

Analysis of the relationship between students' proficiency level and their ability to identify figurative language: The effect of individual factors and extra-curricular activities

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Abstract

Abstract concepts are frequently expressed in natural language by means of metaphors, metonymies and other types of figurative language. Knowledge and appropriate use of these conceptual instances of actual language use by university graduates are related to L2 mastery, and therefore conceptual instruction is expected to facilitate L2 acquisition. The aim of this paper is to study ESP higher-education students' conceptual competence and its relationship to their overall L2 competence. An empirical study measures the students' ability to recognize metaphors and metonymies, including demographic, sociological and individual factors (including the effect of the informal learning of English language by means of extra-curricular activities) as interpretive data on such reflective figurative language recognition. Results indicate a significant difference in learners' figurative language interpretation across academic disciplines. In addition, English language proficiency and age, together with two sociological factors (regular English-related leisure activities and speaking English on the phone) are significant factors in figurative language recognition in a specialised University context. Age and leisure choices also turned out to be significant factors in figurative language identification and literal meaning choice. The findings of the present study have important implications for ESP practitioners regarding the teaching of metaphors and metonymies to their students, as well as learners when practising extracurricular English-related activities. It seems of relevance to insert figurative language recognition and use into ESP programs for L2/FL learners at all levels of English proficiency.

Keywords: metaphor, metonymy, figurative language, ESP, higher education.

Resumen

Análisis de la relación entre el nivel de competencia y la habilidad para identificar el lenguaje figurativo: el efecto de factores individuales y actividades extracurriculares

Los conceptos abstractos se expresan frecuentemente en la lengua por medio de metáforas, metonimias y otros tipos de lenguaje figurativo. El conocimiento y el uso apropiados de estos ejemplos conceptuales de uso real de la lengua por parte de estudiantes universitarios se relaciona con el dominio de la lengua segunda, o L2, y, por consiguiente, se espera que la instrucción conceptual facilite su adquisición. El objetivo de este artículo es estudiar la competencia conceptual de los estudiantes universitarios en un contexto de inglés para fines específicos (IFE) y su relación con su competencia general en la L2. Mediante un estudio empírico se mide la habilidad de los estudiantes para reconocer metáforas y metonimias, incluyendo factores demográficos, sociológicos e individuales (como el efecto del aprendizaje informal de la lengua inglesa por medio de actividades extracurriculares) entendidos como datos interpretativos acerca de esa capacidad de reconocimiento del lenguaje figurativo. Los resultados muestran una diferencia significativa en la interpretación del lenguaje figurativo en diferentes disciplinas académicas. La competencia lingüística y la edad, junto con dos factores sociológicos (la realización continuada de actividades de ocio en lengua inglesa y el uso habitual del teléfono para hablar en inglés) son factores significativos en el reconocimiento del lenguaje figurativo. Los resultados de este estudio tienen implicaciones pedagógicas relevantes respecto a la importancia de introducir el reconocimiento y el uso del lenguaje figurativo en los programas de IFE en todos los niveles de competencia lingüística. También presenta implicaciones para los aprendices de lengua que realicen actividades frecuentes en inglés.

Palabras clave: metáfora, metonimia, lenguaje figurativo, IFE, educación universitaria.

1. Introduction

As integral part of linguistic creativity, both metaphor and metonymy appear profusely in specialised language. They help highlight conceptual relations between entities and constitute a tool for effective communication of knowledge and research (Prelli, 1989). Metaphor has traditionally been defined within cognitive linguistics as a conceptual mapping where target and source domains do not have a common experiential superordinate domain (Lakoff & Turner, 1989, p. 103-104), working essentially through

domain substitution. On the other hand, metonymy has been considered more a cognitive apprehension of the relation between two concepts of particular relevance to communication (Barcelona, 2003).

The omnipresence of metaphor along with metonymy in specialised texts has been the object of frequent discourse research in the last decades, in fields such as Engineering (Berezin, 2018), Physics (Dalke, Grobstein & McCormack, 2006), Politics (Arntfield, 2008), Medicine (Dosani, 2021), Law (Wojtczak & Witzczak-Plisiecka, 2020) and Technology (He, 2021), among other fields. These studies evidence that regardless of their potential nature as mappers, both metaphor and metonymy point at referents through iconic or indexical relations (Panther, 2006, p. 148); these also replace source meaning with target meaning, and consequently displace the target frame or domain structure, which is important for the interpretation of a situation (Lakoff & Johnson, 1980). Such figurative processes create pragmatic inferences, which the reader interprets within such a frame.

When it comes to specialised texts and in English-based instruction to speakers of other languages, this would seemingly complicate the transmission of key concepts and data, as the conceptual frame is often unknown to learners. In L2 contexts, particularly in specialised domains, the nature of such figurative uses can be obscure to apprentices, as they often follow the received epistemological models in their fields of study (i.e., they may focus on particular terms rather than its context or its relation with other words), and language tends to be perceived as primarily literal or denotative. This perception actually distorts the position of language elements within the metonymy-metaphor continuum, and it prevents linking figurative and nonfigurative uses into a more comprehensive use of language as a richer tool for communication (Jiménez Muñoz & Lahuerta Martínez, 2017). As Gibbs pointed out, “tropes in everyday conversation” are used because much of our “thinking is constrained by figurative processes” (1993, p. 253).

This “figurative thinking” entails the “use of a query routine which assumes that an unknown expression might be figurative, or which asks what the implications of using a figurative expression might be” (2006, p. 6). This means that, while it may be true that understanding the literal meaning of a figurative expression is not needed a contextually appropriate interpretation, literal and figurative modes must be clearly set apart in the mind of the language user to avoid pragmatic misunderstandings. Without a fundamental

grasp of this divide (i.e., when figurative expressions such as *HOT UNDER THE COLLAR* are taken literally), L2 learners would fail to understand contextual expressions or, conversely, mistakenly extend literal meanings beyond an adequate scope of application, thus resulting in likely communication breakdown.

However, it has been noted in the literature that “how far language learners need to engage with the complexities” of figurative language to understand such “expressions remains unclear” (Littlemore & Low, 2006, p. 20). The study presented here attempts to shed some light on such an issue by linking how much L2 learners correctly identify as metaphor or metonymy to the potential individual reasons (such as language level, informal learning opportunities, such as pastimes and activities carried out in English) that may explain their performance. There has been virtually no research on such factors, and in those cases where the figurative ability of L2 users was explored (see next section) numbers have tended to be low and language proficiency markedly homogeneous. This study examines a large sample size of individual, demographic, and sociological factors, allowing for a more in-depth analysis of metaphorical and metonymical competence and the potential reasons behind it (in particular, the role of language proficiency in the conscious choices made by learners, and its statistical comparison with other individual factors). Additionally, it does so in a large spectrum of language ability (from beginner to proficient English competence) by asking participants to either identify expressions as literal/unique or adequately interpret a different context where such expressions would be suitable. This allows highlighting whether figurative thinking was at play in their choice, and it establishes not only a rate of successful metaphorical/metonymical interpretation, but also of the misidentification of figurative language as literal. Therefore, it is possible to establish a correlation between their choices and the factors behind them, so that learners and instructors could ultimately infer statistically which areas facilitate better the needed successful separation between literal and figurative modes, and implement these into their teaching-learning routines.

2. Literature review

Much literature regarding figurative language in L1 and L2 contexts has focused on the development of figurative competence with age. For

example, Magnusson (2013) reported that older L2 English students and Swedish monolingual students made greater use of grammatical metaphor, which establishes an implicit link between language proficiency and using figurative uses of the language; this tallies with other studies on the effect of age in adolescent metaphoric competence (Deckert et al., 2018; Willinger et al., 2019). For our study, these findings would imply that greater language proficiency (whether being a L1 or a more competent L2 speaker) aids to the critical separation of literal and figurative modes.

In formal learning, several studies have analysed specialised texts used in EFL instruction and proven the relevance of figurative discourse in academic disciplines. Jiménez Muñoz and Lahuerta Martínez (2017) carried out a cross-field comparison of a corpus of 150 Common European Framework of Reference for Languages (CEFR) B1 set texts to which undergraduates in Economics, Geography, and Chemistry at a Spanish university were exposed, showing the prevalence of metaphor-metonymy overlap in those areas of knowledge.

Other studies address the problems and difficulties figurative language may present to L2 speakers. Thus, Littlemore et al. (2010) carried out two experiments to examine the use of metaphor and metonymy by international students when making use of the metaphors in university lectures across a variety of academic disciplines; they concluded that metaphors are widely used in academic lectures, that they present difficulties to international students, and that most were unaware of these issues. The second study looked into the use of metonymy among members of a staff at a university, finding that “metonymy is used by members of a discourse community in ways that are unique to that community although there are also links with metonymic usages in the wider English-speaking community” (Littlemore et al., 2010, p. 208). Metonymy, thus, presented problems to L2 speakers attempting to enter the discourse community, and members of the community were equally unaware of these difficulties as monolingual staff never attempted to paraphrase their metonymies. Other studies (Azuma, 2005; Aleshtara & Dowlatbadi, 2014) showed a strong correlation between EFL students' knowledge of English vocabulary and general language proficiency and their ability to understand and use English metaphorical expressions. In our study, we have opted to make such literal vs. figurative identification clear by including the option to mark an expression as literal, so that we could measure whether participants made conscious choices between literal and figurative modes, and how successful they were in doing

so, which allows its alignment with language proficiency and other individual factors.

From a more pedagogical point of view, Doiz and Elizari (2013) studied the consequences of developing conceptual metaphor awareness for figurative language learning in the EFL classroom. Compared to traditional translation-based approaches, systematic presentation of the target figurative expressions improved comprehension and retention of the target vocabulary. In addition, this study showed that metaphor awareness is instrumental in the learning of new figurative vocabulary in English and the understanding of disciplinary content.

More recent studies also corroborate these findings in tertiary education. Liardét (2018) explored the different ways Chinese EFL learners evaluate meanings metaphorically in their academic argumentative writing, showing a gradual increase in the frequency of metaphors and steady development toward more metaphoric competence across two years of university study. Chen (2019) showed that learners receiving cognitive-based metaphoric mapping instruction significantly increased their retention and awareness of figurative language; moreover, high-intermediate learners made greater progress in noticing expressions with more abstract mapping relations. Additionally, metaphoric mapping instruction assisted learners at a lower proficiency level to acquire more advanced language ability, beyond their current level.

Most of these studies point to a significant progress in figurative awareness as students become more competent in the L2 or when they receive direct instruction, but virtually no research has analysed the effect of other background factors in their ability to identify figurative language. Our assumption is that both formal and informal L2 learning contribute to such figurative competence, and that while in-class strategies may be devised, out-of-class experiences may also be key. We also intuitively assume that learners in different degrees may also be distinct in their leisure and learning experiences (and that their disciplinary discourses and expectations may also vary), and therefore we analyse subject degrees separately, as well as the whole dataset. The novel contribution of this paper lies in the fact that it examines a larger number of individual, demographic, and sociological factors (proficiency level, degree, age, L1, period of time in immersive context, extra English courses taken, and leisure in general and as individual extra-curricular activities performed as interpreters of such L2 proficiency)

thus allowing for a more in-depth analysis of the reasons for individual metaphorical and metonymical competence. As a result, we do not only aim to analyse the impact of language proficiency in figurative competence in a more numerous cohort than in the studies above (and with a different L1, Spanish) but also to pinpoint whether language proficiency is also related to the identification of the literal-figurative divide, and what individual factors may provide an explanation.

3. Research questions

The research questions of the present study are formulated as follows:

1. Is there a relationship between students' proficiency level and their ability to identify figurative language?
2. Is there a relationship between students' proficiency level and their ability to identify terms as literal or non-figurative correctly?
3. Is there a relationship between students' proficiency level and their misidentification of a figurative expression as literal?
4. Are relationships formulated in RQ1, RQ2 and RQ3 affected by any particular individual factor in the dataset?
5. Are there any links between informal learning by means of extra-curricular activities and students' ability to identify figurative language?

4. Participants

The participants were 342 students majoring in Business, Chemistry and Geography at a Spanish University, 174 of whom were male and 168 female.

	Business	Chemistry	Geography	Total
Male	54	54	66	174
Female	60	72	36	168
Total	114	126	102	342

Table 1. Participant distribution by gender and degree.

The information collected in our questionnaire about age and L1 showed that a total of 16 students (4.68% of the total) were born before the 1990s and 24 before 1995 (7.02%). The bulk of the study population, 296, were born between 1995 and 1998 (86.55%), while only 6 Chemistry students (1.75%) were born in 1999. Standard Deviation (SD) in the age of participants was 4.667. Most students speak Spanish as their first language (320, or 93.57%). Only the Business cohort has some international students: 8 from Germany, 2 from The Netherlands, and 2 from the United Kingdom. Spanish students invariably progress from Spanish high-schools, which only ensures A2 level of competence, although studies show that their actual performance is closer to B1 if enrolled in an EMI degree (Hernández-Nanclares & Jiménez-Muñoz, 2017).

5. Methodology

During the month of February 2019, students from the three degrees were asked to complete a questionnaire and a test on the identification of figurative language. The questionnaire was common to these three degrees; it collected information about their degree, gender, age, L1, their use of English in an immersive context, their engagement in extra-curricular activities, and their current CEFR levels.

Most of the test of figurative language identification was specific to each degree; it consisted in a multiple-choice test designed by the authors so as to assess the ability to identify contextual usage of words regarding their figurative and literal meanings in three fields of study: Business, Geography and Chemistry. However, these three tests shared the same amount of literal, metonymical and metaphorical items. The data used for test development in the study came from a corpus of one hundred and fifty textbook and handbook excerpts (Jiménez Muñoz & Lahuerta Martínez, 2017), fifty from each of the fields of knowledge under study, used by the authors of this study in their own university ESP lessons.

These texts were analysed for metaphors following Steen's three-dimensional taxonomy (2011, p. 40), which allows for a distinction between the non-deliberate versus deliberate uses of metaphor and it includes two further oppositions between conventional versus novel metaphor (conceptual structure) and simile versus metaphor (linguistic form). Following such distinctions, we have considered that a metaphor is used deliberately when

users are aware of its foundation in a cross-domain mapping and opt for this figurative use, while a potential metaphor (v.g. ENGINE as the agent in a process) is used non-figuratively (car ENGINE) in the specialised domain. The frequency of an expression is analysed quantitatively using the BNC corpus and therefore tagged as conventional. The opposition between conventional and novel metaphors refers to the conceptual properties of metaphors; that is, there can be, potentially, expressions which are not part of conventional language use, and whose mapping offers novel ways to conceptualise objects or ideas. In our Business subcorpus, for instance, *WORD OF MOUSE* refers to online comments and ratings given by users through websites and social networks, repurposing *WORD OF MOUTH* into its technologically-updated version. Finally, the opposition between simile and metaphor refers to the primarily linguistic properties of metaphors, often marked linguistically by words such as *like* or *as*, among others. These criteria, based on Steen's taxonomy, were rigorously applied in each subcorpus to identify each type of metaphor.

For the analysis of metonymies in the texts we followed the key metonymy types in Radden and Kövecses (1999) taxonomy, as later adapted by Littlemore and Tagg (2018). Thus, a clear distinction between whole-and-part metonyms and part-and-part metonymies is kept. The former is further subdivided into things and part, scale, constitution, event, category and member, and category and property. Part-and-part metonymies (v.g. to DAMAGE your neck, a LOCAL newspaper) include action, perception, causation, production, control, possession, containment, location, sign and reference, and modification as major categories (Littlemore & Tagg, 2018, p. 6).

The test for each subject degree contained fifty short multiple-choice questions. Thirty out of the fifty questions were drawn from each of the three corpora and were specific to each field of study. Of these thirty questions, twelve items concerned metaphor (v.g. to SUPPORT the measure) and metonymy (v.g. to FACE an issue), while other six items were instances of specialized terms (terms with a unique specialized meaning in their domain, such as PLANET or CURRENCY). The other twenty items were common to the three tests and included metaphor, metonymy and specialized items from the three corpora.

Students were asked whether the word in bold could be linked to another meaning (out of three) or, alternatively, it was a literal use (i.e., specialised, denotative or technical). If they could think of a different use of the word

in any other context, they had to circle the option they thought correct. Otherwise, they had to circle the option “Specialized”. The test was introduced by some examples like the one below (where HEAD OF FINANCE is a whole-part metonymy operating in the Business domain) for a better understanding and clarification of the test items.

*She has a good **head** for numbers.*

a. Specialized

c. The member of a group

b. The person in charge of an organization

d. The front part of a boat

Students could not use any help; they were then given 30 minutes to complete both the background information questionnaire and this test on figurative language.

6. Results

Descriptive analysis

Regarding the amount of time spent in contact with English in an immersive context (such as living abroad), Table 2 shows that the largest percentage was found in “never”; that is, most students said that they have not spend any time in their lives using English for real communication (47.35%). This percentage was quite large, especially among Chemistry and Geography students (59.52% and 52.94%, respectively). It is worth pointing out that only the Business degree has a significant share of students who have spent long spells in immersive contexts, although the percentage is quite low: 7.02% have spent more than 1 year and 1.75% more than 4 years. SD was 1.510.

	Business	Percentage	Chemistry	Percentage	Geography	Percentage	Total	Percentage
Never	32	28.07	75	59.52	54	52.94	161	47.35
1 month	36	31.58	33	26.19	36	35.29	105	30.88
1-3 months	20	17.54	12	9.52	12	11.76	44	12.94
4-6 months	10	8.77	6	4.76	0	0	16	4.71
6-12 months	6	5.26	0	0	0	0	6	1.76
> 1 year	8	7.02	0	0	0	0	8	2.35
> 2 years	0	0	0	0	0	0	0	0
> 3 years	0	0	0	0	0	0	0	0
> 4 years	2	1.75	0	0	0	0	0	0
Total	114	100	126	100	102	100	340	100

Table 2. Time spent using English in an immersive context.

Table 3 below presents the results obtained regarding the information collected about the students' engagement with extra-curricular activities in English. As it can be noted, although the groups can be distinguished by the number of activities they perform, the distribution of activities by percentage of total number of activities performed shows some similarities between degrees. The three groups showed the largest percentage of activities in listening to music, followed by watching videos and visiting websites. The lowest percentage of activities for the three degrees was found in speaking on the phone/videoconferencing.

	Business	%Students	Chemistry	%Students	Geography	%Students	Total	%Students
Music	112	98.25	114	90.48	96	94.12	322	94.15
Books	32	28.07	12	9.52	24	23.53	68	19.88
Websites	74	64.91	48	38.1	66	64.71	188	54.97
Speaking	48	42.11	21	16.67	18	17.65	87	25.44
Phone	10	8.77	6	4.76	0	0	16	4.68
Emails	16	14.04	15	11.9	0	0	31	9.06
SocialN	56	49.12	24	19.05	30	29.41	110	32.16
Videos	102	89.47	93	73.81	96	94.12	291	85.09
Other	0	0	15	11.9	6	5.88	21	6.14
Total	450	43.86	348	30.69	336	36.6	1134	36.84

Table 3. Frequency of extra-curricular activities performed by students.

As aforementioned, students were also asked to report any official language certificates they held or complete self-reported CEFR scales (Council of

Europe, 2001) to best reflect current level in all four skills. As per Table 4, most students are between the B1 (lower intermediate, 34.5%) and B2 (upper intermediate, 30.99%) proficiency range, with great variation across levels. When considered separately, most Business students are at an upper intermediate level of proficiency (B2), whereas most Chemistry students are at a lower intermediate level (B1) and most Geography students could be considered beginners to lower intermediate (A1-B1). Advanced and proficient students are only found in Business and Chemistry, being their percentage in any case comparatively low.

CEFR	Business	Chemistry	Geography	Total	Percentage
A1		21	36	57	16.67
A2	4	18	18	40	11.70
B1	34	54	30	118	34.5
B2	58	30	18	106	30.99
C1	14	3		17	4.97
C2	4			4	1.17
Total	114	126	102	342	100

Table 4. Student CEFR levels.

There were other differences in the data collected for the participants in these groups; we calculated the mean and standard deviations for the background information collected in our questionnaire related to age, number of extra-curricular activities, L2 hands-on experience, extra courses and English level for the three degrees (see Table 5 below). The oldest students were those in Geography (mean 22.88). With respect to the performance of extra-curricular activities, the highest mean was found in Business (mean 4.18 years), followed by Chemistry (3.19), and finally Geography (2.24). The Business group had also received more extra lessons (mean 4.19 years). With respect to their English proficiency, the mean level for Business is B1 or lower intermediate whereas for both Chemistry and Geography, is A2 (beginner). For statistical purposes, CEFR data are normalised as per standard procedures.

		Age	Number of extra-curricular activities	L2 hands-on experience (months)	Extra lessons (years)	English level (CEFR 1-6)
Business	Minimum	19	2	0	0	2 (A2)
	Maximum	42	8	60	8	6 (C2)
	Mean	20.7	3.95	4.18	4.19	3.82 (B1)
	SD	3.615	1.46	8.81	2.95	0.83
Chemistry	Minimum	24	1	0	0	1 (A1)
	Maximum	30	8	6	7	5 (C1)
	Mean	20.44	3.19	0.83	2.71	2.81 (A2)
	SD	1.01	1.49	1.48	2.50	1.06
Geography	Minimum	19	1	0	0	1 (A1)
	Maximum	61	4	3	7	4 (B2)
	Mean	22.88	2.24	0.71	2.76	2.29 (A2)
	SD	10.16	0.83	0.95	2.86	1.16

Table 5. Mean and standard deviations for age, extra-curricular activities, L1 experience, extra courses and English level.

Table 6 below shows the mean and standard deviation of each individual extra-curricular activity for the three degrees under study. It shows that the highest mean for all three degrees corresponds to listening to music, followed by watching videos and visiting websites.

		Music	Books	Websites	Speaking	Phone	E-mails	Social Net	Videos	Other
Business	Mean (%)	98.24	28.07	64.91	42.11	0.88	14.04	49.12	89.47	0
	SD	1.31	4.53	4.87	5.12	2.94	3.52	5.23	3.13	0
Chemistry	Mean (%)	90.47	0.95	38.09	16.67	0.48	11.9	19.05	73.81	11.9
	SD	3.12	3.42	4.96	3.28	2.21	3.31	4.11	4.51	3.32
Geography	Mean (%)	94.11	23.53	64.71	17.6	0	0	29.41	94.11	0.06
	SD	2.41	4.44	4.92	3.92	0	0	0.47	2.42	2.44

Table 6. Mean and standard deviations for each extra-curricular activity.

The mean score (i.e., how many right choices were made) and mean literal choice (i.e., how many elements were thought to be literal) obtained in each degree were compared. As we can see in Table 7, stark differences (more visible in Figure 1) were found: the Chemistry group achieved a higher score in their identification of figurative tropes, followed by Business and Geography.

Degree	Mean score	SD	IQR	0%	25%	50%	75%	100%	n
Business	17.72	6.33	8	5	13	17	21	31	104
Chemistry	20.36	4.58	7	7	11	17	21.5	24	126
Geography	14.35	4.03	6	9	11	14	17	23	102

Table 7. Mean score and distribution per degree.

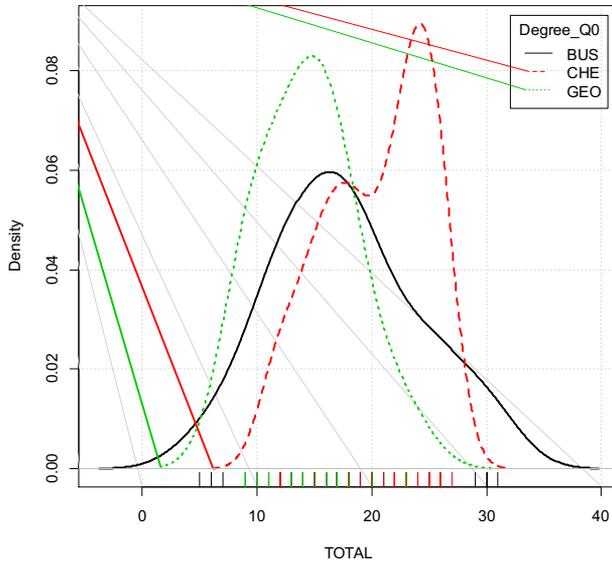


Figure 1. Figure identification score density per degree.

With respect to the percentage of literal meaning choices per degree, Table 8 and Figure 2 show that the highest mean was found in Geography, followed by Chemistry and, finally, Business. Geography undergraduates were the ones who more frequently mistakenly identify specialized terms, which reveals that the figurative-literal divide is still a problem for them, and that their approach to specialized language assumes more literal uses than actual disciplinary discourse contains.

Degree	Avg. score	SD	IQR	0%	25%	50%	75%	100%	n
Business	36.63	15.8	16	9.5	20	34.5	40	44	104
Chemistry	40.71	8.84	9.5	20	34.5	40	44	68	126
Geography	44.82	13.71	16	24	36	42	52	72	102

Table 8. Literal meaning identification by degree (in quartiles).

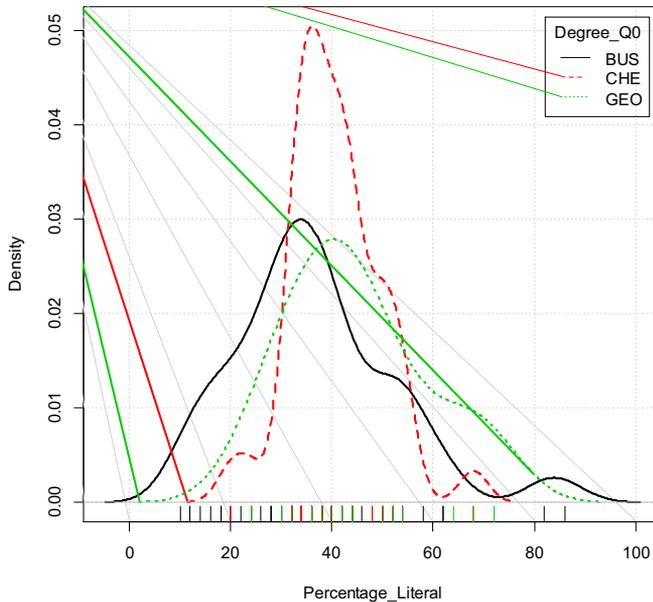


Figure 2. Literal identification score density per degree.

Statistical analysis of test scores

Data were analysed using SPSS (version 27.0, IBM Corp.). Test reliability was calculated on the full dataset, ranging from acceptable to high (Cronbach's alpha = .66–.81). An a priori power analysis, using the effect sizes from pilot data determined the sample size needed to have a power of .80 to reveal effects, if they existed. All inferential analyses were run with standard alpha set at .05 (i.e. 95%). Means are analysed per primary variables, as highlighted in the literature and specified in the research questions above (i.e. language level, gender or age), and a Pearson linear correlation analysis was employed to calculate the correlation between those background variables regarding informal learning experiences and leisure choices (see Table 15). This

approach allows apprehending differences in subgroups with a common trait (v.g, being B1 and studying Chemistry) to identify particular cases that, later on, may deserve pedagogical interventions focused for such demographic, and to determine whether progression exists as language proficiency increases. Additionally, it enables the identification of those informal learning activities with a greater impact on the ability to use figurative language more accurately. Results above will help answer the research questions already put forward by the study.

The first research question wondered whether there was a relationship between student proficiency level and their recognition of figurative tropes in any of the three degrees. The results obtained confirm that the proficiency level had a positive effect on the scores. As per Table 9 below, the higher the student level the higher the overall test score is, which gives empirical support to what previous studies seemed to indicate in terms of language proficiency being linked to figurative identification in context.

LEVEL - Mean Score	BUS	CHE	GEO	ALL
A2	12.5	18.62	13.89	15
B1	14.71	20.11	12.6	15.81
B2	18.79	22.5	18.67	19.99
C1	18.71	26		22.36
C2	29.5			29.5
Mean Score	18.84	21.81	15.05	20.53

Table 9. Students' language competence and figurative trope identification.

The second research question explored the link between students' proficiency level and their ability to identify literal uses correctly. The misidentification of figurative language as a literal use tends to diminish as level increases (see Table 10 below). This is evident both in general and when degree results are analysed separately, despite slight variations in the intensity of such changes per increasing level of competence.

LEVEL - % literal	BUS	CHE	GEO	ALL
A2	58	19.77	22.33	33.37
B1	15.76	20.38	23.6	19.91
B2	19.93	21.1	20.67	20.57
C1	15.71	20		17.86
C2	15			15
Mean %	24.88	20.31	22.2	21.34

Table 10. Students' level of competence and their choice of literal meanings.

A third objective of this study was to examine whether the effect the students' proficiency level had on their misidentification of a figurative expression as literal. As Table 11 shows, it can be discerned that fewer wrong literal choices are found as level increases, which implies that students become more aware of context as their English proficiency increases. We also found here some marked differences among degrees and proficiency levels: the overestimation level (i.e., which percentage of expressions were incorrectly thought to be literal, which reveals that they fail to grasp the figurative-literal divide) in Business is very high at A2, but it decreases sharply as proficiency increases, whereas in Chemistry and Geography such an overestimation level is lower at A2, but it diminishes less strongly, or even fluctuates.

LEVEL - % overestimation	BUS	CHE	GEO	ALL
A2	+38.05	+19.86	+23.5	+27.14
B1	+11.53	+20.78	+29.2	+20.5
B2	+19.86	+22.21	+23.33	+21.8
C1	+11.43	+20.02		+15.73
C2	+10.02			+10.02
Mean %	+18.16	+20.72	+25.34	+21.41

Table 11. Students' proficiency level and their wrong literal choice.

The fourth research question in this study concerned the effect of individual characteristics, such as gender, on the student ability to identify figurative and specialized meanings correctly, and on their misidentification of a figurative expression as literal. No significant difference was found between males and females; gender did not affect the students' wrong literal choice either.

Gender	Score	Literal (rel. %)	Literal overestimation
Female	18.25	39.1	+19.3
Male	18.11	39.53	+19.93

Table 12. Means for test score and literal choice per gender.

However, when students are grouped by age some differences and trends can be observed (see. Table 13 below) in both their ability to identify figurative and literal meanings. The highest score was found among the youngest participants and the lowest score corresponded to the oldest ones. Also notably, literal meaning was the preferred option by the older students, who consequently tended to overestimate terms (v.g. AGENT or WORKSHOP) as literal and unique to their domain.

Age	Score	Literal (rel. %)	Literal overestimation
Over 27 (<1990)	17	56.5	+37.5
23-26 (1990 – 1994)	21.44	31.56	+11.8
19-22 (1995 – 1998)	17.85	38.29	+19.17
18 (1999)	22.5	61	+41

Table 13. Means for test score and literal choice per age.

A Pearson linear correlation analysis was carried out to examine the relationship between the factors collected (degree, age, L1, period of time in immersive context, extra English courses taken, CEFR level and leisure in general and as individual extra-curricular activities performed), students’ figurative meaning score and their literal meaning choices (Table 14 below). This analysis revealed a very moderate positive impact on the score with *Leisure* and *Level* categories, the correlation with leisure being relatively stronger (0.35026698). No remarkable impact on the percentage of literal meaning selected by students was found. E-mails, reading books, and face-to-face speaking are more relevant than the rest of extra-curricular activities. In the case of percentage of literal choices in students’ responses, there are no strong correlations to be mentioned.

	Score	% Literal
Degree	-0.08070081	0.21806379
Age	0.06590989	-0.19798091
L1	0.22956517	0.06837943
Leisure	0.35026698	-0.02467832
Months	0.16145198	-0.01145796
Extra	0.01984099	-0.17323622
Level	0.31280431	-0.13929223
Music	-0.00618924	-0.17311997
Books	0.17647053	0.03864142
Websites	-0.00478443	-0.08443342
Speaking	0.18732953	-0.17164996
Phone	0.1117058	0.1682127
Emails	0.2027941	0.05854121
SocialN	0.03005351	-0.01296878
Videos	0.14193263	0.02392322
Other	0.1348788	0.08100109

Table 14. Correlation between figurative score, literal choice and individual factors.

The last research question in this study explores the effect of informal learning (extra-curricular activities) on the students' ability to identify figurative language. Table 15 below shows the mean score and mean literal meaning choice for each individual activity, per degree. As it can be observed, when degree is not observed as a clustering factor, students regularly writing emails in English had the highest mean scores, and using social networks correlates with the highest percentage of literal choices. When each degree is considered separately, it could be noticed that in all the degrees the highest mean score was found in those who regularly spoke English on the phone (or videoconferencing). With respect to choice of literal meaning, the highest percentage was found in those using social networks in Business and Geography, and those in Chemistry who usually speak English face-to-face with others.

Extra-curricular	BUS		CHE		GEO		ALL	
	Mean Score	Mean % literal						
Music	17.82	36.17	20.63	41	14.44	44.38	17.63	40.52
Books	21.13	37	22.29	41.43	13	52	18.81	43.48
Websites	18.76	36.86	20	41.13	14	31.5	17.59	36.5
Speaking	21.04	35.58	20.13	46.25	16	44	19.06	41.94
Phone	21.8	51.2	26	34	16	44	21.27	43.07
E-mails	21.75	40.75	21.4	41.2			21.58	40.98
SocialN	18.32	37.86	19.9	42.4	14.34	61.34	17.52	47.2
Videos	17.94	36.86	19.89	40.56	14.64	47.27	17.49	41.56
Other			22.5	38.34			22.5	38.34
Mean	19.82	39.04	21.42	40.7	14.63	46.36	19.27	41.51

Table 15. Students' test scores and literal choices per informal learning tasks.

A subsequent confirmatory factorial analysis also hints at the effect of these activities on student performance. 21.248⁰% of variation in cases are strongly explained by the amount of English-related leisure activities undertaken regularly (sig. 0.798) and their language proficiency (sig. 0.755), while 13.154% are relatively explained by being younger (sig. -0.383) or speaking English on the phone regularly (sig. 0.347).

7. Discussion

The aim of the present paper was to examine and quantify the impact of individual background factors such as language proficiency and informal learning experiences on the recognition and use of two figurative tropes, namely metaphor and metonymy, as figurative language in a university ESP context. This also allows discerning differences among subject degrees, and to anticipate some of the problems undergraduates with a specific set of characteristics may experience when reading discipline-specific texts in English.

Considering overall score (see Tables 7 and 8), our findings indicate marked differences in figurative trope competence according to discipline and degree, with Chemistry undergraduates performing better and Geography students most frequently misidentifying literal terms. This points to a difference in figurative language interpretation skills among students from

various academic disciplines, which calls for further research into the separate discourse and affordances in these disciplines so that field-bound pedagogical interventions can be devised. This approach would highlight the importance of figurative language in ESP design, and would deviate from any pedagogical inclination to consider technical English (i.e. literal or denotative) the primary communication mode in ESP.

A relevant finding of this study was that English language proficiency and age, together with two sociological factors (namely, English-related leisure activities undertaken regularly, and frequently speaking English on the phone/videoconferencing) can be moderate predictors in figurative language recognition in a specialised University context. In our study we first considered the relationship between English proficiency level and ability to identify figurative language. The results obtained revealed a positive correlation of the proficiency level on the students' test scores so that it may be inferred from means distribution (see Table 9) that the higher the student level the higher their metaphoric and metonymic competence. In addition, the misidentification of figurative language as a literal use tended to diminish as proficiency increased, and fewer incorrect literal choices (i.e., non-technical terms less frequently mistaken for technical, unique words) were found in higher competence levels, which implies that as their English proficiency increases, students also become more aware of context, and they are better able to identify figurative and literal interpretations of a term in its usage-circumscribed context of appearance (see Table 11).

By studying *both* metaphor and metonymy, our results partially corroborate those obtained by Aleshtara and Dowlatabadi (2014) and Azuma (2005), who showed a strong correlation between EFL students' knowledge of English vocabulary and their metaphorical competence, and Liardét (2018), whose study revealed an increase in the frequency of metaphors and a gradual development toward more metaphoric competence among EFL learners across two years of university study.

Regarding the correlation of the rest of the factors examined on figurative language recognition and leisure options turned out to be acting factors in figurative language identification and literal meaning choice. Specifically, the highest score in figurative language identification was found among the youngest participants and the lowest score corresponded to the oldest ones (see Table 13). Literal meaning was the preferred option by the older students, who also misinterpreted these in many occasions. This result

fundamentally disagrees with studies carried out with younger informants; both Magnusson (2013) and Willinger et al.'s (2019) assertion that metaphor identification and comprehension invariably increase with age seems to be applicable to the transition to adolescence, but not necessarily be the case with adult learners.

This study was also designed to gauge the effect that the informal learning of English language might have on reflective figurative language recognition and wrong literal misidentifications – which is largely understudied empirically in ESP contexts. Findings reveal that students regularly writing emails in English showed highest figurative language competence and those using social networks most often made an incorrect identification of a figurative expression as literal. On the other hand, when each degree was considered separately, the highest mean score in all degrees corresponded to students who reported regularly speaking English on the phone/videoconferencing. With respect to choice of literal meanings, the highest percentage corresponded to those using social networks in Business and Geography, and speaking English face-to-face in Chemistry.

Most authors have focused on language proficiency as a determining factor in figurative competence, but not so much on how such proficiency has been acquired (esp. informal vs. informal learning) or whether a distinct mindset was at play. For instance, Aleshtar and Dowlatabadi (2014), who focused on the concept of metaphoric competence and its essential role in L2 acquisition, argued that higher language proficiency students are more aware of the need to acquire a solid English competence for their future careers and do more extra-curricular activities. This points out, like does our study (see Tables 7 and 8, and Figures 1 and 2), at mindset or aprioristic differences in the approach to language or language conceptualization on the part of ESP students (which seem to be also discipline-bound), perhaps worth exploring further from a more psycholinguistic angle. It also stresses the need to include the teaching of metaphorical expressions in disciplinary content to improve students' figurative language competence – which is as important as communicative and grammatical competences (Littlemore & Low, 2006).

The results of our study are indicative that once L2 learners have reached a reasonable and acceptable level of L2 proficiency (set here between CEFR B2 and C1, as per Table 9 above), they are able to understand metaphorical and metonymic language; results highlight that students below B2 may have

greater difficulty in discerning the difference between figurative and literal expressions in a tertiary-education context. In addition, regular English-related leisure and communication have revealed themselves as potentially beneficial (see Table 15) in undergraduates' figurative-language recognition across different degrees – which may potentially impact their academic performance. This is an interesting result, as it points to new unexplored ways in which language learners (perhaps in a more individualised manner) can be helped to identify, interpret, and make use of, the functions of metaphor and metonymy via both direct instruction and informal learning.

The study has some limitations. First, learners were given limited time to answer a complex questionnaire, and memory or speed may have affected its completion. However, all questionnaires were filled in time and no student asked for an extension. Also, regarding age, the result obtained may be explained by the fact that among the older undergraduates in our sample there may be students who have fallen behind academically or those who have chosen to go to college later in life, but such data was not collected. Finally, as it regards analytical methods, the separation of metonymy and metaphor into two different analyses and a heightened focus on the statistical relevance for each subgroup (v.g. Geography students with B1 level, for which a large-scale study would be needed) would be of use to explore learner differences further.

8. Conclusion and pedagogical implications

Genre-specific metaphor and metonymy extend the meanings of conventional lexis; its prevalence in academic and discipline-specific texts makes figurative language a research issue worth studying. The analysis of figurative discourse may help us to shed some light on learners' figurative competence and help devise strategies to deal with its acquisition. The findings presented here allow us to conclude that individual factors like the participants' English proficiency level, demographic factors like age, and sociological factors like English-related leisure activities and speaking English on the phone have a positive effect on ESP students' metaphor and metonymy identification and comprehension.

There are also implications for the ESP practitioners regarding the teaching of metaphors and metonymies to their students; in the light of results here, it seems of relevance to insert figurative language recognition and use into

ESP programs at all levels of English proficiency. In this vein, Boers (2000) suggests that it is essential to draw students' attention to the source domain or origin of the figurative expressions they come across in their specialised reading, and proposes to "include explicit reference to the literal sense or origin, grouping figurative expressions under their source domains, and questioning the validity of the underlying analogies" (2000, p. 145).

Littlemore et al. propose "to highlight the use of metaphor and metonymy by particular discourse communities, and to help their students to prepare for it. Not only LSP students need to know that their target discourse community will make use of its own specific lexis, but also that the meaning of mainstream lexis may be extended via metaphor and metonymy" (Littlemore et al., 2010, p. 208). ESP teachers need to teach their students the metaphorically and metonymically extended meanings characteristic of their specialized discipline and, at the same time, help them develop the kinds of strategies they need to work out the meanings of such usages when they encounter them. Roldán-Riejos and Úbeda also argue that it would be advisable to concentrate on metaphor as a learning feature by offering students corpora-driven examples of metaphor visibility "addressing non-verbal elements, such as sketches, drawings, designs and pictures where metaphor may be used" (2013, p. 107).

Our study shows that such pedagogical focus is needed to highlight the differences between figurative and literal uses, and it offers a method to assess the figurative competence of a group of ESP students. A similar discipline-specific test can also be used to reflect about some of these figurative uses in a teaching-learning context. The findings of the present study can help students and University instructors gain a more in-depth understanding of how features of figurative language are employed by learners at different stages of EFL competence in higher education. However, this is a relatively unexplored domain that calls for further research. More contrastive studies are needed to confirm the effect of the factors examined regarding figurative competence, and how it may be more successfully fostered.

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