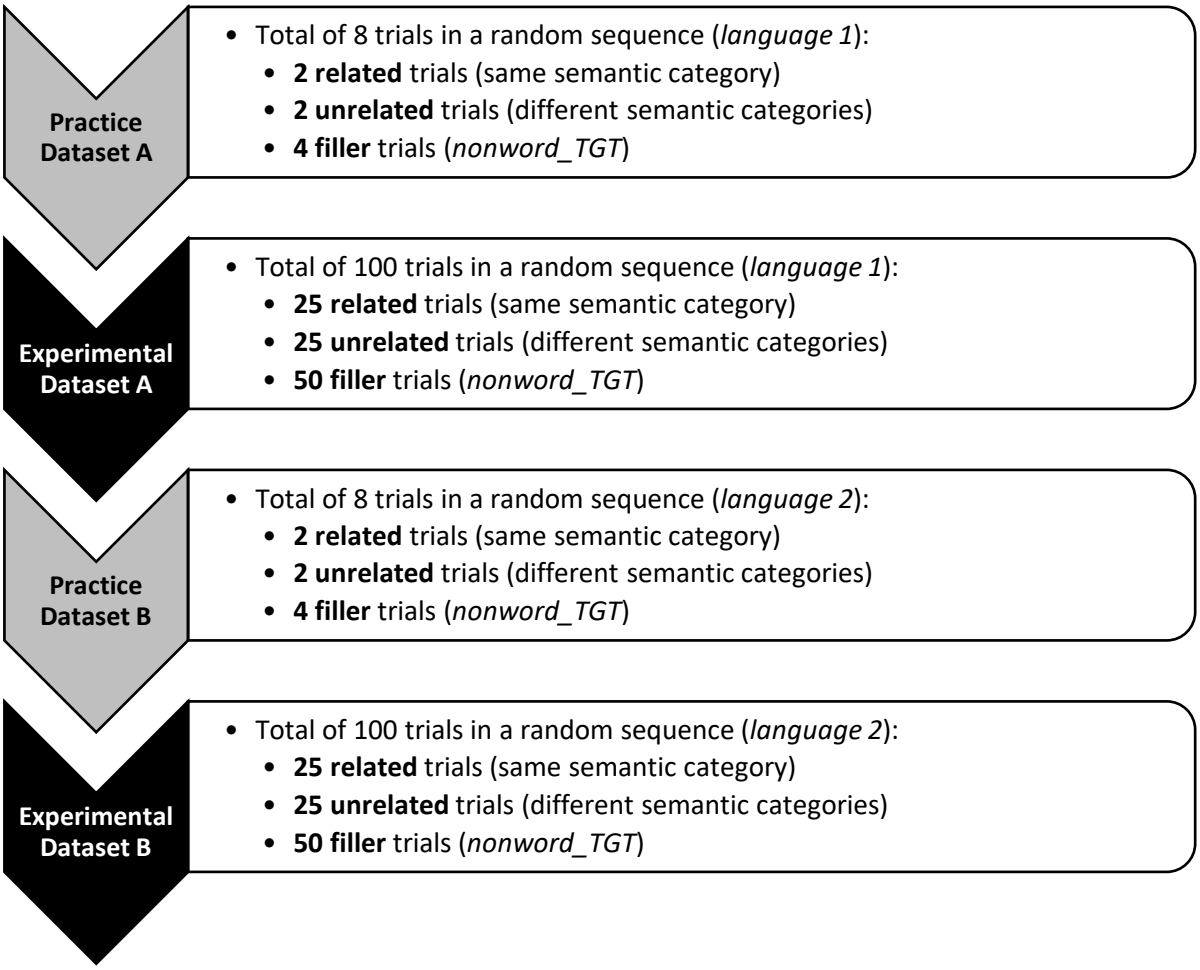
Structure of the Affective Priming Tasks



Note. Each affective priming task consisted of 9 practice and 90 experimental trials, which was then repeated in the other language. Thus, each participant saw a total of 18 practice trials and 180 experimental trials. As the datasets were kept distinct, no participant was exposed to the same stimuli in both languages.

Figure 6

Structure of the Semantic Priming Tasks



Note. Each semantic priming task consisted of 8 practice and 100 experimental trials, which was then repeated in the other language. Thus, each participant saw a total of 16 practice trials and 200 experimental trials. As the datasets were kept distinct, no participant was exposed to the same stimuli in both languages.

3.2.3. Results

This study measured mean response latency for correctly categorized target items in the experimental blocks of the two semantic and the two affective priming tasks. To control for outliers, trials which were more than 2.5 standard deviations faster or slower than the mean were discarded. As reported above, two participants were disregarded due to accuracy rates below 55% in one or more tasks, and another was excluded because of their unclear questionnaire responses. Mean response latencies were submitted to a 2 (task language: English vs. Maltese) by 2 (prime–target relation: related vs. unrelated or congruent vs. incongruent) by 2 (language dominance: English vs. Maltese) ANOVA with repeated measures on the first two factors for both semantic and affective priming tasks. Language dominance was computed as a binary categorical variable (i.e., either "English" or "Maltese"). RT scores (in ms) are reported in Table 7 and effect types are summarized in Table 8, while accuracy rates are indicated in Table 9.

Table 7

RT Marginal Means in Milliseconds (and Standard Errors) for Three-Way Interaction among Dominance, Task Language, and Condition

SEMANTIC PRIMING	English-Dominant Participants			Maltese-Dominant Participants		
	Related	Unrelated	Δ	Related	Unrelated	Δ
English Task	635 (19)	627 (21)	-7 (9)	675 (21)	678 (23)	3 (10)
Maltese Task	746 (26)	751 (26)	5 (9)	724 (28)	686 (28)	-38** (10)
AFFECTIVE PRIMING	English-Dominant Participants			Maltese-Dominant Participants		
	Congruent	Incongruent	Δ	Congruent	Incongruent	Δ
English Task	705 (21)	694 (20)	-11 (18)	744 (23)	750 (21)	6 (12)
Maltese Task	831 (23)	840 (26)	10 (12)	823 (25)	812 (28)	-12 (13)

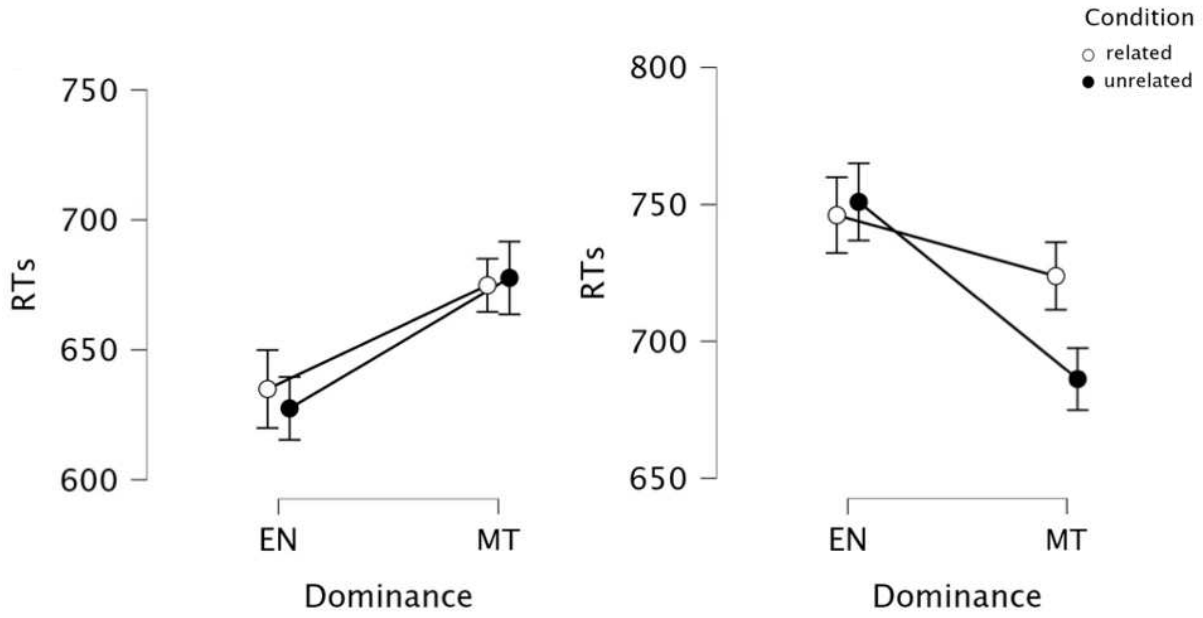
Note. Light gray for results in the dominant language, dark grey for results in the non-dominant language.
** p = .003.

Semantic Priming

A significant main effect of task language was observed for semantic priming together with a significant interaction of task language by language dominance. Thus, while it is true that responses in English (*M* = 654, *SE* = 14.46) were overall faster than in Maltese (*M* = 727, *SE* = 18.81), results also indicate that participants were generally more rapid when using their dominant language (*M* = 674, *SD* = 106.76) compared with their non-dominant language (*M* = 715, *SD* = 133.54). However, no main effect of condition was found: As can be seen from Table 7, the observed effect sizes were minimal, with the only statistically significant effect recorded for Maltese-dominant participants in Maltese semantic priming tasks (*MD* = -38, *p* = .003). Nevertheless, the direction of the effects was opposite to what was expected: Negative priming magnitudes were observed when participants used their dominant language, and positive scores were recorded when they used their non-dominant language. This was supported by a further significant three-way interaction of all factors, that is, among task language, condition, and language dominance. The results are shown in Figure 7.

Figure 7

Average RTs for Semantic Priming in English (Left) and Maltese (Right) Tasks



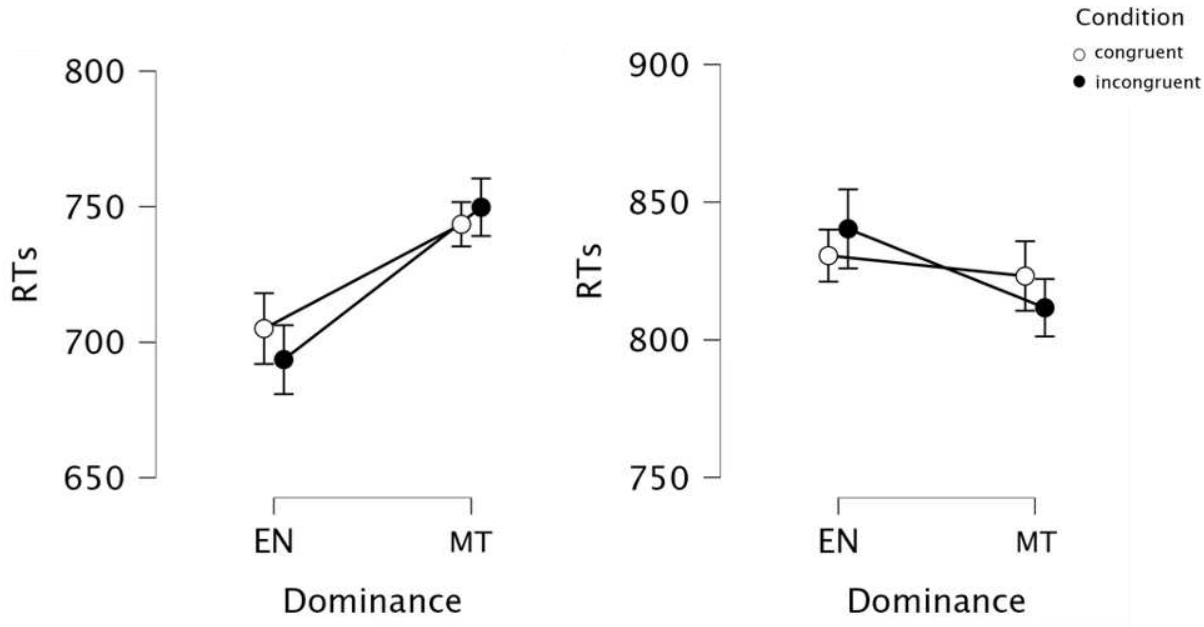
Note. Empty circles for semantically related trials; full circles for unrelated trials.

Affective Priming

Similarly, a significant main effect of task language and an interaction of task language by language dominance were also observed for affective priming. This again suggested that participants were faster in English (M = 723, SE = 14.46) than in Maltese (M = 826, SE = 17.57) and also in their dominant language (M = 756, SD = 124.78) compared with their non-dominant language (M = 793, SD = 119.21). Likewise, no main effect of condition was recorded. However, unlike semantic priming, no significant three-way interaction was found either. In fact, no significant affective priming effects emerge from Table 7. The general trend observed in semantic priming is still found here, that is, negative effects for tasks administered in the participant's dominant language, and positive effects for those done in their non-dominant language. Yet, none of these priming effects were statistically significant. Figure 8 illustrates these results.

Figure 8

Average RTs for Affective Priming in English (Left) and Maltese (Right) Tasks



Note. Empty circles for valence-congruent trials; full circles for incongruent trials.

Table 8

Summary of RM ANOVA Effects for RTs (Top) and Accuracy Rates (Bottom)

	Semantic Priming	Affective Priming
Main effect of Task Lang.	Significant*** ($F(1,46) = 24.78$, $p < .001$, $\eta_p^2 = 0.35$)	Significant*** ($F(1,46) = 75.95$, $p < .001$, $\eta_p^2 = 0.62$)
Main effect of Condition	None ($F(1,46) = 3.21$, $p = .08$, $\eta_p^2 = 0.07$)	None ($F(1,46) = 0.09$, $p = .763$, $\eta_p^2 = 0.002$)
Interaction Task Lang. ∗ Condition	None ($F(1,46) = 2.83$, $p = .099$, $\eta_p^2 = 0.06$)	None ($F(1,46) = 0.02$, $p = .889$, $\eta_p^2 = 4.30\times10^{-4}$)
Interaction Task Lang. ∗ Dominance	Significant** ($F(1,46) = 9.07$, $p = .004$, $\eta_p^2 = 0.17$)	Significant** ($F(1,46) = 7.59$, $p = .008$, $\eta_p^2 = 0.142$)
Interaction Task Lang. ∗ Condition ∗ Dominance	Significant** ($F(1,46) = 9.91$, $p = .003$, $\eta_p^2 = 0.18$)	None ($F(1,46) = 2.63$, $p = .112$, $\eta_p^2 = 0.05$)
Main effect of Task Lang.	Significant* ($F(1,46) = 5.51$, $p = .023$, $\eta_p^2 = 0.11$)	Significant*** ($F(1,46) = 18.47$, $p < .001$, $\eta_p^2 = 0.29$)
Main effect of Dominance	Significant* ($F(1,46) = 5.36$, $p = .025$, $\eta_p^2 = 0.10$)	Significant* ($F(1,46) = 6.90$, $p = .012$, $\eta_p^2 = 0.13$)
Interaction Task Lang. ∗ Dominance	None ($F(1,46) = 2.74$, $p = .105$, $\eta_p^2 = 0.06$)	None ($F(1,46) = 2.26$, $p = .139$, $\eta_p^2 = 0.05$)

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Accuracy Rates

While accuracy rates are prone to ceiling effects and thus offer less insight than RTs, it is interesting to note the differences in performance between the two participant groups and the two tasks. Main effects of task language and language dominance were found for both semantic and affective priming; however, no interaction was found in either case (Table 8). As can be observed in Table 9, the implication is thus that (i) English trials were more accurate across the board, and that (ii) Maltese-dominant participants produced greater accuracy rates in all tasks, even those completed in English. The absence of an interaction hence indicates that, contrary to the RT findings, there was no significant relationship between task language and participants' language dominance with regard to accuracy rates. Therefore, they did not show a statistically

significant increase in accuracy when responding in their dominant language. While all participants maintained accuracy between 94% and 95% in their dominant language, this dropped to 89.9% for English-dominant participants in both semantic and affective priming tasks carried out in Maltese. Conversely, Maltese-dominant participants achieved even greater accuracy when performing the tasks in English than in Maltese, scoring 95.3% in the semantic priming task and even 97.0% in the affective priming tasks.

Table 9

Accuracy Rate Marginal Means for Dominance–Task Language Interaction

SEMANTIC PRIMING	English-Dominant Participants	Maltese-Dominant Participants
English Task	94.1% (0.009)	95.3% (0.010)
Maltese Task	89.9% (0.013)	94.5% (0.014)
AFFECTIVE PRIMING	English-Dominant Participants	Maltese-Dominant Participants
English Task	95.1% (0.007)	97.0% (0.008)
Maltese Task	89.9% (0.013)	94.5% (0.014)

Note. Light gray for results in the dominant language, dark grey for results in the non-dominant language. SE in brackets.

3.2.4. Discussion and Limitations

A main effect of task language and its interaction with language dominance were observed in both semantic and affective priming tasks. In other words, English trials were faster across all participants and tasks, with a greater speed advantage for English-dominant participants. However, no main effect of condition was found, and a three-way interaction of all factors (i.e., task language by condition by language dominance) was only found for semantic priming. Out of the seven expected priming effects, only that of Maltese-dominant participants performing Maltese semantic priming tasks emerged as statistically significant. Still, all effects recorded when task language matched participant dominance, whether significant or not, went in the opposite direction to what was expected, with valence-congruent and semantically related trials producing slower RTs than their incongruent and unrelated counterparts, respectively. When participants performed the task in their non-dominant language,

priming magnitudes were positive, yet none of them proved statistically significant. This study thus failed to replicate Degner et al.'s (2012) results with an early bilingual population: They only found a three-way interaction of all factors in affective priming tasks, and observed positive priming effects across all tasks with the sole exception of affective priming for unsocialized L2 users.

A number of limitations may have contributed to this outcome. First, the participant sample (n = 48) and stimulus sets were quite limited, although Degner et al.'s (2012) original sample was smaller (n = 41). As for the participant number, this was due to logistical considerations. For the same reason, it was not possible to only recruit participants within a specific age range, so the variability in participant age, as well as that in the age of acquisition of the two languages, albeit far smaller, might be at fault, too. Regarding the experimental stimuli, these presented greater challenges than initially anticipated. The reason here is twofold. First, Degner et al. (2012) did not publish their stimulus sets, so it was impossible to reproduce them or adapt them for a different language pair. Second, no Maltese valence-normed data exist to date, making it virtually impossible to elaborate a comprehensive and thorough set of affective word stimuli. This issue was addressed by translating the Affective Norms for English Words list (Bradley & Lang, 1999) into Maltese, thereby making the materials rather anglocentric and disregarding a potentially consistent body of alternative affective stimuli. Furthermore, many items had to be discarded for the following reasons: (i) a number of (loan)words had the same spelling and/or pronunciation in both languages (e.g., YACHT; CAKE–KEJK)[11]; (ii) several potential translation equivalents in Maltese were judged as obsolete by the three native-speaker informants (e.g., CHARM–SEĦĦER); (iii) some English terms could not be rendered as single words in Maltese (e.g., SUNLIGHT–DAWL TAX-XEMX). Consequently, the stimulus sets eventually became rather small, which in turn resulted in a limited number of trials (9 practice trials and 90 experimental trials for each affective priming task). Similar challenges were encountered regarding the semantic priming stimulus set (8 practice trials and 100 experimental trials for each semantic priming task), as most published works used words which would not have been appropriate for this language pair due to the same translation challenges mentioned above. In this case, stimulus

[11] Some of these (e.g., STRESS, TORNADO, IDEA) were included in the practice blocks due to a lack of suitable ANEW stimuli.

sets were created from scratch starting from five semantic categories. For both semantic and affective priming tasks, frequency was only judged by the native-speaker informants, which posed a clear limitation compared with the use of frequency corpora. Future studies would also benefit from pre-testing the materials. As for the online modality, since absolute RTs and accuracy rates were in line with other published priming studies, it does not seem to have had a significant impact on the outcome of the study.

There might have also been some underlying language-specific limitations at play. Given the prevalence of Mixed Maltese English within Maltese society, that is, Maltese lexical items integrated into an otherwise English sentence (Vella, 2013), this may be a particularly difficult language pair to disentangle. Among other factors, it seems that code-mixing might be prompted by the conversation topic, with certain everyday matters being more readily available in one of the two languages, and/or by the need for emotional expression (Blom & Gumperz, 1972; Gumperz, 1970, as cited in Gauci, 2017, p. 10). This would imply that even those participants who emerged as English-dominant from the BLP questionnaire might in fact draw from Maltese for emotion-laden items such as swearwords. Therefore, the fact that this study was not able to reproduce Degner et al.'s (2012) results might suggest that unsocialized L2 users should not be equated with non-dominant yet early-to-simultaneous bilingual language users. Furthermore, the three informants highlighted that the rise of English particularly among younger speakers has led to considerable intergenerational variability in the Maltese lexicon currently in use, with an increase in English-based loanwords at the expense of Italian and Arabic. If this is the case, more qualitative research in the form of interviews, questionnaires, and conversation analysis is required to gain a better understanding of these phenomena and, possibly, to inform future priming studies conducted with this particular language pair. This is consistent with Dewaele and Pavlenko (2002), who note the need to complement quantitative findings with qualitative research through triangulation to reveal certain phenomena that do not emerge in the former alone.

Lastly, there are several limitations inherent to cognitive studies which cannot be overlooked. That of disentangling affective processing from cognitive processing is notably a challenging endeavor (Pavlenko, 2012), to which end this study's

experimental design was based on Degner et al. (2012), where affective and semantic priming performances were compared. Nevertheless, cognitive measures alone do not seem to suffice. Eilola and Havelka (2011) found that their L2 participants diverged from L1 speakers in terms of physiological arousal reactions despite exhibiting similar patterns at the behavioral level while performing an emotional Stroop task (see §1.3). According to Pavlenko (2012), this exposes an intrinsic limitation of purely cognitive designs, as they fail to consider physiological autonomic measures such as skin conductance levels and often regard affective processing as mere processing of valence. This makes it impossible to establish whether valence is to be regarded as a component of semantic meaning or whether it actually causes heightened arousal levels. Moreover, several scholars agree that context plays a crucial role in determining affective responses to verbal stimuli. Delatorre et al. (2019) pointed out that Bradley and Lang's (1999) ANEW corpus failed to predict emotional responses when the stimuli were presented in a certain situational context. Therefore, they used the SAM model (Self-Assessment Manikin) to create a new corpus by gathering Spanish participant ratings for valence, arousal and dominance in the context of a fictional scene of suspense. They then compared it with the Spanish adaptation of decontextualized ANEW (Redondo et al., 2007), and found that valence and arousal tended to be lower in the contextualized corpus, especially for elements that are expected to be found in a scene of suspense. Along the same lines, Sharif and Mahmood also argue against emotional processing designs based on single words, as "language is not processed merely as a single decontextualized word, registered individually" (2023, p. 10). Rather, they highlight the importance of the stimuli's co-text and pragmatic context in eliciting emotional responses. This is consistent with the remark that "the emotional meaning of the stimulus emerges in a situated process, where its perceived emotional content and relevance are shaped by a complex interplay of informational, contextual, and individual factors" (Brosch et al., 2010; Eder et al., 2007, as cited in Pavlenko, 2012, p. 409). To address these underlying limitations, more psychophysiological research and naturalistic studies examining affective reactions to language in context are required.

Concluding Remarks and Lines for Future Research

To isolate language dominance as a variable in its own right and test the context-of-use account for the language embodiment lag, the present work attempted to reproduce Degner et al.'s (2012) results obtained with sequential bilinguals in the context of the unbalanced early-to-simultaneous bilingual population of Malta. They concluded that high levels of language immersion and frequency of L2 use played a crucial role in the automatic activation of affective connotations, as they found significant L2 affective priming only for participants who were immersed in their L2, while they observed comparable semantic priming in both L1 and L2 for both immersed and not immersed participants. However, different results were found with the early-to-simultaneous bilingual participants in this study. While absolute RTs and accuracy rates were in line with other published works, out of the seven expected effects based on Degner et al. (2012), only one proved statistically significant. Still, contrary to expectations, valence-congruent trials and semantically related trials produced slower RTs in all tasks where stimulus language matched participant language dominance. When these didn't match, priming magnitudes were positive, yet not statistically significant. Whereas a main effect of task language and its interaction with participant dominance was observed in both task types, with faster English trials across the board, especially for English-dominant participants, no main effect of condition (*congruent*/*incongruent* and *related*/*unrelated*) was observed. Furthermore, a three-way interaction among task language, condition and dominance, which was expected to be found only for affective priming, was found only in semantic priming tasks. This study thus failed to replicate Degner et al.'s (2012) sequential bilingualism results with Maltese–English early-to-simultaneous bilinguals.

A number of potential shortcomings were discussed. Aside from the limited sample and stimulus set sizes, as well as the lack of valence-normed stimuli in Maltese, both language-specific and design-specific factors might have been at fault. First, given the fact that Maltese–English bilinguals commonly mix the two languages (Vella, 2013), even English-dominant participants might in fact perceive stronger affective connotations in Maltese, and vice versa. Furthermore, purely cognitive studies which leave out physiological measures such as skin conductance levels fail to distinguish affective processing from mere processing of valence (Eilola & Havelka, 2011).

Therefore, converging evidence from cognitive, psychophysiological, introspective, as well as neuroimaging and clinical studies is needed to understand the extent to which language dominance might influence affective connotation activation automaticity. Future research should also focus on whether Degner et al.'s (2012) results are reproducible with other groups of sequential bilinguals, as this was one of the first studies of its kind. It would be interesting to see whether the same results can be obtained when using the same task for both semantic and affective priming (e.g., a lexical decision task), and whether similar effects would also arise in cross-linguistic priming. In line with the complementarity principle, dominance needs to be regarded as a variable in its own right, complementing other traditionally studied variables such as proficiency and age of acquisition. To this end, and in agreement with Dewaele and Pavlenko (2002), more qualitative data in the form of interviews, questionnaires, and conversation analysis are also required, especially with regard to the Maltese context. This remains a precious testing ground for psycholinguistic theories by virtue of both its condition of historical bilingualism and the multifaceted nature of the Maltese language itself, which incorporates elements from Arabic, Italian, Sicilian, French, and, more recently, English (Brincat, 2011; Cassar Pullicino, 1979; Mifsud, 1995; Spagnol, 2011; Vella, 2013). More fine-grained, perhaps qualitative kinds of analyses are required to overcome the challenge posed by Mixed Maltese English in distinguishing different degrees of perceived affective connotation. For instance, conversation analysis can reveal whether code-mixing is triggered when emotion-laden lexical items and topics are discussed. These studies on the perceived emotional weight of language should be mindful of Dewaele's (2008) findings regarding the importance of recent language practice variables (e.g., language dominance, nature of L2 interlocutor network, L2 proficiency, degree of L2 socialization), as compared with sociobiographical factors related to the distant past (e.g., gender, education, trait emotional intelligence).

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Appendix A. Information Letter & Informed Consent

Dear participant,

Thank you for agreeing to participate in this study: your involvement is greatly appreciated. Please review the following information before proceeding.

DESCRIPTION

This study is directed towards early and simultaneous **Maltese-English bilinguals** aged **18 or older**, and it aims to investigate the automaticity of affective word connotations in English and Maltese within this population. Estimated completion time is around **20 minutes** (to be completed in a single session), and the structure is as follows:

1. Short demographic questionnaire (*1 minute*).
2. Two Experimental tasks: in which we will record your reaction times and accuracy in classifying English and Maltese words (*15 minutes*).
3. Two questionnaires: to assess your linguistic background and your ability to perceive and express your emotions (*4 minutes*).

Participation is **voluntary**. This research poses no known risks. No compensation is offered upon participation.

To carry out the experiment, it is necessary to:

- Have access to a **computer** (desktop or laptop);
- Be alone in a **quiet environment** without any noise;
- **Close all windows** and programs on the computer and activate the **full screen mode** when requested;
- Set your mobile phone to **silent mode** (turn off the volume).

WHO CAN PARTICIPATE

For primarily statistical reasons, we kindly ask you to participate in this study only if:

- You are at least 18 years old;
- You do not have any intellectual disability (diagnosed by a specialist);
- You do not regularly use hard drugs;
- You have never been diagnosed with any psychiatric disorder by a specialist;

If you are unable to participate in this study for one or more of the aforementioned reasons, simply close the browser window.

DATA TREATMENT

All information collected in this research will be treated in accordance with Italian Legislative Decree No. 196/2003 (Privacy Law, as amended by Legislative Decree No. 101/2018), EU GDPR 679/2016 (Personal Data Protection Law), and art. 9 of the Deontological Code of Italian Psychologists. The person in charge of the research undertakes to comply with the obligations set forth by current legislation regarding the collection, processing, and storage of sensitive data.

To protect your privacy, all data will be processed **anonymously** and not linked to your identity (in accordance with Ca' Foscari Ethical Code and EU Regulation 2016/679, as well as Italian Legislative Decree No. 196/2003). Data will be used solely for research purposes. Aggregated and anonymized data may be included in publications or presented at scientific conferences and seminars. The processing of your data will only be initiated upon the signing of this consent.

CONTACT INFORMATION

The present research project is conducted by MA graduand Federico Capolini, under the supervision of Dr. Gianluca Lebani from the Department of Linguistics and Comparative Cultural Studies at Ca' Foscari University of Venice, and of Prof. Roberta Sellaro, affiliated with the Department of Developmental Psychology and Socialization at the University of Padova.

For any queries regarding the procedure of the study, you can contact:

- **Research Supervisor**: Dr. Gianluca Lebani (gianluca.lebani@unive.it). Department of Linguistics and Comparative Cultural Studies, Ca' Foscari University of Venice.
- **Data Collector**: MA graduand Federico Capolini (894817@stud.unive.it)
- **Experimental Laboratory**: BemboLab (bembolab@unive.it)

I DECLARE:

- To be of legal age and to meet all the inclusion criteria
- To voluntarily participate in the research project as a participant
- To be aware of the objectives and purposes of this research project
- To be aware that I can withdraw from the study at any time, without providing explanations, without any penalty and obtaining the non-use of the data
- To be aware that the data collected, in absolute anonymity, will be treated exclusively for educational and research purposes
- To be aware that, since the data will be collected anonymously, it will not be possible to retrieve the submitted data once it has been sent

Thank you very much for your valuable contribution!

CONSENT TO PARTICIPATION AND DATA PROCESSING

I AGREE to participate in the research

I DO NOT agree to participate in the research

Appendix B. Demographic Questionnaire

Before starting the experiment, we kindly ask you to fill out this brief demographic questionnaire.

Gender you identify with:

Male
Female
Other

Type in your age: _____

Highest level of education achieved:

Elementary school diploma
Middle school diploma
High school diploma
Bachelor's degree
Master's degree
Post-graduate specialization or PhD
Other (specify)

Nationality:

Maltese
British
Italian
Other or dual (specify)

Preferred language:

English
Maltese

Handedness:

Right-handed
Left-handed
Ambidextrous

Appendix C. Affective Priming Task Materials

Prime_EN	Target_EN	Prime_MT	Target_MT	Prime_ Type	Tgt_Type (answer)	Condition	Prime_ Arousal	Prime_ Pleasure	Target_ Arousal	Target_ Pleasure
practice block A										
BED	**CANDY**	**SODDA**	**ĦELU**	positive	positive	congruent	40.929705	85.147392	51.927438	74.14966
BED	**FAT**	**SODDA**	**XAĦAM**	positive	negative	incongruent	40.929705	85.147392	54.535147	25.85034
MEMORIES	**PROFIT**	**MEMORJI**	**PROFITT**	positive	positive	congruent	69.160998	84.807256	75.736961	86.507937
OBSESSION	**TORNADO**	**OSSESSJONI**	**TORNADO**	neutral	negative	*filler*	72.675737	51.247166	77.437642	28.911565
OBSESSION	**BLISS**	**OSSESSJONI**	**HENA**	neutral	positive	*filler*	72.675737	51.247166	50	78.798186
ARMY	**LIE**	**ARMATA**	**GIDBA**	neutral	negative	*filler*	57.029478	53.514739	67.573696	31.632653
STRESS	**ABUNDANCE**	**STRESS**	**ABBUNDANZA**	negative	positive	incongruent	84.46712	23.696145	62.471655	74.716553
STRESS	**VANDAL**	**STRESS**	**VANDALU**	negative	negative	congruent	84.46712	23.696145	72.562358	30.725624
RAT	**NECTAR**	**FAR**	**NEKTAR**	negative	positive	incongruent	56.122449	34.240363	44.104308	78.231293
experimental block A1										
RAINBOW	**SAVIOR**	**QAWSALLA**	**SALVATUR**	positive	positive	congruent	52.60771	92.290249	65.759637	87.641723
RAINBOW	**MORGUE**	**QAWSALLA**	**MORTWARJA**	positive	negative	incongruent	52.60771	92.290249	54.875283	21.768707
CIRCUS	**SKY**	**ĊIRKLU**	**SEMA**	positive	positive	congruent	67.687075	82.76644	48.412698	83.560091
CIRCUS	**TUMOR**	**ĊIRKLU**	**TUMUR**	positive	negative	incongruent	67.687075	82.76644	73.809524	26.75737
LIFE	**PASSION**	**ĦAJJA**	**PASSJONI**	positive	positive	congruent	68.253968	82.426304	82.312925	91.043084
LIFE	**DEBT**	**ĦAJJA**	**DEJN**	positive	negative	incongruent	68.253968	82.426304	64.399093	25.170068
MOTHER	**CHRISTMAS**	**OMM**	**MILIED**	positive	positive	congruent	69.501134	95.124717	71.088435	88.435374
MOTHER	**GERMS**	**OMM**	**MIKROBI**	positive	negative	incongruent	69.501134	95.124717	50.907029	32.426304
FOOD	**FANTASY**	**IKEL**	**FANTASIJA**	positive	positive	congruent	67.120181	86.734694	58.276644	84.013605
FOOD	**TRAITOR**	**IKEL**	**TRADITUR**	positive	negative	incongruent	67.120181	86.734694	65.53288	25.170068
DARK	**MUSIC**	**DLAM**	**MUŻIKA**	neutral	positive	*filler*	48.526077	53.401361	60.31746	92.176871
DARK	**FRAUD**	**DLAM**	**FRODI**	neutral	negative	*filler*	48.526077	53.401361	65.192744	30.272109
RADIATOR	**ENJOYMENT**	**RADJATUR**	**TGAWDIJA**	neutral	positive	*filler*	45.578231	52.947846	58.956916	88.435374
RADIATOR	**MASSACRE**	**RADJATUR**	**MASSAKRU**	neutral	negative	*filler*	45.578231	52.947846	60.430839	25.85034
CORRIDOR	**COMEDY**	**KURRITUR**	**KUMMIEDJA**	neutral	positive	*filler*	41.156463	55.328798	66.326531	94.897959
CORRIDOR	**CRIME**	**KURRITUR**	**KRIMINALITÀ**	neutral	negative	*filler*	41.156463	55.328798	61.337868	32.76644
CURTAINS	**VICTORY**	**PURTIERI**	**REBĦA**	neutral	positive	*filler*	41.609977	54.761905	75.170068	94.331066
CURTAINS	**SICKNESS**	**PURTIERI**	**MARD**	neutral	negative	*filler*	41.609977	54.761905	63.605442	25.510204

IRON	**COUPLE**	**ĦADID**	**KOPPJA**	neutral	positive	*filler*	42.630385	55.555556	72.44898	84.013605
IRON	**FILTH**	**ĦADID**	**ĠDIEM**	neutral	negative	*filler*	42.630385	55.555556	58.049887	28.004535
MEASLES	**AFFECTION**	**ĦOSBA**	**AFFEZZJONI**	negative	positive	incongruent	57.369615	31.06576	70.408163	95.124717
MEASLES	**DIVORCE**	**ĦOSBA**	**DIVORZJU**	negative	negative	congruent	57.369615	31.06576	71.768707	25.170068
HORROR	**TALENT**	**ORRUR**	**TALENT**	negative	positive	incongruent	81.746032	31.292517	71.088435	85.714286
HORROR	**TRAGEDY**	**ORRUR**	**TRAĠEDJA**	negative	negative	congruent	81.746032	31.292517	70.748299	20.181406
BURIAL	**PROMOTION**	**DIFNA**	**PROMOZZJONI**	negative	positive	incongruent	57.596372	23.24263	73.015873	92.970522
BURIAL	**MISTAKE**	**DIFNA**	**ŻBALL**	negative	negative	congruent	57.596372	23.24263	58.730159	32.426304
AGONY	**STAR**	**AGUNIJA**	**STILLA*	negative	positive	incongruent	68.707483	27.55102	66.099773	82.426304
AGONY	**CRASH**	**AGUNIJA**	**ĦABTA**	negative	negative	congruent	68.707483	27.55102	78.798186	26.190476
HOSTAGE	**LAUGHTER**	**OSTAĠĠ**	**DAĦK**	negative	positive	incongruent	76.643991	24.943311	76.530612	95.804989
HOSTAGE	**RAGE**	**OSTAĠĠ**	**RABJA**	negative	negative	congruent	76.643991	24.943311	92.630385	27.324263
experimental block A2										
SPRING	**KISS**	**REBBIEGĦA**	**BEWSA**	positive	positive	congruent	64.285714	87.981859	82.993197	93.650794
SPRING	**INJURY**	**REBBIEGĦA**	**WEĠA'**	positive	negative	incongruent	64.285714	87.981859	64.512472	28.231293
HOLIDAY	**SUN**	**VAGANZA**	**XEMX**	positive	positive	congruent	74.716553	85.600907	57.142857	85.600907
HOLIDAY	**DISCOMFORT**	**VAGANZA**	**SKUMDITÀ**	positive	negative	incongruent	74.716553	85.600907	47.278912	24.829932
JOKE	**REWARD**	**ĊAJTA**	**PREMJU**	positive	positive	congruent	76.417234	91.836735	56.122449	85.37415
JOKE	**JEALOUSY**	**ĊAJTA**	**GĦIRA**	positive	negative	incongruent	76.417234	91.836735	72.108844	28.45805
MILLIONAIRE	**LUXURY**	**MILJUNARJU**	**LUSSU**	positive	positive	congruent	69.614512	91.043084	53.854875	89.342404
MILLIONAIRE	**WAR**	**MILJUNARJU**	**GWERRA**	positive	negative	incongruent	69.614512	91.043084	84.920635	23.582766
WARMTH	**DIAMOND**	**SĦANA**	**DJAMANT**	positive	positive	congruent	42.290249	84.013605	62.698413	89.795918
WARMTH	**TRAUMA**	**SĦANA**	**TRAWMA**	positive	negative	incongruent	42.290249	84.013605	71.768707	23.809524
THERMOMETER	**ADVENTURE**	**TERMOMETRU**	**AVVENTURA**	neutral	positive	*filler*	42.970522	53.628118	79.138322	86.1678
THERMOMETER	**OBESITY**	**TERMOMETRU**	**OBEŻITÀ**	neutral	negative	*filler*	42.970522	53.628118	43.877551	30.952381
ERRAND	**FRIEND**	**QADJA**	**ĦABIB**	neutral	positive	*filler*	43.650794	51.927438	65.079365	87.755102
ERRAND	**HARDSHIP**	**QADJA**	**TBATIJA**	neutral	negative	*filler*	43.650794	51.927438	53.968254	27.777778
CORNER	**RESPECT**	**KANTUNIERA**	**RISPETT**	neutral	positive	*filler*	44.331066	49.433107	58.843537	86.621315
CORNER	**LOSER**	**KANTUNIERA**	**TELLIEF**	neutral	negative	*filler*	44.331066	49.433107	56.122449	25.510204
STOMACH	**HOME**	**STONKU**	**DAR**	neutral	positive	*filler*	44.557823	54.648526	47.732426	89.68254
STOMACH	**POISON**	**STONKU**	**VALENU**	neutral	negative	*filler*	44.557823	54.648526	68.594104	22.44898
HABIT	**KNOWLEDGE**	**DRAWWA**	**GĦARFIEN**	neutral	positive	*filler*	44.78458	46.598639	67.120181	85.941043
HABIT	**ABUSE**	**DRAWWA**	**ABBUŻ**	neutral	negative	*filler*	44.78458	46.598639	77.437642	20.408163
GRIEF	**DESIRE**	**NIKET**	**XEWQA**	negative	positive	incongruent	54.195011	19.160998	83.333333	87.188209

GRIEF	**ACCIDENT**	**NIKET**	**AĊĊIDENT**	negative	negative	congruent	54.195011	19.160998	70.975057	23.24263
POVERTY	**TREASURE**	**FAQAR**	**TEŻOR**	negative	positive	incongruent	55.21542	18.93424	76.530612	93.764172
POVERTY	**FEAR**	**FAQAR**	**BIŻA**	negative	negative	congruent	55.21542	18.93424	78.911565	31.292517
AMBULANCE	**JOY**	**AMBULANZA**	**FERĦ**	negative	positive	incongruent	83.106576	28.004535	81.85941	97.505669
AMBULANCE	**SLAUGHTER**	**AMBULANZA**	**QATLA**	negative	negative	congruent	83.106576	28.004535	76.75737	18.594104
DEMON	**TRUTH**	**DIMONJU**	**VERITÀ**	negative	positive	incongruent	76.643991	23.922902	56.689342	88.435374
DEMON	**SIN**	**DIMONJU**	**DNUB**	negative	negative	congruent	76.643991	23.922902	65.53288	31.746032
GUILLOTINE	**MONEY**	**GILJOTTINA**	**FLUS**	negative	positive	incongruent	74.376417	28.117914	64.62585	86.054422
GUILLOTINE	**INFECTION**	**GILJOTTINA**	**INFEZZJONI**	negative	negative	congruent	74.376417	28.117914	57.029478	18.820862
experimental block A3										
SEX	**GOLD**	**SESS**	**DEHEB**	positive	positive	congruent	83.446712	91.269841	65.306122	85.487528
SEX	**TOMB**	**SESS**	**QABAR**	positive	negative	incongruent	83.446712	91.269841	53.628118	33.333333
MIRACLE	**GOD**	**MIRAKLU**	**ALLA**	positive	positive	congruent	86.734694	97.505669	67.460317	92.403628
MIRACLE	**DANGER**	**MIRAKLU**	**PERIKLU**	positive	negative	incongruent	86.734694	97.505669	82.993197	33.446712
SCHOLAR	**ACHIEVEMENT**	**STUDJUŻ**	**KISBA**	positive	positive	congruent	58.049887	82.312925	62.698413	89.455782
SCHOLAR	**RAPE**	**STUDJUŻ**	**STUPRU**	positive	negative	incongruent	58.049887	82.312925	77.210884	14.172336
JUSTICE	**GIFT**	**ĠUSTIZZJA**	**RIGAL**	positive	positive	congruent	62.018141	88.208617	69.614512	88.095238
JUSTICE	**SLAVE**	**ĠUSTIZZJA**	**SKJAV**	positive	negative	incongruent	62.018141	88.208617	70.408163	20.861678
BUTTERFLY	**HEAVEN**	**FARFETT**	**ĠENNA**	positive	positive	congruent	39.342404	81.292517	63.605442	82.76644
BUTTERFLY	**DAMAGE**	**FARFETT**	**ĦSARA**	positive	negative	incongruent	39.342404	81.292517	63.151927	34.580499
STOOL	**PERFECTION**	**PORGA**	**PERFEZZJONI**	neutral	positive	*filler*	45.351474	51.70068	67.460317	82.199546
STOOL	**INVADER**	**PORGA**	**INVAŻUR**	neutral	negative	*filler*	45.351474	51.70068	62.358277	34.580499
KNOT	**FAME**	**GĦOQDA**	**FAMA**	neutral	positive	*filler*	46.145125	52.60771	74.263039	89.909297
KNOT	**ALLERGY**	**GĦOQDA**	**ALLERĠIJA**	neutral	negative	*filler*	46.145125	52.60771	52.60771	34.807256
FUR	**DANCER**	**PIL**	**ŻEFFIEN**	neutral	positive	*filler*	47.39229	51.133787	68.027211	80.952381
FUR	**FLOOD**	**PIL**	**GĦARGĦAR**	neutral	negative	*filler*	47.39229	51.133787	68.027211	36.1678
CANE	**PALACE**	**BASTUN**	**PALAZZ**	neutral	positive	*filler*	47.619048	45.351474	57.823129	81.519274
CANE	**FIRE**	**BASTUN**	**NAR**	neutral	negative	*filler*	47.619048	45.351474	81.292517	36.507937
GLASS	**TROPHY**	**ĦĠIEĠ**	**TROFEW**	neutral	positive	*filler*	48.412698	53.854875	61.111111	88.208617
GLASS	**FAILURE**	**ĦĠIEĠ**	**FALLIMENT**	neutral	negative	*filler*	48.412698	53.854875	56.122449	19.274376
BEGGAR	**PLEASURE**	**TALLAB**	**PJAĊIR**	negative	positive	incongruent	55.668934	36.507937	65.079365	93.877551
BEGGAR	**WASP**	**TALLAB**	**ŻUNŻANA**	negative	negative	congruent	55.668934	36.507937	62.358277	38.208617
TRASH	**HEART**	**ŻIBEL**	**QALB**	negative	positive	incongruent	47.165533	30.272109	71.882086	83.786848
TRASH	**HURRICANE**	**ŻIBEL**	**URAGAN**	negative	negative	congruent	47.165533	30.272109	77.437642	37.868481
MISERY	**HUMOR**	**MIŻERJA**	**UMORIŻMU**	negative	positive	incongruent	58.61678	21.882086	62.358277	97.052154
MISERY	**PANIC**	**MIŻERJA**	**PANIKU**	negative	negative	congruent	58.61678	21.882086	79.591837	35.37415
HATE	**FREEDOM**	**MIBEGĦDA**	**LIBERTÀ**	negative	positive	incongruent	78.798186	24.036281	62.585034	85.941043
HATE	**TORTURE**	**MIBEGĦDA**	**TORTURA**	negative	negative	congruent	78.798186	24.036281	69.160998	17.687075
MALICE	**LEGEND**	**MALIZZJA**	**LEĠĠENDA**	negative	positive	incongruent	66.439909	30.498866	55.328798	72.44898
MALICE	**TROUBLE**	**MALIZZJA**	**INKWIET**	negative	negative	congruent	66.439909	30.498866	77.664399	34.353741

practice block B										
SLEEP	**BRIDE**	**IRQAD**	**GĦARUSA**	positive	positive	congruent	31.746032	81.632653	62.92517	83.219955
SLEEP	**FUNERAL**	**IRQAD**	**FUNERAL**	positive	negative	incongruent	31.746032	81.632653	56.00907	15.759637
IDEA	**HUMAN**	**IDEA**	**UMAN**	positive	positive	congruent	66.439909	79.365079	51.020408	78.117914
NUN	**MENACE**	**SORU**	**THEDDIDA**	neutral	negative	*filler*	33.219955	55.895692	62.585034	32.653061
NUN	**BOUQUET**	**SORU**	**BUKKETT**	neutral	positive	*filler*	33.219955	55.895692	61.904762	79.591837
INSECT	**STENCH**	**INSETT**	**INTIENA**	neutral	negative	*filler*	46.145125	46.145125	49.433107	24.829932
BEES	**QUEEN**	**NAĦAL**	**REĠINA**	negative	positive	incongruent	73.809524	36.281179	53.968254	73.015873
BEES	**INTRUDER**	**NAĦAL**	**INTRUŻ**	negative	negative	congruent	73.809524	36.281179	77.777778	31.405896
BULLET	**PIE**	**BALLA**	**TORTA**	negative	positive	incongruent	60.430839	37.301587	47.619048	72.675737
experimental block B1										
PEACE	**HONOR**	**PAĊI**	**UNUR**	positive	positive	congruent	33.446712	87.528345	66.893424	86.848073
PEACE	**DEATH**	**PAĊI**	**MEWT**	positive	negative	incongruent	33.446712	87.528345	52.040816	18.253968
LOVE	**ANGEL**	**IMĦABBA**	**ANĠLU**	positive	positive	congruent	73.015873	98.866213	54.761905	85.37415
LOVE	**BLACKMAIL**	**IMĦABBA**	**RIKATT**	positive	negative	incongruent	73.015873	98.866213	68.367347	33.446712
EXCELLENCE	**KINDNESS**	**EĊĊELLENZA**	**ĠENTILEZZA**	positive	positive	congruent	62.811791	95.011338	48.752834	88.662132
EXCELLENCE	**CANCER**	**EĊĊELLENZA**	**KANKRU**	positive	negative	incongruent	62.811791	95.011338	72.789116	17.006803
GLORY	**KING**	**GLORJA**	**RE**	positive	positive	congruent	68.253968	85.600907	62.471655	82.312925
GLORY	**KILLER**	**GLORJA**	**QATTIEL**	positive	negative	incongruent	68.253968	85.600907	89.115646	21.428571
PRESTIGE	**TRAVEL**	**PRESTIĠJU**	**VJAĠĠ**	positive	positive	congruent	66.439909	82.312925	70.408163	80.498866
PRESTIGE	**SCAR**	**PRESTIĠJU**	**FERITA**	positive	negative	incongruent	66.439909	82.312925	54.30839	38.321995
KEROSENE	**PRIDE**	**PITROLJU**	**KBURIJA**	neutral	positive	*filler*	49.206349	54.421769	66.099773	79.365079
KEROSENE	**CRISIS**	**PITROLJU**	**KRIŻI**	neutral	negative	*filler*	49.206349	54.421769	61.678005	31.06576
CELLAR	**DREAM**	**KANTINA**	**ĦOLMA**	neutral	positive	*filler*	49.773243	48.979592	51.360544	76.303855
CELLAR	**BLASPHEMY**	**KANTINA**	**DAGĦA**	neutral	negative	*filler*	49.773243	48.979592	55.895692	42.517007
EXCUSE	**INFATUATION**	**SKUŻA**	**INFATWAZZJONI**	neutral	positive	*filler*	50.793651	45.918367	79.591837	76.303855
EXCUSE	**PRESSURE**	**SKUŻA**	**PRESSJONI**	neutral	negative	*filler*	50.793651	45.918367	68.820862	38.321995
HAMMER	**GLAMOUR**	**MARTELL**	**FAXXINU**	neutral	positive	*filler*	51.927438	55.328798	53.061224	76.643991
HAMMER	**LAWSUIT**	**MARTELL**	**KAWŻA**	neutral	negative	*filler*	51.927438	55.328798	55.895692	38.208617
CANNON	**HOPE**	**KANUN**	**TAMA**	neutral	positive	*filler*	53.401361	55.555556	61.678005	79.931973
CANNON	**SCANDAL**	**KANUN**	**SKANDLU**	neutral	negative	*filler*	53.401361	55.555556	58.049887	37.641723
HELL	**MELODY**	**INFERN**	**MELODIJA**	negative	positive	incongruent	60.997732	25.396825	56.462585	80.15873
HELL	**COFFIN**	**INFERN**	**TEBUT**	negative	negative	congruent	60.997732	25.396825	57.029478	29.024943
COCKROACH	**FATHER**	**WIRDIENA**	**MISSIER**	negative	positive	incongruent	69.274376	31.85941	67.120181	80.272109

COCKROACH	**NUISANCE**	**WIRDIENA**	**INKONVENJENZA**	negative	negative	congruent	69.274376	31.85941	50.907029	37.07483
LONELINESS	**COMFORT**	**SOLITUDINI**	**KUMDITÀ**	negative	positive	incongruent	51.70068	18.253968	44.557823	80.15873
LONELINESS	**DUMP**	**SOLITUDINI**	**MIŻBLA**	negative	negative	congruent	51.70068	18.253968	46.712018	36.394558
ABDUCTION	**FLOWER**	**ĦTIF**	**FJURA**	negative	positive	incongruent	62.698413	31.292517	45.351474	75.283447
ABDUCTION	**PAIN**	**ĦTIF**	**UĠIGĦ**	negative	negative	congruent	62.698413	31.292517	73.696145	24.14966
LEPROSY	**CROWN**	**LEBBRA**	**KURUNA**	negative	positive	incongruent	71.315193	23.696145	48.526077	74.603175
LEPROSY	**SNAKE**	**LEBBRA**	**SERP**	negative	negative	congruent	71.315193	23.696145	77.324263	37.528345
experimental block B2										
DOG	**SNOW**	**KELB**	**BORRA**	positive	positive	congruent	65.306122	85.827664	65.192744	80.272109
DOG	**HANDICAP**	**KELB**	**ŻVANTAĠĠ**	positive	negative	incongruent	65.306122	85.827664	43.197279	37.301587
SUCCESS	**QUALITY**	**SUĊĊESS**	**KWALITÀ**	positive	positive	congruent	69.274376	93.99093	50.793651	70.861678
SUCCESS	**TOBACCO**	**SUĊĊESS**	**TABAKK**	positive	negative	incongruent	69.274376	93.99093	54.761905	37.188209
FAMILY	**AGREEMENT**	**FAMILJA**	**FTEHIM**	positive	positive	congruent	54.421769	86.734694	56.9161	80.272109
FAMILY	**CARCASS**	**FAMILJA**	**KARKASSA**	positive	negative	incongruent	54.421769	86.734694	54.761905	37.868481
BEACH	**TOY**	**BAJJA**	**ĠUGARELL**	positive	positive	congruent	62.698413	91.043084	57.936508	79.365079
BEACH	**SPIDER**	**BAJJA**	**BRIMBA**	positive	negative	incongruent	62.698413	91.043084	64.739229	37.755102
BEAUTY	**FAVOR**	**SBUĦIJA**	**FAVUR**	positive	positive	congruent	56.122449	88.662132	51.473923	73.24263
BEAUTY	**MANIAC**	**SBUĦIJA**	**MIĠNUN**	positive	negative	incongruent	56.122449	88.662132	61.111111	42.630385
ALLEY	**OCEAN**	**SQAQ**	**OĊEAN**	neutral	positive	*filler*	55.668934	50.793651	56.122449	80.725624
ALLEY	**CYCLONE**	**SQAQ**	**ĊIKLUN**	neutral	negative	*filler*	55.668934	50.793651	72.108844	40.816327
CLIFF	**YOUTH**	**IRDUM**	**ŻGĦOŻIJA**	neutral	positive	*filler*	70.861678	52.947846	64.285714	76.530612
CLIFF	**BOMB**	**IRDUM**	**BOMBA**	neutral	negative	*filler*	70.861678	52.947846	81.06576	23.809524
LIGHTNING	**SAINT**	**SAJJETTI**	**QADDIS**	neutral	positive	*filler*	74.943311	51.814059	50.907029	73.582766
LIGHTNING	**SCORPION**	**SAJJETTI**	**SKORPJUN**	neutral	negative	*filler*	74.943311	51.814059	60.997732	41.836735
SQUARE	**VIRTUE**	**KWADRU**	**VIRTÙ**	neutral	positive	*filler*	36.054422	53.741497	51.247166	70.521542
SQUARE	**MUCUS**	**KWADRU**	**MUKUS**	neutral	negative	*filler*	36.054422	53.741497	38.662132	37.868481
BANDAGE	**POWER**	**FAXXA**	**QAWWA**	neutral	positive	*filler*	44.217687	51.473923	75.623583	74.14966
BANDAGE	**FAULT**	**FAXXA**	**TORT**	neutral	negative	*filler*	44.217687	51.473923	46.145125	38.888889
FEVER	**BROTHER**	**DENI**	**ĦU**	negative	positive	incongruent	48.639456	31.292517	53.401361	80.612245
FEVER	**PEST**	**DENI**	**PESTI**	negative	negative	congruent	48.639456	31.292517	63.718821	35.487528
CORPSE	**OPTIMISM**	**KATAVRU**	**OTTIMIŻMU**	negative	positive	incongruent	53.741497	24.716553	60.544218	78.798186
CORPSE	**VICTIM**	**KATAVRU**	**VITTMA**	negative	negative	congruent	53.741497	24.716553	68.707483	24.716553
SURGERY	**INTELLECT**	**OPERAZZJONI**	**INTELLETT**	negative	positive	incongruent	71.995465	32.426304	53.854875	77.324263
SURGERY	**PARALYSIS**	**OPERAZZJONI**	**PARALIŻI**	negative	negative	congruent	71.995465	32.426304	53.628118	22.44898
MALARIA	**PERFUME**	**MALARJA**	**FWIEĦA**	negative	positive	incongruent	49.886621	27.210884	57.256236	76.643991
MALARIA	**URINE**	**MALARJA**	**BEWL**	negative	negative	congruent	49.886621	27.210884	47.619048	36.848073
LICE	**EDUCATION**	**QAMEL**	**EDUKAZZJONI**	negative	positive	incongruent	56.689342	26.190476	65.079365	75.85034
LICE	**PERVERT**	**QAMEL**	**PERVERTIT**	negative	negative	congruent	56.689342	26.190476	70.975057	31.632653

experimental block B3										
THRILL	**SAPPHIRE**	**EĊĊITAMENT**	**ŻAFFIR**	positive	positive	congruent	90.929705	91.269841	56.689342	79.365079
THRILL	**DEPRESSION**	**EĊĊITAMENT**	**DIPRESSJONI**	positive	negative	incongruent	90.929705	91.269841	51.473923	20.975057
COLOR	**WEDDING**	**KULUR**	**TIEĠ**	positive	positive	congruent	53.628118	79.591837	67.687075	88.662132
COLOR	**THIEF**	**KULUR**	**ĦALLIEL**	positive	negative	incongruent	53.628118	79.591837	78.117914	24.14966
BUNNY	**TRUST**	**ŻERMUĠ**	**FIDUĊJA**	positive	positive	congruent	46.031746	82.086168	60.090703	75.736961
BUNNY	**PUNISHMENT**	**ŻERMUĠ**	**KASTIG**	positive	negative	incongruent	46.031746	82.086168	67.23356	25.170068
BABY	**GAME**	**TARBIJA**	**LOGĦBA**	positive	positive	congruent	62.698413	93.197279	66.780045	79.138322
BABY	**IGNORANCE**	**TARBIJA**	**INJORANZA**	positive	negative	incongruent	62.698413	93.197279	49.773243	34.807256
TASTE	**AMBITION**	**TOGĦMA**	**AMBIZZJONI**	positive	positive	congruent	59.183673	75.510204	63.605442	79.818594
TASTE	**MOLD**	**TOGĦMA**	**MOFFA**	positive	negative	incongruent	59.183673	75.510204	46.145125	40.249433
CONTENTS	**HEALTH**	**KONTENUT**	**SAĦĦA**	neutral	positive	*filler*	48.979592	55.442177	58.163265	77.210884
CONTENTS	**TERRORIST**	**KONTENUT**	**TERRORIST**	neutral	negative	*filler*	48.979592	55.442177	82.426304	19.160998
REPTILE	**HONEY**	**RETTILU**	**GĦASEL**	neutral	positive	*filler*	58.730159	54.081633	51.133787	76.303855
REPTILE	**KNIFE**	**RETTILU**	**SIKKINA**	neutral	negative	*filler*	58.730159	54.081633	65.759637	41.043084
SHADOW	**INTEREST**	**DELL**	**INTERESS**	neutral	positive	*filler*	48.752834	49.319728	64.172336	79.024943
SHADOW	**NEEDLE**	**DELL**	**LABRA**	neutral	negative	*filler*	48.752834	49.319728	60.770975	43.310658
VOLCANO	**APPLAUSE**	**VULKAN**	**APPLAWS**	neutral	positive	*filler*	71.768707	54.875283	65.759637	85.034014
VOLCANO	**SCORN**	**VULKAN**	**DISPREZZ**	neutral	negative	*filler*	71.768707	54.875283	62.131519	32.199546
SKULL	**INCENTIVE**	**KRANJU**	**INĊENTIV**	neutral	positive	*filler*	53.854875	48.412698	64.512472	79.365079
SKULL	**FIGHT**	**KRANJU**	**ĠLIEDA**	neutral	negative	*filler*	53.854875	48.412698	81.06576	42.630385
CEMETERY	**JEWEL**	**ĊIMITERJU**	**ĠOJJELL**	negative	positive	incongruent	54.648526	29.818594	60.997732	79.365079
CEMETERY	**DEVIL**	**ĊIMITERJU**	**XITAN**	negative	negative	congruent	54.648526	29.818594	68.820862	25.056689
PRISON	**ADVANTAGE**	**ĦABS**	**VANTAĠĠ**	negative	positive	incongruent	64.62585	23.24263	53.968254	78.798186
PRISON	**GREED**	**ĦABS**	**REGĦBA**	negative	negative	congruent	64.62585	23.24263	53.401361	39.795918
MOSQUITO	**CHOCOLATE**	**NEMUSA**	**ĊIKKULATA**	negative	positive	incongruent	54.195011	31.746032	59.977324	78.004535
MOSQUITO	**THORN**	**NEMUSA**	**XEWKA**	negative	negative	congruent	54.195011	31.746032	58.276644	41.269841
ULCER	**BREEZE**	**ULĊERA**	**ŻIFFA**	negative	positive	incongruent	69.387755	20.181406	49.546485	77.664399
ULCER	**GUN**	**ULĊERA**	**PISTOLA**	negative	negative	congruent	69.387755	20.181406	79.591837	39.342404
PITY	**SPIRIT**	**ĦASRA**	**SPIRTU**	negative	positive	incongruent	42.176871	38.208617	63.038549	79.365079
PITY	**DISASTER**	**ĦASRA**	**DIŻASTRU**	negative	negative	congruent	42.176871	38.208617	71.768707	19.614512

Appendix D. Semantic Priming Task Materials

Prime_EN	Target_EN	Prime_MT	Target_MT	Prm_SemCat	Tgt_Type	Condition
practice dataset A						
SPATULA	**OVEN**	**PALETTA**	**FORN**	tool	word	congruent
SPATULA	**OQEN**	**PALETTA**	**FOHN**	tool	nonword	*filler*
SPATULA	**SHIRT**	**PALETTA**	**QMIS**	tool	word	incongruent
SPATULA	**STIRT**	**PALETTA**	**QQIS**	tool	nonword	*filler*
DONKEY	**TURTLE**	**ĦMAR**	**FEKRUNA**	animal	word	congruent
DONKEY	**TURPLE**	**ĦMAR**	**FEŻRUNA**	animal	nonword	*filler*
DONKEY	**MOON**	**ĦMAR**	**QAMAR**	animal	word	incongruent
DONKEY	**MION**	**ĦMAR**	**QAFAR**	animal	nonword	*filler*
dataset A						
MOUSE	**ANT**	**ĠURDIEN**	**NEMLU**	animal	word	congruent
MOUSE	**AMT**	**ĠURDIEN**	**NEGLU**	animal	nonword	*filler*
MOUSE	**TABLE**	**ĠURDIEN**	**MEJDA**	animal	word	incongruent
MOUSE	**TAWLE**	**ĠURDIEN**	**MEBDA**	animal	nonword	*filler*
PENGUIN	**BUTTERFLY**	**PINGWIN**	**FARFETT**	animal	word	congruent
PENGUIN	**BUTTENFLY**	**PINGWIN**	**FADFETT**	animal	nonword	*filler*
PENGUIN	**REALITY**	**PINGWIN**	**REALTÀ**	animal	word	incongruent
PENGUIN	**REAMITY**	**PINGWIN**	**REAMTÀ**	animal	nonword	*filler*
MONKEY	**CROW**	**XADINA**	**ĊAWLA**	animal	word	congruent
MONKEY	**CROZ**	**XADINA**	**ĊAWPA**	animal	nonword	*filler*
MONKEY	**FRIEND**	**XADINA**	**ĦABIB**	animal	word	incongruent
MONKEY	**FRIOND**	**XADINA**	**ĦATIB**	animal	nonword	*filler*
DOG	**COW**	**KELB**	**BAQRA**	animal	word	congruent
DOG	**XOW**	**KELB**	**BAPRA**	animal	nonword	*filler*
DOG	**ENGINE**	**KELB**	**MAGNA**	animal	word	incongruent
DOG	**ENGIME**	**KELB**	**MACNA**	animal	nonword	*filler*
FROG	**HORSE**	**ŻRINĠ**	**ŻIEMEL**	animal	word	congruent
FROG	**HORKE**	**ŻRINĠ**	**ŻIELEL**	animal	nonword	*filler*
FROG	**CONTRACT**	**ŻRINĠ**	**KUNTRATT**	animal	word	incongruent
FROG	**CONFRACT**	**ŻRINĠ**	**KUNFRATT**	animal	nonword	*filler*
TEETH	**JAW**	**SNIEN**	**XEDAQ**	body_part	word	congruent
TEETH	**JAZ**	**SNIEN**	**XEQAQ**	body_part	nonword	*filler*
TEETH	**REGION**	**SNIEN**	**REĠJUN**	body_part	word	incongruent
TEETH	**REZION**	**SNIEN**	**REĠRUN**	body_part	nonword	*filler*
HIP	**FOOT**	**ĠENB**	**SIEQ**	body_part	word	congruent
HIP	**FOOP**	**ĠENB**	**SIAQ**	body_part	nonword	*filler*
HIP	**CITY**	**ĠENB**	**BELT**	body_part	word	incongruent
HIP	**CIVY**	**ĠENB**	**BEMT**	body_part	nonword	*filler*
MOUTH	**TONGUE**	**ĦALQ**	**ILSIEN**	body_part	word	congruent
MOUTH	**TONVUE**	**ĦALQ**	**ILMIEN**	body_part	nonword	*filler*
MOUTH	**SECTOR**	**ĦALQ**	**SETTUR**	body_part	word	incongruent
MOUTH	**SECTIR**	**ĦALQ**	**SETTIR**	body_part	nonword	*filler*
EAR	**FINGER**	**WIDNA**	**SUBGĦA**	body_part	word	congruent
EAR	**FINKER**	**WIDNA**	**SUDGĦA**	body_part	nonword	*filler*
EAR	**GOAT**	**WIDNA**	**MOGĦŻA**	body_part	word	incongruent
EAR	**GAAT**	**WIDNA**	**MORĦŻA**	body_part	nonword	*filler*

NECK	**STOMACH**	**GĦONQ**	**STONKU**	body_part	word	congruent
NECK	**STOMICH**	**GĦONQ**	**STORKU**	body_part	nonword	*filler*
NECK	**MATTRESS**	**GĦONQ**	**SAQQU**	body_part	word	incongruent
NECK	**MADTRESS**	**GĦONQ**	**SARQU**	body_part	nonword	*filler*
BREAD	**PASTA**	**ĦOBŻ**	**GĦAĠINA**	food	word	congruent
BREAD	**PASKA**	**ĦOBŻ**	**GĦARINA**	food	nonword	*filler*
BREAD	**ROCK**	**ĦOBŻ**	**BLATA**	food	word	incongruent
BREAD	**ROFK**	**ĦOBŻ**	**BLAFA**	food	nonword	*filler*
FRUIT	**VEGETABLE**	**FROTT**	**ĦAXIX**	food	word	congruent
FRUIT	**VEPETABLE**	**FROTT**	**ĦAŻIX**	food	nonword	*filler*
FRUIT	**PAGE**	**FROTT**	**PAĠNA**	food	word	incongruent
FRUIT	**PABE**	**FROTT**	**PALNA**	food	nonword	*filler*
SALT	**SUGAR**	**MELĦ**	**ZOKKOR**	food	word	congruent
SALT	**SUGIR**	**MELĦ**	**ZOKROR**	food	nonword	*filler*
SALT	**BALCONY**	**MELĦ**	**GALLARIJA**	food	word	incongruent
SALT	**BALCOTY**	**MELĦ**	**GALLAWIJA**	food	nonword	*filler*
OIL	**BROTH**	**ŻEJT**	**BRODU**	food	word	congruent
OIL	**BROBH**	**ŻEJT**	**BROXU**	food	nonword	*filler*
OIL	**ANGLE**	**ŻEJT**	**ANGOLU**	food	word	incongruent
OIL	**ANGME**	**ŻEJT**	**ANGOMU**	food	nonword	*filler*
PEPPER	**TOMATO**	**BŻAR**	**TADAMA**	food	word	congruent
PEPPER	**TOMAXO**	**BŻAR**	**TAZAMA**	food	nonword	*filler*
PEPPER	**EFFORT**	**BŻAR**	**SFORZ**	food	word	incongruent
PEPPER	**ERFORT**	**BŻAR**	**SFORQ**	food	nonword	*filler*
ARCHITECT	**JUDGE**	**PERIT**	**IMĦALLEF**	profession	word	congruent
ARCHITECT	**JUPGE**	**PERIT**	**IMĦALPEF**	profession	nonword	*filler*
ARCHITECT	**LINE**	**PERIT**	**LINJA**	profession	word	incongruent
ARCHITECT	**LINU**	**PERIT**	**LINWA**	profession	nonword	*filler*
SCIENTIST	**SAILOR**	**XJENTIST**	**BAĦRI**	profession	word	congruent
SCIENTIST	**SAIMOR**	**XJENTIST**	**BAĊRI**	profession	nonword	*filler*
SCIENTIST	**DINNER**	**XJENTIST**	**PRANZU**	profession	word	incongruent
SCIENTIST	**DINTER**	**XJENTIST**	**PSANZU**	profession	nonword	*filler*
BAKER	**TRANSLATOR**	**FURNAR**	**TRADUTTUR**	profession	word	congruent
BAKER	**TRANSLOTOR**	**FURNAR**	**TRAPUTTUR**	profession	nonword	*filler*
BAKER	**BATH**	**FURNAR**	**BANJU**	profession	word	incongruent
BAKER	**BADH**	**FURNAR**	**BANFU**	profession	nonword	*filler*
CAPTAIN	**CHEMIST**	**KAPTAN**	**SPIŻJAR**	profession	word	congruent
CAPTAIN	**CHENIST**	**KAPTAN**	**SPIXJAR**	profession	nonword	*filler*
CAPTAIN	**FLAME**	**KAPTAN**	**FJAMMA**	profession	word	incongruent
CAPTAIN	**FLAJE**	**KAPTAN**	**FWAMMA**	profession	nonword	*filler*
FISHERMAN	**MUSICIAN**	**SAJJIED**	**MUŻIĊIST**	profession	word	congruent
FISHERMAN	**MUSICION**	**SAJJIED**	**MUŻIŻIST**	profession	nonword	*filler*
FISHERMAN	**MAP**	**SAJJIED**	**MAPPA**	profession	word	incongruent
FISHERMAN	**MAQ**	**SAJJIED**	**MAGPA**	profession	nonword	*filler*
LADDER	**STAIRS**	**SELLUM**	**TARAĠ**	tool	word	congruent
LADDER	**STAIKS**	**SELLUM**	**TAVAĠ**	tool	nonword	*filler*
LADDER	**CLOUD**	**SELLUM**	**SĦABA**	tool	word	incongruent
LADDER	**CROUD**	**SELLUM**	**SĦAJA**	tool	nonword	*filler*
PEN	**PENCIL**	**PINNA**	**LAPES**	tool	word	congruent
PEN	**PEMCIL**	**PINNA**	**LAPAS**	tool	nonword	*filler*
PEN	**ACTION**	**PINNA**	**AZZJONI**	tool	word	incongruent
PEN	**ACTEON**	**PINNA**	**AZZJOĦI**	tool	nonword	*filler*
PADLOCK	**CLAMP**	**KATNAZZ**	**MORSA**	tool	word	congruent
PADLOCK	**CLARP**	**KATNAZZ**	**MOXSA**	tool	nonword	*filler*
PADLOCK	**DIRT**	**KATNAZZ**	**ĦMIEĠ**	tool	word	incongruent
PADLOCK	**DILT**	**KATNAZZ**	**ĦMOEĠ**	tool	nonword	*filler*
KNIFE	**SCISSORS**	**SIKKINA**	**IMQASS**	tool	word	congruent

KNIFE	**SCISSOPS**	**SIKKINA**	**IMĊASS**	tool	nonword	*filler*
KNIFE	**STORY**	**SIKKINA**	**STORJA**	tool	word	incongruent
KNIFE	**STONY**	**SIKKINA**	**STOŻJA**	tool	nonword	*filler*
CUP	**POT**	**TAZZA**	**BORMA**	tool	word	congruent
CUP	**POY**	**TAZZA**	**BOFMA**	tool	nonword	*filler*
CUP	**SHIP**	**TAZZA**	**VAPUR**	tool	word	incongruent
CUP	**SHIH**	**TAZZA**	**VAJUR**	tool	nonword	*filler*
practice dataset B						
PIE	**LEMON**	**TORTA**	**LUMI**	food	word	congruent
PIE	**LEKON**	**TORTA**	**LUHI**	food	nonword	*filler*
PIE	**CARPET**	**TORTA**	**TAPIT**	food	word	incongruent
PIE	**CASPET**	**TORTA**	**TAKIT**	food	nonword	*filler*
SHRIMP	**SQUID**	**GAMBLU**	**KLAMAR**	animal	word	congruent
SHRIMP	**SQYID**	**GAMBLU**	**KLAGAR**	animal	nonword	*filler*
SHRIMP	**SOFA**	**GAMBLU**	**SUFAN**	animal	word	incongruent
SHRIMP	**SOGA**	**GAMBLU**	**SUĊAN**	animal	nonword	*filler*
dataset B						
OCTOPUS	**DUCK**	**QARNITA**	**PAPRA**	animal	word	congruent
OCTOPUS	**DUGK**	**QARNITA**	**PAFRA**	animal	nonword	*filler*
OCTOPUS	**TREE**	**QARNITA**	**SIĠRA**	animal	word	incongruent
OCTOPUS	**TROE**	**QARNITA**	**SIĠXA**	animal	nonword	*filler*
CAMEL	**WHALE**	**ĠEMEL**	**BALENA**	animal	word	congruent
CAMEL	**WHIJE**	**ĠEMEL**	**BATENA**	animal	nonword	*filler*
CAMEL	**CLOCK**	**ĠEMEL**	**ARLOĠĠ**	animal	word	incongruent
CAMEL	**CLOZK**	**ĠEMEL**	**ARĦOĠĠ**	animal	nonword	*filler*
RABBIT	**SHEEP**	**FENEK**	**NAGĦĠA**	animal	word	congruent
RABBIT	**SHAEP**	**FENEK**	**NAŻĦĠA**	animal	nonword	*filler*
RABBIT	**BOTTLE**	**FENEK**	**FLIXKUN**	animal	word	incongruent
RABBIT	**BOTDLE**	**FENEK**	**FKIXKUN**	animal	nonword	*filler*
BEAR	**DEER**	**ORS**	**ĊERV**	animal	word	congruent
BEAR	**DAER**	**ORS**	**ĊETV**	animal	nonword	*filler*
BEAR	**DOOR**	**ORS**	**BIEB**	animal	word	incongruent
BEAR	**DUOR**	**ORS**	**BIAB**	animal	nonword	*filler*
WOLF	**FISH**	**LUPU**	**ĦUT**	animal	word	congruent
WOLF	**FIKH**	**LUPU**	**ĦUW**	animal	nonword	*filler*
WOLF	**BUCKET**	**LUPU**	**BARMIL**	animal	word	incongruent
WOLF	**BUGKET**	**LUPU**	**BARFIL**	animal	nonword	*filler*
HAND	**LEG**	**ID**	**RIĠEL**	body_part	word	congruent
HAND	**LER**	**ID**	**RIPEL**	body_part	nonword	*filler*
HAND	**WINDOW**	**ID**	**TIEQA**	body_part	word	incongruent
HAND	**WINKOW**	**ID**	**TIEĊA**	body_part	nonword	*filler*
EYE	**HEAD**	**GĦAJN**	**RAS**	body_part	word	congruent
EYE	**HEAW**	**GĦAJN**	**RAE**	body_part	nonword	*filler*
EYE	**FIRE**	**GĦAJN**	**NAR**	body_part	word	incongruent
EYE	**FIWE**	**GĦAJN**	**NAO**	body_part	nonword	*filler*
THIGH	**CHEST**	**KOXXA**	**SIDER**	body_part	word	congruent
THIGH	**CHOST**	**KOXXA**	**SILER**	body_part	nonword	*filler*
THIGH	**RIVER**	**KOXXA**	**XMARA**	body_part	word	incongruent
THIGH	**RIXER**	**KOXXA**	**XPARA**	body_part	nonword	*filler*
HEART	**ELBOW**	**QALB**	**MINKEB**	body_part	word	congruent
HEART	**ELKOW**	**QALB**	**MINĠEB**	body_part	nonword	*filler*
HEART	**TRACTOR**	**QALB**	**TRATTUR**	body_part	word	incongruent
HEART	**TRALTOR**	**QALB**	**TRATDUR**	body_part	nonword	*filler*
SHOULDER	**FACE**	**SPALLA**	**WIĊĊ**	body_part	word	congruent
SHOULDER	**FECE**	**SPALLA**	**WAĊĊ**	body_part	nonword	*filler*
SHOULDER	**CANDLE**	**SPALLA**	**XEMGĦA**	body_part	word	incongruent
SHOULDER	**CANXLE**	**SPALLA**	**XEĦGĦA**	body_part	nonword	*filler*
RICE	**HONEY**	**ROSS**	**GĦASEL**	food	word	congruent
RICE	**HOFEY**	**ROSS**	**GĦAĊEL**	food	nonword	*filler*

RICE	**PILLOW**	**ROSS**	**MĦADDA**	food	word	incongruent
RICE	**PIRLOW**	**ROSS**	**MĦEDDA**	food	nonword	*filler*
EGG	**CHEESE**	**BAJDA**	**ĠOBON**	food	word	congruent
EGG	**CHEKSE**	**BAJDA**	**ĠOTON**	food	nonword	*filler*
EGG	**PAPER**	**BAJDA**	**KARTA**	food	word	incongruent
EGG	**PAQER**	**BAJDA**	**KAXTA**	food	nonword	*filler*
TUNA	**MEAT**	**TONN**	**LAĦAM**	food	word	congruent
TUNA	**MEFT**	**TONN**	**LAĦUM**	food	nonword	*filler*
TUNA	**LIGHT**	**TONN**	**DAWL**	food	word	incongruent
TUNA	**LOGHT**	**TONN**	**DAJL**	food	nonword	*filler*
CHESTNUT	**OLIVE**	**QASTAN**	**ŻEBBUĠA**	food	word	congruent
CHESTNUT	**OLUVE**	**QASTAN**	**ŻERBUĠA**	food	nonword	*filler*
CHESTNUT	**BAG**	**QASTAN**	**BORŻA**	food	word	incongruent
CHESTNUT	**BAV**	**QASTAN**	**BOKŻA**	food	nonword	*filler*
CHERRY	**STRAWBERRY**	**ĊIRASA**	**FRAWLA**	food	word	congruent
CHERRY	**STRAJBERRY**	**ĊIRASA**	**FRAJLA**	food	nonword	*filler*
CHERRY	**SHOE**	**ĊIRASA**	**ŻARBUN**	food	word	incongruent
CHERRY	**ZHOE**	**ĊIRASA**	**ŻASBUN**	food	nonword	*filler*
DOCTOR	**LAWYER**	**TABIB**	**AVUKAT**	profession	word	congruent
DOCTOR	**LAJYER**	**TABIB**	**AVUDAT**	profession	nonword	*filler*
DOCTOR	**BLANKET**	**TABIB**	**GVERTA**	profession	word	incongruent
DOCTOR	**BLANKUT**	**TABIB**	**GVURTA**	profession	nonword	*filler*
TEACHER	**SINGER**	**GĦALLIEM**	**KANTANT**	profession	word	congruent
TEACHER	**SINLER**	**GĦALLIEM**	**KANTART**	profession	nonword	*filler*
TEACHER	**BRICK**	**GĦALLIEM**	**BRIKSA**	profession	word	incongruent
TEACHER	**BRIZK**	**GĦALLIEM**	**BRAKSA**	profession	nonword	*filler*
FARMER	**MAYOR**	**BIDWI**	**SINDKU**	profession	word	congruent
FARMER	**MAVOR**	**BIDWI**	**SINDĠU**	profession	nonword	*filler*
FARMER	**ROAD**	**BIDWI**	**TRIQ**	profession	word	incongruent
FARMER	**RIOD**	**BIDWI**	**TRUQ**	profession	nonword	*filler*
WRITER	**SOLDIER**	**KITTIEB**	**SULDAT**	profession	word	congruent
WRITER	**SOLBIER**	**KITTIEB**	**SULDUT**	profession	nonword	*filler*
WRITER	**WALL**	**KITTIEB**	**ĦAJT**	profession	word	incongruent
WRITER	**WADL**	**KITTIEB**	**ĦAXT**	profession	nonword	*filler*
BUILDER	**ACTOR**	**BENNEJ**	**ATTUR**	profession	word	congruent
BUILDER	**ACQOR**	**BENNEJ**	**ATTAR**	profession	nonword	*filler*
BUILDER	**MIRROR**	**BENNEJ**	**MERA**	profession	word	incongruent
BUILDER	**MIBROR**	**BENNEJ**	**MEĦA**	profession	nonword	*filler*
PAN	**TEACUP**	**TAĠEN**	**KIKKRA**	tool	word	congruent
PAN	**TEAFUP**	**TAĠEN**	**KIKŻRA**	tool	nonword	*filler*
PAN	**ROOF**	**TAĠEN**	**BEJT**	tool	word	incongruent
PAN	**ROUF**	**TAĠEN**	**BIJT**	tool	nonword	*filler*
RULER	**RUBBER**	**RIGA**	**GOMMA**	tool	word	congruent
RULER	**RUSBER**	**RIGA**	**GOMĦA**	tool	nonword	*filler*
RULER	**SHELF**	**RIGA**	**XKAFFA**	tool	word	incongruent
RULER	**SHEYF**	**RIGA**	**XKASFA**	tool	nonword	*filler*
HAMMER	**SHOVEL**	**MARTELL**	**PALA**	tool	word	congruent
HAMMER	**SHOVYL**	**MARTELL**	**PAŻA**	tool	nonword	*filler*
HAMMER	**CHAIR**	**MARTELL**	**SIĠĠU**	tool	word	incongruent
HAMMER	**CHAOR**	**MARTELL**	**SIĠĠO**	tool	nonword	*filler*
PLATE	**GRATER**	**PLATT**	**ĦAKKIEK**	tool	word	congruent
PLATE	**GRAFER**	**PLATT**	**ĦALKIEK**	tool	nonword	*filler*
PLATE	**LEAF**	**PLATT**	**WERQA**	tool	word	incongruent
PLATE	**LEAW**	**PLATT**	**WERDA**	tool	nonword	*filler*
SPONGE	**BROOM**	**SPONŻA**	**XKUPA**	tool	word	congruent
SPONGE	**BWOOM**	**SPONŻA**	**XQUPA**	tool	nonword	*filler*
SPONGE	**BRIDGE**	**SPONŻA**	**PONT**	tool	word	incongruent
SPONGE	**BRILGE**	**SPONŻA**	**POĊT**	tool	nonword	*filler*

Appendix E. Bilingual Language Profile: English–Maltese (EN)

I. Language history

In this section, we would like you to answer some factual questions about your language history by placing a check in the appropriate box.

1. At what age did you **start learning** the following languages?

English

☐ ☐
Since birth 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Maltese

☐ ☐
Since birth 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

2. At what age did you **start to feel comfortable** using the following languages?

English

☐ ☐
As early as I can remember 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+ not yet

Maltese

☐ ☐
As early as I can remember 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+ not yet

3. How many years of **classes (grammar, history, math, etc.)** have you had in the following languages (primary school through university)?

English

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Maltese

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

4. How many years have you spent in a **country/region** where the following languages are spoken?

English

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Maltese

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

5. How many years have you spent in a **family** where the following languages are spoken?

English

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Maltese

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

6. How many years have you spent in a **work environment** where the following languages are spoken?

English

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Maltese

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

II. Language use

In this section, we would like you to answer some questions about your language use by placing a check in the appropriate box. Total use for all languages in a given question should equal 100%.

7. In an average week, what percentage of the time do you use the following languages **with friends**?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
English	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maltese	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other languages	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

8. In an average week, what percentage of the time do you use the following languages **with family**?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
English	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maltese	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other languages	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9. In an average week, what percentage of the time do you use the following languages **at school/work**?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
English	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maltese	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other languages	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

10. When you talk to yourself, how often do you **talk to yourself** in the following languages?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
English	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maltese	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other languages	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

11. When you count, how often do you **count** in the following languages?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
English	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maltese	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other languages	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

III. Language proficiency

In this section, we would like you to rate your language proficiency by giving marks from 0 to 6.

	0=not well at all						*6=very well*
12. a. How well do you speak **English**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. How well do you speak **Maltese**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
13. a. How well do you understand **English**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. How well do you understand **Maltese**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
14. a. How well do you read **English**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. How well do you read **Maltese**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
15. a. How well do you write **English**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. How well do you write **Maltese**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6

IV. Language attitudes

In this section, we would like you to respond to statements about language attitudes by giving marks from 0-6.

	0=disagree						*6=agree*
16. a. I feel like myself when I speak **English**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. I feel like myself when I speak **Maltese**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
17. a. I identify with an **English-speaking** culture.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. I identify with a **Maltese-speaking** culture.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
18. a. It is important to me to use (or eventually use) **English** like a native speaker.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. It is important to me to use (or eventually use) **Maltese** like a native speaker.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
19. a. I want others to think I am a native speaker of **English**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. I want others to think I am a native speaker of **Maltese**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6

Appendix F. Bilingual Language Profile: English–Maltese (MT)

I. L-Istorja tal-Lingwi

F'din it-taqsima, nixtiequ li twieġeb xi mistoqsijiet fattwali dwar l-istorja tal-lingwa tiegħek billi timmarka l-kaxxa x-xierqa.

1. F'liema età **bdejt titgħallem** il-lingwi li ġejjin?

Ingliż

☐ ☐
Mit-twelid 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Malti

☐ ☐
Mit-twelid 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

2. F'liema età **bdejt tħossok komdu** tuża l-lingwi li ġejjin?

Ingliż

☐ ☐
Kmieni kemm niftakar 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+ għadu mhux

Malti

☐ ☐
Kmieni kemm niftakar 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+ għadu mhux

3. Kemm kellek snin ta' **klassijiet (grammatika, storja, matematika, eċċ.)** fil-lingwi li ġejjin (skola primarja sal-università)?

Ingliż

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Malti

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

4. Kemm-il sena qattajt **f'pajjiż/reġjun** fejn huma mitkellma l-lingwi li ġejjin?

Ingliż

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Malti

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

5. Kemm-il sena qattajt **fi familja** fejn jiġu mitkellma l-lingwi li ġejjin?

Ingliż

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Malti

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

6. Kemm-il sena qattajt **f'ambjent tax-xogħol** fejn jiġu mitkellma l-lingwi li ġejjin?

Ingliż

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Malti

☐ ☐
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

II. L-Użu tal-Lingwi

F'din it-taqsima, nixtiequ li twieġeb xi mistoqsijiet dwar l-użu tal-lingwa tiegħek billi timmarka l-kaxxa x-xierqa. L-użu totali għal-lingwi kollha f'mistoqsija partikolari għandu jkun ugwali għal 100%.

7. F'ġimgħa ordinarja, liema perċentwal tal-ħin tuża l-lingwi li ġejjin **mal-ħbieb**?

Ingliż	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Malti	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Lingwi oħra	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%

8. F'ġimgħa ordinarja, liema perċentwal tal-ħin tuża l-lingwi li ġejjin **mal-familja**?

Ingliż	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Malti	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Lingwi oħra	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%

9. F'ġimgħa ordinarja, liema perċentwal tal-ħin tuża l-lingwi li ġejjin **fl-iskola/xogħol**?

Ingliż	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Malti	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Lingwi oħra	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%

10. Meta tkellem lilek innifsek, kemm-il darba **tkellem lilek innifsek** fil-lingwi li ġejjin?

Ingliż	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Malti	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Lingwi oħra	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%

11. Meta tgħodd, kemm-il darba **tgħodd** fil-lingwi li ġejjin?

Ingliż	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Malti	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%
Lingwi oħra	☐ 0%	☐ 10%	☐ 20%	☐ 30%	☐ 40%	☐ 50%	☐ 60%	☐ 70%	☐ 80%	☐ 90%	☐ 100%

III. Il-Proficjenza fil-Lingwi

F'din it-taqsima, nixtiequ li tikklassifika l-proficjenza fil-lingwa tiegħek billi tagħti marki minn 0 sa 6.

0=mhux tajjeb xejn *6=tajjeb ħafna*

12. a. Kemm titkellem tajjeb bl-**Ingliż**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Kemm titkellem tajjeb bil-**Malti**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

13. a. Kemm tifhem tajjeb l-**Ingliż**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Kemm tifhem tajjeb il-**Malti**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

14. a. Kemm taqra tajjeb l-**Ingliż**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Kemm taqra tajjeb il-**Malti**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

15. a. Kemm tikteb tajjeb bl-**Ingliż**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Kemm tikteb tajjeb bil-**Malti**? ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

IV. L-Attitudnijiet lejn il-Lingwi

F'din it-taqsima, nixtiequ li tirrispondi għal stqarrijiet dwar l-attitudnijiet tal-lingwa billi tagħti marki minn 0-6.

0=ma naqbilx *6=naqbel*

16. a. Inħossni jiena innifsi meta nitkellem bl-**Ingliż**. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Inħossni jiena innifsi meta nitkellem bil-**Malti**. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

17. a. Nidentifika ma' kultura li **titkellem bl-Ingliż**. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Nidentifika ma' kultura li **titkellem bil-Malti**. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

18. a. Huwa importanti għalija li nuża (jew eventwalment nuża) l-**Ingliż** bħala kelliem nattiv. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Huwa importanti għalija li nuża (jew eventwalment nuża) il-**Malti** bħala kelliem nattiv. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

19. a. Irrid li l-oħrajn jaħsbu li jien kelliem nattiv tal-**Ingliż**. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

    b. Irrid li oħrajn jaħsbu li jien kelliem nattiv tal-**Malti**. ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6