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IZA DP No. 16549

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Robert Breunig
Australian National University and IZA

David Hansell
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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Modelling Australian Public Service Careers*

We investigate whether being female, from a non-English speaking background (NESB) or having a disability affects career advancement in the Australian Public Service. Over the past twenty years, women have become more likely to get promoted at senior ranks than similar men and just as likely at junior ranks. Disability lowers promotion prospects at most ranks. NESB staff have much lower promotion prospects at higher ranks despite being less likely to separate from the public service. These lower promotion prospects for NESB staff are only partially explained by language proficiency or cultural assimilation. The unexplained remainder could reflect a penalty for having non-European features.

JEL Classification: J15, J18, J45, J78

Keywords: public sector employment, affirmative action policies, equal opportunity employment

Corresponding author:
Robert Breunig
Tax and Transfer Policy Institute
Crawford School of Public Policy
Australian National University
Canberra ACT 0200
Australia

E-mail: Robert.Breunig@anu.edu.au

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1 Introduction

We examine promotion and separation in the Australian Public Service (APS) from 2001 to 2020 by gender and for two other Equal Employment Opportunity (EEO) groups - people with a disability and people from non-English speaking backgrounds (NESB). We use the universe of personnel records of the APS and estimate logit models of the probability of promotion and the probability of separation. The data allow us to identify membership in an EEO group and to control for observable characteristics related to productivity and employment.

Our results help deepen our understanding of the composition of the public service, EEO representation, its evolution over time and the degree to which it reflects the diversity of Australia. Our research is particularly important given that Australia is one of the world's most multi-cultural countries. More than half of Australians are first or second generation immigrants (Australian Bureau of Statistics, 2021).

Promotion prospects for women have improved substantially over time at all levels. By 2020, women are as likely as similar men to be promoted at junior levels and more likely than men to be promoted at senior levels. This holds after controlling for a range of skills and experience. Improvements in promotion prospects accelerate after 2012, when gender diversity strategies were implemented by the APS. This provides suggestive evidence that policies like aspirational gender targets, organisational champions and public awareness affected women's promotion prospects.

For people with a disability, promotion prospects are lower than for similar individuals who do not report a disability. There are no improvements over time, except at the lowest level of the APS. This is despite an explicit disability strategy being in place within the APS since 2012.

For NESB, promotion prospects have stagnated or become worse over time. The promotion penalty for being in the NESB group, relative to non-NESB, grows at higher ranks of the public service. The penalty is present for Australian-born NESB and those who migrated to Australia at a very young age. This argues against an explanation driven entirely by language barriers or cultural assimilation. We also rule out an explanation for occupational segregation within the public service.

When we look at the probability of separation, we find little difference between men and women. People with a disability and NESB are less likely to separate from the public service. Lower promotion prospects do not appear to lead to greater exit. This could reflect unobserved characteristics of this group or it could reflect employment barriers outside of the public service for these groups.

Care should be exercised in interpreting our results. We observe some, but not all, individual characteristics.

We do not observe performance evaluations or whether employees have succeeded at their current job level. We do not observe who applies for promotion. We do not observe outcomes for those who leave the public service so we cannot judge whether separation is a good or a bad outcome. While we caution against a causal interpretation, the results for the NESB group in particular raise a note of warning. If being from a non-European background is a barrier to advancement even when someone is fluent in English and raised in Australia, there may be a problem. If nothing else, this finding warrants further investigation by the APS.

Our study, using the entire census of Australian Public Service employees, makes three main contributions to the existing literature. Our paper is unique in studying the impact of immigrating versus being native-born or raised on public sector promotion and separation prospects. Our data allow us to consider promotion at each separate level of the public service. This controls for the possibility of different entry levels to the APS granting employees very different promotion prospects and allows us to investigate the possible existence of 'glass ceilings.' Our paper provides new evidence for Australia and represents the first comprehensive analysis of promotions and separations for the Australian public service. This complements research from other countries, including the US. Much of the previous research has only used small samples rather than a full census, as we do.

The rest of the paper proceeds as follows: we provide additional background in Section 2; Section 3 provides a summary of the literature; Section 4 provides an overview of the Australian Public Service Employment Database (APSED); Section 5 discusses the methodology for modelling promotion and separation, followed by a discussion of results in Section 6. We dig deeper into the results in Section 7 to explore the role of language fluency and cultural assimilation and to examine how promotion prospects have evolved over time. We conclude in Section 8.

2 Background

Australia is a highly successful multicultural country with an orderly immigration system underpinned by its skilled immigration intake. The 2021 Census indicates that more than half of Australians are either first or second generation immigrants. The largest group of immigrants were born in the UK, closely followed by those born in Asia. Reflecting this diversity, 15 per cent of staff in the Australian Public Service (APS) are from a non-English speaking background (NESB).

However NESB staff hold only 7 per cent of Senior Executive (SES) positions (Australian Public Service Commission, 2022).[1] Similar patterns of under-representation are evident for staff with a disability who

[1]The Senior Executive Service (SES) are the leadership cohort in the Australian public service and are similar to the US

make up around 4.7 per cent of the APS and hold 4.2 per cent of all SES positions. Women make up around 60 per cent of all APS employees and hold just over half of all SES positions. Similar to the APS, women and minorities are underrepresented at the higher echelons of the US Federal civil service (Choi (2011) and Marvel (2021)).

Throughout this paper, NESB refers to people who are:

- born outside Australia and whose first language is not English; or
- born in Australia, whose first language is not English and either mother's or father's first language is not English; or
- born in Australia or overseas where both parents' first language is not English.

This definition of NESB is used by the APS for their internal reporting. We apply this definition in our analysis. The data do not include information on race or ethnicity. We use a combination of this NESB definition and country/region of birth to approximate ethnicity.

2.1 Policy landscape

Australia has a long-standing prohibition against racial discrimination. The *Racial Discrimination Act 1975* made it unlawful to discriminate on the basis of race, colour, descent or national or ethnic origin. It afforded persons of all races and ethnic origins equality before the law in matters such as employment or seeking promotions. Similarly, the *Disability Discrimination Act 1992* made it unlawful for employers to discriminate against a person on the grounds of disability. Amendments to this Act were introduced in 2005 requiring employers to make reasonable adjustments to eliminate discrimination. The Australian Human Rights Commission is responsible for enforcing national and state-level equal opportunity and anti-discrimination laws (https://humanrights.gov.au/about).

The *Sex Discrimination Act 1984* prohibits discrimination against persons on the ground of sex, marital status or pregnancy at work, and discrimination involving sexual harassment in the workplace. This was strengthened by the *Equal Opportunity for Women in the Workplace Act 1999*, designed to promote the principle that employment for women should be on the basis of merit. It sought to promote, amongst employers, the elimination of discrimination against women and the provision of equal opportunity for women in relation to employment matters. Rather than merely prohibit sex discrimination, this Act required employers to actively develop equal opportunity for women programs under the direction of a senior officer in the organisation. It required reporting by higher education institutions and employers with more than 100 employees (mostly excluding the government sector). It established the Equal Opportunity for Women in the

Federal Government's SES, and the UK's Senior Civil Service. Executive Level 1 and Executive Level 2 ranks often hold managerial responsibilities, while APS-level staff may hold a wide range of analyst, operational, support and other positions.

Workplace Agency, whose function was to assist and advise employers, conduct research and issue guidelines under the Act. The *Equal Opportunity for Women in the Workplace Act 1999* was replaced by the *Workplace Gender Equality Act 2012* (WGEA Act), which extended coverage to include men. The new Act covered all workplaces irrespective of size but smaller organisations are exempt from the reporting requirements.

Hiring and promotion in the APS is governed by legislation. The *Public Service Act 1999* introduced the requirement that all employment decisions be based on merit. It required the APS to provide a workplace free from discrimination that recognises and utilises the diversity of the Australian community. It required agency heads to establish workplace diversity programs. Following legislative amendments in 2013, the APS Commissioner issued the *Australian Public Service Commissioner's Directions 2013*, which set clear expectations that agency heads include measures directed at eliminating employment-related disadvantage on the basis of gender, race or ethnicity, disability or being a member of a group that is identified as having an employment-related disadvantage. In particular, agency heads were required to create workplace structures, systems and procedures to assist employees in balancing work, family and other caring responsibilities. They were required to develop strategies to attract, recruit and retain employees that reflect the diversity of the Australian community.

Affirmative action measures accompanied these 2013 legislative amendments. They allowed agency heads to identify a vacancy as open only to people with an intellectual disability. They provided for engagement of persons with disability who have been assessed as being unable to participate in a competitive selection process. These affirmative action measures were strengthened by the *Australian Public Service Commissioner's Directions 2016* which included additional measures to support the engagement of persons with disability.

Momentum for gender equality in the APS accelerated alongside the 2012 passage of the WGEA Act. The APS committed itself to "lead the way in improving gender equality in the workforce" (Australian Public Service Commission (2016b)). This focus culminated in policies setting gender equality targets on government statutory boards and at senior levels of the APS. Agency heads became accountable for meeting these targets through their performance agreements (Australian Public Service Commission (2016b)).

A disability strategy was first published in 2012 and strengthened in 2016 (Australian Public Service Commission (2016a)). These two strategies aimed to expand the range of employment opportunities for people with a disability, invest in capabilities of staff with disabilities, increase the representation of people with disability at senior roles and foster inclusive cultures. In contrast to the gender and disability policies, the APS has never issued an employment strategy in relation to NESB staff to the authors' knowledge.[2]

[2]A strategy in relation to culturally and linguistically diverse staff is under development at time of writing; see https://www.apsc.gov.au/working-aps/diversity-and-inclusion/diversity-inclusion-news/aps-culturally-and-linguistically-

3 Literature Review

A common way to approach questions about the relative economic position of women and minority groups is to calculate wage and other 'gaps' and decompose the contribution of a range of factors associated with productivity such as education and experience (Blinder (1973), Oaxaca (1973)). The literature on the factors influencing promotions is more sparse, perhaps due to the challenges of comparing position titles across organisations, difficulties in disentangling wage movements from promotions and lack of access to data.

To study public service promotions, retention and performance, many researchers have used the Federal US government's personnel management database (the Central Personnel Data File, or CPDF) which contain records of Federal civilian employees (Choi and Rainey, 2010; Choi, 2011). Similar to the APS, the US civil service classifies positions across agencies into different grades, with grade increases reflecting higher salary, status, authority and responsibility. Thus, movements up grades can be considered as genuine promotions, and can be clearly distinguished from salary increases, which are also a function of seniority within a grade.

3.1 Studies of the US Federal Civil Service

Analysis using personnel records, mostly from the CPDF database, of Federal US employees has found mixed results on the impact of gender and being black on promotion probabilities (Lewis, 1986; Rich, 1997; Marvel, 2021)) while significantly lower promotion prospects have been found for Indigenous men and women, Asian men and women and staff with disabilities (Lewis and Allee, 1992).

These studies have modelled promotions as either the probability of being promoted in a given year, controlling for grade levels (Lewis (1986), Lewis and Allee (1992), Marvel (2021)) or the total number of promotions over a period of time (Lewis, 1986). A strength of the first approach is that, by analysing each year's promotion outcomes separately, the authors are able to pick up the effect of affirmative action policies that may have been in place across agencies in any given year. Controlling for grade is important, as it is possible that some groups have lower starting positions (due, for example, to inconsistent hiring practices on entry) and therefore have a greater number of grades (and hence more total promotion prospects) above their starting grade.

Using rich person-level data over the years 1979 to 2013, Marvel (2021) employs a linear probability model to estimate the influence of occupation, race and sex on whether staff are more likely to be promoted to the Senior Executive Service of US federal agencies. He shows the dominant occupation of each agency (such as program management or STEM occupations) is influential in promotion prospects, but race and sex are not after controlling for 'quality' as measured by speed of past promotions, pay increases and bonuses. In

diverse-employment-strategy

contrast to our study, Marvel's data only includes employees who are eligible to be promoted to SES (that is, already the equivalent of an EL2 in the Australian context) whereas we estimate promotion and separation at all levels of the APS.

In an important early study, Lewis (1986) analyses gender differences in promotions amongst white-collar, full-time, white workers in the US Federal civil service using a 1 per cent sample of the 1.4 million white-collar employees in the CPDF for each year from 1974 to 1981. The study does not find strong evidence of gender discrimination, with statistically significant results (in favour of male promotion prospects) only found in two of the 18 years analysed. In contrast, differences in promotion probabilities between men and women have been found when analysis is extended to include blue collar jobs (Rich, 1997). Using data on a random sample of new hires in 1978 and 1988, she finds that women have higher promotion probabilities than men. However, she finds that the higher number of promotions of women over the decade is partly due to their starting in lower-paid clerical occupations compared to professional and administrative jobs for men. This is supported by remuneration outcomes: women start on lower salaries and gain less money from promotions than men despite the fact that they are more likely to have a higher number of promotions in total.

The issue of starting grades affecting promotion prospects is also relevant when analysing race, and other 'diversity' outcomes. Rich (1997) finds that not only do white staff have a higher probability of promotion than black staff, they start on higher salaries and gain more money from their promotions. Occupational factors contribute to this result, with black staff more highly represented in lower-paid occupations.

Intersectionality may also matter: in the presence of occupational segregation, it is possible that white women compete with ethnic minority women, which could artificially increase white women's promotion chances if minority women face harsher discrimination than minority men do. For this reason, Lewis (1986) extends the model to include dummies for ethnic minority men and women and finds the dummy on white females is positive in two of the nine years studied (indicating better promotion prospects in those years) and negative for minority men in one year and women in one other year out of the nine years studied (indicating poorer promotion prospects in those years) .

In the most comprehensive study controlling for various 'diversity' attributes of staff using the CPDF, Lewis and Allee (1992) include analysis of the impact of disability, Indigenous status, and Asian ethnicity in addition to a range of other factors on Federal civil service career success for 1977 through 1989. For grade levels (or rank, classed from 1 to 18) white, non minority males had significantly higher grades than comparable female or minority employees. The expected grades of black males were 1.3 grades below those of comparably educated and experienced white males in 1989. Females were expected to be 1.8 to 2.8 grades

below comparably educated and experienced white males. The biggest disadvantage was seen for Native American females (expected grades of 3.5 and 2.8 lower than their counterparts) and Asian females (3.3 and 2.3 grades below their counterparts).

Lewis and Allee (1992) also include disability in their study and report estimates of between 0.51 (non-severely disabled) and 1.53 (severely disabled) lower grade levels compared to staff who do not report a disability. The results on expected grade levels are confirmed by promotions analysis. Lewis and Allee (1992) estimate a logit model including a disability variable alongside ethnic minority status, gender, age and years of education and experience and find that staff with disabilities were consistently less likely to be promoted, even after accounting for their concentration in the lower grades, where promotions are more common.

One shortfall of previous analyses is that they do not control for attrition of the best: if a staff member's ethnic, gender or other status unrelated to work performance is associated with lower promotion prospects, there may be attrition of talented staff into jobs in the private sector or non-Federal public service.

To deal with these issues, we employ a number of strategies. First, we model both promotion and separation (leaving) probabilities controlling for a rich set of factors. Second, we estimate the probability of promotion of staff at each level to the next level, which largely controls for any patterns in starting positions, while using year dummies to control for promotion freezes and different affirmative action policies in different years. Separation by grades/levels also allows us to identify the level(s) at which promotion prospects change sharply ('glass ceilings'). Lastly, we look at the affect of a number of 'diversity' factors following Lewis and Allee (1992) including gender, disability and coming from a non-English speaking background.

3.2 Public service diversity, incentives and performance

Our research has relevance for the growing literature on the impact of diversity and inclusion policies on workplace performance. Rafaqat et al. (2022) reviews the literature of the last two decades and finds that workforce diversity is significantly related to organizational performance. Studies that find positive impacts of diversity are more prevalent than those that find negative impacts. For example, findings from a study of the UK civil service (Andrews and Ashworth, 2015) suggest that gender and minority ethnic representativeness are both associated with an inclusive work climate, with each aspect of representativeness that they consider positively related to higher perceptions of inclusion and lower levels of discrimination and bullying.

There is a large literature on the effect of financial and promotion incentives on public sector performance. There has been debate about whether such incentives improve productivity or instead produce negative selection effects. Some papers have evoked the possibility of monetary incentives undermining intrinsic

motivation (Burgess and Ratto, 2003; Dal Bó et al., 2013; Ashraf et al., 2020). Overall, empirical evidence across all sectors – private, public and non-profit – points to the positive average effect of monetary incentives on employee productivity (see Nistotskaya (2018) for a review of the evidence).

For example Deserranno et al. (2021) find, using a field experiment with the Ministry of Health in Sierra Leone, that meritocratic promotions lead to higher productivity from high performers and workers who expect a steep pay increase. Similarly, using rich data on teacher evaluation scores, Karachiwalla and Park (2016) find that high wage increases for promotion are associated with better performance. Teachers increase effort in years leading up to promotion eligibility. Ki (2021) finds that pecuniary and non-pecuniary rewards improve motivation amongst officials with initially low motivation but not among more motivated officials.

Interestingly, when promotions are not meritocratic (for example when career advancement is achieved through social interactions rather than performance, Cullen and Perez-Truglia (2019)), increasing the pay gradient reduces worker productivity through negative morale effects (Deserranno et al., 2021). Similarly, Karachiwalla and Park (2016) find that teachers reduce effort if they are repeatedly passed over for promotion.

Gender and racial differences can also affect bureaucratic decisions, culture and promotions. For example, women executives are more likely to adopt female-friendly attitudes (Dolan, 2000), women prefer more government expenditure than men in the same organisation (Dolan, 2002), and women see themselves as more influential than men (Dolan, 2004). Racially diverse selection panels may benefit women (Powell and Butterfield, 2002) but may not necessarily benefit racially diverse staff or members of the community (Wilkins and Williams, 2008; Powell and Butterfield, 2002).

The socialising impact of organisational norms has also been explored: agencies associated with 'masculine' academic disciplines pay men more than women for the same job, whereas pay differences at more gender 'neutral' discipline agencies are largely explained by human capital differences (Smith-Doerr et al., 2019), women and men share closer spending preferences within departments than colleagues of their own gender from other departments (Dolan, 2002).

3.3 Other factors: Non-English Speaking Background, Immigrants, Language Fluency and Race

Breunig et al. (2013) find wage gaps for immigrant NESB men and women in Australia and, while wage convergence does occur over time, it is slowest for NESB immigrants. Booth et al. (2012) conduct a field experiment in Australia using work resumés with Anglo-Celtic and minority ethnic[3] names included at the

[3]Defined as those with Indigenous, Italian, Chinese or Middle Eastern names.

top of the resumé. They find that applicants for entry-level roles with minority ethnic names need to apply for more jobs in order to receive the same number of interviews as their counterparts with Anglo-Celtic names.

Recent evidence from a field experiment conducted by Adamovic and Leibbrandt (2023) in Australia suggests that discrimination against ethnic minorities worsens as they climb the career ladder into leadership roles. They submitted 12,000 job applications to over 4,000 job advertisements, to investigate hiring discrimination against six ethnic groups for leadership positions. They find that applicants with names derived from ethnic minorities received 57.4 per cent fewer positive responses than applicants with English names for leadership positions despite identical resumes. For non-leadership positions, those of ethnic minorities received 45.3 per cent fewer positive responses for non-leadership positions despite identical resumes. Ethnic discrimination for leadership positions was even more pronounced when the advertised job required customer contact.

A large literature in the US and Canada has looked at promotion, demotion and separation outside of the public sector context. Generally, these studies find that women and ethnic minorities are disadvantaged in promotion prospects and in retaining their jobs compared to white males, with the possible exception of Asian and Latino staff who are already at executive level. For example, Guest (2016) examines the mobility of ethnic minority and female executives in publicly listed U.S. firms. Promotions and demotions were inferred from changes in position title. Controlling for a range of factors Guest (2016) finds that minority executives as a whole experience lower promotion, higher demotion, and higher exit rates than Caucasian males. Female and African American executives account for the majority of these differences. Specifically, female executives experience lower promotion and exit, while African Americans experience lower promotion, higher demotion, and higher exit. In contrast, Asian and Hispanic executives do not experience different mobility outcomes from Caucasian executives. Using data from the Panel Study of Income Dynamics, Wilson and Maume (2013) find that, from blue collar jobs, African Americans (Latinos) are 25 (18) per cent less likely to attain management positions compared to Whites. Further, from white collar jobs, African Americans (Latinos) are 20 (14) percent less likely to attain management positions than Whites.

Using data from a large U.S. retail firm, Giuliano et al. (2011) examine how racial matches between managers and their employees affect rates of employee quits, dismissals, and promotions. They exploit changes in management at hundreds of stores to estimate hazard models with store fixed effects. They find a general pattern of own-race bias in that employees usually have better outcomes when they are the same race as their manager. Black, Hispanic, and Asian employees have lower relative rates of dismissal and higher relative rates of promotion when their manager is the same race. However, when white employees work under other-race managers, they have similar or even better outcomes than when they work under white managers.

Using a proprietary dataset containing personnel records on over 22,000 full-time, non-unionized employees from a large Canadian firm with nationwide operations from 1996 to 2000, Yap and Konrad (2009) explore the incidence of promotion for women and racial minorities. After controlling for other factors, women and racial minorities are less likely than their white male counterparts to be promoted. For both white women and minority women, the disadvantage is most severe at the lower rungs of the organizational hierarchy, similar to what we find for the Australian public service. Significant promotion disadvantages occur for white women, visibly minority women, and visibly minority men at the middle ranks of the organization. Visibly minority men continue to experience a promotion disadvantage at the highest organizational levels.

Fitzsimmons et al. (2020) study labour market outcomes of first and second generation immigrants in Canada, controlling for skin colour, language and gender. Without controlling for these factors, the pay and promotion prospects of immigrants were lower than the native population. However, once these factors are added, they find white male immigrants who speak English fare better than the native population.

One possible explanation for these results with respect to ethnic minorities or migrants is that employers infer lack of language fluency and cultural understanding from ethnicity or family name when assessing job applicants and these assumptions lead to poorer labour market outcomes in service sectors such as the public service. Since service sector occupations rely on people-to-people interactions, another possibility is that minorities may be disadvantaged when interacting with the majority due to (real or perceived) racial, ethnic, cultural and linguistic differences. For example, Borghans et al. (2014) find the increasing demand for 'people skills' between the late 1970s and 1990s in the United States explains movements in the gender and black-white wage gaps.

Language fluency may assist in acquiring information about optimal job search strategies and convincing employers of a candidate's qualifications. Language fluency is a prerequisite for many unskilled jobs. Using data from France, Germany and the UK, Dustmann and Fabbri (2003) find language fluency increases employment probabilities, but the effect is stronger for males than females. These findings on the importance of fluency are supported by Borjas (2015), who examines the evolution of immigrant earnings in the United States from 1970 to 2010. He finds that more recent cohorts may have experienced less economic assimilation partly due to lower investment in English language proficiency.

In our analysis, we examine the issues highlighted in this literature. We consider promotion and separation outcomes of all NESB. We then analyze the NESB group separately by those who are born in Australia or who arrived before the age of 6 in order to gain some understanding of the impact of language fluency and cultural assimilation. We separately analyze Asian-born NESB to learn more about the effect of race.

4 The APSED data

We use a version of the APS Employment Database (APSED) covering 2001-2020 that has had identifying information, including agency/department, removed.[4] APSED is a high-quality personnel database that tracks the employment, promotion, separation and other details of every employee in the Australian Public Service (APS). The APSC creates a 'snapshot' report twice-yearly on the employee characteristics of the APS (Australian Public Service Commission, 2021a). We utilise the December snapshots and combine them with another APSC file that tracks movements within the APS to create panel data indexed by a unique identifier for each employee. In December 2020, there were 145,902 ongoing staff of whom 2,834 were in the senior executive service (SES).

By combining the snapshot and movement files, we are able to track the career paths of APS employees through time and across agencies and observe when they separate from (i.e. leave) the public service. The details of the process of merging these two files to produce our analysis data are described in Appendix C. Particular variables of interest in the APSED database are summarised below.

Employment and Promotion: Public servants are categorised into APS (levels 1-6), EL1, EL2 and SES ranks.[5] APS officers usually hold analyst positions while EL1 and EL2 ranks hold mid-management and management positions. SES are the strategic leadership cohort, similar to the SES in the US Federal Public Service and the Senior Civil Service in the UK.

EEO Groups: All EEO characteristics are self-identified or constructed using information supplied by employees. Demographic data are gathered by the APS when individuals begin working in the service. While individuals can update their information at any time, there is no obligation for people to update their status regularly. EEO characteristics are most likely to change when an individual changes agency, at which point demographic data are often, but not always, updated.

Thus, the EEO status of individuals can change. However, there are very few changes in our data. For example, less than 1.3 per cent of our sample change NESB status and only 1.2 per cent of people change disability status. We code as NESB or having a disability anyone who reports one of these characteristics at any point during their service. Our rationale for doing this is that the willingness of people to report information on their background or on disability may change over time and that people may become more or less reticent about reporting these characteristics. Also, the impact of disability may be present even before

[4]APSED is not publicly available but the authors are happy to assist other researchers in obtaining the data from the Australian Public Service Commission. Appendix C provides details on our data construction.

[5]The Senior Executive Service in the APS is divided into three tiers: SES Band 1, SES Band 2 and SES Band 3. In this analysis we only consider promotions from EL2 to SES Band 1. For SES Band 2 and Band 3 classifications, cell counts for promotions of staff who are NESB or who have a disability become very small or even zero in some years.

it is officially 'reported.' In our analysis, we also explore what happens if we use time-varying definitions of EEO characteristics and our results are nearly identical. This is not surprising given the very small number of people who change status.

The NESB variable is constructed by the Australian Public Service using employee-provided data on country of birth (COB), year of arrival, first language spoken and parents' first language. Specifically, the NESB variable is derived as any employee with the following characteristics:

- COB not Australia and first language is not English; or
- COB Australia, first language not English and either mother's or father's first language not English; or
- COB Australia or overseas, first language is "English" or "English and another language" and both parents' first language is not English.

For some analysis, we combine those who are born in Australia with those who were born overseas and arrive in Australia before the age of 6 and compare them to those born overseas who arrive at age 6 or later. We do this to capture differences in schooling, English language skills and cultural attributes acquired in Australia as opposed to overseas.

For disability and NESB, we treat missing values as being equal to zero. There is no compulsion to answer these EEO questions and the APS does not follow up with individuals who leave these questions unanswered. Our interpretation is that people who don't answer these questions most likely do so because they are not relevant for their situation. We check this by dropping the missing values from our analysis and our results do not change in any substantive way–see Appendix D.

Skills: Skills indicators are derived from the data directly or provided on commencement of employment, often as a pre-condition of engagement. These include being an APS graduate or trainee; holding a bachelor degree or above; central agency experience[6]; and a qualification in the field of economics, finance or accounting.

Other Characteristics (Controls): An employee's part-time status[7]; whether an employee is on maternity leave; experience within the public service (i.e., time at level); and age are also included in APSED. For age and experience, we allow quadratic effects. Year dummies are also added to control for public sector expansions and promotion freezes. We create a variable which captures the fraction of time which an individual is part-time over their entire career. This variable takes value one if a person has been part-time in all years of their career and zero if the peson has never been part time. For someone who has been part-time in three of the five years she is observed in the data, this variable would take value 0.6.

[6]Central agencies are defined as Prime Minister and Cabinet (PM&C), Treasury and Finance. The APS provided us an indicator variable for individuals being in one of these three agencies.

[7]Breunig and Rospabe (2013) document the importance of part-time status in explaining wage gaps between male and female employees in the public sector in France.

4.1 APSED Summary Statistics

Table 1 shows summary statistics for key variables of interest at all levels of seniority used in our analysis pooled over the period 2001 to 2020. It shows that the proportion of those promoted falls from 15.4 per cent (APS5) to 2.1 per cent (EL2) as we move up levels whereas the proportion of those who separate increases from 3.2 per cent (APS4) to 4.6 per cent (EL2).

	APS4	APS5	APS6	El1	EL2	SES
Promotion	0.097	0.154	0.085	0.047	0.021	n/a
Separation	0.032	0.035	0.039	0.041	0.046	n/a
Female	0.679	0.579	0.544	0.485	0.404	0.392
Disability	0.069	0.054	0.054	0.052	0.05	0.056
Non-English Speaking Background	0.148	0.146	0.153	0.138	0.102	0.065
Asian-born NESB	0.046	0.050	0.056	0.050	0.028	0.012
European-born NESB	0.018	0.019	0.021	0.020	0.017	0.011
Accounting/Economics/Finance degree	0.04	0.054	0.067	0.094	0.119	0.175
Bachelors or Above	0.202	0.306	0.443	0.544	0.642	0.727
Graduate Program	0.079	0.142	0.135	0.165	0.183	0.263
Central Agency Experience	0.029	0.053	0.059	0.096	0.124	0.255
Part-Time	0.186	0.104	0.121	0.109	0.071	0.026
Maternity leave	0.027	0.020	0.022	0.020	0.012	0.004
Arrived age 5 or younger	0.130	0.127	0.139	0.135	0.119	0.091
Arrived age 5 or younger (NESB)	0.072	0.070	0.078	0.070	0.046	0.020
Arrived age 5 or younger(Asian-born NESB)	0.040	0.041	0.048	0.043	0.024	0.009
Born in Australia	0.667	0.658	0.653	0.664	0.654	0.709
Asian-born ESB	0.022	0.023	0.025	0.022	0.018	0.014
Observations	665483	467175	662308	505511	232983	47427

Values in cells are proportions of individuals in the data for whom the variable is equal to one.
Standard deviations can be calculated as $p(1-p)$.
Note: SES is the top level so there is no promotion. Most SES are on contracts and rather than separating, they leave when they come to the end of their contract.

Table 1: Summary Statistics of Main Variables of Interest

The proportion of staff with characteristics related to skills increases at each level. For example, at the APS4 level 20.2 per cent have a bachelors degree or above while 64.2 (73) per cent of those at EL2 (SES) level have a bachelors or above. In contrast, the proportion of those from an EEO group (non-English speaking background, disability, female) is lowest at the highest levels. The proportion of those working part-time also falls as people move up levels.

Appendix A presents descriptive statistics for each level of seniority for three points in time: 2002, 2010 and 2020. The proportion of female individuals has increased over time at all levels of the APS. The proportion of people who report a disability has decreased over time at all levels in the APS. The proportion of NESB in the public service has increased over this time period at all levels with the exception of the SES level where

the proportion of NESB individuals has remained just over 6 per cent. We look at the time trends in the data with respect to relative promotion probabilities in more depth in section 7.4.

4.2 Australian Public Service Gazette data

To check that these patterns hold in other sources, we examined publicly available data from the APS Gazette.[8] Using OnoMap[9] (following Booth et al. (2012)) we infer the ethnicity of last names of all staff promoted in the APS from 2002-03 to 2021-22. While around 12 per cent of promotions at junior and analyst ranks are of staff with non-European names,[10] this falls to 10 per cent for mid-management/management promotions (EL1 or EL2) and 4 per cent for SES promotions. Over the past two decades, around 96 per cent of promotions to SES were awarded to staff carrying Anglo, Celtic or European names.

What might be driving these patterns in APS employment? Could there be characteristics related to productivity (such as years and type of experience, education and English fluency) that contribute to career success for different groups? Or could different rates of attrition play a role? To disentangle these effects, we explore the impact of these factors on promotion and separation prospects for different EEO groups and eliminate a number of possible explanations.

5 Modelling career movement

In each period APS staff at each level either leave, stay at level or get promoted. To analyse the determinants of these alternatives, we estimate logit models of promotion and separation to analyse the influence of an individual's skills and characteristics on these outcomes while controlling for a range of factors.

Let X_{it} stand for the characteristics of individual i at time t. $Y_{i,t+1}$ is the binary outcome for individual i at time $t+1$: either promotion or separation. Separation includes voluntary resignation, voluntary and involuntary redundancy and other terminations, but excludes retirement, death, and invalidity.

The conditional probability of $Y_{i,t+1}$ equaling one is modeled as:

$$Prob\left(Y_{i,t+1}=1|X_{it}\right)=F\left(X_{it}\right) \tag{1}$$

where F is the logistic function. X_{it} includes characteristics which vary over time and a constant and time

[8]The APS Gazette publishes names of individuals engaged by, or promoted in, the APS. A small number of names are excluded for national security reasons. See https://www.apsjobs.gov.au/s/gazette. The authors are happy to share this data upon request.

[9]The OnoMap family of software tools is widely used in research for the classification of names. See www.onomap.org for more details.

[10]'Non-European' means those names that are not Anglo, Celtic or European including those that can not be classified.

dummies for each year, which do not vary across individuals.

Individual characteristics include whether the staff member has a Bachelor's degree or above, has central agency experience, was part of an APS graduate intake or has a degree in economics, accounting or finance. We also control for experience at level and its square, age and its square, part-time status, maternity leave status and year (to account for public service recruitment and promotion freezes). For part-time status, we control for an individual's current part-time status and we include an indicator if an individual has been part-time throughout their entire career. We also include a rolling variable which captures the percentage of an individual's career inside the APS which has been part-time; see Section 4 above.

Relevant work experience outside the APS is not available in APSED. Including age will, to some degree, pick up work experience outside the APS. The vast majority of public servants are located in the federal capital, Canberra. We have location data available but these data correspond to the position and not to the physical location of the individual. For example, a person could live and work in Sydney but hold a position that is Canberra-based. Including location data does not change our results and we omit it from all of our models.[11]

In both models (for promotion and separation), $Y_{it+1} = 0$ for those who remain with the APS and remain at level. For the models of promotion, we are thus estimating over the subset of those who are promoted and those who remain with the APS. We exclude those who separate. For the models of separation, we estimate over the subset of those who separate and those who remain at level with the APS. We exclude those who are promoted. We estimated multinomial logit models with all three outcomes and the results are similar.[12] The assumption of independence of irrelevant alternatives which underpins the multinomial logit model is inappropriate in this situation and we thus prefer the results from the two distinct logit models. We pool data across multiple years in estimation so we cluster the standard errors at the level of the individual. We focus on odds ratios in our discussion of the results in the next section. Details of coefficient estimates from all models that we estimate are provided in Appendix B.

6 Results

We begin by estimating baseline models using equation (1) for promotion and separation for all individuals pooled across all years of our data. For coefficient estimates, see Appendix Tables B1 and B12. We summarise the results, first for promotion and then for separation. We focus on the marginal effects from the model - that is, what is the relative probability of promotion for groups with different attributes conditional on all

[11] Results including location are available from the authors upon request.

[12] We do not report these results. They are available from the authors upon request.

other characteristics. We present these marginal effects in graphical form.

6.1 Promotion: Equal Employment Opportunity (EEO)

Figure 1 compares the probability of promotion of the first group to the second group in each panel of the figure. These estimates are based upon logistic regressions using data pooled across all twenty years of our data and control for all other observable skills and attributes. The first panel of Figure 1 compares promotion probabilities for men and women conditional on all other observable characteristics. Men have higher promotion probabilities than women at all levels from APS4 to EL1. However, and somewhat strikingly, women have higher promotion probabilities than men when going from EL2 to the top level of SES.

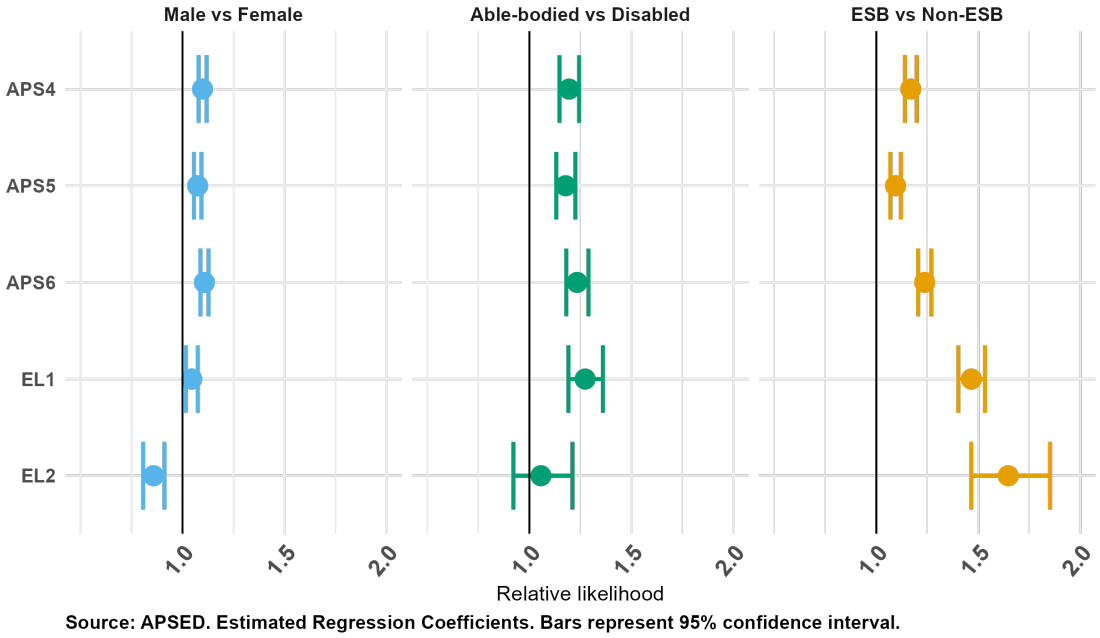

Figure 1: Promotion and EEO Characteristics

The second panel compares those with and without disability. At all levels from APS4 through EL1, people who do not report a disability have higher probabilities of promotion. These are statistically different than zero at the five per cent level as the 95 per cent confidence intervals exclude the 'Just as likely' line. At the top level, promotion from EL2 to SES, there is no statistically significant difference in promotion probabilities between those who report or do not report a disability. This is partly due to the wide confidence interval.

The gap in promotion probabilities between men and women at the APS4 to EL1 levels is about half as large as the gap between people with and without disability. This is reflected in the estimates from Table B1 where the coefficient on 'disability' is about twice that of 'female' at these levels.

The most striking results in Figure 1 are the comparison between those from an English-speaking background (ESB) and those from a non-English speaking background (NESB). The NESB group have lower probabilities of promotion at every level and the difference is statistically significant. Unlike for women and those with disabilities, the NESB promotion prospects decrease at higher levels. For promotion for EL2 to SES, those in the ESB group are about 70 per cent more likely to be promoted than those in the NESB group, conditional on all other observable characteristics.

6.2 Separation: Equal Employment Opportunity (EEO)

Could these promotion outcomes be driven by differing rates of attrition? Figure 2 shows that disability is associated with a lower probability of separation, except at the EL2 level. Being from a non-English speaking background is also associated with being less likely to separate from the APS at all levels. Gender does not seem to have much relationship with separation from the APS. Women are more likely to separate at higher levels which matches their higher promotion prospects at those higher levels.

The disability and NESB results are perhaps surprising. If these characteristics are associated with a lower likelihood of promotion, then we might expect these same characteristics to be associated with a higher likelihood of separation as workers may seek employment outside the APS. However, we do not observe this. In fact, we observe the opposite. One possibility is that these individuals prefer to work in the APS for reasons that we do not observe. Another is that promotion prospects for this group outside the APS may not be better than within the APS. For NESB staff, the low proportions of non-Europeans in senior leadership positions in the private sector (see Diversity Council of Australia (2018) and section 3.3 above) may mean that they see little benefit in switching careers, especially where such switching may be costly.

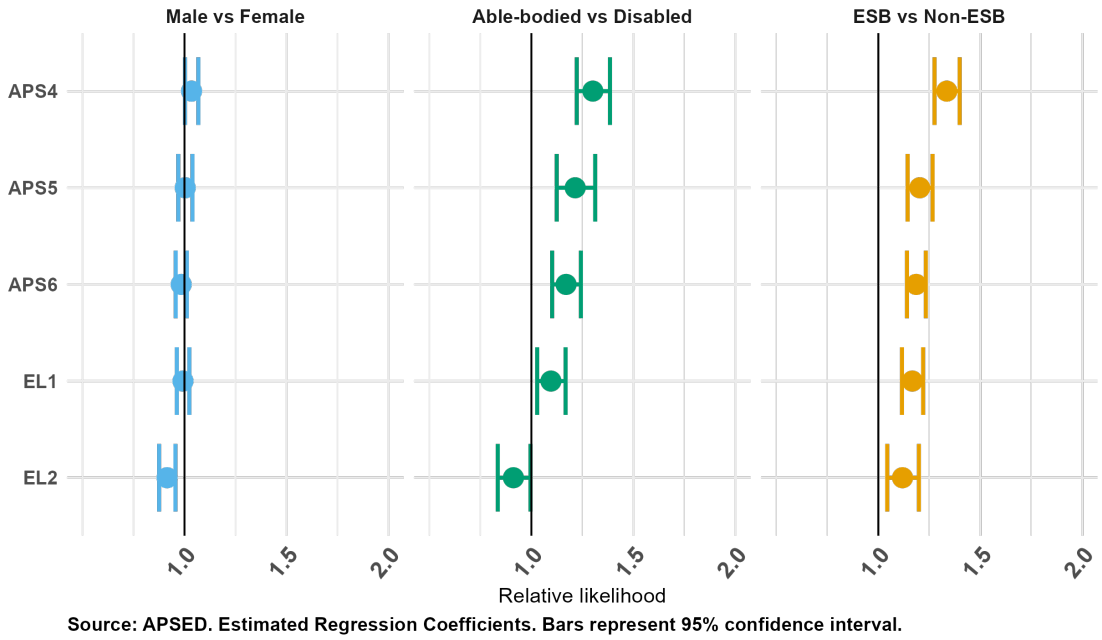

Figure 2: Separation and EEO Characteristics

6.3 Promotion: Skills

Figure 3 shows how skills are related to the probability of promotion from each level. Having a bachelor degree or above is important at junior levels. Having qualifications in the fields of accounting, economics or finance seem to matter little for promotion prospects. This is a commonly held belief by Australian public servants and it is interesting to see that there seems to be little evidence of this in the data once we control for other characteristics. Graduate program participation has statistically significant results at most levels but they are inconsistent, with a negative effect for promotion from APS5 to APS6 level and a positive effect for promotion from APS4, APS6 or EL2 levels. It is not clear what we should infer from this pattern.

Experience with a central agency is positive and highly statistically significant at all levels; for example, staff with experience in a central agency are around twice as likely to be promoted from EL2 to SES relative to those with no central agency experience. This may reflect skills that are acquired at a central agency or may be picking up selection effects. Unobserved characteristics about an individual that make them more likely to get promoted may be correlated with being more likely to work or have worked at a central agency.

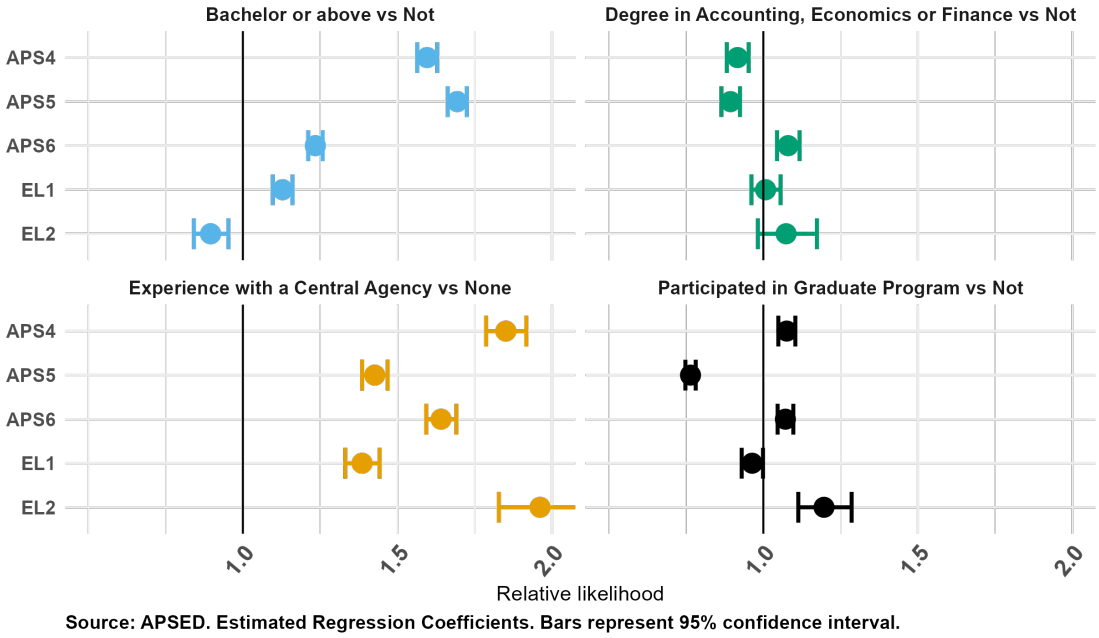

Figure 3: Likelihood of promotion and Skills

6.4 Separation: Skills

Figure 4 shows how skills influence the probability of separation from APS4 to EL2. It shows that having a bachelor degree or above has little influence on whether staff continue to be employed with the APS at the APS4 and APS5 levels. However, once people become more senior, having a bachelor degree or above lowers the probability of separation and this effect is larger at higher levels. In contrast, those with degrees in accounting, economics or finance are less likely to leave the APS when they are below EL1 level. However, EL2 individuals with a degree in one of these fields are more likely than similar colleagues to depart the APS.

Experience with a central agency makes leaving the APS more likely at levels below EL1. The coefficient for departures from APS5 is only significant at the 10 per cent level.

Entering the public service via the graduate program is associated with a lower probability of separation at higher levels–specifically EL1 and EL2. It is associated with a higher level of departure for those at APS4 level. Those in the graduate program are viewed as being selected for future leadership potential and some of them may use this reputational signal early in their career to leave the service quickly.

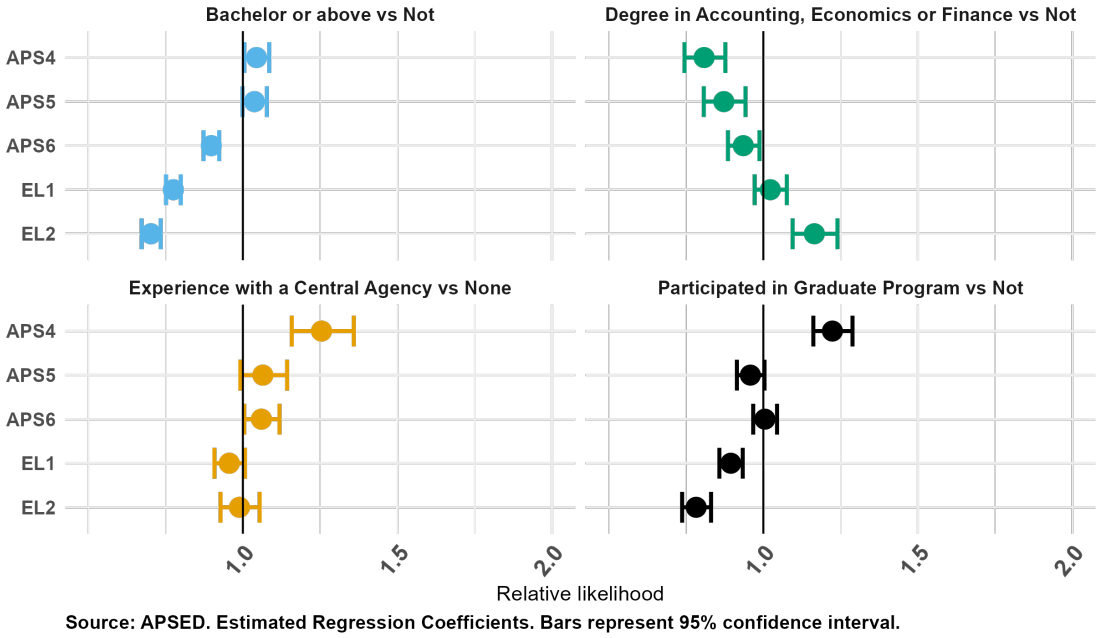

Figure 4: Separation and Skills

7 Digging deeper

In this section we explore these results in more depth. First, we examine the results for those from non-English speaking backgrounds (NESB). Their lower probabilities of promotion relative to similar, non-NESB employees raise several questions. First, is this driven by language ability or cultural fluency? Second, could this be driven by race? Recall that we do not have data on ethnicity or race, but we do know country of birth and we can use this as a rough proxy for race.

A third explanation is that these results are affected by occupational segregation within the public service. There is a stereotype that NESB individuals are often in more 'technical' jobs which have lower promotion prospects than more 'general' and managerial jobs. Women may also be concentrated in administrative positions with little prospect for promotion. Considering promotion at each level, as we do, controls for some of this occupational segregation but we can also use data on job families to examine these hypotheses. Job family data are only available for the most recent years.

The literature from the US, see Lewis (1986) and Lewis and Allee (1992), suggests that the effect of disability or NESB might differ for men and women. We explore that hypothesis. Finally, given the changing policy landscape during our analysis period, as described in section 2.1 above, do we see changes in the relative promotion probabilities of those from EEO groups over time?

7.1 Language and cultural fluency

The relative promotion probabilities for staff from non-English speaking backgrounds (NESB) decrease as we move from lower to higher ranks. To what degree is this related to unobserved language ability or cultural fluency? In other words, are the differences in promotion probabilities that we observe driven by cultural or language barriers that inhibit promotion? This would be possible because a common promotion selection criterion is 'clear verbal and written communication skills'.[13] We also explore whether the act of immigrating to Australia has an effect on promotion prospects, separate from language fluency factors.

In order to answer these questions we split NESB into those who were born in Australia or who migrated before the age of six, and those who migrated at six or older.[14] We also compare NESB and ESB migrants to see if we can separate language effects from cultural assimilation.

Figures 5 and 6 present promotion and separation results from four comparisons. Coefficient estimates from the promotion (P) and separation (S) models are in the Appendix Tables indicated in square brackets:

1. *Australian born or moved to Australia before the age of six:* NESB compared to ESB [P: Table B2; S: Table B13];
2. *Migrants who arrived in Australia after the age of five:* NESB compared to ESB [P: Table B3; S: Table B14];
3. *All ESBs:* ESB who migrated to Australia after the age of five compared to ESBs who were born in Australia or migrated before the age of six [P: Table B4; S: Table B15];
4. *All NESBs:* NESB who migrated to Australia after the age of five compared to NESBs who were born in Australia or migrated before the age of six [P: Table B5; S: Table B16].

The top left panel of Figure 5 shows that among APS staff born in Australia or who arrived prior to the age of six, those with a non-English speaking background are consistently still less likely to be promoted, and the relative probability of promotion falls as we ascend levels. The difference between the relative promotion gaps that we saw in Figure 1 are similar in nature to those in Figure 5. The relative promotion penalties at APS4, APS5 and APS6 levels are nearly the same as when we do not condition on being born in Australia or arriving at a young age. For the EL1 level, the gap is reduced by about 25 per cent and for the EL2 level, the gap is reduced by about 40 per cent.

This is a striking result: the lower promotion probabilities faced by Australian-born or young-arrival NESB staff is almost the same as later-arriving NESB staff until EL levels. This can be seen by looking at the bottom right panel of Figure 5. This is evidence against a simple language or cultural fluency explanation for the poor promotion prospects of NESB Australian Public Servants.

[13]The Integrated Leadership System contains criteria for APS staff at all levels and includes "Communicates with influence" as one of five core capability clusters (Australian Public Service Commission, 2021b).

[14]We chose this age because those who arrive in Australia aged five or younger are educated in Australia under a common national curriculum. They will almost certainly speak English with an Australian accent. We also tested whether the results changed if we use a later cut-off of age 10. Those results are consistent with what we report here.

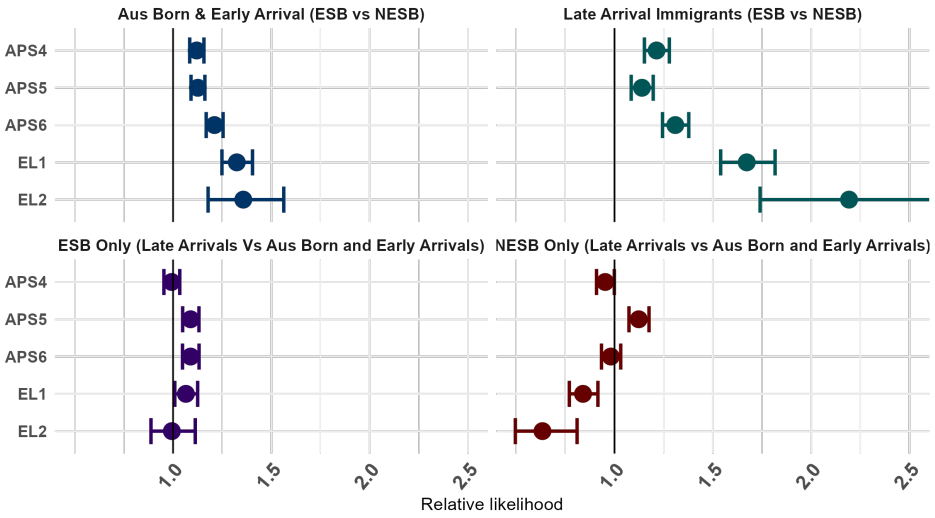

Figure 5: Promotion by Australian born/raised and NESB status

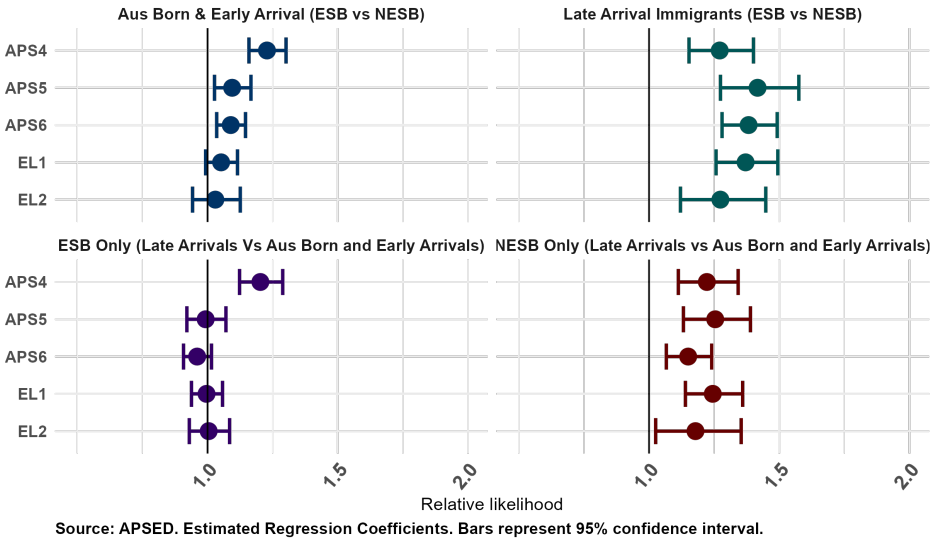

Figure 6: Separation by Australian born/raised and NESB status

The upper right hand panel of Figure 5 shows that among immigrants who arrived in Australia after the age of five, those with an English speaking background have a significantly higher likelihood of being promoted than those of non-English speaking background. This likelihood becomes significantly larger again at the most senior levels, with ESB late-arrival immigrants having more than double the prospects of promotion relative to NESB late-arriving immigrants at the EL2 level, controlling for all other observable characteristics. This may be evidence of a language penalty but without more detailed information about language fluency levels it is hard to separate out the language and cultural differences when comparing late arriving migrants from English speaking and non-English speaking countries given the potential for very large cultural differences.

The bottom left panel of Figure 5 shows that at all levels of seniority the likelihood of promotion of ESB staff are similar whether they were born in Australia or immigrated before the age of six, or if they arrived later. While the differences at APS5 and APS6 levels are statistically significant, they are small and there are no statistically significant differences at other levels. This suggests that the act of immigrating itself does not hinder promotion prospects in the APS.

Figure 6 looks at the probability of separation for the same population splits as Figure 5. There are only small differences between the probability of separation for ESB and NESB individuals who are either born in Australia or who arrived before the age of 6. If separation is a proxy for prospects outside the APS, this suggests that the promotion prospects for early arrival NESB might be better in the wider job market. There are no differences, except at the APS4 level, in separation probabilities for ESB individuals based upon whether they migrated after the age of 5 or whether they were born in Australia or arrived at an early age. For the NESB group, late arrival immigrants are more likely to separate than those who arrived before the age of 6 (or who were born in Australia), consistent with their lower promotion probabilities. For late arrival immigrants, the ESB are more likely to separate than the NESB at all levels. For all four comparisons, there are not many differences across different APS levels.

The poorer promotion prospects of NESB individuals is not easily explained by language difficulties or cultural assimilation. Might it be due to racial factors? 'White Australia' was legislated policy from 1901 and was only completely dismantled with the passage of the *Racial Discrimination Act 1975*. Anti-Asian sentiment has long been a part of the landscape in Australia and it worsened during COVID-19, see Biddle et al. (2020).

The Gazette data, described in section 4.2 above indicate that staff with East Asian/Pacific and South Asian names make up around 9% of APS level promotions but only around 2% of SES promotions. To investigate the degree to which being Asian, as opposed to simply coming from a non-English speaking background, affects our results we compare promotion prospects for Australian-born ESB staff to those born in Asia and

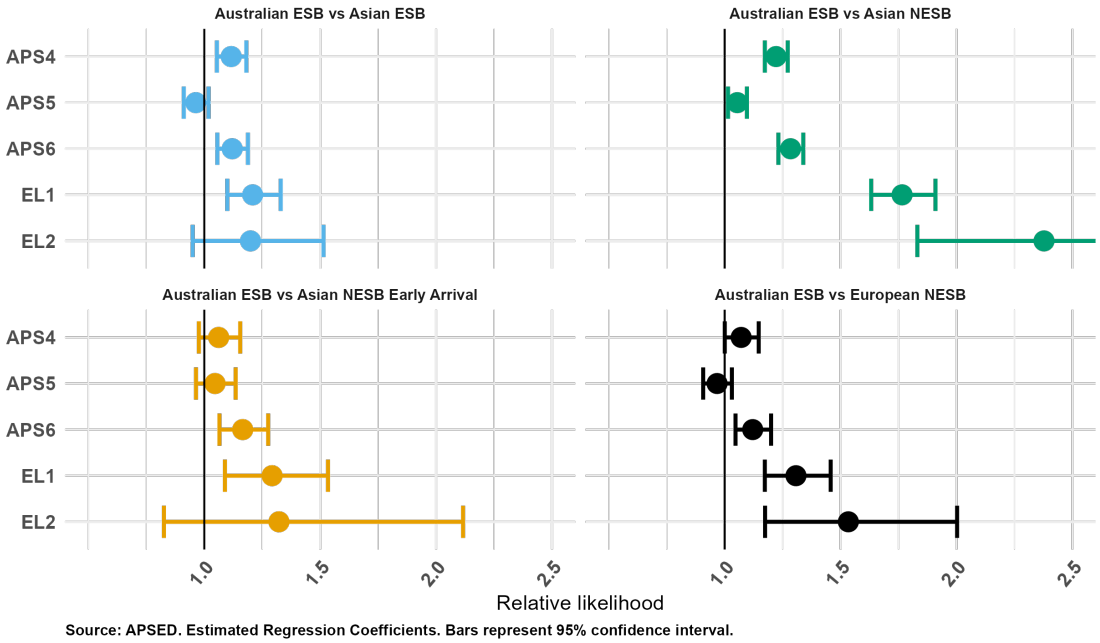

Figure 7: Promotions, by continent of birth and language background

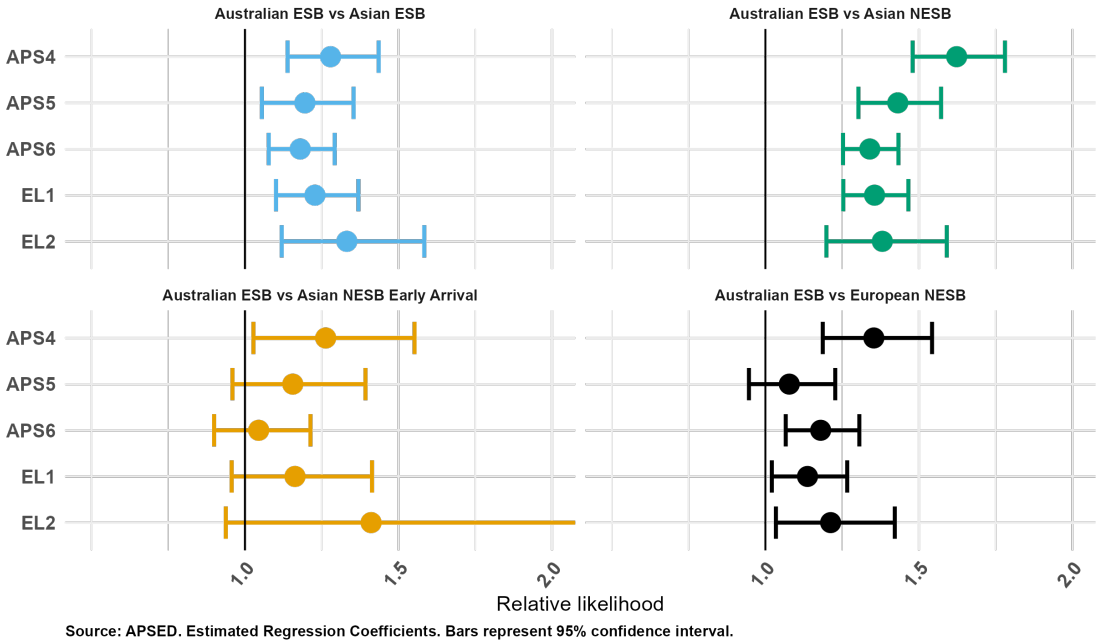

Figure 8: Separations, by continent of birth and language background

non-Asian NESBs. 'Asia' here is defined as the Australian standard classification of countries 5101 to 7211[15], spanning South East Asia, North East Asia and Southern and Central Asia. Recall that our data have no information on race or ethnicity so we use country of birth and language background to proxy 'Asian-ness'.

Figure 7 shows several interesting patterns. First, Asian-born individuals of English speaking background are less likely than Australian-born English speakers to be promoted at every level except the APS5 and EL2 levels. Comparing the upper left hand panel of Figure 7 to the bottom left panel of Figure 5, there seems to be a penalty for English-speaking background immigrants born in Asia relative to other ESB immigrants. This group is quite mixed. It includes Anglo-looking Australians who were born to Australian parents overseas but also includes Singaporeans (or Malaysians, Hong Kongese, etc.) of various ethnic backgrounds who grew up speaking English. The results here could be due to cultural or racial differences for some people in this group.

Comparing the two left-hand side panels of Figure 7, we can see little difference in promotion prospects for Asian ESB and Asian NESB who arrived in Australia before the age of six. This is further evidence that the poorer promotion prospects of Asian NESB who arrive in Australia are not driven by language differences. Comparing the two right hand side panels of Figure 7, the promotion prospects of NESB born in Asia are much worse than those born in Europe. A direct comparison of Asian NESB to European NESB shows statistically significant differences (with European NESB having better promotion prospects) for promotion from the APS4, APS6 and EL1 levels.

NESBs who arrive from Asia before the age of 6 face a promotion penalty relative to Australian ESBs. They have worse promotion prospects at all levels, but the differences are only statistically significant at the APS6 and EL1 levels. The point estimates that generate the bottom left panel in Figure 7 are quite similar to those for all NESBs who arrive in Australia before the age of 6 (the upper left hand panel of Figure 5) which suggests that early arrival NESBs from Asia do not face any penalty relative to other early arrival NESBs.

For completeness, we include the results for separation in Figure 8. The separation results for Asian-born NESB are similar to the overall results for NESB as reported in Figure 6. The other comparisons have wide confidence intervals due to small sample sizes and are not particularly informative. Tables B6 through B9 and Tables B17 through B20 in Appendix B contain the model results which produce Figures 7 and 8.

7.2 Job family

We use job family data from the APSC to look at the possible role occupational segregation may play in APS promotion outcomes–Lind and Colquhoun (2021) and KPMG (2022) document and discuss the strength and

[15]See https://www.abs.gov.au/statistics/classifications/standard-australian-classification-countries-sacc/latest-release.

persistence of occupational segregation in Australia.

Our approach of modelling promotion probabilities separately for each APS rank effectively controls for Analyst, Manager and Senior Manager status, since work-level expectations for these job titles across different agencies are set by the APSC through the Integrated Leadership System, a system of performance standards that is common across agencies. Nonetheless, there may be differences in roles even after controlling for rank. For example, while all staff at the EL1 level may be considered mid-managers, some staff may be concentrated in logistical or coordination roles that have limited prospects for career advancement. In contrast, other staff may be concentrated in policy formulation or advising that have better promotion prospects. We add information on job family, available only in the 2017-2020 period, to address this issue.

Job family refers to high-level groupings of roles that carry out similar types of work and hence require similar skills, capabilities and job-related knowledge. Job family categories are exclusive, meaning that any role falls into one and only one job family. It may be that some job families provide better promotion prospects than others and that employees from the different EEO categories are concentrated in those job families which provide poor promotion opportunities.

The APSC uses 18 Job Family categories such as Accounting and Finance, Communication and Marketing, Legal and Parliamentary services, Data and Research and Policy (which includes roles such as economists and policy analysts). Certain key roles such as Chief Data Officer are classed in the Senior Executive job family.

Many job families have an uneven gender representation. For example, 70 per cent or more of the staff in Service Delivery, Human Resources, Administration and Communications and Marketing are women. In addition, NESB staff make up a relatively high proportion (25 to 30 per cent) of staff in ICT and Digital Services, Accounting and Finance and Legal and Parliamentary.

The job family data are only available for about 70 per cent of staff and only from 2017. We begin by re-estimating our baseline promotion and separation models over this shorter time period and reduced sample to determine whether the estimates for the 2018-2020 period are the same as for the 2002-2020 period (see Tables B10 and B21). We need 2017 data to estimate whether someone is promoted or separated in 2018. The main difference in the coefficient estimates is that females are now more likely to be promoted than males at every level except APS5 to APS6. Promotion prospects for women have clearly changed over time and we explore this further in the next subsection.

Looking at the results for separation in Table B21, we now see that staff with disabilities are more likely to separate at all levels in sharp contrast with the baseline results of Figure 2. The patterns of separation for women have also changed. Women in this more recent period are less likely to separate than men at the

APS6 level and higher and are not different than men at the APS4 and APS5 levels.

We then add job family fixed effects (see Tables B11 and B22) into these two models. Comparing Figures 9 and 10, we find no evidence that occupational crowding and segregation are driving the NESB outcomes, with the coefficients almost unchanged when we add job family fixed effects. There is a small decrease in the size of the NESB promotion effect for promotion from EL2 to SES level but the overall conclusions do not change. The distribution of NESB staff across job families do not explain their poor promotion prospects.

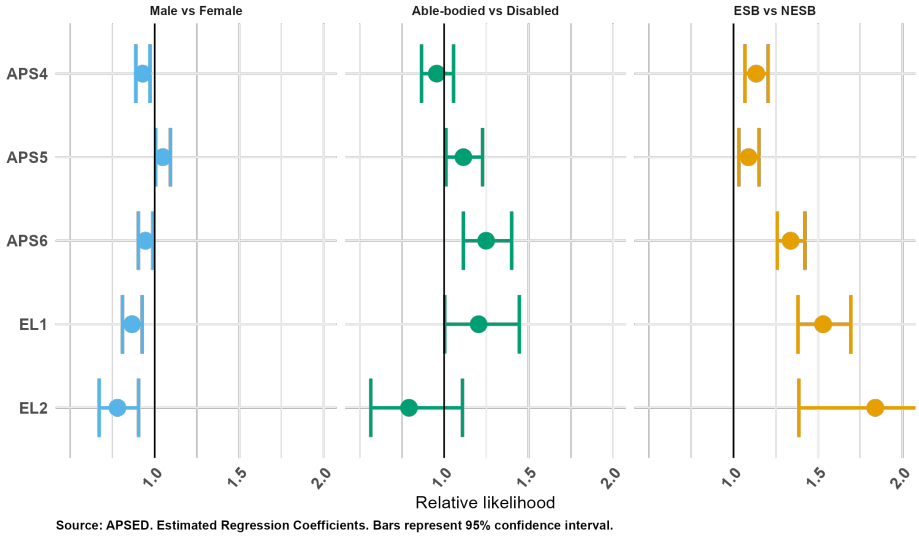

Figure 9: Promotions, baseline model, 2018-2020

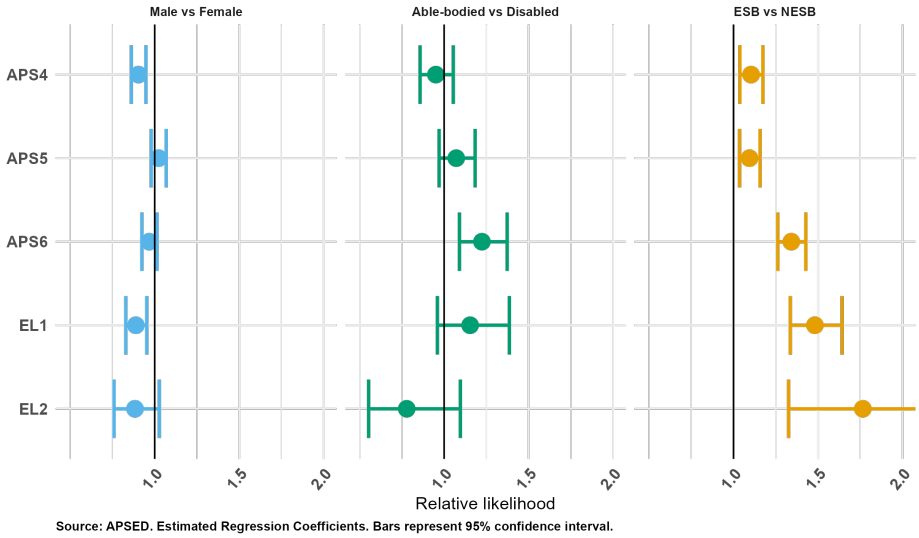

Figure 10: Promotions, job family fixed effects, 2018-2020

Occupational segregation may play some role in different promotion prospects for males and females. For

every level we see attenuation in the coefficients when we add job family fixed effects. The higher promotion prospects for women at APS6 and EL2 become statistically insignificant. The lower promotion prospects for women at APS5 also become statistically insignificant. Some of the differences we found earlier are thus coming from men and women being in different job families and once we control for this, there is not much difference in promotion prospects at APS5, APS6 and EL2 levels. This may be endogenous - women may select into those job families where they know that their promotion prospects are better. Women are still more likely to be promoted than similar men, in this 2018-2020 time period, from APS4 and EL1.

Women make up around 70 per cent in jobs families such as administration, human resources and customer support. Women also make up over 60 per cent of staff in job families with the highest probabilities of promotion from EL2 to SES - the Policy and Legal and Parliamentary job families.

Unfortunately the job family data are only available for the 2017-2020 period and we cannot tell to what degree these issues explain the results from earlier years. Our preferred estimates remain those that use the entire 19 year sample.[16]

7.3 The interaction between gender, NESB and disability

Figures 11 and 12 show relative promotion probabilities for staff with disabilities (relative to those who do not report disability) and NESB (relative to ESB) split by gender. In the United States (Lewis and Allee, 1992) females within EEO categories had worse outcomes than similar males. In Australia, we find that this is not the case. There is almost no difference in the promotion prospects for NESB or staff with disabilities when we split by gender. This is an interesting result and suggests that gender is not playing a large role in the poorer employment prospects for those with disabilities or the NESB and that the increases in promotion probability for women overall have largely bypassed women with disability and NESB women.

Similarly for separation, we find almost no differential effects for those with disabilities and NESB individuals by gender. If we reproduce Figure 5 split by gender, we also find very few differences by gender in the patterns of differences between ESB and NESB individuals separated by whether they migrated early in life or late in life to Australia. These results are presented in Figures E1 through E4 in Appendix E. We also find that the effect of skills on promotion or separation probabilities are not much different by gender.[17]

[16] Estimates for the separation model are included in Appendix B (see Tables B21 and B22). The small number of separations over this time period results in all comparisons being statistically insignificant so we have not included any figures based upon these estimates.

[17] These results are available from the authors upon request. We estimated versions of our models where we interacted EEO characteristics with the skills and other control variables and the marginal effects from those models are nearly identical to the ones we report here. We thus prefer the more parsimonious model without interactions.

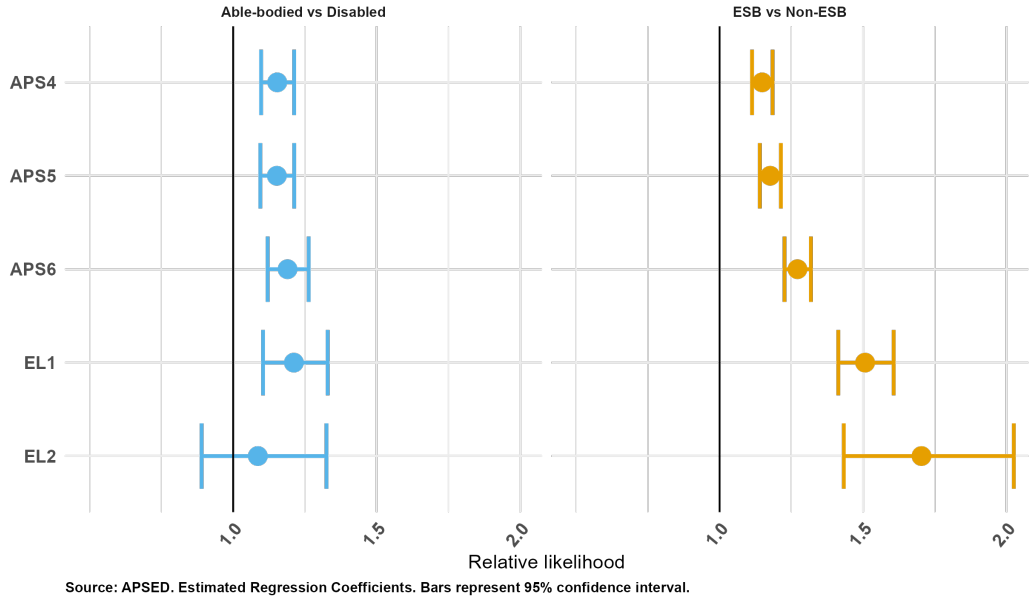

Figure 11: Promotions, females, by EEO group

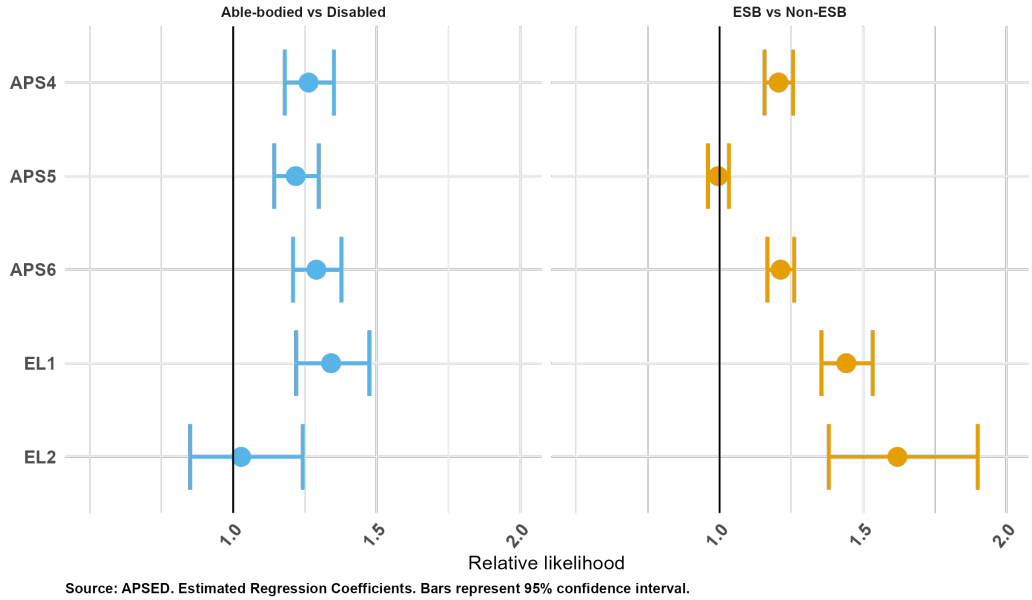

Figure 12: Promotions, males, by EEO group

7.4 Changes in promotion prospects over time

We saw in Section 7.2 above that the promotion probabilities for women relative to men became positive in the 2018-2020 period. Figures 13 through 14 show how the impact of female, NESB and disability evolve across the entire 19 years. We estimate the model on four-year windows and roll the window forward across time. The first estimate is for the 2001 - 2004 window and the last estimate is for the 2017-2020 window.

For women, promotion prospects relative to men have increased over time for most levels. For promotion from APS4, APS6 and EL1, there is a relatively steady trend over the entire time period. For APS5, promotion probabilities are higher relative to men in the last 4 years of data, but dipped between 2010 and 2015. There is a similar dip between 2007 and 2015 for promotion from EL2 to SES ranks, but throughout the time period, women's promotion prospects were always at least as good as those of similar men.

Recall from section 2.1 that the *Workplace Gender Equality Act 2012* came into force in 2012. The timing of this appears to match an uptick in women's promotion prospects relative to men with notably higher probabilities of promotion for women in the points from 2015 onward where most of the data would have been affected by this act. Recall that the 2015 estimate incorporates data from 2012-2015.

We find no clear pattern for the relative promotion probabilities of staff with a disability. At the APS4 level, there is steady improvement over time with promotion probabilities for those with a disability catching up to those without a disability by the end of the period. For the other levels, the trend is downward or flat in the early period with perhaps some sign of improvement towards the last five years. There is no discernible impact from the 2005 amendments to the Disability Discrimination Act that were intended to improve employment prospects for staff with disability. There is perhaps a small improvement in employment probabilities for staff with disability coming from the 2013 Commissioner's directions (see section 2.1 above) with increases in employment prospects for those reporting disability, relative to those who do not, at most levels apparent from 2017 onward.

For NESB, relative promotion probabilities from APS4 and APS5 are mostly constant over the time period. For all of the higher levels, the promotion probabilities of NESB relative to non-NESB have decreased across the two decades covered by our data. There is no visible impact from the 2013 amendments to the Public Service Act which required departments to improve the degree to which the public service reflected the diversity of the Australian population.

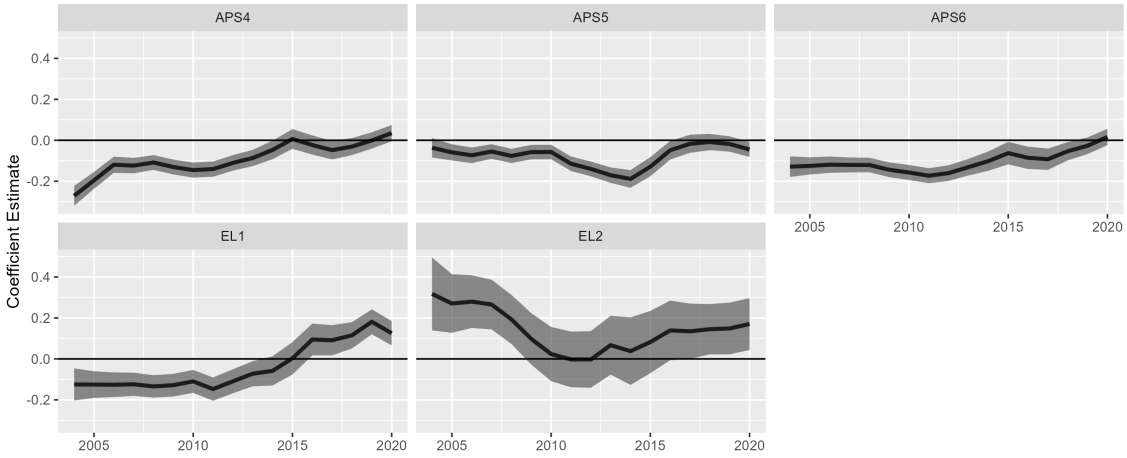

Figure 13: Females promotion relative to males: changes in coefficient over time

Estimates based upon rolling 4-year window from 2001-2004 to 2017-2020

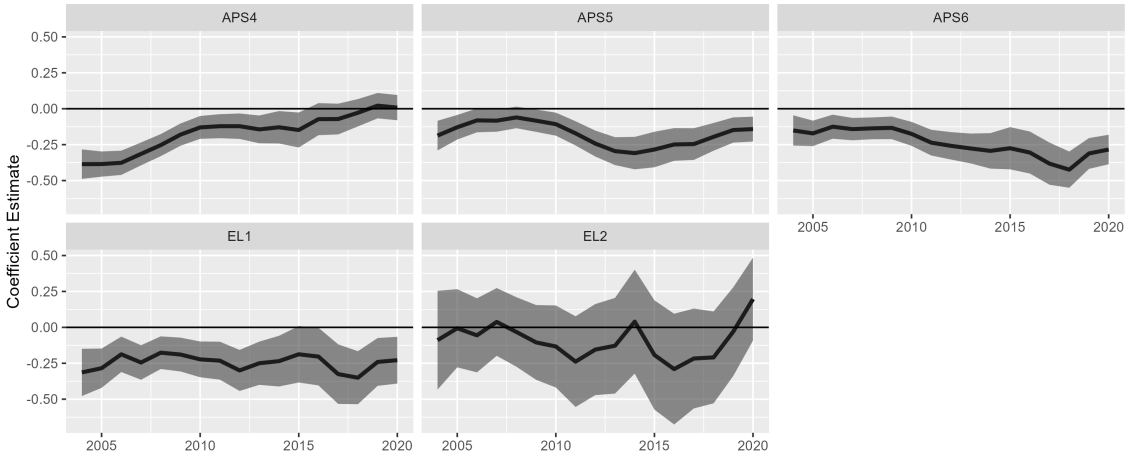

Figure 14: Disability promotion relative to non-disability: changes in coefficient over time

Estimates based upon rolling 4-year window from 2001-2004 to 2017-2020

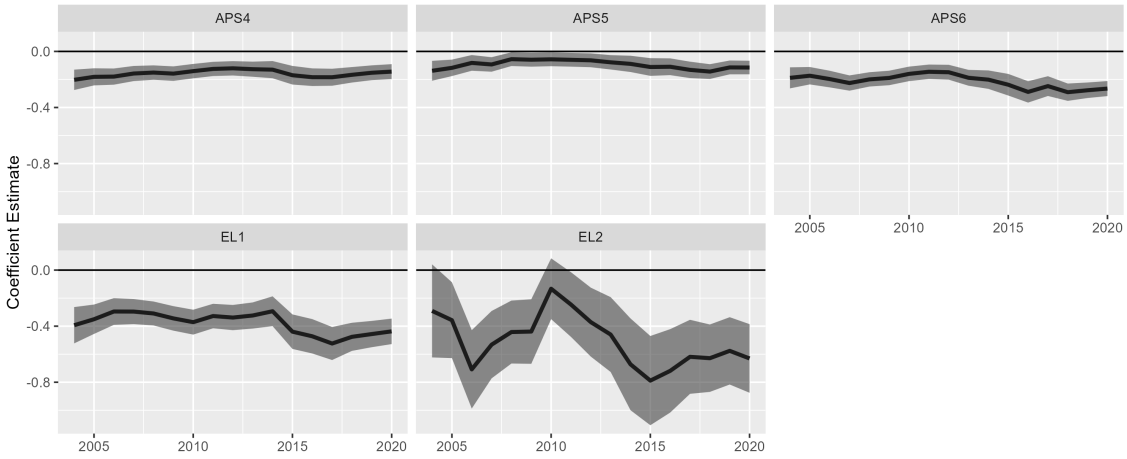

Figure 15: NESB promotion relative to ESB: changes in coefficient over time

Estimates based upon rolling 4-year window from 2001-2004 to 2017-2020

8 Discussion and conclusion

We examine the probabilities of promotion and separation in the Australian Public Service (APS) for three groups which are under-represented in the senior ranks. We use the universe of the APS' personnel database and consider promotion and separation through separate models for each of five different levels of seniority.

For women, we find that in the 2002-2015 period they are less likely to be promoted than similar men after controlling for a wide range of observable characteristics at the four lowest levels of rank. However, for promotion at the very top level, from EL2 to SES, women have been consistently more likely to be promoted than similar men. At all levels, the relative promotion prospects of women have increased dramatically over time. In the later years of our data, particularly in the 2017-2020 period, women are at least as likely as similar men to be promoted at all levels. At the two most senior levels, EL1 and EL2, they are more likely than similar men to be promoted. We find no evidence of a 'glass ceiling' for women. Using data for the three most recent years only, it appears that some of the better promotion prospects for women may come from women being in job families where there are more promotions. Women are still more likely to be promoted than similar men, but the differences diminish when we control for occupational segregation.

The story is quite different for those who identify as being from a non-English speaking background (NESB). NESB are less likely to be promoted than similar ESB individuals and the gap in promotion prospects increases as we consider higher levels of rank in the public service. Promotion prospects for the non-NESB appear to have gotten worse over time compared to similar individuals from an English-speaking background. Other than a general policy that the public service should reflect the diversity of the Australian population, the APS does not have targets or other types of affirmative action for this group.

The NESB results are only partially explained by language fluency and cultural assimilation. When we consider NESB who are born in Australia or who arrived at a young age, we find smaller, but still statistically significant differences in relative probability promotions compared to Australian-born or immigrant ESB. Asian-born NESB who migrate here before the age of six appear to do about as well as other migrants who arrive before the age of six. However, Asian-born NESB who arrive after the age of five have worse promotion prospects than non-Asian NESB who arrive after the age of five. Asian-born NESB who arrive before the age of six have similar promotion prospects to Asian-born ESB. These two results suggests that there is some 'Asian penalty' that is not related to language or cultural assimilation. Immigration itself does not hamper promotion prospects, as ESB individuals arriving after six years of age face similar promotion probabilities to their native-born counterparts.

For staff with disabilities, they are less likely to be promoted than similar individuals who do not report a

disability but the gap narrows as we move up in rank. There does seem to have been some narrowing in the gap in the relative probability of promotion over time, particularly since 2017. Unlike in the US, we do not find that the decreased promotion probabilities for NESB or those with disability differ by gender.

We examine separation and find that all three groups are less likely to separate from the public service at all levels. However, the relative probabilities of separation for the groups get smaller as we move up in levels and, at the top level, women and staff with disabilities are more likely to separate than men or those who do not report a disability, respectively. In more recent years, staff with disabilities are more likely to separate from the public service than those without and women are more likely to separate than similar men. Interestingly, separation probabilities for these two groups have increased at the same time that their promotion prospects have improved.

It is somewhat puzzling that we do not see higher rates of separation from the NESB group given their low internal promotion prospects. It could be due to the employment barriers they face outside of the public service (Booth et al., 2012; Adamovic and Leibbrandt, 2023). It could be that they value other job characteristics inside the public service more highly than they value higher remuneration or promotion outside the public service. Or, it could be that unobservable human capital characteristics explain both the low promotion prospects inside the public service and the low relative rates of separation. More data on what happens to those who leave the public service or information about individual performance reviews from inside the public service would help to disentangle these competing explanations.

The general upward trend in women's relative promotion probabilities suggests that concerted effort and attention over time coupled with dedicated affirmative action policies can raise promotion prospects for EEO cohorts. Notably, the period in which female promotion prospects improved most strongly is after 2012-13, around the time when the *Workplace Gender Equality Act 2012* was passed and the Workplace Gender Equality Agency established. For those with disabilities, relative promotion prospects have increased, most visibly at the two lowest levels, APS4 and APS5. The timing of these increases suggests that there may be some effect of explicit public service focus on the promotion prospects of people with disabilities through the Commissioner's Directions of 2013.

In contrast, the NESB results suggest that in the absence of concerted effort and dedicated policies, outcomes have not improved. To the degree to which these poor relative promotion prospects are driven by "being foreign" or "looking Asian" as opposed to any characteristics related to productivity, this is a problem for the APS. It is failing to reflect the rich diversity of Australia. Further, if poor outcome prospects lead to reduced work effort, as in Karachiwalla and Park (2016) or Deserranno et al. (2021), the Australian community is

being under-served by the APS. More research and focus on this group to find out what is going on would be desirable.

We conclude by noting two important caveats to our results. First, while we observe who gets promoted and who does not, we do not observe who applies for promotion. Differences in promotion prospects may arise through two mechanisms–the decision to apply and the promotion decision itself. We cannot say anything about the relative importance of these two channels. Second, we do not observe anything about the performance of individuals. Information on individual performance reviews would provide useful, additional information about people's performance in their current role that is likely related to promotion prospects.

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Appendix A – Summary statistics by APS level: 2002, 2010, 2020

Values in cells are proportions of individuals in the data for whom the variable is equal to one. Standard deviations can be calculated as $p(1-p)$.

Variable	2002	2010	2020
Promotion	0.084	0.106	0.13
Separation	0.029	0.035	0.016
Female	0.645	0.687	0.681
Disability	0.079	0.069	0.056
Non-English Speaking Background	0.129	0.147	0.153
Accounting/Economics/Finance degree	0.039	0.04	0.036
Bachelors or above	0.194	0.214	0.154
Graduate Program	0.061	0.07	0.104
Central Agency experience	0.025	0.032	0.019
Part time	0.133	0.19	0.212
Maternity leave	0.015	0.029	0.018
Arrived age 5 or younger	0.133	0.129	0.126
Born in Australia	0.655	0.676	0.632
Number of observations	34400	37863	31217

Table A1: APS4 Summary Statistics

Variable	2002	2010	2020
Promotion	0.189	0.166	0.171
Separation	0.027	0.037	0.022
Female	0.503	0.579	0.614
Disability	0.061	0.052	0.049
Non-English Speaking Background	0.121	0.143	0.158
Accounting/Economics/Finance degree	0.067	0.053	0.045
Bachelors or above	0.334	0.316	0.248
Graduate Program	0.139	0.127	0.16
Central Agency experience	0.049	0.056	0.042
Part time	0.069	0.098	0.123
Maternity leave	0.009	0.022	0.018
Arrived age 5 or younger	0.118	0.127	0.123
Born in Australia	0.604	0.667	0.646
Number of observations	18708	27274	26316

Table A2: APS5 Summary Statistics

Variable	2002	2010	2020
Promotion	0.1	0.093	0.086
Separation	0.033	0.037	0.026
Female	0.477	0.545	0.585
Disability	0.067	0.054	0.045
Non-English Speaking Background	0.126	0.15	0.171
Accounting/Economics/Finance degree	0.076	0.064	0.058
Bachelors or above	0.467	0.451	0.389
Graduate Program	0.136	0.124	0.156
Central Agency experience	0.054	0.06	0.054
Part time	0.08	0.118	0.139
Maternity leave	0.01	0.024	0.019
Arrived age 5 or younger	0.127	0.141	0.138
Born in Australia	0.616	0.655	0.658
Number of observations	26699	37469	38533

Table A3: APS6 Summary Statistics

Variable	2002	2010	2020
Promotion	0.06	0.049	0.049
Separation	0.032	0.035	0.024
Female	0.396	0.482	0.54
Disability	0.066	0.056	0.039
Non-English Speaking Background	0.105	0.136	0.157
Accounting/Economics/Finance degree	0.118	0.093	0.084
Bachelors or above	0.594	0.543	0.506
Graduate Program	0.173	0.154	0.196
Central Agency experience	0.095	0.094	0.096
Part time	0.064	0.102	0.124
Maternity leave	0.01	0.022	0.017
Arrived age 5 or younger	0.117	0.138	0.135
Born in Australia	0.617	0.667	0.68
Number of observations	16909	29996	29605

Table A4: EL1 Summary Statistics

Variable	2002	2010	2020
Promotion	0.025	0.019	0.024
Separation	0.04	0.042	0.029
Female	0.303	0.394	0.492
Disability	0.063	0.052	0.036
Non-English Speaking Background	0.078	0.099	0.112
Accounting/Economics/Finance degree	0.146	0.117	0.099
Bachelors or above	0.693	0.638	0.604
Graduate Program	0.177	0.179	0.212
Central Agency experience	0.114	0.127	0.126
Part time	0.037	0.076	0.077
Maternity leave	0.005	0.014	0.01
Arrived age 5 or younger	0.11	0.121	0.109
Born in Australia	0.597	0.652	0.689
Number of observations	8514	13892	12834

Table A5: EL2 Summary Statistics

Variable	2002	2010	2020
Female	0.29	0.375	0.489
Disability	0.063	0.058	0.048
Non-English Speaking Background	0.061	0.071	0.064
Accounting/Economics/Finance degree	0.223	0.177	0.141
Bachelors or above	0.778	0.752	0.651
Central Agency experience	0.218	0.258	0.268
Graduate Program	0.227	0.252	0.295
Part time	0.014	0.026	0.034
Maternity leave	0.002	0.005	0.004
Arrived age 5 or younger	0.092	0.094	0.073
Born in Australia	0.678	0.716	0.728
Number of observations	1740	2725	2834

Table A6: SES Summary Statistics

Appendix B – Logistic Regression Results

For all Tables in this Appendix, values in cells are coefficients from logistic regression. Standard errors are clustered at the level of the individual. Significance at the 10, 5 and 1 per cent levels are indicated by *, ** and *** respectively. All regressions include a dummy for part time status, whether an individual is always part time and a continuous variable indicating the rolling fraction of part time work.

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0938***	-0.0720***	-0.102***	-0.0448**	0.153***
Disabled	-0.178***	-0.163***	-0.210***	-0.241***	-0.0550
NESB	-0.156***	-0.0901***	-0.213***	-0.383***	-0.499***
Skills					
Accounting/Economics/Finance degree	-0.0872***	-0.112***	0.0772***	0.00744	0.0711
Bachelor or above	0.467***	0.527***	0.210***	0.121***	-0.110***
Graduate program participant	0.0730***	-0.269***	0.0690***	-0.0368*	0.179***
Central agency experience	0.615***	0.355***	0.495***	0.326***	0.674***
Controls					
Maternity leave	-0.750***	-0.628***	-0.526***	-0.480***	-0.915***
Time at level	-0.307***	-0.226***	-0.118***	-0.0828***	-0.0579***
Time at level squared	0.00950***	0.00701***	0.00279***	0.00239***	0.00137**
Age	0.0809***	0.0836***	0.174***	0.232***	0.284***
Age squared	-0.00121***	-0.00125***	-0.00229***	-0.00280***	-0.00318***
Year FEs	YES	YES	YES	YES	YES
Observations	644442	450854	636706	484728	222233
Pseudo R^2	0.130	0.084	0.058	0.037	0.038

Table B1: Promotion, Baseline model 2002-2020

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0982***	-0.0481***	-0.0813***	-0.0177	0.138***
Disabled	-0.168***	-0.163***	-0.213***	-0.243***	-0.0689
NESB	-0.114***	-0.119***	-0.191***	-0.281***	-0.305***
Skills					
Accounting/Economics/Finance degree	-0.0871***	-0.0830***	0.0927***	0.00658	0.0737
Bachelor or above	0.489***	0.536***	0.221***	0.130***	-0.101**
Graduate program participant	0.0783***	-0.257***	0.0763***	-0.0327	0.166***
Central agency experience	0.610***	0.360***	0.502***	0.332***	0.670***
Controls					
Maternity leave	-0.773***	-0.635***	-0.536***	-0.492***	-1.036***
Time at level	-0.301***	-0.213***	-0.105***	-0.0723***	-0.0490***
Time at level squared	0.00927***	0.00646***	0.00233***	0.00190***	0.000758
Age	0.0815***	0.0804***	0.176***	0.228***	0.274***
Age squared	-0.00120***	-0.00121***	-0.00233***	-0.00277***	-0.00307***
Year FEs	YES	YES	YES	YES	YES
Observations	559770	393238	547514	419152	195804
Pseudo R^2	0.128	0.080	0.056	0.034	0.037

Table B2: Promotion, 2002-2020 (Sample excludes those who came to Australia after age 5)

3

Variable	APS4	APS5	APS6	EL1	EL2
Skills					
Attributes					
Female	-0.0653*	-0.214***	-0.230***	-0.247***	0.271**
Disabled	-0.272***	-0.175**	-0.195**	-0.241*	0.0831
NESB	-0.194***	-0.131***	-0.269***	-0.514***	-0.785***
Skills					
Accounting/Economics/Finance degree	-0.0664	-0.191***	0.0317	0.0200	0.0167
Bachelor or above	0.356***	0.427***	0.109***	0.0535	-0.163
Graduate program participant	-0.0102	-0.378***	0.000857	-0.102	0.293*
Central agency experience	0.660***	0.311***	0.455***	0.287***	0.738***
Controls					
Maternity leave	-0.528***	-0.587***	-0.487***	-0.416	0.241
Time at level	-0.343***	-0.305***	-0.187***	-0.151***	-0.130***
Time at level squared	0.0109***	0.0106***	0.00514***	0.00558***	0.00588***
Age	0.0604***	0.0687***	0.160***	0.238***	0.377***
Age squared	-0.000993***	-0.00115***	-0.00207***	-0.00287***	-0.00416***
Year FEs	YES	YES	YES	YES	YES
Observations	84672	57616	89192	65576	26419
Pseudo R^2	0.143	0.116	0.077	0.058	0.053

Table B3: Promotion, 2002-2020 (Sample includes only those who came to Australia after age 5)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.106***	-0.0529***	-0.0981***	-0.0391**	0.155***
Disabled	-0.169***	-0.158***	-0.204***	-0.256***	-0.115
Arrived age 6 or more	-0.00701	0.0857***	0.0856***	0.0633*	-0.00598
Skills					
Accounting/Economics/Finance degree	-0.0828***	-0.0896***	0.0850***	0.0144	0.0795
Bachelor or above	0.494***	0.543***	0.224***	0.131***	-0.102**
Graduate program participant	0.0622***	-0.278***	0.0767***	-0.0378*	0.175***
Central agency experience	0.605***	0.348***	0.495***	0.331***	0.674***
Controls					
Maternity leave	-0.768***	-0.601***	-0.529***	-0.469***	-0.936***
Time at level	-0.309***	-0.225***	-0.119***	-0.0841***	-0.0612***
Time at level squared	0.00958***	0.00698***	0.00283***	0.00243***	0.00145**
Age	0.0839***	0.0813***	0.172***	0.233***	0.284***
Age squared	-0.00123***	-0.00121***	-0.00226***	-0.00280***	-0.00317***
Year FEs	YES	YES	YES	YES	YES
Observations	548278	384803	538746	417258	199445
Pseudo R^2	0.130	0.083	0.058	0.035	0.037

Table B4: Promotion, 2002-2020 (Sample excludes those from NESB)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0269	-0.183***	-0.133***	-0.0995*	0.137
Disabled	-0.253***	-0.219***	-0.272***	-0.103	0.650**
Arrived age 6 or more	-0.0485*	0.116***	-0.0187	-0.175***	-0.456***
Skills					
Accounting/Economics/Finance degree	-0.0725*	-0.156***	0.0710*	-0.0251	-0.0357
Bachelor or above	0.341***	0.419***	0.0932***	0.0167	-0.221
Graduate program participant	0.109***	-0.235***	0.0287	-0.0192	0.236
Central agency experience	0.662***	0.394***	0.501***	0.290***	0.662***
Controls					
Time at level	-0.3024 ***	-0.2475 ***	-0.1036 ***	-0.0687 ***	-0.0083
Maternity leave	-0.641***	-0.800***	-0.500***	-0.575**	-0.666
Time at level	-0.291***	-0.222***	-0.104***	-0.0678***	-0.00609
Time at level squared	0.00888***	0.00703***	0.00250***	0.00190*	0.000138
Age	0.0592***	0.102***	0.189***	0.222***	0.286*
Age squared	-0.00101***	-0.00160***	-0.00257***	-0.00283***	-0.00338**
Year FEs	YES	YES	YES	YES	YES
Observations	96164	66051	97960	67470	22788
Pseudo R^2	0.130	0.095	0.062	0.040	0.045

Table B5: Promotion, 2002-2020 (Sample includes only those from NESB)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.130***	-0.0451***	-0.0895***	-0.0268	0.168***
Disability	-0.202***	-0.144***	-0.229***	-0.247***	-0.115
Born in Australia	0.110***	-0.0371	0.114***	0.190***	0.182
Skills					
Accounting/Economics/Finance degree	-0.0690**	-0.0896***	0.0754***	0.0162	0.0261
Bachelor or above	0.491***	0.563***	0.242***	0.177***	0.0269
Graduate program participant	0.0505**	-0.241***	0.116***	-0.0151	0.147***
Central agency experience	0.589***	0.353***	0.481***	0.336***	0.614***
Controls					
Maternity leave	-0.740***	-0.610***	-0.540***	-0.506***	-0.970***
Time at level	-0.300***	-0.196***	-0.0915***	-0.0473***	0.0406**
Time at level squared	0.00931***	0.00600***	0.00199***	0.000957**	-0.00245***
Age	0.0822***	0.0788***	0.184***	0.247***	0.267***
Age squared	-0.00123***	-0.00120***	-0.00244***	-0.00300***	-0.00314***
Year FEs	YES	YES	YES	YES	YES
Observations	96164	66051	97960	67470	22788
Pseudo R^2	0.130	0.095	0.062	0.040	0.045

Table B6: Promotion, 2002-2020 (Sample includes only Australian ESBs and Asian-born ESBs)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.129***	-0.0422***	-0.0889***	-0.0287	0.153***
Disability	-0.201***	-0.142***	-0.233***	-0.249***	-0.0881
Born in Australia	0.0686*	-0.0334	0.114***	0.268***	0.428**
Skills					
Accounting/Economics/Finance degree	-0.0574*	-0.0686**	0.0871***	0.0128	0.0374
Bachelor or above	0.494***	0.570***	0.246***	0.180***	0.0283
Graduate program participant	0.0569***	-0.239***	0.113***	-0.0157	0.145***
Central agency experience	0.582***	0.350***	0.478***	0.332***	0.620***
Controls					
Maternity leave	-0.733***	-0.626***	-0.541***	-0.508***	-1.119***
Time at level	-0.299***	-0.195***	-0.0909***	-0.0487***	0.0374**
Time at level squared	0.00924***	0.00596***	0.00199***	0.00103**	-0.00229***
Age	0.0816***	0.0791***	0.184***	0.248***	0.263***
Age squared	-0.00121***	-0.00120***	-0.00245***	-0.00301***	-0.00310***
Year FEs	YES	YES	YES	YES	YES
Observations	404734	280344	394952	307738	140250
Pseudo R^2	0.132	0.079	0.056	0.036	0.037

Table B7: Promotion, 2002-2020 (Sample includes only Australian ESB and Asian-born NESBs)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.130***	-0.0374***	-0.0859***	-0.0215	0.155***
Disability	-0.196***	-0.147***	-0.229***	-0.244***	-0.1000
Born in Australia	0.0602	0.0453	0.153***	0.257**	0.279
Skills					
Accounting/Economics/Finance degree	-0.0610*	-0.0838***	0.0852***	0.0175	0.0419
Bachelor or above	0.490***	0.572***	0.249***	0.177***	0.0272
Graduate program participant	0.0556***	-0.234***	0.116***	-0.0112	0.141**
Central agency experience	0.587***	0.354***	0.477***	0.331***	0.629***
Controls					
Maternity leave	-0.748***	-0.626***	-0.536***	-0.513***	-1.121***
Time at level	-0.299***	-0.191***	-0.0867***	-0.0451***	0.0400**
Time at level squared	0.00925***	0.00580***	0.00179***	0.000860**	-0.00249***
Age	0.0826***	0.0781***	0.184***	0.246***	0.265***
Age squared	-0.00123***	-0.00119***	-0.00245***	-0.00299***	-0.00311***
Year FEs	YES	YES	YES	YES	YES
Observations	397590	275536	386944	301313	137274
Pseudo R^2	0.132	0.078	0.055	0.035	0.038

Table B8: Promotion, 2002-2020 (Sample includes Australian ESB and Asian-born NESB early arrival)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.118***	-0.0550***	-0.0966***	-0.0251	0.159***
Disability	-0.193***	-0.149***	-0.219***	-0.239***	-0.0873
Born in Australia	0.200***	0.0530**	0.250***	0.568***	0.866***
Skills					
Accounting/Economics/Finance degree	-0.0505*	-0.112***	0.0781***	0.0194	0.0486
Bachelor or above	0.472***	0.548***	0.237***	0.167***	0.0164
Graduate program participant	0.0587***	-0.233***	0.112***	-0.00880	0.142***
Central agency experience	0.600***	0.350***	0.472***	0.327***	0.630***
Controls					
Maternity leave	-0.729***	-0.643***	-0.526***	-0.527***	-1.125***
Time at level	-0.298***	-0.196***	-0.0894***	-0.0466***	0.0388**
Time at level squared	0.00926***	0.00602***	0.00186***	0.000944**	-0.00246***
Age	0.0818***	0.0809***	0.184***	0.244***	0.264***
Age squared	-0.00123***	-0.00124***	-0.00245***	-0.00297***	-0.00310***
Year FEs	YES	YES	YES	YES	YES
Observations	423434	294438	417982	322439	142683
Pseudo R^2	0.131	0.079	0.056	0.037	0.040

Table B9: Promotion, 2002-2020 (Sample includes Australian ESB and Europe-born NESBs)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	0.0739**	-0.0474*	0.0566*	0.144***	0.249***
Disabled	0.0446	-0.108*	-0.222***	-0.186*	0.233
NESB	-0.126***	-0.0850**	-0.291***	-0.425***	-0.609***
Skills					
Accounting/Economics/Finance degree	-0.381***	-0.218***	0.0331	-0.147*	-0.0133
Bachelor or above	0.387***	0.379***	0.177***	0.0920**	-0.250***
Graduate program participant	0.0606*	-0.0927***	0.213***	-0.00788	0.0141
Central agency experience	0.732***	0.383***	0.416***	0.186***	0.637***
Controls					
Maternity leave	-0.612***	-0.606***	-0.617***	-0.508***	-0.986*
Time at level	-0.201***	-0.138***	-0.00722	0.0216	0.0616*
Time at level squaredl	0.00533***	0.00316***	-0.00221***	-0.00236***	-0.00431***
Age	0.0824***	0.114***	0.156***	0.232***	0.264***
Age squared	-0.00135***	-0.00164***	-0.00222***	-0.00299***	-0.00317***
Year FEs	YES	YES	YES	YES	YES
Observations	407409	282076	397709	308894	140370
Pseudo R^2	0.132	0.079	0.056	0.036	0.037

Table B10: Promotion, baseline model 2018-2020

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	0.101***	-0.0225	0.0329	0.118***	0.124
Disabled	0.0501	-0.0692	-0.202***	-0.143	0.250
NESB	-0.0987**	-0.0902**	-0.294***	-0.393***	-0.568***
Skills					
Accounting/Economics/Finance degree	-0.166**	-0.109*	0.0316	-0.122	0.00449
Bachelor or above	0.278***	0.310***	0.191***	0.0957**	-0.184*
Graduate program participant	-0.0652*	-0.109***	0.164***	-0.0134	-0.0204
Central agency experience	0.480***	0.263***	0.146***	0.0742	0.455***
Controls					
Maternity leave	-0.616***	-0.597***	-0.623***	-0.507***	-0.995*
Time at level	-0.191***	-0.141***	-0.0135	0.0272*	0.0548*
Time at level squared	0.00521***	0.00339***	-0.00189***	-0.00257***	-0.00400**
Age	0.117***	0.133***	0.170***	0.228***	0.270***
Age squared	-0.00168***	-0.00182***	-0.00234***	-0.00295***	-0.00322***
Year FEs	YES	YES	YES	YES	YES
Job FEs	YES	YES	YES	YES	YES
Observations	94101	74535	108913	82001	35284
Pseudo R^2	0.141	0.068	0.052	0.030	0.041

Table B11: Promotion, model with job family fixed effects, 2018-2020

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0342*	-0.00374	0.0162	0.00725	0.0890***
Disabled	-0.263***	-0.195***	-0.157***	-0.0915**	0.0923*
NESB	-0.289***	-0.185***	-0.170***	-0.154***	-0.112**
Skills					
Accounting/Economics/Finance degree	-0.213***	-0.137***	-0.0670*	0.0225	0.153***
Bachelor or above	0.0432*	0.0367	-0.108***	-0.255***	-0.353***
Graduate program participant	0.202***	-0.0428	0.00510	-0.111***	-0.245***
Central agency experience	0.227***	0.0626	0.0582*	-0.0450	-0.0111
Controls					
Maternity leave	-5.041***	-4.682***	-5.195***	-4.718***	-4.637***
Time at level	0.0957***	0.148***	0.106***	0.100***	0.108***
Time at level squared	-0.00346***	-0.00400***	-0.00228***	-0.00173***	-0.00241***
Age	-0.128***	-0.176***	-0.181***	-0.206***	-0.114***
Age squared	0.00121***	0.00168***	0.00176***	0.00219***	0.00130***
Year FEs	YES	YES	YES	YES	YES
Observations	630354	408811	628030	495540	235566
Pseudo R^2	0.035	0.036	0.033	0.038	0.042

Table B12: Separation, Baseline model 2002-2020

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0361*	0.00133	0.0239	0.0135	0.0885***
Disabled	-0.283***	-0.228***	-0.183***	-0.0984**	0.0869
NESB	-0.205***	-0.0902**	-0.0852***	-0.0507	-0.0295
Skills					
Accounting/Economics/Finance degree	-0.222***	-0.148***	-0.0828**	0.00449	0.143***
Bachelor or above	0.0736***	0.0401*	-0.0888***	-0.253***	-0.355***
Graduate program participant	0.206***	-0.0396	0.00646	-0.104***	-0.220***
Central agency experience	0.209***	0.0346	0.0449	-0.0556*	-0.0244
Controls					
Maternity leave	-4.992***	-4.611***	-5.400***	-4.627***	-4.563***
Time at level	0.0977***	0.148***	0.112***	0.100***	0.106***
Time at level squared	-0.00359***	-0.00399***	-0.00250***	-0.00176***	-0.00241***
Age	-0.123***	-0.172***	-0.184***	-0.210***	-0.112***
Age squared	0.00117***	0.00165***	0.00181***	0.00226***	0.00130***
Year FEs	YES	YES	YES	YES	YES
Observations	547302	357341	540267	428551	207524
Pseudo R^2	0.034	0.035	0.033	0.038	0.042

Table B13: Separation, 2002-2020 (Sample excludes those who came to Australia after age 5)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.00296	-0.0275	-0.0265	-0.0453	0.0911
Disabled	-0.103	0.0953	0.00925	-0.0492	0.129
NESB	-0.240***	-0.348***	-0.324***	-0.315***	-0.242***
Skills					
Accounting/Economics/Finance degree	-0.138	-0.0829	0.00514	0.103	0.195*
Bachelor or above	-0.0945	0.0658	-0.211***	-0.216***	-0.317***
Graduate program participant	0.104	-0.116	-0.0543	-0.178**	-0.511***
Central agency experience	0.395**	0.335**	0.173*	0.0594	0.117
Controls					
Maternity leave	0	0	-4.042***	0	0
Time at level	0.0784***	0.149***	0.0746***	0.108***	0.128***
Time at level squared	-0.00267***	-0.00428***	-0.00115**	-0.00191***	-0.00271***
Age	-0.196***	-0.226***	-0.191***	-0.224***	-0.169***
Age squared	0.00192***	0.00217***	0.00177***	0.00220***	0.00167***
Year FEs	YES	YES	YES	YES	YES
Observations	81846	50718	87763	66138	27865
Pseudo R^2	0.032	0.040	0.036	0.037	0.046

Table B14: Separation, 2002-2020 (Sample includes only those who came to Australia after age 5)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0233	0.00749	0.0311*	0.0187	0.0967***
Disabled	-0.272***	-0.241***	-0.171***	-0.109**	0.0827
Arrived age 6 or more	-0.185***	0.00728	0.0409	0.00394	-0.00430
Skills					
Accounting/Economics/Finance degree	-0.201***	-0.146**	-0.0702*	0.0174	0.145***
Bachelor or above	0.0752***	0.0412*	-0.0908***	-0.253***	-0.344***
Graduate program participant	0.190***	-0.0367	-0.00480	-0.107***	-0.243***
Central agency experience	0.173***	0.0209	0.0307	-0.0701*	-0.0310
Controls					
Maternity leave	-4.949***	-4.563***	-5.355***	-4.879***	-4.542***
Time at level	0.101***	0.149***	0.109***	0.0993***	0.107***
Time at level squared	-0.00377***	-0.00400***	-0.00239***	-0.00169***	-0.00243***
Age	-0.122***	-0.169***	-0.172***	-0.200***	-0.108***
Age squared	0.00114***	0.00159***	0.00167***	0.00213***	0.00125***
Year FEs	YES	YES	YES	YES	YES
Observations	537014	349603	531474	426571	211508
Pseudo R^2	0.034	0.036	0.032	0.037	0.042

Table B15: Separation, 2002-2020 (Sample excludes those from NESB)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.120*	-0.0697	-0.0686	-0.0762	0.00723
Disabled	-0.195*	0.158	-0.0646	0.0460	0.186
Arrived age 6 or more	-0.200***	-0.226***	-0.140***	-0.219***	-0.164*
Skills					
Accounting/Economics/Finance degree	-0.224**	-0.101	-0.0598	0.0418	0.195*
Bachelor or above	-0.143**	0.0170	-0.201***	-0.268***	-0.447***
Graduate program participant	0.254***	-0.116	0.0326	-0.145*	-0.261**
Central agency experience	0.556***	0.327***	0.215**	0.132	0.188
Controls					
Maternity leave	0	0	-4.458***	-3.978***	0
Time at level	0.0588***	0.142***	0.0926***	0.109***	0.122***
Time at level squared	-0.00163*	-0.00399***	-0.00167***	-0.00210***	-0.00238***
Age	-0.176***	-0.228***	-0.237***	-0.256***	-0.179***
Age squared	0.00177***	0.00226***	0.00232***	0.00269***	0.00187***
Year FEs	YES	YES	YES	YES	YES
Observations	91019	57972	96556	68969	23813
Pseudo R^2	0.031	0.033	0.039	0.042	0.047

Table B16: Separation, 2002-2020 (Sample includes only those from NESB)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0435*	-0.0300	0.0146	0.00107	0.0823**
Disability	-0.243***	-0.199***	-0.181***	-0.105**	0.0552
Born in Australia	0.246***	0.178**	0.166***	0.205***	0.287***
Skills					
Accounting/Economics/Finance degree	-0.181***	-0.121*	-0.0744*	0.00942	0.109**
Bachelor or above	0.204***	0.102***	-0.0433*	-0.209***	-0.291***
Graduate program participant	0.157***	-0.0324	0.0206	-0.0979***	-0.269***
Central agency experience	0.274***	0.0474	0.0522	-0.0410	-0.0616
Controls					
Maternity leave	-4.536***	-4.266***	-5.080***	-4.635***	0
Time at level	0.0991***	0.169***	0.117***	0.0997***	0.112***
Time at level squared	-0.00379***	-0.00512***	-0.00283***	-0.00174***	-0.00259***
Age	-0.118***	-0.175***	-0.179***	-0.195***	-0.127***
Age squared	0.00114***	0.00168***	0.00178***	0.00210***	0.00148***
Year FEs	YES	YES	YES	YES	YES
Observations	397118	253732	389652	314354	146016
Pseudo R^2	0.032	0.035	0.031	0.036	0.040

Table B17: Separation, 2002-2020 (Sample includes Australian ESB and Asian-born ESBs)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0489*	-0.0331	0.00406	0.00159	0.0795**
Disability	-0.228***	-0.176***	-0.177***	-0.0938*	0.0649
Born in Australia	0.484***	0.359***	0.293***	0.304***	0.323***
Skills					
Accounting/Economics/Finance degree	-0.173***	-0.108*	-0.0534	0.0186	0.112**
Bachelor or above	0.197***	0.101***	-0.0532**	-0.210***	-0.301***
Graduate program participant	0.169***	-0.0405	0.0245	-0.109***	-0.277***
Central agency experience	0.299***	0.0722	0.0489	-0.0346	-0.0400
Controls					
Maternity leave	-4.542***	-4.574***	-5.103***	-4.388***	0
Time at level	0.0974***	0.169***	0.117***	0.100***	0.114***
Time at level squared	-0.00374***	-0.00511***	-0.00289***	-0.00176***	-0.00265***
Age	-0.122***	-0.177***	-0.185***	-0.195***	-0.134***
Age squared	0.00119***	0.00170***	0.00184***	0.00210***	0.00155***
Year FEs	YES	YES	YES	YES	YES
Observations	412108	264471	409475	328204	148445
Pseudo R^2	0.033	0.037	0.032	0.036	0.041

Table B18: Separation, 2002-2020 (Sample includes Australian ESB and Asia-born NESBs)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	-0.0432*	-0.0233	0.0186	0.00176	0.0796**
Disability	-0.237***	-0.195***	-0.190***	-0.103**	0.0569
Born in Australia	0.233*	0.145	0.0437	0.151	0.344
Skills					
Accounting/Economics/Finance degree	-0.204***	-0.116*	-0.0742*	0.00660	0.101**
Bachelor or above	0.215***	0.112***	-0.0406*	-0.209***	-0.292***
Graduate program participant	0.153***	-0.0321	0.0268	-0.0971***	-0.271***
Central agency experience	0.288***	0.0473	0.0406	-0.0418	-0.0552
Controls					
Maternity leave	-4.526***	-4.550***	-5.481***	-4.343***	0
Time at level	0.0993***	0.170***	0.120***	0.101***	0.115***
Time at level squared	-0.00383***	-0.00517***	-0.00298***	-0.00178***	-0.00271***
Age	-0.117***	-0.173***	-0.178***	-0.191***	-0.130***
Age squared	0.00114***	0.00166***	0.00177***	0.00207***	0.00152***
Year FEs	YES	YES	YES	YES	YES
Observations	387603	248006	379176	306677	142807
Pseudo R^2	0.032	0.035	0.031	0.036	0.040

Table B19: Separation, 2002-2020 (Sample includes Australian ESB and Asian-born NESB early arrival)

Attributes					
Variable	APS4	APS5	APS6	EL1	EL2
Female	-0.0370	-0.0214	0.0300	-0.00302	0.0778**
Disability	-0.239***	-0.196***	-0.188***	-0.108**	0.0484
Born in Australia	0.303***	0.0750	0.166**	0.129*	0.193*
Skills					
Accounting/Economics/Finance degree	-0.187***	-0.0949	-0.0667	0.0126	0.114**
Bachelor or above	0.209***	0.112***	-0.0491**	-0.209***	-0.298***
Graduate program participant	0.151***	-0.0366	0.0286	-0.0914***	-0.272***
Central agency experience	0.283***	0.0555	0.0446	-0.0339	-0.0565
Controls					
Maternity leave	-4.528***	-4.554***	-5.485***	-4.629***	0
Time at level	0.0984***	0.167***	0.118***	0.102***	0.113***
Time at level squared	-0.00377***	-0.00506***	-0.00288***	-0.00184***	-0.00262***
Age	-0.119***	-0.171***	-0.176***	-0.192***	-0.128***
Age squared	0.00116***	0.00164***	0.00174***	0.00207***	0.00148***
Year FEs	YES	YES	YES	YES	YES
Observations	394905	252568	387325	313390	146028
Pseudo R^2	0.032	0.035	0.031	0.036	0.041

Table B20: Separation, 2002-2020 (Sample includes Australian ESB and Europe-born NESBs)

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	0.178	-0.104	0.187	0.106	-0.125
Disabled	0.753**	0.473	0.651*	-0.584	0.404
NESB	-0.0193	0.282	-0.563*	-0.0609	-1.701
Skills					
Accounting/Economics/Finance degree	-0.508	-0.232	-0.0640	0.267	1.068**
Bachelor or above	0.524**	0.382*	0.435**	0.298	-0.537
Graduate program participant	-2.010***	-1.338***	-0.606*	-0.303	-0.514
Central agency experience	1.282***	0.228	0.814***	0.298	0.663
Controls					
Maternity leave	-1.593	0	0	-1.275	0
Time at level	-0.456***	-0.208**	-0.292***	-0.189***	-0.104
Time at level squared	0.0131***	0.00334	0.00802***	0.00716***	0.00451*
Age	-0.00129	-0.0730	-0.00150	-0.0306	0.170
Age squared	-0.000285	0.000374	-0.0000994	0.000177	-0.00174
Year FEs	YES	YES	YES	YES	YES
Observations	82830	60389	97040	77986	34081
Pseudo R^2	0.127	0.065	0.058	0.039	0.087

Table B21: Separation, baseline model, 2018-2020

Variable	APS4	APS5	APS6	EL1	EL2
Attributes					
Female	0.134	-0.152	0.141	0.0153	-0.202
Disabled	0.802**	0.547	0.748**	-0.585	0.408
NESB	0.00741	0.283	-0.528*	-0.0215	-1.619
Skills					
Accounting/Economics/Finance degree	-0.413	-0.247	-0.113	0.298	1.209**
Bachelor or above	0.424*	0.363	0.408**	0.273	-0.665*
Graduate program participant	-1.956***	-1.211***	-0.605*	-0.275	-0.413
Central agency experience	0.910**	-0.201	0.534*	0.0665	0.540
Controls					
Maternity leave	-1.550	0	0	-1.284	0
Time at level	-0.429***	-0.206**	-0.279***	-0.190***	-0.0874
Time at level squared	0.0123***	0.00341	0.00782***	0.00742***	0.00371
Age	0.0304	-0.0439	0.0205	-0.00915	0.205
Age squared	-0.000609	0.000117	-0.000316	-0.0000227	-0.00207
Year FEs	YES	YES	YES	YES	YES
Job FEs	YES	YES	YES	YES	YES
Observations	82353	58398	87572	75708	26326
Pseudo R^2	0.139	0.088	0.067	0.051	0.103

Table B22: Separation, model with job family fixed effects, 2018-2020

Appendix C - Summary of APSED data cleaning routine

Overview: Section 44 of the Public Service Act 1999 gives the APSC the power to request information required for the presentation to Parliament of a report into the state of the (public) service. In pursuit of this goal, the APSC maintains the APS Employment Database, which tracks all employment movements in the Australian Public Service. Data are sourced from each department's corporate section.

The two (related) files provided by the APSC for analysis:

- Twentyyear, which is a file of all movements including demographic characteristics.
- Snapshots, which is derived from the Twentyyear file, is a combination of APS-wide censuses from 2001 to 2020 taken in December. June snapshots also exist, but have not been used in our analysis.

Using the twentyyear file, we extract values (where they exist) for each of the following:

- Sex (female = "W", male = "M")
- Bachelor or above (highestqualification = 1, 2, 3, or 4)
- Field of study (fos1 or fos2 = 2, 3, or 4 corresponds to accounting, economics or finance)
- Disability (disable = 11)
- Non-English speaking background (nesb = 1 or 2 for children of immigrants or immigrants)
- Graduate program (maxlevel = 60 or 65)
- Experience with a central agency (provided by APSC)

For ease of use, in most of the analysis, we treat these as time invariant and so there is one row for each individual linked with the unique panel id.

Using the twentyyear file, we recode the SAS date for birthday and then subtract arrival year (arrival) from birthday to define the age at which the employee enters Australia. A small number of individuals with missing values (or invalid dates) in arrival year or birthday are removed from the data.

Promotions are defined within the snapshot files where a person moves up a level as defined by the variable `maxlevel`, which is the substantive classification of a person's job. This avoids measuring as promotions people who are in interim or acting roles.

While there is a variable (`mvmt`) that records promotions, engagements and separation, it misses people moving through levels via broadbanding and thus undercounts promotion, mainly at lower levels. Broadbanding is the practice of having some jobs defined across multiple levels (e.g. APS5/APS6) and the individual moving from one category to the other without having to explicitly apply for promotion.

Separations: Using the variable `mvmt`, we define separation as those with values of 501, 502, 503, 504, 506 and 517. These codes correspond to different forms of voluntary resignation and termination. There are other reasons for leaving the public service, such as retirement due to age, death and invalidity which we do not define as separation. The values 505, 507, 508, 511, 514, 515, 516, 518, 519, 520, 521, 522 and 599 include these categories and other separations that are unlikely to be separation to another job outside the public service.

Time at level: The variable called `lal` – length at level - is measured in days. However when we link this to the snapshot file we need to recode the value for both the separation and promotion modelling because `lal` starts again when someone is promoted and so we create an extra row and add the lagged value of `lal` with the new value of `lal`. For example, if an individual has an `lal` value of 365 prior to promotion and a value of 65 in the year of promotion we add these together. Otherwise the value is close to a perfect predictor for promotion. The year of separation often has no value for `lal` since the person has left by the time of the census/snapshot. In this case we add one year for simplicity. Finally time at level is divided by 365 to express it in years.

`age` (and hence age-squared) is included in the snapshot file so does not require any data re-coding. We use the year which is recorded in the snapshot file (*snap*) to create the year fixed effects.

Appendix D - Sensitivity Analysis to Missing Data

In the main analysis, we set 'diversity' indicators equal to zero when we are unable to determine if an individual is described by that characteristic. Female is never missing, but for 26.4 per cent of cases we are unable to determine if an individual is NESB and for 26.1 per cent of cases we are unable to determine if an individual has a disability. We think that missing in these situations can be interpreted as not applying because people can skip over these questions when they complete the survey instrument.

To check whether this matters for our analysis, we re-estimated all of our models dropping the missing values (rather than setting them to zero) for NESB and Disability. Table D1 shows these results for promotion for the baseline model for all years, 2002-2020. These results can be compared to Table B1.

The main conclusions do not change when we drop missing values. Some coefficients increase and some decrease, but the patterns of sign and statistical significance are the same whether we include the missing values or exclude them.

We do not present other results without missing values, but the conclusion is the same. These results can be obtained from the authors upon request.

Intercept	-1.7853 ***	-2.0983 ***	-5.0702 ***	-7.4551 ***	-10.3908 ***
Skills					
AEF Degree	-0.0553 **	-0.108 ***	0.0758 ***	-0.0037	0.0024
Bachelor or above	0.422 ***	0.5408 ***	0.2213 ***	0.18 ***	0.0319
Graduate Program	0.0636 ***	-0.2041 ***	0.0896 ***	-0.0368 *	0.1878 ***
Central Agency Experience	0.5648 ***	0.3708 ***	0.4722 ***	0.3458 ***	0.6115 ***
Controls					
Work part-time	-0.7899 ***	-0.3416 ***	-0.6383 ***	-0.7026 ***	-1.2601 ***
Time at level	-0.3003 ***	-0.2359 ***	-0.0977 ***	-0.0434 ***	0.0425 ***
Time at Level Squared	0.009 ***	0.0069 ***	0.0021 ***	9e-04 ***	-0.0022 ***
Age	0.0791 ***	0.0836 ***	0.1853 ***	0.2441 ***	0.3174 ***
Age Squared	-0.0012 ***	-0.0013 ***	-0.0025 ***	-0.003 ***	-0.0038 ***
Year Dummies	YES	YES	YES	YES	YES
Regression Information					
Number of observations	349905	256211	376046	302475	139912
Pseudo R2	0.134	0.082	0.058	0.036	0.039

Table D1: Promotion, Baseline model 2002-2020 with missing values removed

Appendix E - Analysis split by gender

E.1 Separations by EEO group and gender

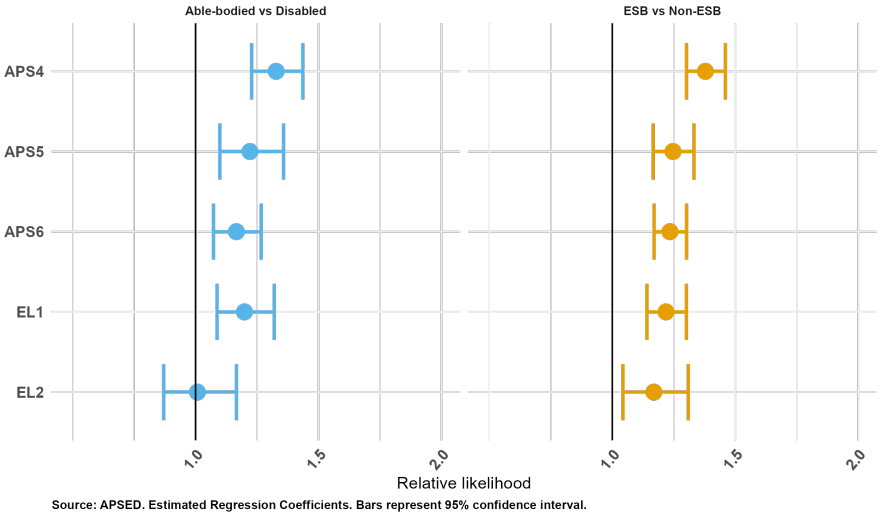

Figure E1: Separations, females, by EEO group

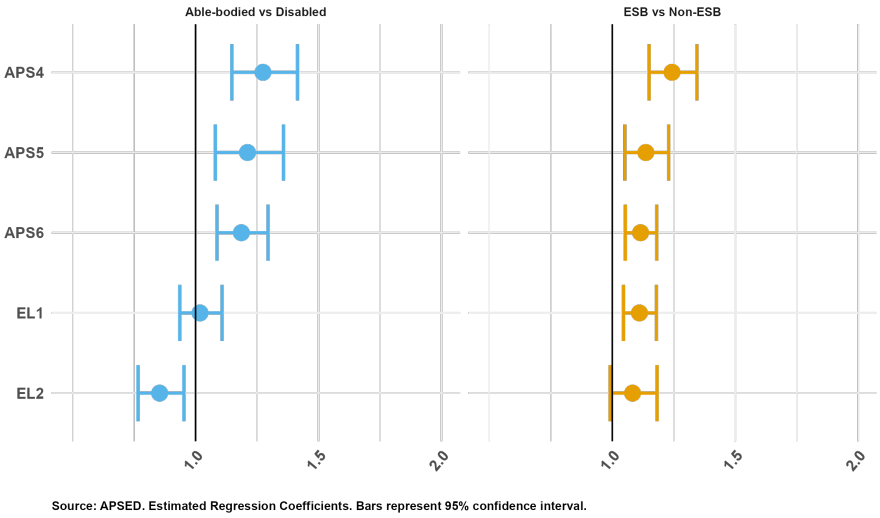

Figure E2: Separations, males, by EEO group

E.2 Disaggregated NESB Promotions, by gender

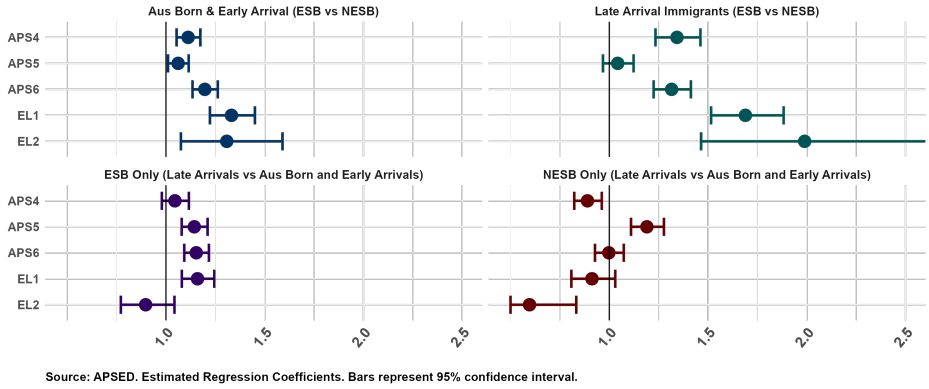

Figure E3: Promotions, females, by arrival in Australia

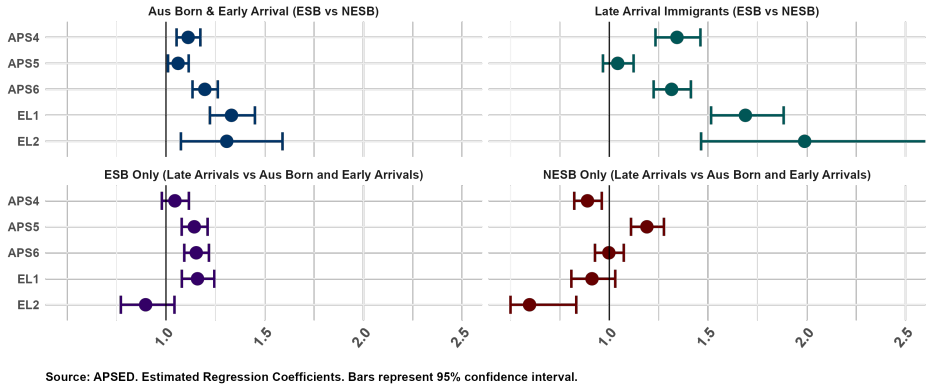

Figure E4: Promotions, males, by arrival in Australia