The Determinants of Labour Force Participation for Older Australian Women: A Statistical Analysis of the Negotiating the Life Course Survey Data

By

Siobhan Austen

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Siobhan Austen
Women in Social & Economic Research

http://www.cbs.curtin.edu.au/wiser

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Women in Social & Economic Research can be contacted by:

Phone: +61 8 9266 7755

Facsimile: +61 8 9266 3368

Email: wiser@cbs.curtin.edu.au

Postal Address: WiSER
                    School of Economics and Finance
                    Curtin University of Technology
                    GPO Box U1987
                    Perth, Western Australia, 6845

Women in Social & Economic Research (WiSER)

Women in Social & Economic Research (WiSER) has recently changed its name from the Women's Economic Policy Analysis Unit (WEPAU) to reflect the broader scope of academic and consultancy research into women's experiences of the *social* and economic policies that permeate their lives.

WiSER is a research program that spans two divisions of Curtin University: the Curtin Business School (CBS) and the Division of Humanities. WiSER was founded in April 1999 in response to a growing void, both within the Australian and international contexts, in the gendered analysis of the economic and social policy issues that confront women. As such, WiSER is committed to producing high quality quantitative and qualitative research on a broad range of issues which women identify as impeding their ability to achieve equity and autonomy. The gender perspective generated through the work of WiSER has provided a number of key opportunities to inform the policy debates within numerous government departments. WiSER seeks to further its commitment to providing a meaningful gender analysis of policy through pursuing further research opportunities which focus on women's experiences of social and economic policies within the Australian context. The broad objectives of WiSER include:

- To identify the cases and causes of women's disadvantaged social and economic status and to contribute to appropriate policy initiatives to address this disadvantage;
- To demonstrate the way in which social factors, particularly gender, influence the construction of economic theory and policy;
- To extend current theory and research by placing women and their social context at the centre of analysis;
- To contribute an interdisciplinary approach to the understanding of women's position in society. In turn, this should enable the unit to better reflect the interrelatedness of the social, economic and political discourses in policy and their consequent implications for women;
- To foster feminist research both nationally and internationally;
- To expand linkages with industry;
- To establish and support a thriving Curtin University of Technology post-graduate research community with a common interest in feminist scholarship.

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Introduction

This report summarises the findings of a detailed statistical analysis of older Australian women's labour force participation behaviour in the last three decades of the 20th century. It utilises data collected in the first wave of the Negotiating the Life Course Survey (NLCS) of 1997[1] and, as such makes use of unique career history information on Australian women and men that is likely to be important in understanding, especially, their later working life participation behaviour. As was observed in our review of existing studies of older women's labour force participation (see Austen and Birch 2005), the dynamic (or life course) aspects of women's participation behaviour have, thus far, been poorly researched topics in Australia. An important aim of this report is to contribute information on these aspects.

This report is organised into 7 sections. Section 1 provides details of the number of women included in our study, the measures of labour force participation that we utilised, and the general patterns of participation observed in the NLCS data set. Section 2 describes the methodology employed in this analysis of participation behaviour. The sections that follow this outline the findings of our data analysis, beginning (in Section 3) with information on how older women's participation chances appear to vary according to factors such as their educational qualifications, health status and the presence of children in the household. In Section 4 attention is focused on the subset of women who are partnered, and findings are presented on the additional effects on women's participation chances of factors such as their partner's employment and health status. Sections 5 and 6 of the report are devoted to an examination of the patterns of women's participation behaviour across their 20s, 30s and 40s. Section 5 reports these relationships for tertiary educated women and Section 6 reports the relationships for other women. A summary and conclusion is in Section 7.

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[1] Baxter, Jones, McDonald and Mitchell (2001). We acknowledge the Social Science Data Archives as the source of this data.

1. Description of the Data

1.1 The NLCS Data

This study was based on data available in the NLCS for women who were aged between 30 and 55 years in 1997 (the date of the survey). In total there were 924 women included in the study; 445 women in their 30s, 344 women in their 40s, and 135 women in their 50s.

Reflecting the project brief, the investigation of these women's participation behaviour focused, as much as possible, on their participation behaviour in the later parts of their working lives. Specifically, each woman's participation behaviour in 3 key periods of her life were identified: participation between the ages of 36 to 40 years, 41 to 45 years, and 46 to 50 years. The decision to split the study into these three parts of the life course was motivated, first, by the need to account for changes in participation that are related to a woman's age. As was noted in Part 1 of the 'Paving the Way' report (Birch and Austen, 2005), it is important not to treat older women as a homogenous group with regards their participation behaviour. Substantial differences in participation behaviour occur within the group of older women that are related to age differences and these should be taken into account in any analysis of participation rates. The second reason for studying the 3 age ranges separately was to identify the connections between participation behaviour in the different stages of women's lives. That is, to see how participation in earlier stages of the life course affects the chances of participation in later years.

However, the decision to focus the study on the later life participation behaviour of women restricted the amount of data available for the investigation. Specifically, only 218 women in the sample had data on their participation behaviour when they were between the ages of 46 and 50 years. There were 399 women with data on their participation behaviour between the ages of 41 and 45 years; and 610 women with data on their participation behaviour between the ages of 36 and 40 years. One consequence of these sample size restrictions was that the study's ability to investigate the determinants of participation behaviour in certain sub-groups of women (for example, partnered women who were tertiary educated) was limited. A

further consequence of the relatively small sample sizes was that the chance of identifying statistically significant relationships was reduced. Additional comments on these data limitations are made when specific results are presented in Sections 2 – 6.

Related data restrictions meant that we were unable to study the determinants of women's participation behaviour when they were in their 50s. Only a handful of women in the NLCS had information on their labour force experience in this part of the life course.

1.2 Measurement of Labour Force Participation and Observed Patterns of Participation in

the NLCS Data

The measure of participation behaviour utilised in this study was based on the number of years within each part of the life course each woman identified herself as mainly engaged in paid work and not studying. In each part of the life course (for example when women were aged between 46 and 50 years), women who identified themselves as mainly engaged in paid work/not studying for 4 or more years were classified as labour market participants; the other women were classified as non-participants.

Several comments are warranted on the choice of this particular measure of participation. The first relates to the "cut off" point (of 4/5 years) for the identification of labour market participants in each part of the life course. This choice was made because the large majority of women in the study fell into only 2 groups, those who participated for each of the 5 years in each part and those who did not participate at all. In other words, very few women in the sample participated between 1 and 4 years in each part of the life course and, thus, the chosen cut off point served to effectively identify participants and non-participants. Furthermore, given the limited variation across the sample in the number of 'participation years' in each part, alternative measures of participation (for example, continuous measures

of the actual number of years each woman participated), would have created errors in the application of standard regression models[2].

A second observation on the measure of participation used in the study is that it produces a relatively high measured incidence of participation. In the sample, 79.8 per cent of women were participants when they were aged between 46 and 50 years; 77.9 per cent were participants when they were aged between 41 and 45 years; and 67.9 per cent were participants when they were aged between 36 and 40 years. As was reported in Part 1, the participation rates measured in the ABS Labour Force Survey are lower than this (although they do follow the same pattern across the age groups). For example, in the ABS data, the labour force participation rate for women in their 40s is around 72 per cent (see Figure 1, Part 1).

The reason for this difference lies largely in the nature of the NLCS question on participation. It asked the respondents to identify their primary employment status for the whole of each year since the time they turned 15. Response options to these questions included "worked full time/no study", "worked part time/no study", and "no work/no study". Women who worked only part of a particular year are likely to have selected one of the first 2 response options and, thus, have been classified in our study as 'participants' in that year. By contrast, the ABS survey measures labour force participation with reference to the respondent's activity in the preceding week. Thus, several women (specifically those women who work only part of a particular year) would be classified as non-participants in the ABS survey, although they would 'appear' as participants in our study[3].

2. Methodology

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[2] Greene (1997) provides a detailed explanation of the inappropriateness of using standard (OLS) regression techniques to model situations where the dependent variable (in our case measured participation behaviour) has limited variance.

[3] Some insights to the significance of this difference is measurement approach is provided by Hayghe and Bianchi (1994, p.25). They used 1992 Population Survey data for the US to show that while 72.9 per cent of mothers had some work experience during the year only 47.9 per cent of these women worked throughout the year.

2.1 Regression Model

In this report the analysis of a woman's chances of being a labour force participant was conducted using a set of Probit regression models. The Probit model was developed by statisticians to specifically accommodate situations where the dependent variable (in our case participation behaviour) has only two possible values (in our case, either the woman is a labour market participant during a particular part of the life course or she is not). The model calculates how the probability that one or other possible values of the dependent variable is recorded is related to variations in the measured characteristics of the environment (in our case each woman's economic and demographic characteristics) and certain unmeasured factors. On the assumption that the influence of the unmeasured factors is normally distributed across the sample of observations and has a unit variance, the probability that a woman will be a labour force participant (denoted by Y = 1) is expressed as:

$$\text{Prob } [Y_i = 1] = \int_{-\infty}^{B'x} \phi(t)dt$$

$$= \phi(\beta' x) \tag{1}$$

where $\phi(t)$ indicates the standard normal cumulative distribution function at time period t and $\beta'x$ is an index function that identifies the influence of the various measured characteristics of the woman's environment on the participation probability[4] (see Greene, 1997, for a full account of the procedure).

2.2 Model Specification: Models 1-3

We found it necessary to construct a number of regression models to study the various questions that exist on the determinants of older women's participation chances. In the first part of the study we used 3 models to examine how the participation probabilities of all women (that is, partnered and non-partnered women) were affected by factors such as their age cohort, partnered status,

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[4] The coefficients (the β's) are estimated using maximum likelihood. The coefficients provide information about the direction and significance of each relationship. However, it is necessary to calculate marginal effects to see the extent to which changes in the value of each explanatory factor effects the probability that the woman will be a labour market participant.

education, the presence of young children in the household and their parent's employment characteristics. The 3 models examined, in turn, how these factors affected participation chances in the 3 parts of the life course, namely, when women are aged in their late 30s, early 40s and late 40s.

2.3 Variable Selection: Models 1-3

The explanatory variables used in the first 3 models are outlined in Table 1.

Table 1: Variable Labels and Descriptions for Regression Models 1-3

Variable Label	Variable Description	Mean
Mother NP	Categorical; mother did not participate in the paid workforce when the respondent was aged 15	0.53
Father HS	Categorical; father was mainly employed in high status jobs when the respondent was aged 15; default includes no father was present	0.43
Tertiary	Categorical; respondent possessed a tertiary qualification in 1997	0.31
Young Child[a]	Categorical; respondent had a child aged under 5 years when aged between 36 and 40 years	0.60
Age Group 40s	Categorical; respondent aged in her 40s in 1997; default is age group 50s or 30s	0.56
First Occ. (High Skill)	Categorical; respondent's first main job was manager or professional; default first occupation is elementary clerical or production	0.25
First Occ.(Med.Skill)	Categorical; respondent's first main job was assoc. professional, trades or adv. clerical) ; default first occupation is elementary clerical or production	0.19
First Occ. (Low Skill)	Categorical; respondent's first main job was intermediate clerical or production; default first occupation is elementary clerical or production	0.33
Partnered	Categorical; respondent was in a partnered relationship in 1997	0.71
Health (Fair or Poor)	Categorical; respondent's self assessed health status in 1997 was fair or poor; default is health is good or excellent	0.13

Note: means are derived from the 610 women included in the model of participation behaviour when women are aged between 36 and 40 years.
a) In the models of participation behaviour of women in their late 30s or early 40s this variable identifies the presence of young children in the household when the woman is within this age group. Because only 2 women in the sample had a young child when they were in their late 40s, in the model where participation in this part of the life course is examined the 'young child' variable refers to the presence of a child aged between 5 and 10 years.

The rationale for selecting these variables as possible explanatory factors in the determination of women's participation in the paid labour market relates, first, to the findings of our review of the existing empirical and theoretical literature on older women's participation behaviour (see Birch and Austen, 2005). That review identified how educational qualifications (in our case measured by the variable 'tertiary') are commonly linked to women's opportunities in the paid labour market and to their chances of participation. The presence of young children in a household

(measured here by the variable 'young child') is commonly predicted to increase the direct and opportunity costs of labour force participation. Similarly, having poor health (measured by 'health (fair or poor)') is often associated with reduced job opportunities and increased difficulties in combining paid work and other activities. In the economic literature, having a partner (measured by the variable 'partnered') is seen to potentially increase a woman's access to alternative sources of income and, thus, potentially reduce the likelihood of participation[5].

A number of variables have been incorporated into our models of participation behaviour that were not apparent in the various studies of older women's participation behaviour canvassed in the literature review. These include measures of parents' employment status – drawing on the sociological literature that suggests that women's attitudes to labour force participation may be positively affected by their mother's involvement in paid work and by their father's experience of paid work (see Austen, 2004). Also included was a measure of the respondent's age group ('age group 40'), with the aim of identifying possible cohort-related differences in participation behaviour. Finally, measures of women's first occupation (for example, 'first occupation (high skill)') were included in an attempt to explore the hypothesis that early positive career experiences are likely to increase a woman's opportunities and perceptions of paid work throughout the life course (see Goldin, 1989).

However, there are some variables that were examined in other studies of older women's participation behaviour that we were unable to incorporate into our analysis. These include, notably, measures of each woman's proficiency in English. The NCLS did not measure this factor and the large majority of women in our study were born either in Australia or in English speaking countries[6].

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[5] The variables relating to the woman's partnered and health statuses refer to circumstances at the time of the survey. The woman's circumstances in earlier time periods (when her participation is measured) may have been different. For example, a woman who was divorced (and un-partnered) in 1997 may have been married when she was aged between 36 and 40 years. This will produce some errors in the analysis, which we expect to be small.
[6] In technical terms, the 'cell sizes' for women from countries other than Australia were too small to enable regression analysis of the importance of this factor to proceed.

2.4 Model Specification and Variable Selection: Models 4-6

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The second set of models used in the analysis of participation behaviour presented in this report (models 4 – 6) focuses on the subset of women who were partnered in 1997. The reasons for examining the determinants of participation probabilities separately for this group of women are two-fold. First, it enables us to test the hypothesis that the effects of factors, such as health status, on participation chances differ between partnered and non-partnered women. Second, additional data is available for partnered women on some factors that might be relevant to participation chances. These factors, which include partner's employment status and partner's health status, are measured by the variables described in Table 2.

Table 2: Additional Variables for Models 4 to 6

Variable Label	Variable Description	Mean
Partner Employed	Categorical; respondent's partner was employed in 1997	0.87
Partner's Health (Fair Or Poor)	Categorical; respondent's assessment of her partner's health status in 1997 was fair or poor; default is respondent's assessment of her partner's health status was good or excellent	0.13

Note: means are derived from the partnered women included in the study of participation behaviour in the 36 to 40 year age group.

As was noted in the literature review (Birch and Austen, 2005), women's participation behaviour has been identified in some studies as varying positively with their partner's employment status, whilst other studies have identified a negative relationship. A theoretical explanation of a positive relationship between partner's employment status is one of 'assortative mating', whereby women with 'good' labour market chances are more likely to be partnered to men with similar chances. For older women there is also a possibility that a decision not to participate in the labour market is related to their partner's retirement from paid work. A negative relationship between the employment status of partners has been theorised as deriving from an 'added worker' effect, whereby a woman increases her involvement in the paid work to compensate for a loss in household income when her partner is not employed.

Partner's health status can be linked to the demands on a woman's caring labour and, thus, the expectation is that it would be negatively associated with the chances of participation in the paid workforce.

2.5 Model Specification and Variable Selection: Models 7-24

The final set of models constructed for this report focuses attention on the dynamic aspects of women's participation behaviour, that is, on how older women's participation chances are related to their involvement in the paid workforce in earlier parts of the life course.

The approach taken to this part of the analysis was, first, to split the sample into 2 groups based on the education variable ('tertiary'). Within each of these sub groups we then constructed models to examine how participation behaviour in each of the 3 parts of an older woman's life course (that is, in the 36 to 40, 41 to 45 and 46 to 50 year parts) were related both to the variables listed in Table 1 *and* prior labour market experience.

Conducting a detailed investigation of the relationship between prior labour market experience and participation probabilities involved adding a degree of complexity to the analysis. Specifically, because our aim was to study how, for example, the chances of participation in a woman's late 40s varied according to whether she participated in her early 40s *and to also* study how these chances varied according to whether the woman participated in her late 30s, we needed to construct a relatively large number of separate models. The high correlation between participation behaviour in each part of the life course meant that it was not possible to include variables relating to participation in each part of the life course in a single model[7]. Rather, separate models – each one including a variable relating to participation in a single previous period of participation – were required.

The reasons for splitting this part of the study into two sub-groups based on the education variable were two-fold. First, and most importantly, we were interested in studying whether previous labour market experience was as important in determining the later life participation chances of tertiary educated women as it was for women with lower levels of education. Second, because participation probabilities in earlier parts of the life course are affected by education, it helped the estimation of the effects of previous experience to leave the education variable out of individual models and, instead, to structure the 2 sets of models around the education variable.

3. Results: Models of the Participation Behaviour of All Women (Partnered and Un-Partnered)

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[7] The specific statistical problem is one of multi-collinearity

This section summarises the results of regression models 1 – 3, which examined how the probability of labour force participation in different parts of the life course varied for women according to their demographic and economic circumstances. Table 3 identifies what are known as the 'marginal effects' of changes in each of the explanatory variables included in the models. These effects show the percentage point change in the probability of participation associated with a one-unit change in the explanatory variable (calculated at mean values). The t-statistics are used in the identification of statistically significant effects.

Table 3: Marginal Effects on Labour Force Participation in Later Life, Australian Women (Partnered and Non-Partnered), NLCS data, 1997

	Model 1: Probability of participation between 46 and 50 years		Model 2: Probability of participation between 41 and 45 years		Model 3: Probability of participation between 36 and 40 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.1507	1.943*	0.1419	2.316*	0.1782	3.586*
Mother NP	0.0119	0.207	0.0211	0.5	-0.0030	0.084
Father HS	-0.0277	0.466	0.0070	0.161	0.0274	0.74
Tertiary	0.0556	0.816	0.1400	3.084*	0.1407	3.414*
Young Child	0.0199	0.331	-0.1535	4.084*	-0.1448	6.999*
Age Group 40s	0.0339	0.613	-0.0482	1.146	0.0515	1.437
First Occ.(High Skill)	0.0687	0.834	0.0593	0.956	0.0758	1.377
First Occ.(Med.Skill)	0.0148	0.194	0.0020	0.034	-0.0168	0.31
First Occ.(Low Skill)	0.0040	0.055	0.0739	1.473	-0.0204	0.438
Partnered	0.0865	1.349	0.1014	2.061*	.0612	1.478
Health (Fair Or Poor)	-0.1667	1.892*	-0.1065	1.597	-0.1586	2.752*

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Model 1=218; Model 2=399; Model 3=610.

The figures in Table 3 indicate that educational qualifications, the presence of children and health status are important predictors of women's participation behaviour in these parts of their life course.

To give meaning to the marginal effects data presented in Table 3, it can help to examine the estimated participation probabilities of women with different demographic and economic characteristics using the models' results. For example, we can examine the estimated probability that a woman would have been a labour market participant in her *late 40s* in 1997 (Model 1) if she was typical of most

women in the NLCS sample with regards the set of explanatory factors. Such a woman had the following characteristics:

- She was aged in her 40s in 1997;

- She was partnered but didn't have a young child in her 40s;

- She did not possess tertiary qualifications in 1997;

- Her first occupation was a low skill one;

- Her mother worked when she was 15 years old and her father was not in a high-status occupation when she was 15; and

- She rated her health as good or excellent.

A woman with these 'modal' characteristics had an estimated probability of being a labour market participant in her late 40s of 81.6 per cent. However, when her health status changed to fair or poor (and all other characteristics remained the same) the estimated probability that she would participate in the labour market in her late 40s fell to 64.3 per cent.

Repeating the same exercise using the results from Model 2 and Model 3 produces similar substantial measured effects of health on participation probabilities when a woman is in her early 40s or late 30s. The measured probability of participation in the 41 to 45 year part of the life course is 77.4 per cent for a 'typical' woman in good or excellent health, but this falls to 64.3 per cent for a woman with fair or poor health. A 'typical' woman has a measured probability of being a labour market participant in her late 30s equal to 67.9 per cent if she is in good or excellent health, but this falls to only 49.8 per cent if she is in only fair or poor health.

In summary, these findings indicate that poor health is a major barrier to the chances of labour market participation for older Australian women.

The presence of young children in the household had a substantial negative influence on participation probabilities for women when aged between 36 and 46 years. Using the same technique as above, we estimated that the probability a woman would participate in the labour market when she was aged between 41 and 46 years was equal to 57.9 per cent *if she had a young child*, but the probability of participation

rose to 77.4 per cent if a young child was not present in the household. The estimated probability that a woman in her late 30s would participate in paid work was 67.9 per cent if young children were present in the household, and 82.4 per cent if young children were not present.

This result helps to identify the important constraint on labour force participation caused by the presence of young children in a household. It also serves to illustrate that one of the reasons for the different participation rates across women in the various age groups is due to women in the 36-40 year age group having more young children than women in the other 2 age groups. That is, it can be noted that women in the 36 to 40 age group who did not have young children recorded participation probabilities close to those of typical women in the older age groups.

As was described in Section 2, it was only possible to measure the effects of older children (between 5 and 10 years of age) on the participation chances of women when they were aged in their late 40s. Measured participation probabilities in this part of the life course were not significantly related to the presence of these older children.

Predicted participation probabilities were significantly higher in the 36 to 40 and 41 to 46 age groups for women with tertiary qualifications. A 'typical' woman without tertiary qualifications had a predicted probability of being a labour force participant in her late 30s equal to 67.9 per cent, but this rose to 83.3 per cent if she had a tertiary qualification. In the case of participation probabilities in a woman's early 40s, the comparative figures were 77.4 per cent (for women without tertiary qualifications) and 90.5 per cent (for women with such qualifications). Tertiary qualifications were not a statistically significant source of difference in participation probabilities for women in their late 40s[8].

In the sample data we utilised, evidence was *not* found of significant differences in participation probabilities associated with measured parental characteristics, cohort, or first occupation. However, partnered women had higher participation

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[8] As was noted earlier, the small sample size in this part of the study limited the likelihood of identifying significant relationships.

probabilities than other women in the model for 41 to 45 year participation behaviour.

4. Results: Models of the Participation Behaviour of Partnered Women

The following table identifies the marginal effects of the explanatory variables included in the models *for partnered women* in the NLCS data set. The information in the table provides insights to the role of a partner's employment status and health in determining women's labour force participation at different stages of the life course. A comparison of the marginal effects data in this table with that provided in Table 3 is also useful as it shows, for example, the different effects that poor health can have on participation probabilities according to whether a woman is in a partnered relationship or not.

The first observation that can be made of the data in Table 4 is that partner's employment status had a statistically significant positive effect on participation probabilities in each of the 3 stages of the life course considered in the models. We can use the 'typical woman' approach once again to illustrate these effects. A 'typical' woman with an employed partner had an estimated probability of being a labour market participant when she was in her late 40s equal to 77.6 per cent, but this fell to 54.2 per cent if her partner was not employed. The relative probabilities of participation when a woman was in her early 40s were 64.6 per cent if she had an employed partner and 43.9 per cent if her partner was not employed. The estimated probability of participation when a woman was in her late 30s was 56.7 per cent if her partner was employed and only 34.3 per cent otherwise.

Table 4: Marginal Effects on Labour Force Participation in Later Life, Partnered Australian Women, NLCS data, 1997

	Model 4: Probability of participation between 46 and 50 years		Model 5: Probability of participation between 41 and 45 years		Model 6: Probability of participation between 36 and 40 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.0971	0.8810	0.1666	1.8940*	0.1385	1.7630*
Mother Np	0.0255	0.3950	0.0413	0.8840	-0.0304	0.7390
Father Hs	-0.0725	1.0640	-0.0014	0.0300	0.0078	0.1840
Tertiary	0.0164	0.2090	0.1185	2.4180*	0.1104	2.2340*
Young Child	-0.0450	0.7040	-0.1555	3.8940*	-0.1417	6.0640*

Age Group 40s	0.0392	0.6200	-0.0748	1.6250*	0.0563	1.3410
First Occ.(High Skill)	0.0591	0.6540	0.0173	0.2360	0.0580	0.8800
First Occ.(Med.Skill)	0.0626	0.7690	-0.1052	1.2990	-0.0627	0.8900
First Occ.(Low Skill)	0.0212	0.2470	0.0401	0.6460	-0.0202	0.3430
Health (Fair or Poor)	-0.0891	0.9030	-0.0779	0.9480	-0.1442	2.0510*
Partner Employed	0.1850	1.9060*	0.1514	1.8170*	0.1916	2.5480*
Partner's Health (Fair or Poor)	-0.0463	0.5160	-0.0001	0.0010	0.0152	0.2480

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Model 4=152; Model 5=283; Model 6=435.

Therefore, it appears that, in many partnered households both partners work, whilst in a significant number of other households both partners do not participate or are not employed. This evidence diminishes the argument that women "add" their labour to the paid workforce to compensate for a lack of income from their partner. It is also possibly indicative of the financial barriers to participation faced by women (via the loss of family benefits or pension entitlements) whose partners are either unemployed or retired.

A second observation on the data in Table 4 is that partner's health status does not appear to have a significant effect on the participation probabilities of women in any of the three stages of the life course. This contrasts with Woolcott's (1998) findings (discussed in Part 1 of the Paving the Way report), which indicate that a major reason for early retirement from paid work by women is the need to care for other family members.

A third observation is that the effects of a woman's own health on her participation probabilities are not significant for partnered women in their early and late 40s, although this was a significant factor when the sample included all women. One possible (and tentative) explanation for this difference is that partnered women are more able to access the support they need to continue with paid work when their health is poor than their single counterparts. However, it must be noted that poor health remains as a significant barrier to labour force participation by women when they are in their late 30s.

5. Results: Models of the Dynamic Aspects of Women's Labour Force Participation (Tertiary Educated Women)

This and the next section of the report present our findings on the inter-relationships between women's participation behaviour at different stages of the life course. As was explained in Section 2, this analysis was conducted separately for tertiary educated and other women. Of special interest are the effects of early periods of non-participation on women's subsequent involvement in the paid workforce – and how these effects might differ between the two groups of women.

The following set of tables shows the measured relationships between participation at different stages of the life course for tertiary educated women. In the first table the focus is on the measured effects of earlier labour force participation on the chances that a woman will be a labour force participant in her late 40s. The following tables provide results derived from the same type of analysis but with the focus shifted, first, to the probability of participation by a woman in her early 40s and, second, to the probability of participation by a woman in her late 30s.

Table 5: Marginal Effects on Labour Force Participation Between 46 and 50 Years, Australian Women with Tertiary Qualifications, NLCS data, 1997

	Model 7: Includes measure of participation between 41 and 45 years		Model 8: Includes measure of participation between 36 and 40 years		Model 9: Includes measure of participation between 31 and 35 years		Model 10: Includes measure of participation between 26 and 30 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.1732	1.7190*	0.2515	2.2650*	0.2607	2.3450*	0.2277	2.0730*
Mother NP	0.0638	0.8730	0.0332	0.4140	0.0369	0.4760	0.0474	0.5730
Father HS	-0.1092	1.5510	-0.0999	1.2460	-0.1040	1.3330	-0.1110	1.3560
Young Child	0.0300	0.5980	-0.0220	0.4080	-0.0463	0.9080	-0.0430	0.8110
Age Group 40s	0.1045	1.6640*	0.1285	1.8380*	0.1366	1.9850*	0.1231	1.7300*
First Occ. (High Skill)[a]	0.1036	1.2280	0.0234	0.2910	0.0409	0.5130	0.0365	0.4320
Partnered	-0.0471	0.9550	-0.0360	0.5010	-0.0384	0.5570	-0.0544	0.7530
Health (Fair Or Poor)	-0.0040	0.0560	-0.0795	0.5910	-0.0727	0.5750	-0.0473	0.3710
Participant (41-45)	**0.6847**	**3.2090***						
Participant (36-40)			**0.1551**	**1.0310**				
Participant (31-35)					**0.1097**	**1.2340**		
Participant (26-30)							**-0.0534**	**-0.6990**

Notes:
a) Tertiary educated women's first occupation is concentrated in the high skill group and cell sizes are small in the occupational categories used in previous models. For this reason, only one occupation variable was retained in these models
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Models 7 to 10=72.

The data in Table 5 show that for tertiary educated women in their late 40s, the probability of participation is very strongly determined by participation behaviour in the early 40s but not by earlier patterns of activity. Elaborating on this point, a woman who had the modal characteristics of the sub group *and participated when she was in her early 40s* had a predicted probability of being a labour market participant in her late 40s equal to 91.9 per cent. In extreme contrast, a woman who shared the other modal characteristics of the group but who did not participate in the paid workforce in her early 40s had an estimated probability of participating in her late 40s equal to only 14.6 per cent. Thus, in this sub-group of women, involvement in paid work when older appears to be largely determined by the age of 45. However, the non-significance of the variables measuring earlier periods of participation

indicate that, for this group of women, periods spent out of work earlier in the life course do not necessarily dictate participation behaviour in later life.

It is also interesting to note that cohort effects were measured as significant and positive in each of these models. This suggests that tertiary educated women born in the 1950s were, on average, more likely to participate in the labour market in their late 40s than the women born a decade earlier. However, the small sample size restricts the confidence with which we can report this particular result.

Table 6 reports the results of an analysis of the dynamic aspects of the determination of tertiary educated women's participation *in their early 40s*. The results presented in the table show that a tertiary educated woman's chances of participation in her early 40s are also strongly affected by participation behaviour in the preceding period. A woman with modal characteristics who participated in her late 30s had an estimated 95.1 per cent chance of participating in the labour market when she was in her early 40s, whilst this chance fell to only 38.2 per cent if she didn't participate in the earlier age group. As is indicated by the smaller size of the marginal effects on the other participation variables, the importance of being a participant in the early 30s or late 20s was less pronounced. Comparing the results from Table 5 and 6, it also appears that there is a greater (although still limited) chance of a tertiary educated woman moving from non-participation in her late 30s to participation in her early 40s, than there is of the same movement occurring between the 41 to 45 and 46 to 50 year parts of the life course.

Table 6: Marginal Effects on Labour Force Participation Between 40 and 45 Years, Australian Women with Tertiary Qualifications, NLCS data, 1997

	Model 11: Includes measure of participation between 36 and 40 years		Model 12: Includes measure of participation between 31 and 35 years		Model 13: Includes measure of participation between 26 and 30 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.2684	3.1010*	0.2898	3.3340*	0.2888	3.3080*
Mother NP	-0.0675	1.5900	-0.0512	1.0580	-0.0298	0.5710
Father HS	0.0142	0.2980	-0.0258	0.4910	-0.0387	0.7050
Young Child	-0.0319	0.9520	-0.0809	2.0620*	-0.0741	1.8270*
Age Group 40s	-0.0061	0.1400	-0.0039	0.0780	-0.0221	0.4280
First Occ. (High Skill)[a]	-0.0682	1.5360	-0.0057	0.1090	-0.0046	0.0830
Partnered	0.0637	1.0600	0.0595	0.9480	0.0831	1.2050
Health (Fair Or Poor)	-0.2124	1.4700	-0.1703	1.2660	-0.1718	1.2520
Participant (36-40)	**0.5119**	**3.5640***				
Participant (31-35)			**0.1861**	**2.3350***		
Participant (26-30)					**0.1352**	**1.9750***

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Models 11 to 13=124.

Other observations that can be made of the data in Table 6 are, first, that the presence of young children in a household when a tertiary educated woman is in her early 40s exerts a strong negative influence on participation chances. The other explanatory variables were not shown to be statistically significant. Thus, in this part of the life course, and for this group of women, we were unable to identify strong cohort effects.

The last table in this section (Table 7) shows the measured relationships between participation probabilities for a tertiary educated woman in her late 30s and earlier periods of participation.

Table 7: Marginal Effects on Labour Force Participation Between 36 and 40 Years, Australian Women with Tertiary Qualifications, NLCS data, 1997

	Model 14: Includes measure of participation between 31 and 35 years		Model 15: Includes measure of participation between 26 and 30 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.2829	4.0430*	0.2901	4.1220*
Mother NP	-0.0030	0.0700	0.0191	0.3900
Father HS	0.0079	0.1770	-0.0163	0.3340
Young Child	-0.0757	3.3440*	-0.1096	4.4060*
Age Group 40s	0.0568	1.2730	0.0397	0.8300
First Occ. (High Skill)[a]	0.0464	0.9580	0.0583	1.1000
Partnered	-0.0029	0.0590	0.0326	0.5360
Health (Fair Or Poor)	-0.1877	1.7470*	-0.1941	1.8260*
Participant (31-35)	**0.2919**	**4.1070***		
Participant (26-30)			**0.1777**	**2.7320***

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Models 14 & 15=188.

For this group of women, the role of earlier periods of participation in explaining later year participation remains strong but is smaller in this part of the life course. A tertiary educated woman with the modal characteristics of her group had a predicted probability of being a labour market participant in her late 30s equal to 97.6 per cent if she participated in the labour market in her early 30s. This estimate fell to 74.9 per cent if she didn't participate in her early 30s.

Partly reflecting the smaller importance of previous labour force involvement (but also the larger sample size), a number of other variables were significant in the explanation of women's participation chances in their late 30s. The presence of young children exerted a downward pressure on these chances, as did poor health – lending support to conclusions reached in previous sections of the report.

6. Results: Models of the Dynamic Aspects of Women's Labour Force Participation (Non-Tertiary Educated Women)

This section largely repeats the above section, providing details of results from models that explored the inter-relationships between participation behaviour at different stages of the life course for *non-tertiary educated women*. Comparisons of the apparent importance of previous labour market experience for the 2 groups of women are made throughout the section.

Table 8: Marginal Effects on Labour Force Participation Between 46 and 50 Years, Australian Women without Tertiary Qualifications, NLCS data, 1997

	Model 16: Includes measure of participation between 41 and 45 years		Model 17: Includes measure of participation between 36 and 40 years		Model 18: Includes measure of participation between 31 and 35 years		Model 19: Includes measure of participation between 26 and 30 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.4930	4.2300*	0.3324	3.3130*	0.2530	2.4650*	0.1504	1.4310
Mother NP	-0.1502	2.2790*	-0.0798	1.1440	-0.0499	0.6890	-0.0232	0.3100
Father HS	0.0275	0.3650	0.0198	0.2680	0.0502	0.6960	0.0413	0.5560
Young Child	0.1663	1.8800*	0.0775	0.8670	-0.0004	0.0040	0.0482	0.5180
Age Group 40s	0.0546	0.7820	-0.0036	0.0480	-0.0375	0.4990	-0.0309	0.4130
First Occ. (High Skill)	0.1254	1.6870	0.1386	1.8540*	0.1395	1.5410	0.1614	1.8880*
First Occ. (Med. Skill)	-0.0752	0.6880	0.1189	1.5960	0.0658	0.7840	0.0559	0.6420
First Occ. (Low Skill)	-0.0696	0.6940	0.0707	0.8860	0.0341	0.4040	0.0230	0.2660
Partnered	-0.0068	0.0870	0.0160	0.2040	0.1246	1.4980	0.1504	1.7820*
Health (Fair Or Poor)	-0.0470	0.4500	-0.1707	1.4840	-0.1981	1.8050*	-0.1942	1.7880*
Participant (41-45)	**0.7938**	**9.7910***						
Participant (36-40)			**0.4938**	**5.4650***				
Participant (31-35)					**0.2188**	**2.8740***		
Participant (26-30)							**0.0511**	**0.7130**

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Models 16 to 19=146.

The importance of prior labour market experience in determining the chances of participation in the 46 to 50 year age group appear stronger for this group of women (as compared to tertiary educated women). The results indicate that if a woman without tertiary qualifications (who had the modal characteristics of the group) was a labour force participant in her early 40s then she had a 92.3 per cent chance of also participating in her late 40s. However, if she wasn't a participant in the

earlier period, then this chance was only 9.1 per cent. This particular relativity was larger than that observed when the sample was limited to tertiary educated women and indicates that for women with lower levels of qualifications the chances of re-entering the workforce after the age of 45 are particularly low.

The results presented in Table 8 also indicate that, in contrast to the experience of tertiary educated women, a significant correlation exists between labour force participation between the ages of 31 and 40 and a less educated woman's chances of being a labour force participant in her late 40s. For example, in this group, a woman with 'modal' characteristics who did not participate in the workforce in her late 30s recorded a participation probability in her late 40s equal to only 28.8 per cent. If she did participate in her late 30s this probability increased to 84.5 per cent. Thus, adding to the conclusion to the discussion in the previous paragraph, it appears that for women with lower levels of qualifications later life participation behaviour is largely determined by the time a woman reaches her mid 30s.

An additional comment on the results shown in Table 8 is that self-assessed health status and the woman's first occupation were significant determinants of participation probabilities in several models. Consistent with the results of earlier models, poor health reduced the 'late 40s' chances of labour market participation within this sub-group of women. Having a first occupation that was either professional or, more likely, managerial increased these chances. It is interesting to note that these variables were not significant determinants of participation chances for tertiary educated women. This adds weight to the conclusion that the possession of tertiary qualifications makes an older women's involvement in paid work a more permanent and stable part of her life experience.

The significance of the first occupation variable for women without tertiary qualifications also raises the possibility that variations in the quality of work experiences are relatively large within this group of women. Those women who are able to secure 'good' work early in their careers may well have more favourable attitudes to, and opportunities for, labour market participation over the rest of their lives than other women. Thus, within this group of women the likelihood of

remaining in the workforce could be expected to vary with the characteristics of the

woman's first occupation.

Table 9: Marginal Effects on Labour Force Participation Between 41 and 45 Years, Australian Women without Tertiary Qualifications, NLCS data, 1997

	Model 20: Includes measure of participation between 36 and 40 years		Model 21: Includes measure of participation between 31 and 35 years		Model 22: Includes measure of participation between 26 and 30 years	
	Marginal effect	*T statistic*	*Marginal effect*	*T statistic*	*Marginal effect*	*T statistic*
Constant	0.3220	4.0040*	0.3315	4.0460*	0.2805	3.3240
Mother NP	0.0540	0.9230	0.0631	1.1210	0.0404	0.7220
Father HS	0.0580	1.0070	0.0439	0.7830	0.0503	0.8890
Young Child	-0.1453	2.5590*	-0.2470	4.3570*	-0.2386	4.3090*
Age Group 40s	-0.0558	0.9480	-0.0554	0.9780	-0.0599	1.0520
First Occ. (High Skill)	0.0859	1.0550	0.0776	0.9140	0.1039	1.2780
First Occ. (Med. Skill)	0.0489	0.6940	0.0023	0.0330	-0.0105	0.1420
First Occ. (Low Skill)	0.1148	1.7660*	0.1006	1.5760	0.0840	1.2930
Partnered	0.0262	0.4020	0.0856	1.3210	0.1044	1.5990
Health (Fair Or Poor)	-0.0873	0.9920	-0.1631	1.8940*	-0.1085	1.3190
Participant (36-40)	**0.5667**	**9.4730***				
Participant (31-35)			**0.3489**	**6.3910***		
Participant (26-30)					**0.2081**	**3.9440***

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Models 20 to 22=275.

The results presented in Table 9 further emphasise the importance of earlier labour

force participation in determining the chances of labour force participation by non-

tertiary educated women in their 40s. A woman with the group's modal

characteristics who participated in her late 30s had an estimated 70.5 per cent

chance of participating in the labour market when she was in her early 40s, whilst

this chance fell to only 29.4 per cent if she didn't participate in the earlier age group.

In contrast to the results derived for tertiary educated women, the magnitude of the

correlations between 'early 40s' participation probabilities and observed

participation behaviour in the women's late 20s and early 30s were also relatively

large. The marginal effects on these variables were 0.21 and 0.35 respectively for

non-tertiary educated women, whilst they were only 0.14 and 0.19 for their tertiary educated counterparts. This adds support to the conjecture that early and continued contact with the workforce is a more important determinant of the chances of later life labour force participation for women who do not have high levels of education. For a substantial number of women in this category it appears that the chances of later life labour force participation are determined at a fairly young age.

As a final comment on the figures in Table 9, the important role played by the presence of young children in the determination of participation probabilities stands out once again. In addition, it appears that the negative effects of children on participation chances are relatively large for this particular group of women. Comparing the results from Tables 6 and 9, it is apparent that the marginal effects on the young child variable are around 3 times larger in the models for non-tertiary educated women than those recorded for their tertiary educated counterparts.

The last table in this section (Table 10) shows the measured relationships between participation probabilities for a non-tertiary educated woman in her late 30s and early periods of participation.

The role of earlier periods of participation in explaining later year participation remains strong in this set of results (for this part of the life course), but is smaller than relationships identified in the previous models. A woman with the modal characteristics of her group had a predicted probability of being a labour market participant in her late 30s equal to 93.1 per cent if she participated in the labour market in her early 30s. This estimate fell to 46.7 per cent if she didn't participate in her early 30s. The comparative estimates for women who did and did not participate in their late 20s were 82.9 and 51.6 per cent.

Table 10: Marginal Effects on Labour Force Participation Between 36 and 40 Years, Australian Women without Tertiary Qualifications, NLCS data, 1997

	Model 23: Includes measure of participation between 31 and 35 years		Model 24: Includes measure of participation between 26 and 30 years	
	Marginal effect	T statistic	Marginal effect	T statistic
Constant	0.3607	5.8630*	0.3365	5.2320*

Mother NP	0.0576	1.2110	0.0032	0.0680
Father HS	0.0277	0.5780	0.0492	1.0420
Young Child	-0.1334	4.6760*	-0.1929	6.6520*
Age Group 40s	0.0894	1.8560*	0.0752	1.5970
First Occ. (High Skill)	0.0316	0.3690	0.0765	0.9750
First Occ. (Med. Skill)	-0.0318	0.4760	-0.0231	0.3530
First Occ. (Low Skill)	0.0289	0.5090	0.0210	0.3700
Partnered	0.0849	1.5820	0.0941	1.7620
Health (Fair Or Poor)	-0.1807	2.4250*	-0.1377	1.9600*
Participant (31-35)	0.4922	11.2430*		
Participant (26-30)			0.2949	6.5880*

Notes:
*Denotes the effect is statistically significant from zero at the 10% level.
Number of observations: Models 23 & 24=422.

A comparison of these results with those in Table 7, which examined participation probabilities in the same part of the life course for tertiary educated women, indicates that, once again, the importance of prior experience is greater for non-tertiary educated women. The marginal effects on the 2 previous participation variables reported in Table 7 (for tertiary educated women) were 0.292 and 0.177, whereas they were 0.492 and 0.295 in the results reported in Table 10 (for non-tertiary educated women).

In line with previous results, the presence of young children had a very strong negative effect on participation chances for non-tertiary educated women in their late 30s. The measured size of these effects was close to double those recorded for tertiary educated women in the same part of the life course.

7. Summary and Conclusion

This report summarised the findings of a detailed statistical analysis of older Australian women's labour force participation behaviour based on data collected in the first wave of the Negotiating the Life Course Survey of 1997. The study featured an analysis of the dynamic (or life course) aspects of women's participation behaviour. It focused on the role of prior labour force experience in determining the

likelihood of later life participation in the labour market. This relationship was examined in the light of considerations of how a range of other demographic and economic factors also affects older women's participation behaviour.

Although some sample size restrictions limited the number of inter-relationships we could examine – and the reliability of some of the models' results – we were able to draw a number of conclusions about the determinants of older Australian women's participation in the paid labour market. These are summarised in the following paragraphs.

Educational qualifications, the presence of children and health status are important predictors of women's participation behaviour in the later parts of their life course, although these effects are more important in deciding the participation chances of women in their late 30s and early 40s than they are in determining participation probabilities for women in their late 40s. In the last part of the life course that we studied (that is the ages of 46 to 50 years), the key predictor of participation is prior labour force experience.

Our findings indicate that poor health is a major barrier to the chances of labour market participation for older Australian women. They also show that the presence of young children in a household acts as a substantial constraint on the participation chances of women in their late 30s and early 40s.

We show that both these effects were particularly strong for women who did not possess tertiary qualifications in 1997. This leads us to an important general conclusion, that the possession of tertiary qualifications makes an older women's involvement in paid work a part of her life experience that is less 'vulnerable' to other life events.

The effects of poor health were less important for partnered women than non-partnered women in their 40s. One possible (and tentative) explanation for this difference is that partnered women are more able than their single counterparts to access the support they need to continue with paid work when their health is poor.

The results of our study on the effects of young children on participation chances indicate that one of the reasons for the different participation rates across women in the various age groups is due to women in the 36-40 year age group having more young children than women in the older age ranges. We found that women in the 36 to 40 age group who did not have young children recorded participation probabilities close to those of women in the older age groups (where fewer young children were present).

An additional finding of the study is that the participation behaviour of older partnered women is significantly affected by their partner's employment status. It appears that in many partnered households both partners work, whilst in a significant number of other households both partners do not participate or are not employed. This evidence diminishes the argument that women "add" their labour to the paid workforce to compensate for a lack of income from their partner. It is also possibly indicative of the financial barriers to participation faced by women (via the loss of family benefits or pension entitlements) whose partners are either unemployed or retired.

Although significant cohort effects were not evident in most of the models we analysed, they did appear as important predictors of participation chances for tertiary educated women in the 'late 40s' part of the life course. There, women aged in their 40s in 1997 had a significantly higher likelihood of participation than women aged in their 50s in 1997.

The dominant finding of the study is of a very strong linkage between the participation chances of older women and the pattern of earlier labour market involvement. The results in the report show that older women's participation behaviour must be understood as the outcome of a dynamic process – and not simply explained by older women's current circumstances. In other words, we demonstrate that a woman who did not participate in the labour market when she was younger is currently quite unlikely to be involved when she is in her late 40s, regardless of her current family and economic circumstances.

These findings applied to all women in our study but were especially pronounced in the results for the group of women without tertiary qualifications. Very few women with this level of education move from non-participation in their early 40s into participation in their late 40s. There is also only a small chance of a woman in this group changing from being a non-participant when aged in her 30s into a participant when she is in her 40s. The chances of moving from being out of the labour force back into paid work are much greater for tertiary educated women. Thus, it appears that for women with lower levels of qualifications later life participation behaviour is largely determined by the age of 35. For tertiary educated women later life participation is largely determined by the age of 45.

Our tentative assessment of the policy implications of these findings include, first, that higher levels of education will contribute to women's ability to remain engaged (and to re-engage) with paid work over the whole of their life course. This creates further arguments for ensuring that education is accessible and affordable for women.

Our findings also provide preliminary evidence that the group of women who encounter the greatest barriers to re-engagement with paid work are women with relatively low levels of education. Policies aimed at increasing skill levels, addressing a potential lack of job contacts, and improving women's confidence in approaching the job market are likely to be especially important for this group of women.

Our findings on the dynamic aspects of women's participation behaviour indicate that action to increase older women's involvement in paid work must also take on a long-term perspective. Measures that, for example, increase the ability of younger women with children to either remain engaged in paid work, or pursue additional study, are likely to have a substantial effect on the chances that they will be labour market participants in the future.

Workplace measures that reduce the work-life conflict experienced by older women who are suffering from poor health will also contribute to higher participation rates and, most likely and importantly, improve the life outcomes of these women.

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