

Vocational guidance in childhood and career aspirations by gender

Orientación vocacional en la infancia y aspiraciones de carrera por género

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Abstract: The aim of this work is to identify the areas of study and the factors that children take into account to choose their career or occupation aspirations. The research is based on the contextual and evolutionary theories of people's life cycle and integrates the traditional professions by gender; in addition, it implements a research-action project in groups of primary-school level in two schools of Tepatitlán, Jalisco (Mexico). The results reveal that the fields of knowledge are still chosen according to gender and the most frequent are health sciences, biotechnology and agricultural sciences, humanities and engineering; the factors of interaction with larger registrations are macro- and micro-level (immediate and proximate environment), this is to say family and school. Childhood is a period of vocational attainment, vocational guidance programs in basic education will expand the information panorama and create favorable conditions for children.

Key words: vocational guidance, gender, children, educational policy, educational psychology.

Resumen: El objetivo del trabajo es identificar las áreas de estudio y los factores que toman en cuenta los infantes al registrar sus aspiraciones de carrera u ocupación. La investigación se fundamenta en las teorías contextuales y evolutivas del ciclo de vida de las personas e integra las profesiones tradicionales por género; además implementa un proyecto de investigación-acción en grupos de nivel primaria de dos escuelas de Tepatitlán, Jalisco (México). Los resultados develan que los campos del saber continúan eligiéndose de acuerdo con el género y que los más frecuentes son: ciencias de la salud, biotecnología y ciencias agrícolas, humanidades e ingenierías. Los factores de interacción con mayores registros

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son de nivel macro-medio y micro (entorno inmediato y próximo), donde se encuentran la familia y la escuela. La infancia es un periodo de logros vocacionales; los programas de orientación vocacional en educación básica ampliarían el panorama informativo y generarían condiciones favorables para los infantes.

Palabras clave: orientación vocacional, género, infancia, política educativa, psicología educativa.

Introduction

Career development theories take each individual's personality, occupational decision, sociology and vocational interests into account (Osipow, 1990; Sánchez and Valdés, 2003). These theories value the most important factors with an impact on occupational decisions over people's life experiences. According to Srebalus (cited in Sánchez and Valdés, 2003), in childhood, vocational interests are supported on the idea of the external aspect of professions and on activities related to reaching ideals, as well as heroic satisfactory situations. In this way, there is a number of factors that take part in human beings' training along their life cycle. Interests deal with family, the socialization patterns associated with gender differences, friendships, social trends, school, success and satisfaction, and also the guidance of such interests.

The present research considers that these interests, relationships between individuals and their interactions are significant elements that forge occupational aspirations, concurring with what is established in the document by United Nations Educational, Scientific and Cultural Organization (Unesco, 2011). At once, such organization lists them as: macro-level variables (international and national contexts), meso-level factors (linked to institutions and disciplinary fields) and micro-level forces (individual and familial influences), these elements are transcendental to analyze the election of a career.

In order to substantiate and frame the present research, the theoretical foundations of the election of the study areas made by children are exposed, career development approaches are dealt with from the evolutionary and contextual approach for the purpose of substantiating the strategy chosen in the research. In like manner, the present study relates to improving the possibilities of action and career election for men and women; thereby, the elections they opt for are displayed, that is to say, traditional careers linked to gender (López, 1995), in an attempt to evince female career tendencies

—which are an extension of maternity such as caretaking and education (Macías, 2017; Zubieta and Herzig, 2016)—. Whereas for men, engineering is the most mentioned. At national level, the careers least frequently chosen by women are in the engineering area (De Garay, 2012). Specifically, for the population of the State of Jalisco, the careers most frequently chosen by men and women are still those in social sciences and administration (Macías, 2016).

The task of identifying the study areas and factors children take into account when they write down their career or occupation aspirations has defined the general objective of this research. Also, several particular objectives are pursued, among them: identify a first occupational aspiration (previous to the application of the research-action project) of the children and enquire on their considerations to decide; give an account of the aspirations of men and women by study area and according to the sort of school they attend to; and, identify the possibilities that a first aspiration is modified after the activities of the research-action project, taking a specific profession as an instance.

The goal pursued in this description is to start evincing the reality children live and the need to configure the scope of their possibilities, favoring the inclusion of topics and activities —from elementary education—, supporting their aspirations, guiding their vocation and allowing them to broaden their horizons, producing opportunities so that they realize that their expectations may broaden, be modified or verified.

In this way, an intervention project was set up for the purpose of showing the children this sort of professional fields: the case was engineering and metallurgy. In the context of this research, the children were asked to point at the aspects they consider to define their occupation aspirations, in this way, their standpoints were identified. Likewise, multi-disciplinarity, differences in personal training, and the environments of the lives of people who participated in the present action-research project have made this experience of intervention and analysis propitious.

Vocational guidance in childhood

For the purpose of deepening into vocational guidance and career aspirations thought up in childhood, we undertook to review the literature on studies on occupation theories and career decision making that affect the first stage of human beings.

Studies on the election of professional career have been divided into three categories, which are not mutually excluding. One of the categories comprises election as a temporary and interaction process. The second refers to content theories, as they identify with the characteristics of the individuals and the context where they are. And the third contemplates content and process, comprising the people's characteristics, environments, development, and their interaction.

Considerations in childhood to choose vocational aspiration

Ginzberg's (1951) theory of vocational choice retrieves the following elements as basic: vocational choice is a process, which is long and irreversible, in each election there is an essential aspect. The process starts from the individual's birth and continues up to death. The decision-making process may be analyzed into three periods: fantasy choice (before 11 years), tentative choices (between 11 and 17 years of age), and actual decisions (from 17 and the age the young adult individual chooses their career). As regards childhood—a period of fantasy—kids may become what they want, their choices are permeated by impulse and needs.

The aforementioned theory suggests that individual needs in each stage must be identified to offer the support needed, for not only do parents have to tell their children they may become what they want, but their choice would have to make them happy. Children need freedom of choice; however, they need orientation, assistance, knowledge, and delimitation of occupational options.

Following Ginzberg, Donald Super (1980) retrieves the use of the model of career and life according to a rainbow. This model points at the people's life style factors and may be divided into three: personal determinants (such as psychological and biological), environmental (labor market and employment), and determinant situations (such as historic and socioeconomic). Studies on vocational development based on this approach argue that development comprises the entire life cycle of people, representing a multicausal and multidirectional development, where career choice is the main accomplishment of self-conception.

Super's (1980) proposal integrated the concept of the individual themselves, in their self-conception, which for its part, changes over time, and is the result of their experience. Therefore, the rainbow model and self-conception are constant for a lifetime. Super (1980) extends the work of Ginzberg (1951) on life and vocational choice, increasing to five stages and

dividing them into substages. He locates childhood and its linking with this evolutionary approach, and indicates the stage of the process of vocational development calling it: growth; which is conceived from birth to 14 years of age, when the following accomplishments are attained: self-conception, sense of direction toward an occupation or profession and the notion of labor, among others. The substages of fantasy, interests and capacity appear at between 4 and 10 years of age, from 11 to 12 years, and 13 to 14 years of age, respectively.

Verifying these standpoints, a study on the development of vocational guidance in childhood, from an evolutionary-contextual perspective, explains the need to understand the development of vocational guidance as a longitudinal process, which begins in childhood and goes to adulthood and that is influenced by personal and contextual factors (Araújo and Taveira, 2009). The research above is valuable, as it conceives childhood as a period of particular accomplishments in the vocational sphere of influence for the career, being key for the process, since this stage is characterized by laying the basis for interests, attitudes, values, vocational skills and professional exploration.

Likewise, it allows glimpsing the research tendencies regarding vocational guidance and childhood, pointing at the contextual approach as the frame by means of which to study the complexity of processes. On one side, Araújo and Taveira (2009) display the embedded elements, on one side, the importance of the children's familial context and personality dynamics, while on the other, school, leisure, and other activities that affect likes and dislikes which add to the knowledge of the self; all of this in lockstep with the growth developed according to their capacity to work and make their own decisions, and with gender roles and their social valuation.

Then, what influences occupational aspirations and vocational choice? Vocational psychology answers verifying dynamism and interactivity in influences from parents, family, school and environment on the children's professional development, defining thus these environments as the contexts to intervene in order to promote exploration and intentional learning.

Social, cultural and historical contexts offer resources and opportunities; in this way, the bases for change are in the relations that are fostered. According to Lerner (cited in Araújo and Taveira, 2009), these would be those generated among the various levels of human organization, which comprise internal characteristics of people (biological) and external structures (such as public policies or the economic environment). Araújo and Taveira (2009) point at Bronfenbrenner (1987), Vondracek and Porfeli

(2008) for the purpose of including the approach from human development ecology as the frame to analyze the context that impacts professional development, being located at a convergence point amidst the social, psychological and biological sciences that influence the individual.

Family context is crucial to integrate information for future decision making in role shaping. Other family members, siblings, relatives, extended family, teachers, among other individuals offer active and supportive relational environments that help in career choice. Therefore, we consider it is important to ask: what factors influence development? Resorting to Bronfenbrenner's (1987) standpoint to research human development, we pinpoint the conceptions of the individuals, their environment, and the interaction between them, representing a theory of environmental interconnections and their impact on the forces that directly affect psychological development. Moreover, Araújo and Taveira (2009) explain that a series of contextual variables related to the structure and processes of families, schools, leisure and organized extracurricular activities have a heavy impact on the children's career development.

The schools' environment, size and structure, adding to resources, social climate, particular goals, classroom practices, teaching strategies and teachers' expectations also provide learning and motivation opportunities to plan occupation aspirations.

A thorough knowledge of Bronfenbrenner's (1987) iconological environment, an integration of serial structures is identified: a) the innermost level is the immediate, which holds the individual (familiar grounds: house, class); b) that which looks beyond each context separately and their relations (outside what is known); and c) ecologic environment (it goes even further: facts that take place in contexts where the individual is not even present). In this way, the structure of the unknown may influence at the same level as what is known, or for example, of what is beyond, represented, for example, by the labor conditions of the parents of the children.

In like manner, Bronfenbrenner (1987) states that environments of the same culture are usually similar, though are different from one another, in this way, people who participate in them are also dissimilar, have various meanings, partly due to their social environment and experience. For the purpose of analyzing the environments, the author proposes the systems model (composed of people), in which two, three, four and larger interpersonal structures are presented. And as regards the questioning regarding 'what structures are comprised in the ecological environment?', he explains:

a) The first group of interrelation in the immediate environment is called microsystem, and comprises connections between individuals which directly affect individuals in development: the objects and human beings they interact face to face with and the people present in the environment, for directly and indirectly they produce effects on human development.

b) Then we find the mesosystem and is the interconnection between environments where human beings participate, which are as strong and have the same consequences on the developing individual

c) Exo-system, which owing to the interconnection of environments, produces effects on the individuals' immediate environment, though they are never there.

d) Finally, macrosystem, it represents serial and interconnected systems, which are the patterns of ideologies, of the social institutions common to a certain culture or subculture.

Micro, meso and exo-systems tend to be similar from the macrosystem, as it may be the case of religion, ethnic group, and social class. It is worth mentioning that one (macro) relation between science and official policy might define the specific properties of the exo-, meso- and microsystem that occurs in daily life, conducting behavior and development. Therefore, environments are capable of influencing human development in interaction with friends, relatives, neighbors, and nuclear family.

Carrying on with the metatheoretical stances of development contextualism, Vondracek and Porfeli (2008) affirm that the study of professional development is the outcome of the interaction between individuals and their contexts; the latter are defined by the physical, the social and the temporary. The authors point at various theories that consider complexity, simplicity and multiplicity, in which topics such as maturity, self-conception, contribution of interests and the vital vision of career development from infancy are analyzed. The link between the systems theory with career election locates the subjects as open systems, which undergo complex and specialized growth, in which individuals obtain resources from the environment that alter the content and organize their environment, in which the individuals themselves are the open self-regulators of the system.

Vondracek and Porfeli (2008) also consider that this approach places the individuals influenced by reflections and assessments of past experiences, present and their future perspectives, which at once configure their choices: that is to say, the individual is dynamical interaction creating their own career development. Vondracek and Porfeli (2008) complement

Bronfenbrenner's (1987) stance with the interaction of the proximal context of the family to the micro-contexts such as economic conditions and labor markets.

Furthermore, a research work that retrieves such standpoints is the analysis of the university students' vocational process, based on Donald Super's evolutionary approach, and which was carried out by Bulgarelli-Bolaños *et al.* (2017), for the purpose of distinguishing vocational factors of higher influence to choose a career. Such study considered that people faced different tasks in (vocational) stages interconnected with one another over their life trajectories. Moreover, it pointed out that the vocational process and its stages are influenced by personal, professional and social events experienced by individuals over certain periods called mini-cycles.

After these considerations on childhood and the context in the formation of occupational-vocational aspiration, following some arguments on the possibilities of creating vocational guidance opportunities and second aspirations are presented.

How to produce vocational aspirations and second choices?

Bronfenbrenner (1987) explains that environmental facts affect the development of individuals, and the ones noticed the most immediately and powerfully are activities where human beings participate with other people or in their presence; owing to this, he argues that active intervention in what other people do or even the mere fact of observing them frequently inspire an individual to carry out similar activities on their own, being able to produce various options, then substantiating the proposals for vocational guidance and activities linked to the knowledge of professions.

Furthermore, assigning the value children attribute to their interests is related to specific tasks they have conceptualized, since they would not valorize activities in which they feel they are not competent, this is the reason to review which factors make them choose them. In this regard, Araújo and Taveira (2009) affirm that career choices are the outcome of qualitative and quantitative changes perceived over time when interacting with individuals inserted in a context, for in early years interests may change quickly. Children may try various activities in certain short periods, before deciding which they enjoy. Likewise, the usefulness of activities for the future would represent particular involvement for them.

In this regard, Diez-Martínez and Ochoa (2013) produced a research work on a first and second career choice, evincing incongruence as no links between aspirations and fields of knowledge exist. The authors put forward that education, by means of academic projects, shall provide students with information for decision making that supports the improvement of the individuals' future conditions.

After substantiating the valuation to broaden immediateness horizons so that individuals have better options on the election of aspirations, following we review a couple of research works that enquire on the sort of didactics of orientation and on the school stage at which it is offered.

Some experiences on vocational guidance and childhood

Vocational guidance, linking education and the election of a career are needs the students have to cover from early stages. In Spain, for example, Sánchez (2001) presents the reasons to contest the fostering of vocational maturity. In this proposal, the author mentions that not only is vocational guidance contents, but entails activities to encourage the students to reflect and make correct decisions regarding their professional occupation.

Furthermore, in Mexico, Ochoa and Diez-Martínez (2009) point out that children and adolescents are making or not decisions that influence their occupational and professional choices; therefore, in-school counselors have to support the students since their early schooling years over the process of choosing a career. The authors point out that low- and middle-income families cannot offer sufficient information to have a panorama of occupation aspirations, in this way education institutions are able to compensate this lack that the origin context does not provide students with. In this way, the amendment or reduction of these deficiencies, as well as implications they bring along would be furthered. Ochoa and Diez-Martínez (2009) mention that school contents that deal with occupation aspirations since basic education have to be devised.

Following, we emphasize on the career choices with the most enrollment in higher education for men and women, including some gender particularities.

Career choice for men and women

Over time, tendencies on career choice have been associated with cultural and traditional issues (Macías, 2017). As expressed in the present article, pointing out at Unesco data (2011), professional careers linked to social sciences —enterprises and law— had a majority of female participation, virtually everywhere in the world, save Central Asia. Life sciences are also one of the options most resorted to by women. Whereas, areas linked to engineering, industry, and construction have a larger participation of men in 83 out of 84 countries.

In like manner, in Mexico, these panoramas were witnessed. Zubietta and Herzig (2016) point at such female and male participation tendencies by study area. They indicate that women had higher enrollment records in social and administration sciences, then engineering and technology and health sciences. For the school term 2012-2013, it was displayed that the area of education and humanities had more than twice as many female students (67.1%), followed by health areas (65.4%), and the area of social and administrative sciences (56.2%). For its part, the area with the most male participation was engineering and technology (73.2%).

The authors explain that participation tendencies still prevail for men and women out of gender issues and attributions because of the persistent beliefs that women are the main caretakers of dependent relatives, and thereby they can apply the knowledge they gain during their studies in their “natural” development areas.

Furthermore, López (1995 and 2014) mentions that the person has considered their beliefs in the association of a career with their expectations. For example, the author argues that women choose happiness by being at home or exercising a profession. In like manner, she considers theories such as self-conception, linking it to; at once, locating sex and gender enouncing a gender stereotypy, linking it to the prototypical associations of these two excluding categories. López (1995 and 2014) affirms that these gender choices are linked to the cultural construct of beliefs allotted to men and women, for instance, in the case of female students of pedagogy and male students of industrial engineering.

After accounting for theoretical considerations and approaches related to the shaping of the individuals’ occupational aspirations and their relation with childhood, vocational guidance experiences and common selections of men and women, we considered to carry out a project to broaden the information regarding the areas of study and try to broaden the decision-

making horizons relating to career aspirations of a group of children, which is pointed out below.

Vocational guidance through action-research in childhood

It was decided to conduct an intervention project in vocational counseling to identify the study areas and factors considered by the children to register their career aspirations. This research resorted to mixed methodological strategies. As a part of the qualitative work and supported on the principles of the so-called action-research, a socio-educative intervention project was undertaken, and as a part of the quantitative work, a measurement instrument was set up and the data obtained from its application were analyzed.

The sample was incidental non-probabilistic (since the research team decided to obtain information from all the students present on conference days —explained later in the text— who answered the instruments). Such sample comprised 437 students of two elementary schools: one public (55%) and another private (45%), in a municipality in *Region Altos Sur*, State of Jalisco. Out of the total respondents, 272 were women and 165 men. Students from 3rd, 4th, 5th, and 6th grades participated; the inclusion criteria were: being participants of a socio-educative intervention; fill in the measuring instrument utilized; and participate and interact willingly.

The instrument to gather information was an *ad hoc* questionnaire with open-ended and close-ended answers. Given the purposes of the study, such methodological tool was administered in two phases: the first, before a socio-educative intervention; and the second, after this. Close-ended questions referred sociodemographic data such as age, gender, school grade, and sort of school, as well as the interest in finding out other professions and the possibility of thinking of other careers. Open-ended questions asked about the careers they want to study in the future and the reasons for such decision. It is worth stating that as a part of the design of the of the questionnaire, the validation of its content was asked from a panel of experts.

The content of the instrument to gather information integrates questions that ask the children to point at the factors they consider have an influence on their vocational aspirations, for it is intended to reach the goal of finding out whether such factors belong in the macro-meso and micro levels, as the immediate and proximate environments, represented by family and school. With this, it would be possible to value school

environments as stages in which they may be an impact via vocational guidance, supporting the students' informative panorama, trying to make it have general contents from a number of careers and influence their future aspirations, even opening possibilities for fields of study other than the traditional.

In order to didactically support the socio-educative intervention linked to vocational guidance (which consisted in giving two interactive conferences focusing on the development of engineering and in the use of experiments in metallurgy), the following materials were utilized:

- A file with illustrative slides on metallurgic engineering, to be projected in an auditorium, adding to having the physical materials mentioned in the slides.
- Materials and chemical reagents for experiments in a space close at hand for children.
- Materials with various textures.
- Special clothing for laboratory.

The intervention procedure was as follows: for the purpose of presenting and receiving authorization for the research project, interviews were held with people in charge of the schools. Later on, on a day defined beforehand, the students were gathered in an auditorium. A female researcher in the education area delivered a questionnaire in which the children wrote down their sociodemographic data and the name of the profession they wanted to exercise in the future, pointing at the motivating factors to choose it. Following, in the same session, another female researcher in geography gave an interactive lecture and a couple of experiments was run. In the end, the children were asked to answer questions on whether they would be interested in finding out about other professions, and whether they would change their previous decision.

The analysis of the information gathered by means of the instruments before the conferences and experiments breaks down the frequencies of the study areas the children selected and the factors they considered to do so. Moreover, with the information obtained by means of the aforementioned activities, we identified the frequencies of the interest in finding out other professions and about those who may think of studying a career other than the previously chosen. Codification and data analyses were run using to statistic software SPSS® version 22.

Action-research results

On the basis of the open-ended questions about the professions the students chose, the careers were grouped in areas or fields of professional development. In tables 1¹ and 2, the frequencies of such choices by gender and sort of school (public and private) are displayed.

Table 1 shows the study areas with the highest frequencies, namely: medicine and health sciences (19.93%); biotechnology and agricultural sciences (15.10%); and humanities and behavioral sciences (12.59%). In the findings above, it is particularly relevant that girls had higher percentages in comparison with boys in biotechnology and agricultural sciences (19.12% v. 8.48%); medicine and health sciences (18.38% v. 14.55%); humanities and behavioral sciences (18.01% - 3.64%); and, social sciences (8.46% v. 2.42%). For their part, boys surpass girls in engineering and architecture (16.36% v. 10.66%); sports (23.64% v. 2.57%); and, occupations (20.61% v. 5.15%). Likewise, it is convenient to underscore the low frequency (of boys and girls) in the election of physics, mathematics, and earth sciences (1.37%), and also biology and chemistry (2.29%).

In Table 2 noticeable is the fact that children in the private school opted at a larger extent than children in public schools for biotechnology and agricultural sciences (19.58% v. 9.64%); engineering and architecture (14.58% v. 10.66%); and others (14.17% v. 7.61%). Conversely, those in public schools had higher percentages in the election of sports (16.75% v. 5.42%), and occupations (16.75% v. 6.25%).

As regards the reasons and interaction levels of the factors the children took into account to select such study areas (displayed in Table 3), their corresponding frequencies and a ranking that encompasses them into a certain interaction level in accordance with the theory above (macro, macro-meso, meso and micro) are presented. Such categorization refers global and local aspects.

As noticed, the interaction levels with the highest frequencies were macro-meso and micro levels. In like manner, the most frequently cited reasons were: "I think this career has been successful"; "I feel that I have vocation for...", and "I see ____ a lot, I like being as he / she". It is worth underscoring that such options, to a larger extent, were expressed by girls in private schools. For their part, the least mentioned reasons were: "My family doesn't let me study other career"; "That is only for men / women".

1 Tables are at the end of the article in Annex, (Editor's note).

Finally, as regards the positive interest in finding out about other professions —as it was the case of engineering and metallurgy— 92% of the girls and 87% boys answered yes and about the possibility of reconsidering the profession they chose in the first place, 66% of the respondents (regardless of gender) answered in a positive manner.

Conclusions

By contrasting the goals put forward with the results, we verify that the study contributes with information regarding childhood as a period of particular accomplishments in vocation, as in this stage the bases for interests, attitudes, values, vocational skills and personal exploration are defined. By means of this action-research project, we showed the children a sort of professional field or study area; besides, their earliest professional careers were identified and the considerations to make decisions, and elections of boys and girls, and sort of school, we enquired on the possibility of modifying the first vocational election to broaden their panorama of professions.

It is worth pointing out that the fields of professional knowledge still display traditional gender biases, and in the future, in the short and middle term, this scenario is verified. There is still a gender breach in women's election of engineering, mathematics, sciences and technology. It is clear that the children who study in two elementary schools in Mexico have no career election or make poor occupational choices as regards hard sciences such as physics, mathematics, or earth sciences, biology and chemistry, and also engineering (not in the case of architecture, since it is classified in the same area, and has some data). It is verified that girls prefer traditional occupations related to care and protection such as biotechnology and agricultural sciences —since they chose veterinary medicine, that is, animal care— medicine and health sciences —which encompass human health care— and humanities. Boys, for their part, chose occupations linked to sports, other non-professional occupations, engineering and architecture.

In like manner, the application of the intervention project indicated that students consider (at a 2:3 ratio) to study a profession other than the one stated in the case the options widen, that is to say, those that enable them to see themselves in the future. In this way, according to the theoretical section of the present article, this sort of tangible actions in various factors is valid to potentiate the possibilities to make decisions about careers and occupations, substantiating the fact of programming vocational guidance in childhood.

The analysis of the reasons the students selected according to their occupational aspirations, and according to their ranking by factor or interaction level from various theoretical considerations, allows glimpsing the relevance of producing such levels and from various perspectives, supported on theoretical stances, for example: personal factors and contextual variables —family, school, leisure—, according to Araújo and Taveira (2009); the factors and interaction levels, by Unesco (2011): micro, meso and macro; factors according to expectations, beliefs and gender, by López (1995); the factors of the individuals' lifestyles that comprise the internal, environmental, historical and socioeconomic, by Ginzberg strengthened by Super (1980); the factors integrated in the systematic perspective of environmental interconnexion and its impact on psychological development, by Bronfenbrenner (1987), encompassing them in the ecologic environment of seriated structures: internal, from the known environment and from where it is not present; finally, the vocational factors present along life trajectories through mini-cycles, by Bulgarelli-Bolaños *et al.* (2017).

Indeed, these intervention projects help produce a better horizon as wider perspective enables nurturing an environment linked to being aware of the characteristics of professions without limiting or setting gender stereotypes defining if they correspond to masculine or feminine careers. This sort of actions, even at macro-meso and micro levels, would lead to the broadening of knowledge and supporting the satisfaction and success of the children's vocational interests. With this, one might suppose that contexts provide resources for the training of vocational guidance from organized extracurricular activities that impact the development of a career.

A public policy action at macro and meso levels, set up in childhood by means of vocational guidance, would be primordially important in the election of a profession according to occupational theories and career decision making so that for Mexico it would be desirable to integrate it into elementary education

References

- Araújo, Alexandra y Taveira, Maria do Ceu (2009), "Study of career development in children from a developmental-contextual perspective", en *European Journal of Education and Psychology*, vol. 2, núm. 1, España: Universidad de Almería.
- Bronfenbrenner, Urie (1987), *La ecología del desarrollo humano*, España: Paidós Cognición y Desarrollo.

- Bulgarelli-Bolaños, Raquel *et al.* (2017), “El proceso vocacional del estudiantado universitario en condición de logro y rezago académico: Un análisis desde el enfoque evolutivo de Donald Super”, en *Revista Electrónica Educare*, vol. 21, núm. 1, Costa Rica: Universidad Nacional.
- De Garay, Adrián y Del Valle-Díaz-Muñoz, Gabriela (2012), “Una mirada a la presencia de las mujeres en la educación superior en México”, en *Revista Iberoamericana de Educación Superior*, vol. 3, núm. 6, México: Instituto de Investigaciones sobre la Universidad y la Educación, Universidad Nacional Autónoma de México.
- Diez-Martínez, Evelyn y Ochoa, Azucena (2013), “Análisis de la primera y segunda aspiración ocupacional en la adolescencia: reflexiones sobre la importancia del papel de la escuela y la orientación educativa”, en *Interaccoes*, núm. 26, Portugal: Universidade de Lisboa.
- Ginzberg, Eli (1951), “Toward a Theory of occupational choice”, en Hitchcock, Wiliam y Mabry, N. Kemp [eds.], *Readings in guidance*, Estados Unidos: MSS Educational Publishing Company.
- López, Mercedes (1995), *La elección de una carrera típicamente femenina o masculina. Desde una perspectiva psicosocial: la influencia del género*, Madrid: Centro de Investigación y Documentación Educativa, Ministerio de Educación y Ciencia.
- López-Sáez, Mercedes (2014), “Procesos culturales e individuales implicados en la estereotipia de género. Una aproximación empírica a la elección de carrera”, en *Revista de Psicología Social*, vol. 9, núm. 2, España: Fundación Infancia y Aprendizaje, Routledge.
- Macías, Gizelle (2016), “Mujeres y hombres en la universidad. Tendencias de participación en la matrícula y desafíos actuales de la educación superior”, en *Revista educ@rmos*, año 5, vol. 20-21, México: Jaime Navarro Saras.
- Macías, Gizelle (2017), “Trazando vínculos para mujeres y hombres desde las universidades: niveles educativos, vocaciones profesionales y mercado laboral en México”, en Sánchez, Christian [coord.], *Capacidades gubernamentales, sociales y económicas*, México: Instituto de Investigación en Políticas Públicas y Gobierno, Universidad de Guadalajara.
- Ochoa, Azucena y Diez-Martínez, Evelyn (2009), “Las aspiraciones ocupacionales en el bachillerato. Una mirada desde la psicología educativa”, en *Perfiles educativos*, vol. 31, núm. 125, México: Instituto de Investigaciones sobre la Universidad y la Educación, Universidad Nacional Autónoma de México.
- Osipow, Samuel (1990), *Teorías sobre la elección de carreras*, México: Trillas.
- Sánchez, Francisco (2001), *¿Y el año que viene qué? La orientación académica y profesional desde primaria a bachillerato*, España: Wolters Kluwer Educacion.
- Sánchez, Pedro y Valdés, Ángel (2003), *Teoría y práctica de la orientación en la escuela: un enfoque psicológico*, México: Manual Moderno.
- Super, Donald (1980), “A life-span, life-space approach to career development”, en *Journal of Vocational Behavior*, Holanda: Elsevier.
- Unesco (2011), *Compendio mundial de la educación 2010. Comparación de las estadísticas de educación en el mundo*, Canadá: ONU. Disponible en: <http://unesdoc.unesco.org/images/0019/001912/191218s.pdf> [9 de marzo de 2018].
- Unesco (2012), *Atlas mundial de la igualdad de género en la educación*, Francia: ONU. Disponible en: <http://unesdoc.unesco.org/images/0021/002173/217311s.pdf> [1 de marzo de 2018].

- Vondracek, Fred y Porfeli, Erik (2008), "Social contexts for career guidance throughout the world developmental-contextual perspectives on career across the lifespan", en Athanasou, James y Esbroeck, Raoul [eds.], *International Handbook of Career Guidance*, Australia: Springer.
- Zubieta, Judith y Herzig, Monica (2016), *Participation of women and girls in national education & the science, technology and innovation system in México: A National Assessment base on the Gender Equality in the Knowledge Society (GEKS) Indicator framework*, México: Women in Global Science & Technology, Universidad Nacional Autónoma de México, Consejo Nacional de Ciencia y Tecnología.

Annex

Table 1
Election of study area by gender

Study area	Total		Women		Men	
	f	% Population	f	% Population	f	% Population
Physics, mathematics and earth sciences	6	1.37	5	1.14	1	0.23
Biology and chemistry	10	2.29	8	1.83	2	0.46
Medicine and health sciences	74	16.93	50	11.44	24	5.49
Humanities and behavioral sciences	55	12.59	49	11.21	6	1.37
Social sciences	27	6.18	23	5.26	4	0.92
Biotechnology and agricultural sciences	66	15.10	52	11.90	14	3.20
Engineering and architecture	56	12.81	29	6.64	27	6.18
Sports	46	10.53	7	1.60	39	8.92
Occupations	48	10.98	14	3.20	34	7.78
Other	49	11.21	35	8.01	14	3.2
Total	437	100	272	62.24	165	37.76

Source: own elaboration.

Table 2
Election of study area by sort of school

Study area	Total		Private		Public	
	f	% Population	f	% Population	f	% Public
Physics, mathematics and earth sciences	6	1.37	3	0.69	3	1.52
Biology and chemistry	10	2.29	8	1.83	2	1.02
Medicine and health sciences	74	16.93	41	9.38	33	16.75
Humanities and behavioral sciences	55	12.59	26	5.95	29	14.72
Social sciences	27	6.18	18	4.12	9	4.57
Biotechnology and agricultural sciences	66	15.10	47	10.76	19	9.64
Engineering and architecture	56	12.81	35	8.01	21	10.66
Sports	46	10.53	13	2.97	33	16.75
Occupations	48	10.98	15	3.43	33	16.75
Other	49	11.21	34	7.78	15	7.61
Total	437	100	240	54.92	197	100.00

Source: own elaboration.

Table 3

Frequencies of reasons to choose a study area by sort of school and gender

Interaction level	Reasons to choose an study area	Private school						Public school					
		Men f=61			Women f=179			Men f=104			Women f=93		
		f	%		f	%	Σf	f	%		f	%	Σf
Macro	I want to be ___ and work abroad	17	28		57	32	74	28	27		25	27	53
Macro	I want to be ___ and work here	26	43		64	36	90	22	21		30	32	52
	Total	43			121		164	50			55		105
Macro- meso	I want to do otherwise than my family does.	14	23		66	37	80	32	31		33	35	65
Macro- meso	I believe this career has been successful	35	57		97	54	132	62	60		62	67	124
Macro-meso	I feel I have vocation for ___	30	49		102	57	132	57	55		62	67	119
Total		79			265		344	157			151		308
Meso	That occupation I can study in my city	16	26		61	34	77	38	37		37	40	75
Meso	We told ourselves (father, mother, friends, relatives) that they don't work in my city	15	25		33	18	48	21	20		21	23	42
	Total	31			94		125	59			58		117

Micro	This occupation is just like someone in my family (father, mother, sister, aunt, uncle, etc.)	20	33	49	27	69	30	29	23	25	53
Micro	In my school they say it is a good idea to study that	10	16	31	17	41	20	19	20	22	40
Micro	As I see _____ a lot, I'd like to be like them	28	46	86	48	114	48	46	48	52	96
Micro	I've heard people do well	20	33	50	28	70	30	29	25	27	55
Micro	My family does not let me study other career	4	7	17	9	21	17	16	6	6	23
Micro	My family lets me choose what I want	16	26	77	43	93	37	36	33	35	70
Micro	It is only for men	8	13	13	7	21	17	16	8	9	25
Micro	It is only for women	4	7	10	6	14	9	9	7	8	16
Total		110		333		443	208		170		378

Source: own elaboration.

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