Benefits of Adult Education Participation for Low Educated Women

Abstract: Given the double risk of exclusion caused for women with a low educational level, adult education can be a fundamental element that allows them to actively participate in their social, political and cultural environments. Moreover, because educational level has been reported by the scientific literature to be a factor that directly favours personal benefits, such as having better health or greater employability, adult education may be an opportunity to obtain the aforementioned benefits for women with a low educational level. In this study, using the data from the PIAAC survey, a model was developed to perform a structural equation analysis on a sample of 5,838 European women with an educational level of ISCED 0-2 and to investigate the benefits of participating in non-formal education activities. The results show that this participation provides these women with greater social and political confidence, more intense cultural participation and even better health and employability.

Keywords: low-educated women, adult education, social participation, empowerment

Benefits of Adult Education Participation for Low-Educated Women

Introduction

Although the potential of adult education has been recognized as fundamental by organizations such as the European Commission[1] (2009) and CEDEFOP (European Centre for the Development of Vocational Training, 2016) for achieving social and economic inclusion of adults with low educational levels (ISCED[2] 0-2, International Standard

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[1] The European Commission is the EU's politically independent executive arm. It alone is responsible for drawing up proposals for new European legislation, and it implements the decisions of the European Parliament and the Council of the EU. For more information see: https://europa.eu/european-union/about-eu/institutions-bodies/european-commission_en.

[2] The International Standard Classification of Education (ISCED) provides a comprehensive framework for organizing education programs and qualifications by applying uniform and internationally agreed definitions to facilitate comparisons of educational systems across countries. The ISCED is widely used as a global reference for the classification of education systems. In this paper, we have considered the simplified levels of ISCED without sublevels (the levels are ISCED 0: None or only pre-primary education; ISCED 1: Primary education; ISCED 2: Lower secondary education; ISCED 3: Upper secondary education; ISCED 4: Post-secondary non-

Classification of Education, hereinafter ISCED, CEDEFOP, 2018), its benefits have barely been explored by the international scientific community, and its multidimensionality has not been considered, as stated by Windisch (2015) and Nordlund, Stehlik and Strandh (2013), with some exceptions, such as Schuller (2002, 2004), Schuller and Dejardins (2010), Dejardins (2008a) or Panitsides (2014). This study is even more necessary if we refer to groups at a double risk of exclusion, such as women with low educational levels (Lewis, & Lockheed, 2007), who also have a much lower participation in learning activities (OECD, Organisation for Economic Co-operation and Development, 2016). According to authors such as Patterson et al. (2008), Dave, Corman, and Reichman (2012), Tawiah (2017), Norris and Oyasande (2017), Porras-Hernández and Salinas-Amescua (2012), Duckworth and Smith (2018), and Prins, Toso, and Schafft, (2009), although the claim cannot be generalized, low education combined with lack of skills development during adult life could cause these women to be at risk of being excluded from participation in the social, political and cultural spheres of their community and their potential employability could be reduced; they could even have worse health than women with a higher educational level.

To explore the positive effects of adult education on low-educated women, the present investigation, using a sample of 5,838 European women with an educational level of ISCED 0-2 drawn from the sample of the PIAAC survey (OECD, 2016), develops a model that uses structural equations (SEM) based on a literature review and the proposal by Manninen and Meriläinen (2011) on the benefits of non-formal education for adults. The results show that such participation supports greater social and political confidence, more intense cultural participation and even better health and employability.

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tertiary education; ISCED 5: Short-cycle tertiary education; ISCED 6: Bachelor degree or equivalent, master's or equivalent, doctorate and equivalent.

Context and Problem Statement

As Castells (2002) theorizes, in contemporary society, unequal access to information resources has become a source of socioeconomic inequality, with adults' educational level being one of the main determining factors (CEDEFOP, 2016, OECD, 2016, Eurostat, 2018). Following Compaine (2001), this fact causes a risk of exclusion for adults with a low educational level, which in the European context is understood as the proportion of adults aged 25-64 who have completed at most the first cycle of secondary education (ISCED 2) according to CEDEFOP (2018). Within this segment, this fact becomes especially evident for adults who already start from a disadvantaged situation due to their personal characteristics. Thus, older adults, immigrants and women with a low educational level may suffer a double risk in terms of their effective participation on a personal, work and social level, according to Van Greunen and Steyn (2015). For these groups, their low educational level translates into a lower score on basic skills, such as literacy, numeracy and Problem Solving in Technology Rich Environments (PS-TRE) skills (European Commission, 2011 2016; CEDEFOP, 2016, 2018; OECD, 2013); little interest in learning and less participation in educational activities (Boeren, 2016; Desjardins, Rubenson, & Milana, 2006; CEDEFOP, 2016); a lack of cultural resources (Barone, 2006); lower employability indexes (Field, 2012; Laal & Salamati, 2012); little or no social and political participation (Preston, 2004); and even worse health status than people who have a higher level of education (Óhidy, 2008; Holford & Mohorcic-Spolar, 2012; European Commission, 2011).

Given this dynamic, institutions such as the European Commission (2011, 2016), the OECD (2013), and the CEDEFOP (2016, 2018), as well as scientific research, including works by Windisch (2015), Kil, Operti, and Manninen (2012), Manninen and Meriläinen (2011), Schuller (2002, 2004), Desjardins (2008a), Schuller and Dejardins (2010) or

Panitsides (2014), defend participation in adult education as a relevant tool for empowerment, although it can be influenced, among others, by personal variables such as level of education, age or family background. Adult education potential benefits can be very broad, as Schuller et al. (2002, 2004) state: acquiring qualifications, improving knowledge and skills, achieving better health, enhancing employability, improving learning motivation, acquiring positive attitudes and values, and promoting active citizenship, among others. In fact, for Manninen and Meriläinen (2011, p.2), "the lower the educational level, the more changes the participation in adult education generates in the motivation of learning, welfare and other benefits". This statement is also corroborated by Panitsides (2014, p. 68-69) in her qualitative study on the potential benefits of lifelong learning courses for adults: "Successful completion of LLL courses, offering a 'second chance', can be proven exceptionally beneficial to the self-esteem of individuals who failed in formal education". Specifically, Hammond and Feinstein (2005) found that low-educated women who participate in education courses go through a process of increasing self-efficacy, enhancing personal development, and improving family and social relationships as well as their professional status.

However, in this specific case of women with a low level of studies, participation in training activities for adults is much lower than in the case of men. According to data from the OECD (2016), if we consider the activities of non-formal education (NFE), given that the formal type is barely present in this case, only 18.9% of women with ISCED 0-2 had participated in such activities in the last 12 months compared to 24.3% of men. This result is corroborated by several studies, such as Dieckhoff and Steiber (2011), Medel-Añonuevo and Bernhardt (2011) and Massing and Gauly (2017). This lower access of women to adult training may be one of the causes of the persistent inequality in occupational attainment, as reported by Dieckhoff and Steiber (2011) and may therefore be a cause of the socioeconomic inequality between men and women. According to Patterson (2018), this difference in

participation in NFE between men and women with a low educational level is due to a greater weight of family responsibilities for women. Adult education among women with a low educational level has been little explored in the scientific literature. However, studies by Patterson et al. (2008), Dave, Corman, and Reichman (2012), Tawiah (2017), Norris and Oyasande (2017), Porras-Hernández and Salinas-Amescua (2012), Duckworth and Smith (2018), and Prins, Toso, and Schafft (2009), among others, have shown the individual, social, cultural, and even economic benefits of participation in educational activities for women with low starting educational levels. All of this is explored in the hypothetical model that we present below.

Personal and Social Benefits of NFE for Women with a Low Educational Level:

Variables and a Hypothetical Model

Following Manninen (2010), in our study, we argue that an analysis of the benefits of adult learning should be based on a multidimensional and not a fragmented approach that considers different factors. Thus, to elaborate a model tested by an analysis based on structural equations and in the absence of previous models that analyse the benefits of NFE in low-educated women, we started with the work of Manninen and Meriläinen (2011), which is based on previous research on benefits of adult education by Desjardins (2008a) and Schuller and Desjardins (2010). These authors defined a model that used the results of their own questionnaire and defined the "liberal participation of adults in learning activities" (inside the NFE concept)[3] as an observed and exogenous (independent) variable. Their model examines this variable's benefits for educational experiences, social commitment, tolerance, the control of one's own life, health, mental well-being, and family as latent and endogenous (dependent)

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[3] Liberal adult education is defined by Manninen and Meriläinen (2011, p.11) as non-formal education that aims for personal and social growth. However, for the purposes of this study, we have included all NFE.

variables in adults from 10 European countries, without a distinction between gender or among training levels.

For the purposes of this paper, we start with this previous work and propose an integrated hypothetical model that is tested on adult women with a low educational level by using data from the PIAAC survey (OECD, 2016) (see Figure 1). In the proposed model, we tested the influence of adult education (observed variable NFE12, "Participation in non-formal educational activities in the last 12 months") on the latent variables of "learning strategies" and "socio-political trust" and on the observed variables of "work", "health" and "cultural engagement". We controlled the model with the covariates of "education", "parents' education" and "age" (see Table 1 in the methodological section for a description of the variables). The selection of the variables and the relationship among them for the specification of the model was conducted based on the literature review.
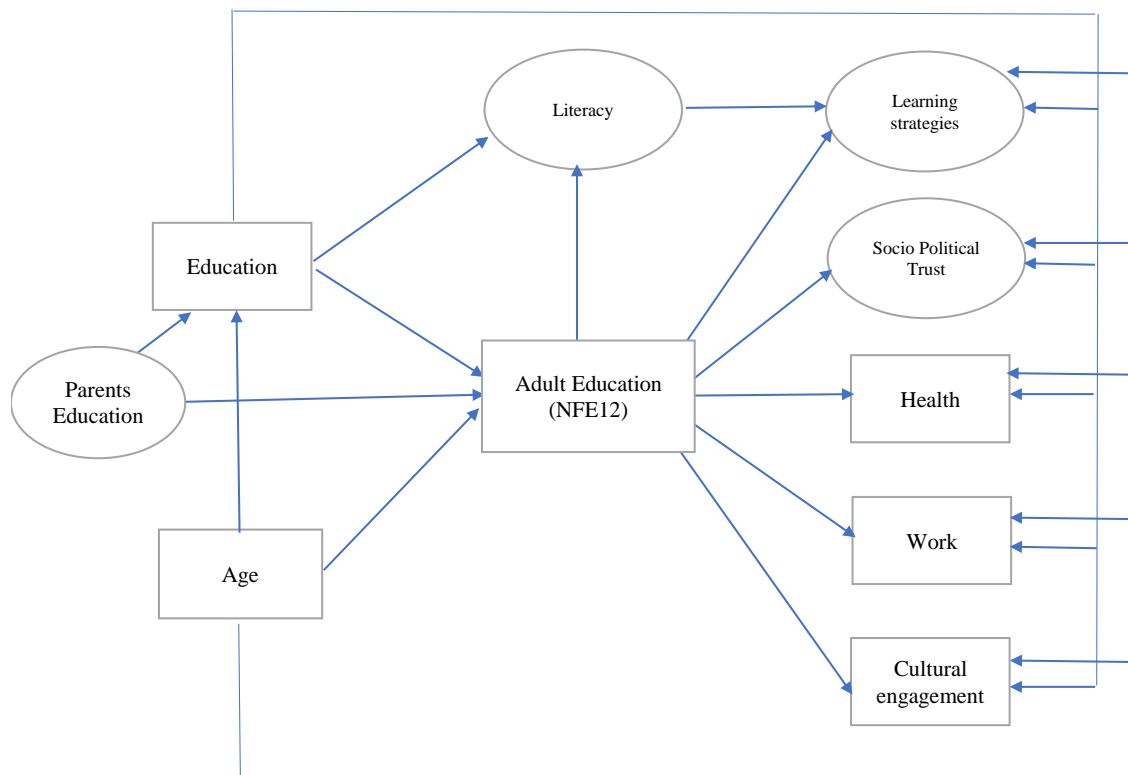

Figure 1. Hypothetical model

Exogenous Covariates: Education and Age

Education. First, regarding exogenous covariates, scientific research shows a clear influence of the variable "education" (educational level, as measured by ISCED levels) on participation in adult education (Patterson, 2008; Desjardins, Rubenson, & Milana, 2006; Desjardins, 2008a, 2008b; Boeren, 2016; Scandurra & Calero, 2017; Iñiguez-Berrozpe & Boeren, 2019).

Parents' education. In addition, the variable "parents' education" is used because it is an educational background factor that, according to authors such as Bukodi and Goldthorpe (2012) and Erikson (2012), helps us understand the achievement of a higher level of education, such as a greater interest in participation in teaching-learning activities, given the demonstrated evidence on intergenerational transmission of education. As Scadurra and Calero (2017) state, in much of the cross-national research literature, this variable is used for understanding the respondent's family background, representing a good proxy for this variable.

Age. This is another traditional control variable for education, adult education and individual and social learning outcomes, showing an inverse relationship with all of them (Scadurra & Calero, 2017; Iñiguez-Berrozpe & Boeren, 2019)[4].

Endogenous Observed Variables: Adult Education, Work, Health and Cultural Engagement

Adult education (NFE12 in PIAAC survey). By using the participation variable of NFE as a dependent variable of "age", "education" and "parents' education" and as an independent variable of the rest of the endogenous variables, a set of the potential benefits of the

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[4] We tried other traditional control variables in the model, such as being a migrant or the number of children, but these were not significant and did not lead to any convergence of the final model.

participation of women with a low educational level is analysed. These are similar to the benefits used in the model of Manninen and Meriläinen (2011) but are based on our study of the variables in the PIAAC test that measure effects that can be compared to the benefits analysed by Manninen and Merilänen. Our choice of using the NFE variable is explained by different reasons. First, participation of low-educated women in Formal Education (FE) is almost non-existent (4.6% in our sample), according to PIAAC data, and does not lead to convergence of the model if we include FE; on the other hand, our model of reference (Manninen & Meriläinen, 2011) used liberal adult education, and although these are not completely overlapping concepts, liberal adult education is included in NFE, and we wanted to maintain this alignment in terms. Finally, as stated by Field (2009) and Manninen and Meriläinen (2011), although there are many well-founded studies on the benefits of formal education, little attention has been paid to personal and social benefits of non-formal adult education, and our research aims to contribute to this knowledge.

Work. Undoubtedly, an improvement in employability is one of the objectives of adult education, and this effect is analysed in the literature on the subject. The studies of Óhidy (2008) or Holford and Mohorcic-Spolar (2012) show that participation in educational activities substantially improves adults' professional identity and commitment to their work, especially in adults with a low educational level, as shown by Nordlund, Stehlik, and Strandh (2013) or Panitsides (2014). Within this group, the case of women has been studied by Patterson et al. (2018), Porras-Hernández and Salinas-Amescua, (2012) and Tawiah (2017), and women in these studies showed a notable improvement in their employability because of a better alignment between their competences that were acquired in these courses and the needs of the labour market. Accordingly, the variable "work" has been included in our model as one of the possible positive effects of AE. However, regarding directionality, employment ("work" in our analysis) has also been pointed out by authors such as Reder (2017) as a

characteristic of this population group that can influence participation in adult education courses. In the current analysis, we have decided to consider it as an endogenous variable (outcome of adult educational participation), following our reference model and the literature mentioned above that analyses job opportunities and better alignment with work requirements as adult education output; however, the results have to be interpreted carefully because of this possible double directionality between adult education and "work".

Health. One of the most discussed correlations in the social sciences is the correlation that has been established between educational achievement and better perceived health (Karas & Friedman, 2015), which is why we considered it as another endogenous variable in our work ("health"). Various studies, such as those of Desjardins (2008a, 2008b), Feinstein and Budge (2007), Feinstein et al. (2008), Manninen (2010) and Field (2009), have shown that adult education has a beneficial effect on mental, emotional, and even physical well-being. Benefits have also been demonstrated for women with a low educational level in the work by Prins, Toso, and Schafft (2009).

Cultural engagement. Finally, the variable "cultural engagement" in the PIAAC survey that refers to "voluntary work for a non-profit organization" has been included in the proposed model. Undoubtedly, the contribution to the social and cultural well-being of the community is another benefit of adult education that has been analysed by the literature at most at a general level (Manninen & Meriläinen, 2011; Field, 2009; Merriam & Kee, 2014; Motschilnig, 2012), specifically in the case of women. According to Norris and Oyasande (2017), participation in non-formal education activities promoted greater social and environmental awareness in women and greater solidarity, as shown by Duckworth and Smith (2018), and the promotion of greater social support in their communities, as stated by Prins, Toso, and Schafft (2009). In short, these benefits are what Freire (1994) advocated

when proclaiming that adult education can offer organic tools of transformation for social awareness.

Endogenous Latent Variables: Learning Strategies, Literacy and Socio-political Trust

Learning strategies and literacy. Regarding the potential benefits of NFE, it seems evident that participation in educational activities potentially influences the acquisition of learning strategies, as demonstrated in previous research by Manninen and Meriläinen (2011) and Patterson et al. (2008) or Hammond and Feinstein (2005) in the case of women with a low educational level. These authors show that participation in educational activities provides these women with a better understanding of the importance of education and with greater self-confidence by transforming the negative perceptions of learning among adults with a low educational level. This variable has been controlled by the literacy level, as measured by the PIAAC (10 plausible values), and considering its improvement, according to Dejardins (2015), it is also a potential benefit of adult education.

Socio-political trust. Previous studies, such as those by Field (2009), Motschilnig (2012), or Feinstein et al. (2008), consider that another variable can benefit from participation in educational activities. This variable is "socio-political trust", which is understood as being assimilable by social capital, and positive elements such as social cohesion, active citizenship, trust and tolerance in society, civic cooperation and the probability of voting (Herreros, 2003) are also demonstrated as effects for low-educated women in the work of Dave, Corman, and Reichman (2012). For our analysis, this latent variable has been constructed from observed "social trust" and "political efficacy", which are comparable to the variables used by Manninen and Meriläinen (2011).

Method

Instrument

Our analysis is based on data from the first round of the Survey of the Programme for the International Assessment of Adult Competencies (PIAAC, OECD, 2016, published in 2008-2013) that measures the skills of adults in key information processing, such as literacy, numeracy and PS-TRE. The dataset also contains information on how these skills are used in different settings, such as at home or in the workplace (OECD, 2016; Reder, 2017). The PIAAC questionnaire also includes questions that measure sociodemographic and socioeconomic variables such as age, gender, country of origin, educational level, employment, income, and participation in formal and non-formal education activities. This survey also includes questions about social and political trust, cultural participation and health.

The survey has been implemented in 40 countries thus far (23 in the first round). The respondents were between 16 and 65 years old. According to the OECD, high-level skills are necessary for enabling people to participate successfully in society and contributing to a productive economy. The skills that are measured in the PIAAC are literacy, numeracy and PS-TRE, which are variables that are measured in a range of different tasks that contain 10 plausible values (PV). Literacy and numeracy are measured with five levels of competence, and PS-TRE is measured with three levels. However, in the present work, in accordance with the findings of the previous literature, we focused our analysis on socio-personal variables, educational participation and factors that may be considered potential personal or social benefits of participation in NFE.

Variables Selection

The PIAAC survey dataset includes 1,329 variables from which we selected a number of observed and latent variables, as shown in Table 1, to test our hypothetical model presented above.

Table 1. *Variables used in the model*

Latent variables		Observed variables		Type
Description	Label	Description	Label	
		Age	AGE	Continuous
		Highest level of education	EDUCATION	Ordinal
		Participation in non-formal educational activities in the last 12 months*	NFE12	Dichotomous
		Working: Current status - Last week - Paid work	WORKING	Dichotomous
		Health status**	HEALTH	Ordinal
		Cultural engagement - Voluntary work for non-profit organisations	CULT	Ordinal
Parents' Education	PARED	Father's highest level of education	FE	Ordinal
		Mother's highest level of education	ME	Ordinal
Learning Strategies	LS	Learning strategies - Relate new ideas to real life	LS1	Ordinal
		Learning strategies - Like learning new things	LS2	Ordinal
		Learning strategies - Attribute something new	LS3	Ordinal
		Learning strategies - Get to the bottom of difficult things	LS4	Ordinal
		Learning strategies - Figure out how different ideas fit together	LS5	Ordinal
		Learning strategies - Looking for additional info	LS6	Ordinal
Socio-political Trust	SOC-POL	Social trust - Trust only a few people	SOC1	Ordinal
		Social trust - Other people take advantage of you	SOC2	Ordinal
		Political efficacy - No influence on the government	POL	Ordinal
Literacy	LIT	Plausible value Literacy 1	PV1	Continuous
		Plausible value Literacy 2	PV2	Continuous
		Plausible value Literacy 3	PV3	Continuous
		Plausible value Literacy 4	PV4	Continuous
		Plausible value Literacy 5	PV5	Continuous
		Plausible value Literacy 6	PV6	Continuous
		Plausible value Literacy 7	PV7	Continuous
		Plausible value Literacy 8	PV8	Continuous
		Plausible value Literacy 9	PV9	Continuous
		Plausible value Literacy 10	PV10	Continuous

Source: OECD, 2016. Own processing
* Participation in non-formal educational activities in the last 12 months: 0-Did not participate in NFE; 1-Participated in NFE; ** Health status: 1-poor; 2-fair; 3-good; 4-very good; 5-excellent

For the variable selection, as explained above, we based our design on a review of the existing literature. All the variables that relate to the individual and social benefits of adult education in women with a low educational level have been treated as ordinal values that vary from 1 (the most negative) to 5 (the most positive).

Sample

In the PIAAC survey, approximately 5,000 adults from each participating country are evaluated, representing the total population of OECD member countries (OECD 2016) between 16 and 65 years of age. For the present analysis, we decided to work with European countries only because our research is based on the studies by Desjardins (2008a) and Schuller and Desjardins (2010) and their subsequent use as a model applied to a European sample by Manninen and Meriläinen (2011). Moreover, although the realities of the different countries cannot be compared (see the section Conclusions: Limitations of the study), all of them are framed by the European Union Policy for Adult Learning (European Commission, 2018) and thus they embrace the same objectives, including the potential benefits explored in the present research. However, in our study, those European countries that measured the PIAAC's concepts that we are analysing differently were excluded from the analysis. Finally, we selected data from the first round of the PIAAC survey (OECD, 2016, published in 2008-2013), including those from Belgium, Czech Republic, Denmark, Finland, France, Ireland, Italy, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden and the United Kingdom. Then, among these countries, we selected women between 25 and 65 years of age, given that the concept of working-age population for cross-sectional studies in Europe is limited to this age group. Although to make the comparison among educational levels we used the entire sample, among these selected women, for the elaboration of the model, we

chose the women who, according to CEDEFOP (2018), are considered to be "adults with a low level of education", which is defined as the proportion of adults (25 to 65 years old) who have at most a secondary grade education (ISCED 2 or lower). Finally, we excluded cases with missing data in the model to make the sample more robust in the analysis process.

The final sample was n = 32,768 women of whom n = 26,930 corresponded to a medium-high level of education (ISCED 3-6). Of these, n = 5,838 had a low educational level (ISCED 0-2) and are the subsample that composes the final model presented in this study; finally, n = 5,533 (ISCED 0-2) were men. In Table 2, the characteristics of the subsample of low-educated women are presented and compared with the characteristics of ISCED 3-6 women and ISCED 0-2 men.

This sample comparison is performed to contextualize the data presented in the results section. Thus, the average age of women with ISCED 0-2 is 50.0, which is higher than the average age of ISCED 3-6 women (43.5) and ISCED 0-2 men (48.7). Although all the analysed countries in the PIAAC survey include women with low educational levels, the most overrepresented countries in the sample are Spain (18.7%) and Italy (12.5%). Regarding whether these women are working, only 36.5% of women with ISCED 0-2 are active in this regard compared to 66.8% of women with ISCED 3-6 and 55.3% of ISCED 0-2 men. Likewise, there are differences regarding origin, given that 11.7% of women with a low educational level are immigrants in the country where the survey was conducted (the percentage is similar for migrant ISCED 0-2 men) compared to 9.8% of women with a higher educational level. There are significant differences in the participation in NFE between subsamples, given that 52.8% of women with ISCED 3-6 participate in NFE, while only 18.9% of women with a low educational level performed an activity of this type in the 12 months prior to the survey; this share is also lower than the percentage of low-educated men who participate in NFE (24.3%). Regarding the distribution by educational levels among

women with a low level of education, in the case of the subsample of women with a low educational level, the highest percentage is found among women who completed up to ISCED 2 (64.7%). Regarding parents' educational background, in our sample, the majority of women with ISCED 0-2 have parents of the same educational level, which is similar to ISCED 0-2 men, while this figure is reduced by more than half in women with a higher educational level.

Table 2. *Sample features and comparison between ISCED 0-2, ISCED 3-6 women and ISCED 0-2 men*

		Women ISCED 0-2	Women ISCED 3-6	Men ISCED 0-2
Age (avearge)		50.0	43.5	48.7
Country	Belgium	5.7%	5.8%	5.1%
	Czech Republic	2.8%	8.5%	1.1%
	Denmark	6.1%	9.8%	6.3%
	Finland	3.7%	7.1%	5.2%
	France	7.9%	6.4%	8.2%
	Ireland	9.1%	8.0%	10.4%
	Italy	12.5%	5.0%	12.5%
	Netherlands	10.4%	5.4%	9.1%
	Norway	2.6%	6.3%	3.5%
	Poland	3.1%	8.2%	4.4%
	Slovak Republic	5.6%	7.5%	3.2%
	Spain	18.7%	4.7%	19.8%
	Sweden	2.3%	5.5%	3.7%
	United Kingdom	9.4%	11.6%	7.5%
Working: Current status - Last week - Paid work	No	63.5%	33.2%	44.7%
	Yes	36.5%	66.8%	55.3%
Born in country	Yes	88.3%	90.2%	88.8%
	No	11.7%	9.8%	11.2%
Participated in NFE	Did not participate in NFE	81.1%	47.2%	75.7%
	Participated in NFE	18.9%	52.8%	24.3%
Highest qualification - level	No formal qualification or below ISCED	12.9%		10.9%
	ISCED 1	22.3%		23.9%
	ISCED 2	64.7%		65.2%
	ISCED 3		47.2%	
	ISCED 4		5.0%	
	ISCED 5		42.3%	
	ISCED 6		5.4%	
Highest level of education - father	ISCED 1. 2. and 3C short	84.1%	43.4%	83.8%
	ISCED 3 (excluding 3C short) and 4	13.8%	39.8%	13.3%
	ISCED 5 and 6	2.1%	16.9%	2.9%
Highest level of education - mother	ISCED 1. 2. and 3C short	91,0%	54,3%	89,7%
	ISCED 3 (excluding 3C short) and 4	7,4%	33,6%	8,4%
	ISCED 5 and 6	1,5%	12,1%	1,9%

Women ISCED 0-2 n.= 5.838
Women ISCED 3-6 n. = 26.930
Men ISCED 0-2 n.= 5.533
Source: OECD. 2016; Own processing

Analysis

First, we compared the subsample object of our study (women with ISCED 0-2) with the subsample of women with a high educational level (ISCED 3-6) and men with a low educational level (ISCED 0-2) by using the variables that we considered potential benefits of AE, according to our reference model (learning strategies, socio-political trust, cultural engagement, working status, and health state) and other previous literature. To first compare the group of ISCED 0-2 women with ISCED 3-6 women and then with ISCED 0-2 men, the Student's t-test was performed on independent samples: we found significant differences in all the variables analysed ($p < 0.001$) and effects from small (0.01) to moderate (0.06) levels by calculating the Eta squared (see Table 3) in the first comparison and significant differences in most of the variables analysed ($p < 0.05$; $p < 0.001$) in the second comparison (see Table 4).

To test our proposed hypothetical model, because of the theoretical review presented above, an analysis was made with SEM. This is a technique that has barely been used in the analysis of adult education, with some exceptions such as Scandurra and Calero (2017), Manninen and Meriläinen (2011) and Iñiguez-Berrozpe and Boeren (2019). According to Byrne (2010), the application of SEM has different advantages: it allows the use of multiple dependent variables in the same model, and it is possible to construct latent variables that are more reliable than the variables observed due to the inclusion of measurement errors. In addition, SEM produces multiple measures of goodness of fit that indicate whether our model fits the data, which represents a more reliable analysis than the application of traditional multiple linear regression techniques, for example. Finally, the selection of SEM as an analysis technique and the directionality of NFE towards potential benefits are based on the aim to perform the same test on low-educated women that our model of reference (Manninen & Meriläinen, 2011) tested on a general sample. Moreover, our aim is to explore with

quantitative data what previous literature has already discussed only in a qualitative way, which is a gap in scientific research, as stated by Panitsides (2014). According to Manninen and Meriläinen (2011), the challenge when analysing causal relations, which includes SEM, is the difficulty in determining the direction of the relations among the variables, which is a common problem in cross-sectional research. Thus, in SEM analysis, researchers have to decide how to build the model, that is, what type of causal links they suppose exist between the factors. A common solution to this type of dilemma is the one proposed by Keith (2006, p.249), emphasizing that "theory, previous research and logic are the appropriate tools for making such judgments"; this is a theory that is also used in the design of our reference model (Manninen & Meriläinen, 2011, p.98) and consequently in the present work. Therefore, the relevant previous literature on the benefits of adult education, including the official reports (European Commission, 2009, CEDEFOP, 2016), has led us to suggest in the model that participation in education generates different types of benefits at the same time, as shown by the SEM model, although the results should be interpreted carefully because directionality is difficult to assume in cross-sectional studies.

To conduct this analysis, we used IBM-SPSS and its AMOS extension (version 22). A model was created in which the contributions of each observed variable to its corresponding latent variable and the values of the proposed structural model, including the observed variables and latent variables, are shown (see the results section, Figure 2 and Table 5). This model of a complete structural equation is used to test the hypothetical patterns of causal structures that relate several variables to the constructed model (Byrne, 2010). This technique has a confirmatory character to confirm a model derived from a review of the relevant literature, such as the model proposed in this study.

The estimator that was selected was the Maximum Likelihood Estimator (MLE), which is a standard tool for finding the values of parameters that make the observed data more

assimilable, despite the different measures that are applied to them in the survey. This procedure has also been recommended in the literature on SEM within AMOS (Byrne, 2010). The results show non-standardized and standardized regression coefficients, standard errors, and critical residues. Finally, the goodness of fit of our model was tested using RMSEA, CFI, TLI, NFI and GFI as indicators, as recommended by Schlermelleh-Engel et al. (2003) and Byrne (2010)[5]. We also replicated our analysis for each country and obtained similar results, which also validated our model.

Results

In the comparison between the two subsamples of women according to their educational level, the differences among all the analysed variables were significant (p <0.001) when applying the Student's t-test to the independent samples. Thus, for all the analysed variables, women with medium or high educational levels had higher scores than women with a low educational level: women with medium or high educational levels presented differences of almost 50 points in literacy and approximately 0.4 in better acquisition of learning strategies, more social and political confidence, more cultural participation (as volunteers in associations), and even better subjective health. Once again, a comparison of working status was included (which is much higher in women with ISCED 3-6). On the other hand, comparing the subsample of low-educated women with low-educated men, significant differences also arise. For most of the variables, the men's level was slightly higher than the women's level, being significant in literacy, learning strategies, and health and employment (p<0.001) (see Table 4). However, given the large sample size, the high level of significance of the differences must be considered with caution since when calculating the eta squared, the values were between small (.01) and moderate (.06).

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[5] The limit criteria for the goodness of fit recommended by Schlermelleh-Engel et al. (2003), Vandenberg (2006) and Byrne (2010) and followed in this paper are: RMSEA <.80; CFI >.93; TLI >.90; NFI >.90; GFI >.90.

Table 3. *Comparison between ISCED 0-2 and ISCED 3-6 women in the values that relate to literacy, learning strategies, cultural engagement, socio-political trust, health state and working.*

PIAAC Variable	Educational Level	Mean 1-5 / %	SD	Eta squared
Literacy	ISCED 0-2	231.0***	42.8	0.02
	ISCED 3-6	280.2***	39.0	
Learning strategies - Relate new ideas to real life	ISCED 0-2	2.87***	0.99	0.04
	ISCED 3-6	3.38***	0.91	
Learning strategies - Like learning new things	ISCED 0-2	3.53***	1.00	0.03
	ISCED 3-6	4.00***	0.84	
Learning strategies - Attribute something new	ISCED 0-2	3.25***	0.98	0.04
	ISCED 3-6	3.79***	0.84	
Learning strategies - Get to the bottom of difficult things	ISCED 0-2	3.27***	1.17	0.02
	ISCED 3-6	3.73***	0.97	
Learning strategies - Figure out how different ideas fit together	ISCED 0-2	3.08***	1.10	0.03
	ISCED 3-6	3.57***	0.95	
Learning strategies - Looking for additional info	ISCED 0-2	3.62***	1.03	0.03
	ISCED 3-6	4.05***	0.81	
Cultural engagement - Voluntary work for non-profit organisations	ISCED 0-2	1.42***	0.94	0.01
	ISCED 3-6	1.65***	1.05	
Political efficacy - No influence on the government	ISCED 0-2	2.23***	1.20	0.03
	ISCED 3-6	2.78***	1.25	
Social trust - Trust only a few people	ISCED 0-2	2.01***	1.03	0.02
	ISCED 3-6	2.45***	1.22	
Social trust - Other people take advantage of you	ISCED 0-2	2.00***	1.03	0.03
	ISCED 3-6	2.51***	1.15	
Health status	ISCED 0-2	2.91***	1.10	0.04
	ISCED 3-6	3.50***	1.01	
Working: Current status - Last week - Paid work	ISCED 0-2	36.5%***		0.06
	ISCED 3-6	66.8%***		

***p<0.001
ISCED 0-2 n.= 5,838
ISCED 3-6 n. = 26,930
Source: OECD, 2016; Own processing

Table 4. *Comparison between Women ISCED 0-2 and Men ISCED 0-2 in the values that relate to literacy, learning strategies, cultural engagement, socio-political trust, health state and working.*

PIAAC Variable	Educational Level	Mean 1-5 / %	SD	Eta squared
Literacy	Women ISCED 0-2	230.9***	42.8	0.01
	Men ISCED 0-2	234.6***	43.7	
Learning strategies - Relate new ideas into real life	Women ISCED 0-2	2.87***	0.99	0.01
	Men ISCED 0-2	2.94***	1.03	
Learning strategies - Like learning new things	Women ISCED 0-2	3.53***	1.00	0.01
	Men ISCED 0-2	3.63***	1.02	
Learning strategies - Attribute something new	Women ISCED 0-2	3.25***	0.98	0.01
	Men ISCED 0-2	3.39***	0.99	
Learning strategies - Get to the bottom of difficult things	Women ISCED 0-2	3.27***	1.17	0.01
	Men ISCED 0-2	3.39***	1.14	
Learning strategies - Figure out how different ideas fit together	Women ISCED 0-2	3.08***	1.10	0.01
	Men ISCED 0-2	3.20***	1.10	
Learning strategies - Looking for additional info	Women ISCED 0-2	3.62	1.03	-
	Men ISCED 0-2	3.67	1.03	
Cultural engagement - Voluntary work for non-profit organisations	Women ISCED 0-2	1.42	0.94	-
	Men ISCED 0-2	1.44	0.96	
Political efficacy - No influence on the government	Women ISCED 0-2	2.23	1.20	-
	Men ISCED 0-2	2.26	1.22	
Social trust - Trust only few people	Women ISCED 0-2	2.01*	1.03	0.01
	Men ISCED 0-2	2.06*	1.05	
Social trust - Other people take advantage of you	Women ISCED 0-2	2.00	1.03	-
	Men ISCED 0-2	1.99	1.01	
Health - State	Women ISCED 0-2	2.91***	1.10	0.01
	Men ISCED 0-2	3.02***	1.12	
Working	Women ISCED 0-2	36.5%***		0.04
	Men ISCED 0-2	55.30%***		

*p<0.05***p<0.001;
Women ISCED 0-2 n.= 5,838
Men ISCED 0-2 n. = 5,533
Source: OECD, 2016; Own processing

Then, we proceeded to test our hypothetical model by considering the subsample of women with an educational level between ISCED 0 and ISCED 2 with SEM. In the present study, the final model is shown, for which the best measures of goodness of fit have been obtained. This model was replicated for the total sample and for the subsample of women

with ISCED 3-6. Although both models showed an optimal goodness of fit, they presented a much higher influence of educational level than NFE for all the outcomes. Therefore, we conclude that our explanatory model—presented below—with a more relevant influence of NFE than the ISCED level can be applied only to the sample of women with a low educational level, with the results being aligned with the qualitative knowledge in the literature and the theory on the subject.

The results of the model, which are specified in Table 5, show that all the non-standardized estimates of the route of the structural parameter were significant (p <0.001, critical residues, Est./SE> 1.96). To facilitate the comparison among different types of variables (dichotomous and ordinal), we used standardized parameters.

First, the results show that all the relationships in the final model are positive, except for the influence of age on most of the variables, other than socio-political trust and cultural commitment. Regarding the variables that influence participation in AE, it was found that both "education" (.080) and "parents' education" (.099) had significant but not high standardized coefficients, which also demonstrates that the influence of intergenerational educational transmission was significant but with a reduced coefficient (the influence of the parents' education on educational level was estimated at .084).

As postulated by our theoretical model, participation in non-formal adult education activities has a relevant effect on individual benefits that go beyond the "educational level" of the women and their family environment, as measured by "parents' education". Therefore, the effect of adult education on "work" shows a coefficient of .250, which is the highest coefficient in this possible relation, while the effect of "education" is much smaller (.108). Similarly, the influence of adult education on the acquisition of learning strategies, with a standardized estimate of .108, exceeds the effect of "education" (.071). In this case, literacy is related to a better acquisition of learning strategies (.159). In addition, participation in adult

education seems to suppose better "health" (.099) in the same way as having a higher educational level (within the parameters of the low-educated women that we considered).

Regarding the social benefits of adult education, the results of the proposed model show that women with a low educational level who participate in these activities have higher levels of socio-political confidence (.138) and higher levels of "cultural engagement" (participation as volunteers in different activities), with a standardized coefficient of .135. Again, the variable adult education for this low-educated group has a more relevant effect on these factors than the women's "educational level". On the other hand, and as the literature suggests, education has a stronger effect on "literacy" (.245), although NFE is also related to this skill (.103).

To evaluate the goodness of fit of our model, we used the indicators and limit criteria that are recommended by the literature for SEM analysis of large samples (Schlermelleh-Engel et al., 2003; Vandenberg 2006, Byrne, 2010). The indicators of GFI (.97), CFI (.98), TLI (.98), NFI (.98) and RMSEA (.03) show that the matrix that is derived from the data and the matrix that is derived from the conceptual model do not have significant differences (see footnote 5). Therefore, the proposed model can be considered optimal.
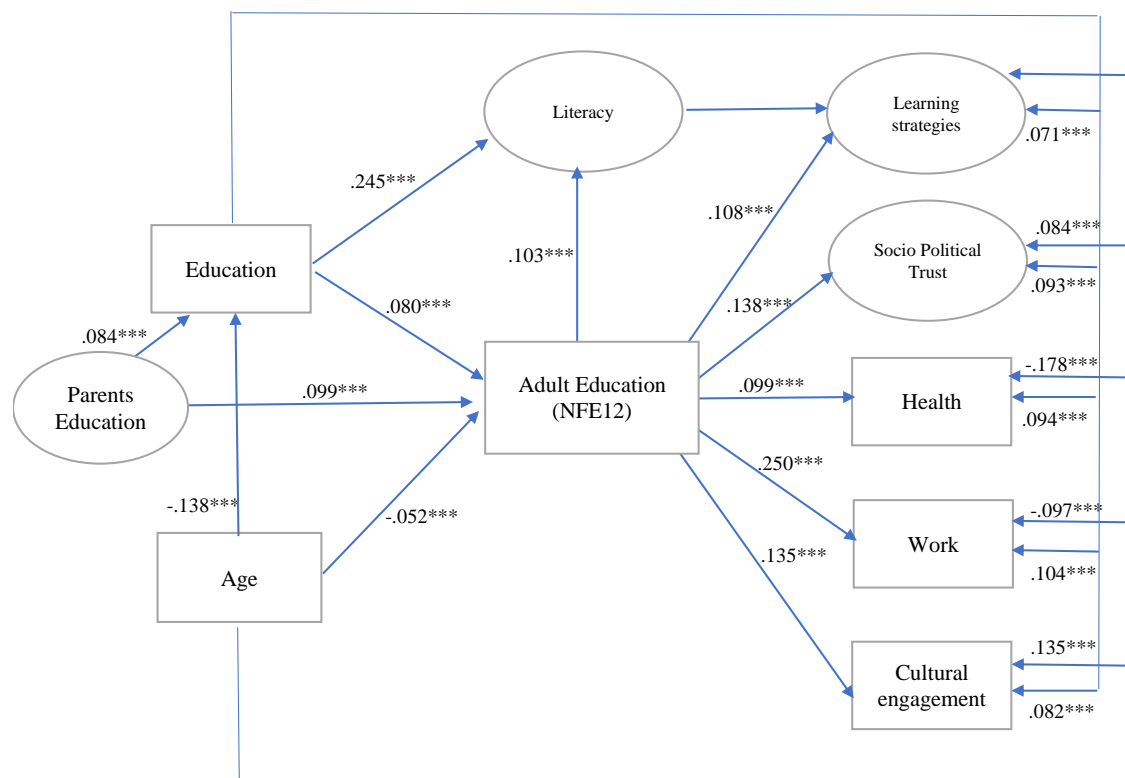
Figure 2. Visual representation of the model. Standardized coefficients
Source: OECD, 2016. Own processing
***p<0.001

Table 5. *AE in low educated women's model results (unstandardized and standardized estimates, standard errors (S.E.) and critical ratio (C.R.)*

			Unstandardized coefficients	S.E.	C.R.	Standardized coefficients
EDUCATION	<---	AGE	-,009	,001	-10,693	-.138
NFE12	<---	AGE	-,002	,000	-3,964	-.052
LS	<---	AGE	-.007	.001	-7.472	-.103
SOCPOL	<---	AGE	.005	.001	5.352	-.084
WORKING	<---	AGE	-.004	.001	-7.727	-.097
CULT	<---	AGE	.011	.001	10.034	.130
HEALTH	<---	AGE	-.017	.001	-13.854	-.178
EDUCATION	<---	PARED	,223	,050	4,449	.084
NFE12	<---	PARED	,145	,029	5,080	.099
NFE12	<---	EDUCATION	,044	,007	6,065	.080
LIT	<---	EDUCATION	14.690	.769	19.107	.245
LS	<---	EDUCATION	.076	.015	4.969	.071
SOCPOL	<---	EDUCATION	.095	.016	5.914	.093
WORKING	<---	EDUCATION	.071	.009	8.268	.104
CULT	<---	EDUCATION	.108	.017	6.318	.082
HEALTH	<---	EDUCATION	.145	.020	7.287	.094
LIT	<---	NFE12	11.224	1.392	8.061	.103
LS	<---	NFE12	.211	.027	7.825	.108
SOCPOL	<---	NFE12	.254	.029	8.691	.138
WORKING	<---	NFE12	.307	.015	19.935	.250
CULT	<---	NFE12	.324	.031	10.472	.135
HEALTH	<---	NFE12	.277	.036	7.719	.099
LS	<---	LIT	.003	.000	11.047	.159
ME		PARED	1,000			.632
FE		PARED	,772	,138	5,579	.612
LS6	<---	LS	1.000			.742
LS5	<---	LS	1.095	.020	55.438	.761
LS4	<---	LS	1.127	.021	53.592	.736
LS3	<---	LS	.929	.018	52.694	.723
LS2	<---	LS	.990	.018	55.072	.756
LS1	<---	LS	.798	.018	44.650	.615
SOC1	<---	SOCPOL	1.000			.701
SOC2	<---	SOCPOL	1.056	.044	24.143	.740
POL	<---	SOCPOL	.640	.029	22.214	.384
PVLIT1	<---	LIT	1.000			.919
PVLIT2	<---	LIT	.995	.008	125.641	.922
PVLIT3	<---	LIT	.999	.008	126.422	.924
PVLIT4	<---	LIT	1.001	.008	125.473	.921
PVLIT5	<---	LIT	.994	.008	124.982	.920
PVLIT6	<---	LIT	.976	.008	123.612	.917
PVLIT7	<---	LIT	1.000	.008	125.335	.921
PVLIT8	<---	LIT	.982	.008	124.681	.920
PVLIT9	<---	LIT	.986	.008	124.197	.918
PVLIT10	<---	LIT	1.001	.008	125.501	.921

p<.001; GFI= .97; CFI=.98; TLI=.98; NFI=.98; RMSEA=.03
n.= 5,838

PARED: Parents Education; EDUCATION: Highest level of education; NFE12: Participation in non-formal educational activities in the last 12 months; LS: Learning strategies; SOCPOL: Socio-political Trust; WORKING: Current status - Last week - Paid work; CULT: Cultural engagement - Voluntary work for non-profit organisations; HEALTH: Health status

Discussion and Conclusions

The low educational level of adults is considered to be one of the main factors that can lead to the risk of exclusion from political, social and cultural participation and to lower employment and even health levels, as stated in publications by CEDEFOP (2018), Field (2012), Laal and Salamati, (2012), OECD (2016), Eurostat (2018). If we add to the low adult educational level the fact of being a woman, among other structural and social factors that burden women and lead to less access to adult training, the possibilities of social exclusion increase (Lewis & Lockheed, 2007), as indicated by OECD (2016) or Patterson's (2018) research. This reduced participation in educational activities and therefore less access to employment translates into a perpetuation of inequality between men and women, especially among women with a lower educational level (Dieckhoff & Steiber, 2011).

According to Nordlund, Stehlik, and Strandh (2013), despite this situation, the studies that have focused on the benefits of adult education for people with low educational levels are very limited, and there are even fewer studies in the case of women. Moreover, none of these studies uses the PIAAC data (OECD). Because of this absence of research, in the present work, we used the PIAAC survey (OECD, 2016) to compare women with ISCED 3-6 and men with ISCED 0-2 to ISCED 0-2 women. We built a model with an SEM analysis that was inspired by previous literature (Manninen & Meriläinen, 2011) but that focused on women with a low educational level (ISCED 0-2) due to their aforementioned risk of exclusion and their lower participation in adult training activities.

In this comparison of women with different educational levels, it is evident, on the one hand, that women with ISCED 0-2 have less developed learning strategies, less socio-

political participation, a higher level of unemployment and even worse health, which corroborates the results of previous studies (Patterson et al., 2008; Dave, Corman, & Reichman, 2012; Tawiah, 2017; Norris & Oyasande, 2017; Porras-Hernández & Salinas-Amescua, 2012; Duckworth & Smith, 2018; Prins, Toso, & Schafft, 2009; Lewis & Lockheed, 2007). When comparing low-educated adults, it is also evident that women face a double risk of exclusion, as explored in reports by Lewis and Lockheed (2007) or the OECD (2016); they have lower levels of learning strategies, social trust, health and employment than ISCED 0-2 men.

On the other hand, when applying our hypothetical model, the results show that, in fact, the difference between participating or not in adults' NFE activities is significant when analysing the different social and personal benefits that are proposed in the model for women with ISCED 0-2. Thus, the effect of having performed some type of NFE in the last 12 months for low-educated women was, for several of the analysed variables, more relevant than the initial educational level and family background, which was measured in terms of parental education.

An example of this is the fundamental effect of participation in adult education on working, that is, on the participants' employability, which corroborates the results of previous works, such as those of Manninen and Meriläinen (2011), European Commission (2011), Nordlund, Stehlik, and Strandh (2013), Patterson et al. (2008), Porras-Hernández and Salinas-Amescua, (2012), or Tawiah (2017). Nonetheless, the possible correlation between NFE and work suggests being cautious with this specific result (see the limitations of the study below). The effect of participation in adult training is also more relevant than the initial educational level on the participation of women in "voluntary work for non-profit organizations". Adult education's contribution to the well-being of the community (Merriam & Kee 2014; Motschilnig, 2012; Schuller & Desjardins, 2010) has also been shown in the case of women

with a low educational level by studies such as Norris and Oyasande (2017), Duckworth and Smith (2018) and Prins, Toso, and Schafft (2009). Undoubtedly, the failure to achieve medium or high levels of education may lead to a lesser capacity to acquire learning strategies, as we have shown in our comparison. Education in adulthood can provide greater motivation, positivity and self-confidence for low-educated women, as corroborated by the results of our study and earlier works such those of Manninen and Meriläinen (2011) and Patterson et al. (2008), and is also related to higher levels of literacy (Dejardins, 2015). Another benefit of AE for women with a low educational level is an increase in socio-political trust, which may increase their awareness of their contribution to active citizenship and social cohesion, as advocated by Herreros (2003) and Dave, Corman, and Reichman (2012). Finally, in our model, it has been suggested that the contribution of adult education is comparable to educational level in terms of having better health. This corroborates that NFE can be a source of physical, mental and emotional well-being, as advocated by authors such as Desjardins (2008a, 2008b), Feinstein and Budge (2007), Feinstein et al., (2008), Manninen (2010), Field (2009), and Schuller (2002, 2004) for adults in general, and by Prins, Toso, and Schafft (2009), Hammond and Feinstein (2005) or Panitsides (2014) for women with a low educational level specifically.

In addition to all the direct effects of NFE on the discussed benefits, in our model, we corroborate that adult training also positively mediates between the educational level and family background and the positive personal and social effects are considered. Thus, it can be considered that in a situation of low educational background (low educational level) that is characterized by a certain social determinism (influence of the education of parents on the educational level achieved), adult education can be a tool for social transformation that could empower these women whose background seems not to favour their active and effective participation in society, as Freire (1994) has advocated.

Given the results of our exploratory study, which shows the potential benefits of adult education for low-educated women and indicates that the level of participation of these women in learning activities is very low, it seems clear that the challenge for public policies is to promote these activities among groups that are at risk of exclusion. Undoubtedly, in a society in which educational level translates into greater employability and therefore a better standard of living, information and knowledge are the basis for active participation in different social and cultural spheres and even health depends on these factors. Accordingly, adult education is positioned as a fundamental tool for social inclusion. Adult training that considers these groups should be promoted. Moreover, given the importance that adult training has for women of a low educational level, adult education is a highly relevant goal for achieving an inclusive information society.

The limitations of the study are found in the absence of a reflection on the structural characteristics of both Europe in general and the countries that compose the sample that we used for our study in particular. Having started with the seminal proposal by Desjardins (2008a) and Schuller and Desjardins (2010) and having assumed the model constructed by Manninen and Meriläinen (2011), all the core underpinnings of our study justify this absence. Additionally, the chosen sample can be considered slightly biased after its depuration, with an overrepresentation of southern European countries, and the directionality of NFE could also be discussed. Indeed, as in all cross-sectional studies that try to measure effects between variables, the results must be interpreted carefully due to the controversy about directionality (i.e., the relationship between AE and "work" or "health"). However, using SEM instead of regression analysis allows calculating the goodness of fit of the entire model (not only the relationships between variables represented by the arrows, as would be the case in any regression analysis). This means that if variables were put into a different place, the goodness of fit could be reduced. Despite the fact that directionality cannot be claimed, a well-fitted

model should increase our understanding of how different variables relate to each other in relation to their strength in predicting each other, and as explained above, the results align with those of previous studies.

Due to these limitations, future research could consider national samples and their structural characteristics and a longitudinal analysis would benefit the interpretation of directionality between variables; moreover, an in-depth quantitative and qualitative analysis of the structural and social factors that affect women specifically to better align adult training to their requirements is needed.

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