EL RIESGO PSICOSOCIAL DE FOSILIZACIÓN EN EL USO LABORAL DEL INGLÉS NO NATIVO EN TECNÓLOGOS DE INFORMÁTICA Y TECNOLOGÍA DE ARGENTINA.

PSYCHOSOCIAL RISK OF FOSSILIZATION BY OCCUPATIONALLY-USED NON-NATIVE ENGLISH IN INFORMATION AND COMMUNICATION TECHNOLOGISTS OF ARGENTINA.

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Resumen:

Objetivo. Las empresas utilizan una lengua no nativa como una herramienta de servicio, y ello puede implicar riesgos psicosociales en el trabajo. Al usarse la interlengua en situaciones comunicativas empobrecidas puede llegar a la fosilización. Esto implica un efecto laboral adverso pues impacta a la productividad y la salud en el trabajo. Por lo tanto, el objetivo es establecer los factores de riesgo psicosocial en el uso de esta herramienta.

Métodos. Se analizaron 348 tecnólogos de la información y la comunicación (TIC). Todos hispanoparlantes con audición normal, y que usaban el Inglés como herramienta de trabajo. La edad, el género, las etapas de adquisición y los errores de la segunda lengua registraron relación con el riesgo de fosilización. Los métodos estadísticos se aplicaron para los datos categóricos ($p < 0,05$).

Resultados. Después de los ajustes por género y edad, se encontró una asociación inversa significativa entre las fases L2 y el riesgo de fosilización ($p < 0,0001$), con un mayor riesgo en las etapa de adquisición de la segunda lengua. Además, los errores en L2 mostraron una relación directa significativa con el riesgo de fosilización ($p = 0,0005$).

Conclusiones. Las etapas de adquisición de una segunda lengua presentan un riesgo psicosocial superior por la posibilidad de fosilización posiblemente debido a la actuación coloquial mecánica por los formatos comunicativos empobrecidos. Estos resultados tienen alto impacto sanitario dado la demanda masiva de estas habilidades profesionales.

Palabras claves: Bilingüismo; cognición; etapa de la lengua; aprendizaje; salud en el trabajo.

Abstract

Aims. Companies use non-native language (L2) as a service tool, and they may incur in occupational psychosocial risks. Interlanguage can be chronic under poor communicative situations, leading to fossilization. It could be an adverse effect because of its impact in productivity and occupational health. Thus, our aim was to establish factors of this psychosocial risk.

Methods. 348 information and communication technologists (ICT) were analyzed. They were native Spanish speakers with normal hearing, and used English as a work tool. Age, gender, L2 stages and errors were recorded in relation to fossilization risk. Statistical methods were applied for categorical data ($p<0.05$).

Results. After gender and age adjustments, a significant inverse association was found between L2 stages and fossilization risk ($p<0.0001$), with higher risk being in the acquisition stage. Also, L2 errors showed a significant direct relation with fossilization risk ($p=0.0005$).

Conclusions. Summing up, ICT in acquisition L2 had upper psychosocial risk to fossilization with mechanistic execution of it, under poorer communicative formats. This results have high sanitary impact given they involved a massively demanded professionals.

Keywords: Bilingualism; cognition; language stage; learning; occupational health.

Background

In accordance with Cifarrelli et al., the generation of a product or service depends on performers, with their productivity and health being integrated[1]. Moreover, labour conditions can impair the functional health of workers, when they are asked to respond duties without adequate training. In this sense, the production of labour services by foreign language use might represent a psychosocial risk for non-native speakers[2].

Two main issues are related to this phenomenon. Firstly, productive use of a second language (L2) requires its identification, measurement and evaluation to establish competitiveness [3][2].Bilingual performance involves a skill development in L2 by progressive learning process [4]. Secondly, intellectual skills and technical knowledge of human resources are difficult to be assessed[3], as L2 acquisition is not always guaranteed, such in case of the matrix or origin language (L1)[5].

L2 acquisition has been standardized[6], with an initial level of limited communicative performance and vocabulary and simple grammatical structures. Then, it progresses to an advanced level, with competent and versatile performanceto address different communicative situations, including degraded messages,unexpected content and low acoustic redundancy [6][7][8][9][10].A basic L2 user (beginner and elementary levels) executes pre-established communication formats in regard to its role, linguistic content and auditory processing. After that, it is constituted a linguistic system called interlanguage[11], when user generates unclearly their messages from L1to L2 assuming that as correct [5]. This stage implies permanent production of linguistic mistakes, which do not belong to either L1 or L2 and leading to fossilization [5][10][12]. On the other hand,role exchange, variability and unpredictability are supported with open formats in competent users (upper intermediate and advan ced levels) [10], with L2 being constructed comprehensively.

Fossilization is a limiting factor for cognitive innovation and communicative challenges[5][10].Given neurobiological data, it involves deficient neuron incorporation into new integrative systems, as it was shown by the neurogenic impact of significant task learning[13]. Thus, it can signify a psychosocial risk, which can be added to alienation, monotony, lowcreativity and poor autonomy with basic L2command.Cognitive abilities of innovation and sion-making are compromised[14], which must be considered in occupational health and safety programs [1]. In consequence, it is imperative to determine the appropriate L2 stageto be productive and avoid fossilization.

There is a risky population which highly uses English L2 as work skill. They are information and communication technologists (ICT) working in globalized Argentinean companies, whose primary resource is language. They are professional speakers who provide client services. Given the above background, our aim was to analyze epidemiological and communicative markers as labour psychosocial risk factors in normal hearing ICT, depending on the bilingualism stage.

Methods

Subjects: 348 adult ICT of both genders (native Spanish speakers who were system engineers working in customer care via telephone in English L2) were analyzed in two large Argentinean cities (Cordoba and Rosario), as inclusion criteria, excluding non-permanent users.

Ethical aspects: This investigation was approved and monitored by the Ethic Committee of the National University of Cordoba (CE-HNC n°1-99/n°103, 2010), and by the Health Ministry of the Province of Cordoba (REPIS n° 475, 2010).

Methodological design:According to Common Framework of Reference for European Languages and the Association of Language Testers in Europe[6], three types of users in L2 were subdivided in two levels of performance depending on four language skills (listening-speaking, reading-writing): initial, elementary, pre-intermediate, intermediate, upper-intermediate and advanced. Then, L2 stages were defined: in acquisition, in development (interlanguage) and stabilized[5]. In addition, L2 errors were recorded, including: incorrect grammatical aspects, failures of understanding, limited vocabulary, inadequate verb conjugation, phonetic-phonological inaccuracies and/or inadequate intonation [12].

Study variables:

Stages of L2: After being evaluated, ICT were classified as:

a. In acquisition: Verbal and written performance compatible with initial and elementary or pre-inter-

mediate levels.
b. In development: Verbal and written performance compatible with intermediate level.
c. Stabilized: Verbal and written performance compatible with aupper- intermediate or advanced levels.

Psychosocial risk determinants for the L2 (fossilization): According to working conditions of communication (enriched: open format; impoverished: close format), they were classified as follows:
a. Absent risk: Conditions of low predictability with regard to messages and roles, with immediate possibility of being assigned.
b. Present risk: Conditions of high predictability (pro-forms), with certain disparity in oral and written performances.

Errors in L2: These markers involved imperfect performances for any aspect of the L2, which were related to semantic decoding-coding and syntactic-phonologicalcoding. Errors included: limited or poor vocabulary, structural failure in sentence construction, repetitive expressions to understand, confusion between grammatical categories and verbal conjugation, misunderstanding, unclear ideas, Spanish interference. Therefore, they were classified as Present or Absent.

Statistical Analysis: Frequencies of each variable category of language and communication were analyzed to establish significant associations at $p<0.05$. It was used the Chi-square test, followed by the adjustment of the corresponding logistic regression models using fossilization risk as dependent variable depending on L2 performance categories (error presence and stage), adjusting them by age and gender. Fossilization risk was grouped by a classification tree method. The Infostat v.2012 software was utilized for the probes[15].

Results

Sample characteristics: Subjects were 74% males and 26% females, with age ranges of 25-35 (85%), 36-46 (14%),>46 (1%) years-old. Gender was significant factor for the L2 stage. Men exhibited lower acquisition level with an OR=0.47 (Wald95%=0.25-0.87, $p<0.02$) for this variable. Thus, the gender effect was controlled in subsequent regression models, where age did not show effects on psychosocial risk.

Concerning psychosocial fossilization, L2 stages were the main grouping criteria, followed by error, which allowed the sample to be grouped into spe-

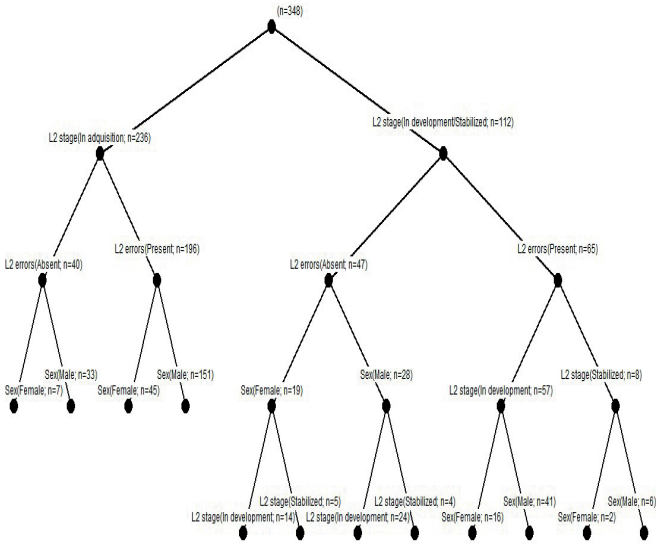

Fig.1 Fossilization-related classification tree of non-native English speaking I+C technologists from two highly-populated Argentinean cities, according to gender, L2 errors and stages (n=348).

Relationship between L2 stages and fossilization risk: These variables showed a statistical inverse association ($p<0.0001$), with a high risk being detected at lower stages (Fig. 2). In development and stabilized stages, psychosocial fossilization OR were 0.004 (Wald95%: 0.002-0.010) and 0.010 (Wald95%: 0.002-0.020), respectively.

Relationship between L2 errors and fossilization risk: It was found a statistical direct association between these two variables ($p=0.0005$), with a low risk being in the absence of errors(Fig. 2). The OR for psychosocial fossilization in presence of errors was 2.76 (Wald95%: 1.57-4.87).

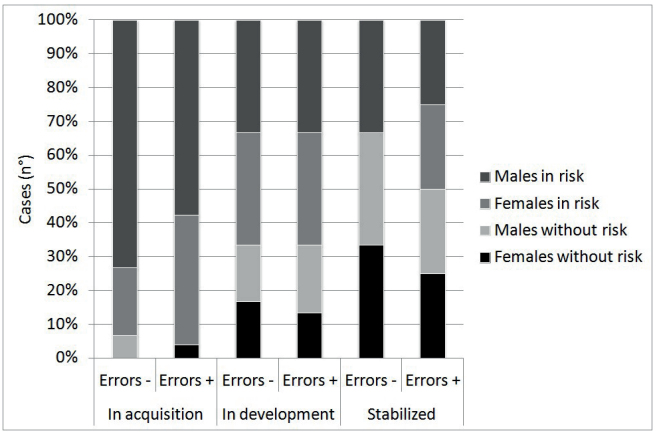

Fig.2 Risk of fossilization per gender according to L2 errors [+: present; -: absent] and L2 stages of non-native English speaking I+C technologists from two highly-populated Argentinean cities [n=348; p?0.0001].

Discussion

The use of a second language, such as English (L2), has high value for labour productivity in the areas of customer service. Nonetheless, it might imply a deleterious occupational condition by favouring fossilization, which is a psychosocial risk without adequate legal and sanitary regulations [1].
The methodological approach used in the present work was supported by concordance between communicative skills and integration of the linguistic structures [16].
Although language and technology are neutral themselves, the misbalance between demand perception, subject resources and working conditions can enhance psychosocial risks [14], which are related to neurocognitive activity[10][17][18].
Therefore, these events underlie negative effects of fossilization, which consolidate interlanguage. Here, subjects with poorer L2 performances were placed in impoverished conditions, with L2 stage being determinant. Finally, subject progress to L2 was delayed[19]. Given that in development and stabilized stages were related to decreased risk of fossilization, the target population of sanitary promotion included in acquisition ICT. It is important to promote metacognitive strategies and communicative challenges, in order to avoid that risk [20]. Thus, competence might be improved by enriched situations and environments, which provide them stabilizing the L2 stage [10].
Under the conditions of this research, the use of telephonic via implied an additional difficulty for ICT during L2 performance, because it constitutes a situation of adverse listening by acoustic filter permeable from 300 to 3000 Hz, which excludes some typical English sounds[21]. Moreover, temporary hearing resolutionis affected [22], which can be impaired by unilateral input[23], leading to the cocktail effect with inadequate attention focus in neuroaudition of competitive sounds[24].
L2 errors highlight transitional processes and strategies of insufficient acquisition in non-native subjects[25][26], in accordance with our results, which could impaired by impoverished environments or closed formats[10]. The presence of errors was a valid indicator of psychosocial risk factors, since it denotes scarce linguistic quality and causes misalignments with working misbalance[20].

Conclusion

The intangible nature of skill assessment does not signify their omission as a health commitment [27], which has not been taken with enough strength. In this regard, brain functionality of two or more languages requires an integrated view of different disciplines, such as biology, health sciences, politics, and language sciences [28].
Summing up, ICT in acquisition L2 had upper psychosocial risk to fossilization with mechanistic execution of it, under poorer communicative formats. Also, they used to be prematurely assigned to work with rudimentary linguist structures. Consequently, these workers should be evaluated and helped to over come this error- augmented stage. New tools and ways of working require the analysis of health sciences to detect and prevent emergent associated risks.

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Conflict Of Interest
None.
Ethical standards
No experimental procedures were done.

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