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**Implicit language attitudes in Catalonia (Spain): investigating preferences for Catalan or Spanish
using the Implicit Association Test**

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ABSTRACT

In line with the increased interest in studying implicit language attitudes, this study aims to explore implicit attitudes towards Catalan and Spanish in the multicultural and multilingual context of Catalonia (Spain) using the Implicit Association Test (IAT). A sample of 113 adolescents completed the IAT and a set of explicit measures of attitudinal and motivational variables. Results show a general preference for Catalan over Spanish. However, differences appear when home language is taken into consideration, as participants tend to prefer their home language. The paper discusses the relationship between implicit and explicit attitudes, highlighting the importance of incorporating implicit measures in language attitudes research in Catalonia.

Keywords: implicit attitudes, Implicit Association Test, language attitudes, Catalonia, multilingualism

INTRODUCTION

This past decade has seen the rise of the secessionist movement in Catalonia, which led to the referendum on its independence from Spain organized on 1 October 2017. As a response to the declaration of independence issued a month later, the Spanish government suspended Catalan autonomy. There seems to be a social fracture between unionists and the secessionists (Oller et al. 2019), configured by identity, language and attitudinal factors (Elliot 2018; Guntermann et al. 2018; Juarez Miro 2020; Lapresta et al. 2019).

Catalonia has been promoting a multilingual and multicultural project of coexistence, with Catalan as the main language of communication (Newman & Trenchs-Parera 2015; Trenchs-Parera & Newman 2015). In the current context of social and political uncertainty, the success of this project is contingent on the attitudes of the younger generations. Focusing on the linguistic future of the region, it is relevant to study the implicit language attitudes towards Catalan and Spanish held by young people living in Catalonia. Implicitness is understood according to the implicit memory research tradition (e.g., Greenwald et al. 2002). Thus, implicit attitudes are “introspectively

unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects” (Greenwald & Banaji 1995, p. 8).

Explicit attitudes are under the individual’s awareness and control, and their measurement using self-reported data can be vulnerable to social desirability and contextual biases (Paulhus & Vazire 2007). While a wide variety of studies focused on explicit language attitudes in Catalonia (e.g., Ianos et al. 2017 ; Madariaga, Huguet, and Janés 2016; Woolard 1989), there is no data available regarding implicit language attitudes in this context.

The present study explores the implicit attitudes towards Catalan and Spanish using an IAT focused on languages as attitudinal objects. Due to the intricate connections between language attitudes, identity, and language use (Madariaga, Huguet, and Janés 2016; Lapresta, Huguet, and Janés 2010), this new information can provide much needed answers concerning the social and linguistic future of Catalonia.

The case of Catalonia: languages and education

One of Spain’s multilingual autonomous communities, Catalonia has two official languages, Catalan and Spanish, throughout its territory, and a third official language, Aranese, in the Aran Valley. The relationship between Catalan and Spanish has been historically fraught, as Catalan has gone through several cycles of oppression and revival, culminating with a movement for independence which has been gradually rising since 2010 (Fabà Prats & Torres-Pla 2017).

Thus, the cultural repression during Franco’s dictatorship was followed by a successful revitalization of Catalan (Fishman 2001). This has been achieved through a series of policies designed to promote the use of Catalan in all spheres of social and cultural activity (e.g., the Linguistic Normalization Law 1983; the Linguistic Policy Law 1998). Among these, it is worth noting the implementation of a Catalan-medium education system based on the principles of immersion bilingual education, so that all students, regardless of their family language, become proficient in both official languages –

Spanish and Catalan (Vila 1995). These measures were strongly supported by the local population, whose attitudes towards Catalan were highly favorable (Hoffmann 2000). The significant influence of language attitudes that was observed in Catalonia aligns with Lewis's (1981) argument regarding the role played by attitudes in the design and implementation of linguistic and educational policies.

In their review of Catalonia's history of language use, Newman, Trenchs-Parera, and Corona (2019) highlight the positioning of Spanish as a counterpoint to Catalan, seeing that language policies have focused on counterbalancing Spanish dominance. Also, to promote Catalan it was deemed essential to recruit new speakers among the newcomers (Strubell 2001). This is especially relevant considering that over 15% of the total population of Catalonia are international migrants (IDESCAT 2019). Several studies (e.g., Ianos, Huguet, and Lapresta 2017; Madariaga, Huguet, and Janés 2016; Madariaga, Huguet, & Lapresta 2013) found that young people of immigrant origin¹ have less favorable attitudes towards Catalan and more positive attitudes towards Spanish than their autochthonous peers. However, a slight improvement of newcomers' attitudes towards Catalan was found over a two-year period (Ianos et al 2017) which has been interpreted as a likely result of instrumental and integrative orientations.

Furthermore, a series of social and political changes were set in motion in 2010 when the Spanish Constitutional Court abolished several passages of Catalonia's Statute of Autonomy ratified in 2006. The annulations included the symbolic definition of Catalonia as a "nation" and the high status of the Catalan language in education and public administration (Guibernau 2014). The following years saw an intense mobilization of the pro-independence movement, which culminated with the referendum on independence organized by the Catalan government on 1 October 2017. The Spanish government considered the referendum illegal and sent riot police to try to prevent it. In response to the subsequent declaration of Catalonia's independence, the Spanish government invoked Article 155 of

¹ According to the literature (e.g., Lapresta et al., 2010), the group of young people of immigrant origin includes first-generation immigrants who were born abroad and second-generation immigrants with at least one parent that was born outside Spain.

the Constitution to suspend Catalan autonomy and called an election to the Catalan Parliament (Guntermann et al. 2018).

On the one hand, the current political and social climate seems to be characterized by a division between Catalan and Spanish identities (Marí - Kloze 2018; Oller et al. 2019). Along this line, the attitudinal patterns of the population that point towards a competitive, mutually exclusive relationship between Spanish and Catalan (Ianos et al. 2017). On the other hand, recent studies have argued that there was an increased support for linguistic cosmopolitanism, a language ideology that breaks down ethnolinguistic boundaries and promotes heterogeneity and multilingualism (Trenchs-Parera & Newman 2009). Further studies are needed to understand the contradictory findings and to delve into automatic associations less susceptible to be influenced by participants' tendency to project favorable images of themselves or to offer socially encouraged answers.

Implicit language attitudes

Attitudes have been conceptualized as dual in nature (Pantos 2019). According to the associative – propositional evaluation model (APE Model; Gawronski & Bodenhausen 2006) the implicit-explicit duality is a result of two different mental processes involved in attitude formation. Associative processing refers to the activation of salient pre-existing associations (Hahn & Gawronski 2018) and yields implicit attitudes. On the other hand, propositional processing requires a validation of the information activated, based on an assessment of consistency, leading to explicit attitudes. Thus, as implicit and explicit attitudes differ from one another, correspondingly different measurements methods are also needed (Greenwald & Banaji 1995; T. D. Wilson et al. 2000). One such example is the Implicit Association Test (IAT; Greenwald et al. 1998) – an implicit measure that accesses implicit attitudes (Pantos 2019, p. 3). The IAT estimates the strength of association between concepts and attributes. It is assumed that the IAT can uncover different associations than the ones accessed through introspection and reported directly (Lane et al. 2007), while also reducing the likelihood of socially desirable responses (Campbell-Kibler 2012). However, there is debate concerning the extent

to which the IAT detects individual attitudes or cultural knowledge (Vuletic and Payne 2019). Uhlmann, Poehlman, and Nosek (2012) argue that, according to both positions, automatic associations guide behavior. Namely, if evaluative associations are considered the basis of implicit attitudes, then they are expected to correlate with behavior. On the other hand, if interpreted as knowledge of cultural normative attitudes, the automatic associations may also predict behavior, as people are guided by both their own explicitly endorsed attitudes and by perceived social norms (Fishbein and Ajzen 1974). Additionally, both positions note the influence of environmental and cultural factors on automatic associations (Gawronski and Bodenhausen 2006; Nosek 2007). Implicit and explicit attitudes may reflect different aspects of the cultural context (Uhlmann et al. 2012, p. 250). Automatic associations result from classical conditioning by the environment, while explicit attitudes represent internalized logical propositions (Gawronski and Bodenhausen, 2006).

There has been an increasing interest in exploring implicit measures of various attitudinal objects commonly gathered under the umbrella term “language attitudes” (Baker, 1992). Most of the studies using the IAT have focused on implicit attitudes towards language variation, such as foreign (i.e, Korean) and U.S. accented speech in the US (Pantos and Perkins 2012), Standard South African English and Afrikaans-accented English in South Africa (Álvarez-Mosquera and Marín-Gutiérrez 2018), Northern English and Southern English speech in England (McKenzie and Carrie 2018). These studies found relatively low correlations between implicit and explicit attitudes, indicating that their coexistence as distinct constructs, both with the potential to guide and direct behavior (Pantos and Perkins 2012). The IAT has also been employed to study the social meaning of language varieties (Campbell-Kibler 2012; Lehnert and Hörstermann 2018).

Focusing on languages as attitudinal objects, Redinger (2010) carried out a small-scale pilot study regarding language attitudes in Luxembourg. Along the same lines, Lee (2015) studied implicit attitudes towards Welsh and English in Wales and found differences between two educational

contexts (i.e., Welsh-medium and English-medium schools) indicating preference for the language dominant in each context.

The above studies showed that IAT has been used successfully with labels (Álvarez-Mosquera and Marín-Gutiérrez 2018; Lee 2015; McKenzie and Carrie 2018) and audio stimuli (Álvarez-Mosquera and Marín-Gutiérrez 2018; Lehnert and Hörstermann 2018; Pantos and Perkins 2012). However, Álvarez-Mosquera and Marín-Gutiérrez (2018) found that text inputs are processed faster than audio stimuli.

The present study argues that identifying implicit language attitudes is essential in a multilingual context such as Catalonia, negotiating the co-existence of two official languages that have been historically fighting for dominance.

The Present Study

The primary aim of this study was to analyze the implicit language attitudes of young people living in Catalonia (Spain). Namely, the IAT is employed to capture the preference for Catalan relative to Spanish. The sample is composed of adolescents in the final years of secondary education in the Catalan bilingual system, as it is assumed that their language attitudes are already formed (Baker 1992) and that they have mastered both official languages (Generalitat de Catalunya 2015).

Furthermore, this segment of population is the best suited to indicate the progress of social projects and policies (Pujolar 2008). Young people represent a critical demographic for language maintenance and revitalization (Fishman 1991).

The study focuses on exploring implicit language attitudes and how they relate to a series of attitudinal and motivational variables traditionally studied in this context. Previous literature suggests that the integrative and instrumental value of Catalan is internalized as logical propositions (i.e., explicitly endorsed language attitudes) (Lapresta, Hugué, and Janés 2010). We aim to

investigate whether the aforementioned motivational variables are also associated with the automatic associations measured by the IAT.

Data regarding implicit-explicit correlations can provide useful indications regarding evaluative strength, attitude importance and elaboration, among others (Hofmann et al. 2005; Nosek 2005):

Hypothesis 1: Implicit language attitudes will correlate positively with explicit language attitudes.

Furthermore, there is a strong on-going body of evidence showing that people tend to have more positive attitudes towards their home language (e.g., Baker 1992; Mettewie and Janssens 2007; Moriarty 2010). Studies conducted in Catalonia found that participants whose home language was Catalan had significantly more favorable attitudes towards Catalan than Spanish, while participants whose home language was Spanish expressed more positive attitudes towards Spanish in comparison with Catalan (Huguet, Janés and Chireac 2008; Madariaga et al. 2016, 2013). Home language has also been found to be related to language use and identity (Pujolar 2008), as well as support for the independence movement (Oller, Satorra and Tobeña 2019). It is expected to find differences between the home language groups with respect to their implicit language attitudes:

Hypothesis 2a: Participants whose home language is Catalan have a greater preference for Catalan over Spanish than the rest of the participants.

Hypothesis 2b: Participants whose home language is Spanish have a greater preference for Spanish over Catalan compared with the other participants.

Method

Sample

Participants consisted of 113 adolescents (74 girls and 39 boys) between the ages of 14 and 20 ($M = 16.2$, $SD = 1.92$) at four schools in Lleida – a capital city in the western part of Catalonia. Forty-four

percent of participants indicated that Catalan was their home language, 26% Spanish, 11% had both Spanish and Catalan as home languages, while 19% had other home languages (i.e., by order of frequency, Romanian, Arabic, Chinese, Mandinka, Bulgarian). Twenty-nine participants (25.7%) were of immigrant origin.

Measures

Implicit Association Test. The language attitudes IAT measuring relative preference for Catalan versus Spanish was coded and administered using Milisecond's Inquisit 5 software. The procedure requires participants to two target categories (Catalan and Spanish), and two attribute categories (positive and negative). The fundamental assumption states that it is easier to perform the same behavioral answer (pressing a key) for strongly associated concepts than for weak associations. Specifically, shorter response times for the combinations *Catalan + positive attributes and Spanish + negative attributes* than for the combinations *Catalan + negative attributes and Spanish + positive attributes* indicate a stronger association for the former combinations. In other words, this would show a preference for Catalan than for Spanish.

The stimuli for the target categories consisted of written words that were chosen based on the following criteria: a) affective neutrality, b) word prevalence, c) word length in number of letters. First, there is strong evidence that words' affective properties can influence language processing and a variety of cognitive tasks (see Guasch, Ferré, and Fraga 2016; Stadthagen-Gonzalez, Imbault, Pérez Sánchez, and Brysbaert 2017). To minimize these extraneous influences, the words chosen as stimuli had to be neutral with respect to the two main dimensions of emotional content – valence and arousal. Valence describes how pleasant a stimulus is, whereas arousal refers to the degree of activation elicited by the stimulus (Guasch et al. 2016). Second, word prevalence as a measure of occurrence indicating what percentage of the population knows a word was shown to play an important role in word processing times (Keuleers, Stevens, Mandera, and Brysbaert 2015).

Stadthagen-Gonzalez et al. (2017) provided a set of norms for valence and arousal for 14,031 Spanish words. The authors also included measures of word prevalence – calculated as the percentage of respondents that knew the word. From this dataset, only the words that were known by 100% of participants and that were neutral on both valence and arousal were selected. To complement the data regarding word occurrence, the lexical frequency of Catalan words as reported by Guasch et al. (2013) was also taken into consideration. Further, it was checked whether the words had the same length in Spanish and Catalan, accepting a difference of maximum one character between the Spanish and Catalan words. Table 1 presents the properties of the stimuli used for the target categories.

The positive and negative stimuli were selected from those used by Dorantes Argandar, Ferrero Berlanga, and Tortosa Gil (2015). The valence of these stimuli was verified using Stadthagen-Gonzalez et al.'s (2017) set of norms so that negative stimuli have low valence scores, while positive stimuli have high valence scores (see Table 1).

The test consisted of seven blocks in which participants had to perform categorization tasks. The two category labels were displayed in the left and right upper corners of screens and participants had to press the left key (d) or the right key (l) to classify the word stimuli. Table 2 presents the categories of each block. To minimize order effects, blocks 1, 2, and 4 were switched with blocks 5, 6, and 7 for half of the participants.

Table 1. Means and standard deviations for the valence and arousal of the written words used as stimuli in the language attitudes IAT. Data extracted from Stadthagen-Gonzalez et al. (2017)

Category	Words			Valence		Arousal	
	Spanish	Catalan	English	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Stimuli for target categories	ajo	all	garlic	5.1	1.71	5.7	1.49
	eje	eix	axis	4.9	1.07	4.75	1.16
	fecha	data	date	4.95	1.1	4.8	2.31
	hervir	bullir	to boil	5.13	0.56	5.4	1.57
	hierro	ferro	iron	4.83	0.71	4.9	0.97
	rodilla	genoll	knee	4.9	0.55	4.4	1.14
Positive attributes	alegria	alegria	joy	8.35	1.69	6.75	2.51
	maravilloso	meravellós	wonderful	8.55	0.76	4.25	2.9
	placer	plaer	pleasure	8.18	1.2	6.55	3.25
	feliz	feliç	happy	8.3	1.47	5.73	3.06
	risa	riure	laughter	8.2	1.15	6.33	2.62
	glorioso	gloriós	glorios	7.45	1.05	6.45	2.35
Negative attributes	agonía	agonia	agony	2.3	1.36	7.75	1.12
	terrible	terrible	terrible	2.5	1.15	7.1	1.86
	desagradable	desagradable	unpleasant	2	1.26	7.4	1.19
	malísimo	dolentíssim	awful	2.1	0.91	7.4	1.05
	horrible	horrible	horrible	2.45	1.61	6.9	1.25
	dolor	dolor	pain	2.15	1.14	8.25	1.02

The participants' response latencies obtained in the two combined tasks (i.e., Catalan + positive attributes and Spanish + negative attributes, on the one hand, and Catalan + negative attributes and Spanish + positive attributes, on the other hand) were used to compute the D score – “an individual effect size monotonically related to Cohen's d'' ” (Nosek and Sriram, 2007, p. 393). The D score was computed using the procedure recommended by Greenwald et al. (2003).

Table 2. Block sequence of language attitudes IAT

Block	Type of block	No. of trials	Task	Stimuli assigned to left key (D)	Stimuli assigned to right key (L)
1	Practice	20	Target categorization	Catalan words	Spanish words
2	Practice	20	Attribute categorization	Positive words	Negative words
3	Practice	40	First block of first combined task	Catalan words + positive words	Spanish words + negative words
4	Test	40	Second block of first combined task	Catalan words + positive words	Spanish words + negative words
5	Practice	20	Reverse target categorization	Spanish words	Catalan words
6	Practice	40	First block of second combined task	Spanish words + positive words	Catalan words + negative words
7	Test	40	Second block of second combined task	Spanish words + positive words	Catalan words + negative words

Larger positive D scores indicate greater preference for Catalan over Spanish, while negative scores show preference for Spanish over Catalan. However, Blanton et al. (2015) studied IAT measures of racial and ethnic bias and argued that these are right-biased, in the sense that “such that individuals who are behaviorally neutral tend to have positive IAT scores” (p. 1468). Thus, they recommend caution when using cut points and to correct for right bias by regressing the D scores onto behavioral criteria and examine the intercept, as a positive intercept shows that participants who behaved neutrally in the study had positive D scores.

Explicit language attitudes. The explicit instruments were chosen to respond to the significant cultural and linguistic diversity that characterizes Catalonia. In this regard, we used a language attitudes questionnaire developed in the bilingual context of Wales by Sharp and his collaborators (1973) and adapted to Catalonia (González-Riaño et al. 2017; Huguet 2005; Madariaga et al. 2016) to

reflect the traditional Catalan-Spanish bilingualism. The questionnaire consists of two scales measuring attitudes towards Catalan and attitudes towards Spanish, respectively. Each scale is composed of ten dichotomous items, requiring participants to state if they agree or not with general statements about each language (see Appendix 1). The Cronbach's alpha coefficients obtained for the present study were .79 for the scale measuring attitudes towards Catalan and .48 for attitudes towards Spanish.

Attitude/Motivation Test Battery (AMTB). The Attitude/Motivation Test Battery (Gardner 1985) was also included in order to acknowledge the cultural and linguistic reality of over a quarter of the sample that is of immigrant origin. The mini-AMTB version (Bernaus and Gardner 2008; Bernaus, Wilson, and Gardner 2009) was used revised to measure participants attitudes and motivation towards Catalan and Spanish (see Wilson (2010, 2012) for more information regarding the use of the mini-AMTB to measure first language (L1), second language (L2), and foreign language (FL) attitudes and motivation). For each language there are 12 items measured on a 7-point Likert scale. These can be aggregated to form the major variables in the Socio-educational model:

- a) *Integrativeness.* An aggregate of attitudes towards speakers, interest in foreign languages, and integrative orientation, it measures participants' openness to other cultures and willingness to integrate in other communities. The Cronbach's alpha coefficients were .49 for Catalan and .83 for Spanish.
- b) *Attitudes towards the learning situation.* A composite of teacher evaluation and course evaluation, it had an internal consistency of .73 for Catalan and .83 for Spanish.
- c) *Motivation* included motivational intensity, desire to learn the language, and attitudes towards learning the language of interest. The Cronbach's alpha coefficients were .65 for Catalan and .56 for Spanish.

- d) *Language anxiety* measured the discomfort and concern felt by participants when using the language by aggregating their reported class anxiety and language use anxiety. The alpha coefficients were .75 for Catalan and .93 for Spanish.
- e) *Instrumental orientation* was a single-item measure capturing the utilitarian motives of learning and using a language.
- f) *Parental encouragement* was also a single-item measure.

Social desirability. The Marlowe – Crowne Social Desirability Scale (Crowne and Marlowe 1960) as adapted and validated by Ferrando and Chico (2000) was employed under its C Form – consisting of 13 dichotomous items.

Demographic data and other variables. A series of questions regarding socio-demographic aspects was included (i.e., gender, age, nationality, place of birth). An open-ended question was used to gather data regarding participants' home language. The answers were later grouped into four categories: Catalan, Spanish, bilingual Catalan and Spanish, other languages (e.g., Arabic, Bulgarian, Chinese, Romanian). Participants were given the option of using Catalan or Spanish to complete measures. This dichotomous variable aimed to capture their language choice.

Procedure

After approving the study, the Department of Education granted access to four schools located in Lleida. From each school a class was randomly selected, thus opting for a simple cluster sampling approach. The IAT and the questionnaires were administered online in the computer labs of each school, under the supervision of a member of the research team. The IAT was performed first, followed by the self-report questionnaires. This administration order was selected in order to avoid possible influences of prior tasks on implicit associations (Nosek, Greenwald, and Banaji, 2005). Participants needed around 30 minutes to complete all tasks.

The computer labs could accommodate between six and eight students at the same time. Students were invited to the computer labs by their teachers and the initial introduction to the study was carried out in Catalan as the language of communication in Catalan schools. Participation was voluntary and anonymous, following the ethical guidelines of the European Commission (2010). Once seated in front of a computer, participants could see a bilingual message inviting them to click on either Catalan or Spanish to further access the instructions of the IAT and questionnaires in the language of their choice.

Results

Implicit language attitudes

D scores were calculated following Greenwald, Nosek, and Banaji's (2003) algorithm. Accordingly, practice-block data (i.e., blocks 3 and 4) is also used. The differences between participants' mean response latencies in the two combined tasks (i.e., blocks 3 and 4 versus blocks 6 and 7) were scaled by the standard deviation of the response latencies pooled across the two conditions. The *D* scores have a possible range between -2 and 2. Positive *D* scores indicate greater preference for Catalan over Spanish, while negative scores show preference for Spanish over Catalan, with zero representing no difference between the two conditions.

The *D* scores of the present sample ranged between -1.10 and 1.23. The mean *D* score obtained was 0.24 (*SD* = 0.54). A one-sample t-test confirmed that the mean *D* score was significantly higher than 0 ($t_{(112)} = 4.70, p < .001$). In terms of effect size, it can be qualified as small (McKenzie and Carrie 2018; Nosek, Greenwald, and Banaji 2007). These results suggest a modest preference for Catalan over Spanish.

The D scores followed a normal distribution ($D_{(113)} = 0.07, p = .200$) with skewness of -0.38 ($SE = 0.23$) and kurtosis of -0.57 ($SE = 0.45$).

Furthermore, considering that Blanton et al. (2015) found that behaviorally neutral participants tend to have positive scores on IAT measures of ethnic and racial prejudice, we followed the procedure they proposed to investigate if the language attitudes IAT had a similar right bias as indicated by a positive intercept when the IAT is regressed onto behavioral criteria. The IAT was regressed onto the dichotomous variable language choice. The intercept was significant and negative ($b = -0.21, SE = 0.07, p = .003$), indicating that the language attitude IAT test does not seem to have a right bias.

Considering that the language attitudes IAT was the first one designed to assess attitudes towards Catalan and Spanish in Catalonia, it was considered necessary to verify if the instrument met the reliability requirements. The reliability of the IAT was estimated using the split-half method. Following the standard procedure (Schnabel, Asendorpf, and Greenwald, 2008), the D scores corresponding to blocks 6/3 and 7/4 were employed. The Spearman-Brown coefficient obtained was of .86, consistent with previous studies that found that split-half reliabilities usually ranged from .7 to .9 (Nosek, Greenwald, and Banaji 2007).

Relationships between implicit language attitudes and explicit attitudinal and motivational variables

Participants' IAT scores were correlated with their self-reported attitudes towards and the attitudinal and motivational variables composing Gardner's socio-educational model (1985) concerning both Catalan and Spanish. The explicit measures whose Cronbach's alpha coefficients indicated that the scales were not reliable were not included in the following analyses. Kolmogorov-Smirnov tests showed that the explicit measures did not follow a normal distribution (the test statistic ranged between 0.10 and 0.30, $p < .001$). Consequently, Spearman correlations were

computed. The corresponding descriptive statistics and the correlation matrices are displayed in Table 3 and 4, grouping variables regarding Catalan and Spanish, respectively.

The implicit measure correlated positively and moderately with the explicit measure of attitudes towards Catalan and with motivation to learn Catalan. The results also showed a small positive correlation between the D scores and parental encouragement and a negative moderate correlation with Catalan language anxiety. On the other hand, the only significant association found between the D score and explicit measures regarding Spanish was with Spanish language anxiety – namely a positive moderate correlation. Additionally, integrative orientation for Spanish correlated significantly with social desirability, although of a small effect size, while the D score did not.

Table 3. Means, standard deviations and correlations between variables regarding Catalan ($N = 113$)

	1	2	3	4	5	6	7	8
1. Implicit attitudes								
2. Explicit attitudes towards Catalan	.49*							
3. Attitudes towards the learning situation	.09	.18						
4. Motivation	.36*	.59*	.57*					
5. Instrumental orientation	.18	.33*	.15	.51*				
6. Catalan language anxiety	-.39*	-.49*	-.36*	-.55*	-.27*			
7. Parental encouragement	.24*	.49*	.34*	.52*	-.49*	-.41*		
8. Social desirability	.03	.12	.11	.13	.15	-.07	.03	-
<i>M</i>	0.24	6.50	4.80	5.15	5.76	2.59	5.03	6.21
<i>SD</i>	0.54	4.21	1.74	1.34	1.47	1.83	2.12	2.47
<i>Minimum</i>	-2	-10	1	1	1	1	1	1
<i>Maximum</i>	2	+10	7	7	7	7	7	13

Note: * $p < .05$

Table 4. Means, standard deviations and correlations between variables regarding Spanish ($N = 113$)

	1	2	3	4	5	6	7
1. Implicit attitudes							
2. Attitudes towards the learning situation	.08						
3. Integrative orientation	-.10	.29*					
4. Instrumental orientation	-.01	.24*	.62*				
5. Spanish language anxiety	.28*	-.35*	-.47*	-.35*			
6. Parental encouragement	-.05	.33*	.46*	.41*	-.26*		
7. Social desirability	.03	.15	.21*	.15	-.12	.15	
<i>M</i>	0.24	4.93	5.97	6.09	2.12	5.14	6.21
<i>SD</i>	0.54	1.65	1.17	1.04	1.51	1.82	2.47
<i>Minimum</i>	-2	1	1	1	1	1	1
<i>Maximum</i>	2	7	7	7	7	7	13

Note: * $p < .05$

The influence of home language on implicit language attitudes

A One-Way ANOVA analysis was conducted to examine differences between the four home language groups (e.g, Catalan, Spanish, bilingual, and other languages) for scores on the IAT (see Table 5). The analysis was robust to the different group sizes, as the IAT respected the assumptions of normality and homogeneity of variance.

Table 5. Means and standard deviations for the *D* scores depending on home language

Home language	<i>n</i>	<i>M</i>	<i>SD</i>
Catalan	50	0.54	0.36
Spanish	29	-0.22	0.54
Bilingual	13	0.41	0.47
Other languages	21	0.06	0.46

The results indicated that the IAT scores of the four home language groups differed significantly, $F_{(3,109)} = 19.62, p < .001$. Hochberg GT pairwise comparisons revealed that participants whose home language was Catalan preferred Catalan over Spanish significantly more than those whose home language was Spanish ($t_{(78)} = 7.30, p < .001, r = .64$) or some other language ($t_{(70)} = 4.19, p < .001, r = .45$), while the bilingual group had similar scores to the Catalan group ($t_{(62)} = 0.97, p = .908, r = .12$). As expected, the group with Spanish as their home language was the only one to show a preference for Spanish over Catalan. In this regard, their D scores differed significantly to those of the bilingual group ($t_{(41)} = -4.19, p < .001, r = .55$).

Discussion and conclusions

This paper aims to explore implicit language attitudes in the multilingual and multicultural context of Catalonia. The study presented is the first one to use the Implicit Association Test to assess the attitudes of young people living in Catalonia. It is worth noting that the IAT is an association test that allows one to deduce attitudes based on the strength of associations between attitudinal objects (Spanish and Catalan in the present study) and positive and negative attributes. Furthermore, it is a relative measure as it assesses evaluations of competing categories (Nosek 2005). Thus, the results do not indicate absolute attitudes towards Catalan and Spanish, but they establish relative preferences for one language over the other.

Overall, the D scores indicate to be a preference for Catalan over Spanish. The answers to the explicit language attitudes questionnaire also indicate general favorable attitudes towards Catalan. Regarding the implicit-explicit relationship, a moderate correlation between IAT scores and the explicit measure of attitudes towards Catalan was found, confirming hypothesis 1. Considering that implicit-explicit correlations have been reported between .24 and .47 (Hofmann et al. 2005; Nosek 2005), the correlation of .49 found in this study seems to indicate a relative high correspondence between the IAT scores and the explicit attitudes towards Catalan. This is consistent with theoretical and empirical data regarding the relationship between implicit and explicit evaluations – generally

considered to be distinct constructs that are systematically related (Hofmann et al., 2005; Nosek, 2005). Attitude strength and importance have been found to moderate correlations between implicit and explicit attitudes (Karpinski, Steinman, Hilton 2005; Nosek 2005). Language attitudes have been posited to be strong attitudes, especially when the attitudinal object is one's home language, and thus intricately connected to their cultural and linguistic identity (Ianos et al. 2017). Additionally, topics related to Catalan language and culture have been increasingly present in media as well as daily conversations. As a result, these are highly important attitudes which are likely to be elaborated – characteristics that increase implicit-explicit attitude correspondence (Karpinski, Steinman, and Hilton 2005).

Conceptual correspondence provides further interpretations of implicit-explicit correlations (Gawronski 2019). Increased correspondence between the implicit and explicit measures increases correlations between the two measures. In this regard, the IAT is a relative measure of preference, whereas the explicit attitudes scales were phrased per language. However, the latter included items counterposing the two languages, such as "Catalan is more important than Spanish", which may have determined a degree of conceptual overlap between the two measures.

Some of the attitudinal and motivational variables included in the Socio-educational model (Gardner 1985) were also significantly related with the IAT, confirming the first hypothesis. Namely, the IAT score was positively correlated with motivation to learn Catalan, aligning with the rich body of evidence on the intricate relationship between attitudes and motivation (Baker 1992; Bernaus, Wilson, and Gardner 2009), with attitudes often described as precursors of motivation (Gardner 1985).

The IAT scores were associated with language anxiety for both languages. Specifically, D scores indicating a higher preference for Catalan over Spanish were positively correlated with Catalan language anxiety and negatively correlated with Spanish language anxiety. Further studies are needed to understand if these results are moderated by language proficiency or language use –

understood as the frequency with which a language is used. For example, adolescents who have more favorable attitudes towards Catalan, have a higher Catalan proficiency and use Catalan more frequently were found to have less favorable attitudes towards Spanish and use Spanish less frequently (Ianos, Huguet, and Lapresta 2017).

The preference for Catalan indicated by the IAT, in addition to the favorable attitudes towards Catalan reported explicitly and the lack of significant correlations with social desirability could be indicative of correspondence between individual attitudes and cultural norms. In this regard, it is worth mentioning the various policies and campaigns promoting Catalan as linguistic common ground (Newman and Trenchs-Parera 2015; Trenchs-Parera and Newman 2015).

Although overall the results showed a preference for Catalan over Spanish, when taking home language into account, adolescents seem to show a significant implicit bias towards their home language. Participants whose home language was Catalan or bilingual Catalan and Spanish preferred Catalan over Spanish, whereas those with Spanish as their home language preferred Spanish over Catalan, confirming hypotheses 2a and 2b. According to the Associative – Propositional Evaluation model (Gawronski and Bodenhausen 2006), IAT scores correspond to associate processes where previously existing information is automatically retrieved from memory. This aligns with the influence of home language on implicit attitudes understood as a result of past experiences and feelings (Álvarez-Mosquera and Marín-Gutiérrez 2018). These findings are also consistent with previous research finding differences in explicit language attitudes depending on participants' home languages (Madariaga, Huguet, and Janés 2016). Similarly, the positive correlation was uncovered between the D scores and parental encouragement for Catalan mirrors González-Riaño et al.'s (2019) findings regarding the role of parents in the construction of language attitudes measured explicitly.

On the other hand, participants who spoke other languages at home (i.e, young people of immigrant origin) had scores that can be categorized as neutral, showing no preference for either of Catalonia's

official languages over the other. These findings seem to counterbalance some of the previous research arguing that students of immigrant origin have more positive attitudes towards Spanish than Catalan (e.g Madariaga, Huguet, and Janés 2016; Madariaga, Huguet, and Lapresta 2013). Larger samples would be necessary to confirm the results and to infer on their possible interpretation as a promising sign for Catalan's future vitality (Strubell 2001).

The aforementioned findings concerning the influence of the family environment on implicit language attitudes indicates that implicit language attitudes are shaped by environmental and cultural factors. It might be expected that for an individual there are more positive associations with the home language. Parents' linguistic and cultural identities and behaviors might shape their children's automatic associations. In this sense, "implicit attitudes reveal the power of cultures to reproduce themselves in individual minds and the futility of conscious protests to the contrary" (Uhlmann, Poehlman, and Nosek 2012, 250).

Cultural or environmental changes may prove more effective than interventions at individual level with regard to attitude change (Vuletic and Payne 2019). In this regard, it is critical that educational and linguistic policies focus on family and community contexts, acknowledging their role in shaping automatic associations.

These findings show the potential of studying implicit language attitudes in Catalonia. Not only is the IAT relevant for socially sensitive topics and politically charged contexts, it could also considerably change our perspective on phenomena including attitude change, the role of attitudes in language learning and language use. For example, studies that reported attitudinal changes - such as the longitudinal investigation conducted by Janos et al. (2017) with secondary education students of immigrant origin whose attitudes towards Catalan in the 4th grade were significantly more positive than in the 2nd grade – may discover that these changes were overestimated, seeing that explicit attitudes change faster than implicit ones (McKenzie and Carrie 2018).

Nonetheless, there are several limitations to this study. First, the sample focuses on Lleida, so caution is advised when generalizing the findings to different regions, such as Barcelona. Second, the sample is modest, especially concerning Catalan-Spanish bilingual participants and participants of immigrant origin with other home languages. The sample was also imbalanced with respect to gender. A higher percentage of girls than boys may reflect previous findings suggesting that women are more willing to participate in surveys and interviews (Groves, Cialdini, and Couper 1992). Further studies are needed to confirm the results with larger samples, balanced with respect to gender and home language.

Third, some of the scales, such as the explicit measure of attitudes towards Spanish were deemed unreliable and were removed from the analyses. More data is needed to examine the relationship between the IAT and explicit attitudes towards Spanish. Also, the AMTB was answered by both L1 and L2 speakers, although it was originally designed for L2 users. As there is limited research regarding the use of the AMTB to measure attitudes and motivation towards L1 (A. Wilson, 2010, 2012), caution is advised when interpreting the findings.

Fourth, participants were assumed to be competent in both official languages of the Autonomous Community, as they were in the final years of secondary education and the Catalan educational system was designed to foment bilingualism (Generalitat de Catalunya 2015). Future studies should incorporate objective measures of language proficiency, as well as self-perceived language proficiency in order to analyze how they relate to implicit attitudes and if they may affect the functioning of the IAT. Likewise, observed and self-reported language use may contribute to future research.

A thorough understanding of language attitudes phenomena needs both explicit and implicit attitudes. The hope is that the present study will contribute to future research regarding language attitudes and language-related behaviors in Catalonia, as well as in other regions of Spain.

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Appendix. English translation of the explicit language attitudes questionnaire

Attitudes towards Catalan

- (1) I approve of all the children in my town studying Catalan.
- (2) Learning Catalan is unpleasant.
- (3) Learning Catalan is useless because I may never use it.
- (4) We should all try harder to use Catalan more frequently.
- (5) Learning Spanish is more important than learning Catalan.
- (6) I live in a place where Catalan is spoken, so I must know, study and speak Catalan.
- (7) Only Catalan people should study Catalan.
- (8) Catalan is an ill-sounding language.
- (9) I like (or I would like) to speak Catalan.
- (10) I like listening to people speaking Catalan.

Attitudes towards Spanish

- (1) Spanish is a beautiful language.
- (2) In my town, we must know how to speak Spanish.
- (3) Spanish should only be learned and studied by Spanish speakers.
- (4) I like listening to people speaking Spanish.
- (5) In my town, other languages than Spanish should be studied.
- (6) Catalan is more important than Spanish.
- (7) Spanish is a language that is easy to learn.
- (8) Learning Spanish is boring.
- (9) Spanish should be taught in all countries.
- (10) In my town, we should speak less Spanish.