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Shorter Article

Frontiers of mobility: Was Australia 1870–2017 a more socially mobile society than England? ☆

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ABSTRACT

There is longstanding pride among Australians that by throwing off the social class demarcations that defined their ossified colonial parent society, England, they created an open, socially mobile society. The paper tests this belief by estimating long run social mobility rates in Australia 1870–2017, using the status of rare surnames. The status information includes occupations from electoral rolls 1903–1980, and records of degrees awarded by Melbourne and Sydney universities 1852–2017. Status persistence was strong throughout, with an intergenerational correlation of occupational or educational status of 0.7–0.8, and no change over time. Mobility rates were also just as low within UK immigrants and their descendants, so ethnic group effects explain none of the immobility. The less pronounced class divisions of Australia compared to England did not enhance social mobility. A possible sign of enhanced Australian social mobility – the fact that surnames associated with convicts already had a modest elite status by 1870 – seems to derive from convicts transported to Australia from England being positively selected in terms of human capital.

There is a long-held pride among Australians about living in a fluid society, where Jack isn't just as good as his master, but perhaps better. Relative to national income, the all-time richest-ever Australian was probably Samuel Terry, who was sent as a convict to Australia for stealing stockings. The man known as 'The Botany Bay Rothschild' died in 1838 with an estate equivalent to around 4 percent of GDP in that year.[1] As Charles Darwin wrote in his diary when he visited in the 1830s, Australians of that era seemed to believe that anyone could strike it rich: 'The whole population, poor and rich, are bent on acquiring wealth: amongst the highest orders, wool and sheep-grazing form the constant subject of conversation.' (Darwin 1845, 444). In the 1960s, McGregor (1966, 110) argued of Australia that: 'There is not so much difference between the way the different classes speak, the way they dress or the schools they went to as in England, which makes it easier for individuals to move from social group to group. … The lack of widespread extremes in social differentiation makes it easy for class-jumpers to "pass".'

A belief in social mobility has accompanied a pride in Australian egalitarianism. In WWI, off-duty Australian soldiers refused to salute British officers. Some briefly went on strike. Soldiers prize the epithet 'digger'. Citizens often call one another 'mate'. Australians rarely stand when the Prime Minister enters the room, and often ride in the front seat of taxis.

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[1] Terry's estate was worth £250,000 (Dow 1967), and Australian GDP for 1838 has been estimated at £5.9 million (Butlin 1985, Table 1).

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The popular belief in a socially open and mobile Australia found support in academic studies of social mobility in recent years. Leigh (2007) estimated an intergenerational elasticity for fathers and sons in the range of 0.2 to 0.3. Using considerably more data, Mendolia and Siminski (2016) re-estimated the modern-day intergenerational earnings elasticity at 0.35, which stands as the benchmark estimate for Australia.

An international comparison of mobility (Corak, 2013) puts the intergenerational income elasticity for Britain and the United States each at around 0.5. Comparing across countries, this suggests that on conventional metrics, Australia is a more socially mobile society than Britain, its old colonial power, or of the United States.

But here we show using an alternative measure of social mobility, the persistence of status among surnames, that Australia was as immobile as England. Despite Australia being an immigrant society incorporating migrants from a wide variety of backgrounds, and without some of the entrenched social institutions and rigidities of England, underlying social mobility rates from 1870 to 2017 were just as slow as in England. Also there is no sign of any increase in mobility rates in the most recent years.

The reason the surname estimates of mobility present a very different picture from conventional measures is that they measure a different aspect of mobility. For detail on this see Clark et al., 2014. Observed social status at any time for an individual is best described as consisting of an underlying component, which is heritable, and a transitory component, which is not. That transitory component includes measurement errors. Occupational labels, for example, loosely describe actual occupational status. But the transitory component also includes true deviations from parent status in a generation that are transitory, and not subject to inheritance. Conventional estimates of status persistence are measuring a mix of how strongly underlying status is inherited, and how substantial are the transitory components. In contrast the surname estimates are measuring only how hereditable is the underlying status of families. However, inheritance of underlying status is the measure that matters if we want to estimate how social status evolves over multiple generations, or how persistent will be differences in social status between different social groups.

1. Surname measures of mobility

The Son Also Rises (Clark et al., 2014) analyzed social mobility by grouping people by rare surnames or surname types, and then examining the intergenerational correlation of status among surnames. If social mobility rates were as fast as conventionally measured then surnames of unusually high or low status should quickly regress to the mean after a few generations.

Clark et al. (2014) showed that this method consistently reveals intergenerational correlations of surnames with status measures such as wealth, education, and occupational status in the range 0.7–0.8 for a wide variety of countries. England in particular shows this pattern of slow mobility from 1800 to 2015 (Clark and Cummins, 2015). Here we apply that same method to surname data for Australia and find similar strong correlations of surname status across generations, measured using both occupational status and education. More details of the methodology may be found in the more detailed working paper version (Clark et al., 2020). Replication data for the estimates reported here can be found at 20

2. Estimating mobility rates from surnames and occupation status in Australia

One source for a surname measure of status persistence in Australia are the electoral rolls from 1903 to 1983. The first Commonwealth Parliament in 1902 granted universal adult suffrage to non-indigenous men and women over 21 in Commonwealth elections. Compulsory enrolment was introduced in 1911. The voting rolls 1903–1983 include occupations. Thus we have from the rolls a census of the occupations of the entire adult non-indigenous Australian population 1912–1983,[2] and for 1903–1911 equivalent data for most of the adult population.

We define a set of elite rare surnames in 1900 as those surnames where 29 or fewer people held the name in Australia in 2014 in the voting roll, and where someone holding that name graduated from Melbourne or Sydney universities 1870–1899.[3] This is a set of 159 surnames. Then for the benchmark years 1903–1907, 1926–1930, 1954, and 1980 we calculate the average status of these surnames (treating a generation as 30 years).

To derive mean population occupation status for the relevant social group in Australia we used a sample of occupations for the common surname *Smith* (and variants such as *Smyth*) for each benchmark period. Smith was chosen since the majority of the rare surnames were British and Irish in origin, so this would be the relevant comparison group.

For 1980 we assign social status to each occupation using the index of occupational status for Australia derived by Broom et al., 1977 (ANU2). Scores ranged from 331 (laborers) to 896 (industrial efficiency engineers). We checked the robustness of the results by also applying the ANU3 scale derived by Jones, 1989. Scores on ANU3 were scaled to range from 0 (low status) to 100 (high status). Status scores for ANU3 were assigned based on occupational prestige ratings and worker characteristics from the 1986 census. For 1954 we also applied the ANU2 scale.

In addition for 1903, 1928 and 1954 we applied a scale derived from English occupation data 1841–1939, where that scale was based for each occupation on reported wealth at death, higher educational attainment, and probability of being at work aged 11–20.

Table 1 shows the estimated average status of the sample of elite Australian surname in each period, as well as the estimated average status of the equivalent population as a whole derived from the *Smith* sample. We then calculate the implied deviation of

[2] Many Indigenous Australians were blocked from voting in the early years after Federation. Amendments in 1962 provided that Indigenous Australians should have the right to enroll and vote in federal elections, but Indigenous enrollment was not compulsory until 1984.

[3] 29 or less was an arbitrary choice of surname size cutoff for rareness.

Table 1
Status index mean and standard deviations, Australia, 1904–1980.

Year	Social status scale	Elite N	Elite mean	Elite standard deviation	*Smith* N	*Smith* mean	*Smith* standard deviation
1904	English	358	40.95	26.30	1037	22.29	12.11*
1929	English	559	38.70	24.06			
1954	English	547	36.23	21.36	380	23.84	13.22
1954	ANU2	556	592.7	156.3	389	496.8	111.6
1980	ANU2	570	608.8	146.6	412	527.8	127.0
1980	ANU3	570	46.76	24.76	406	33.08	20.72

Notes: *Average of 1903 and 1928. Males only.

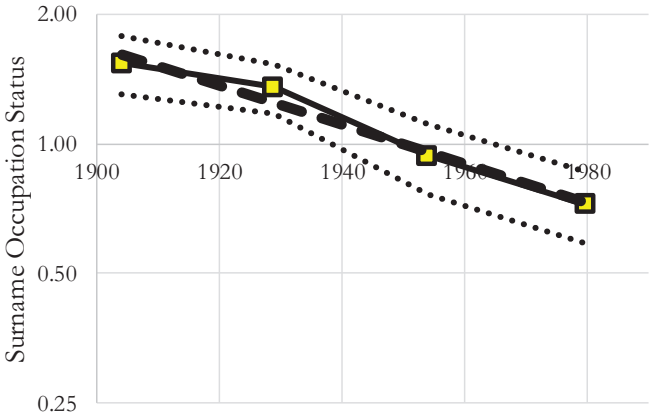

Fig. 1. Rare elite surname occupation status, 1904, 1929, 1954, 1980. *Notes:* Occupational status shown as standard deviation units above the social mean. The light dotted lines show the 95% confidence interval on mean status for the elite surnames.

the elite surnames from average status in standard deviation units in each year on each status measure, and the standard deviation of these mean status estimates for the elite surnames. The elite surnames deviate very significantly, in quantitative and statistical terms, from mean surname status even in 1980. These surnames, remember, were identified as high status based on someone with the surname graduating from Melbourne or Sydney Universities before 1900. This shows the slowness of social mobility in twentieth century Australia.

Fig. 1 shows the estimated status of the elite surnames at each benchmark, measured in standard deviation units above mean social status, as well as the 5 percent confidence interval around these estimates. Also shown is the best fitting estimate with a constant rate of intergenerational mobility from 1904 to 1980. The best fitting correlation of status across generations for the whole period is 0.73.

The fit across all four generations is very tight, with the intergenerational correlation very similar across all periods. If we just compare 1903 and 1980 then the estimated correlation of status across generations, assumed 30 years, is 0.744 with a standard deviation of 0.037. The 95% confidence for this correlation is thus 0.68–0.82, well above conventional estimates for social mobility for Australia in recent years.

3. Checking for ethnic subgroup persistence

The earlier Clark et al., 2014 results have been criticized as capturing not slow individual mobility, but the persistence of ethnic subgroups within the population (Chetty et al., 2014a, 2014b, Torche and Corvalan, 2018). Clark and Diaz-Vidal (2017) shows that such group persistence would have a different character to that produced by individual persistence, and we can show with English data that the persistence observed within surnames is stemming from individual rather than group or social class effects.

To exclude this possibility of ethnic group persistence, we narrowed the list of rare surnames to a smaller group of 117 that were British or Irish in origin, thus excluding surnames of German, French, Scandinavian, and Jewish origin. Do we now observe much faster mobility within this more ethnically homogenous population of British and Irish origin? With smaller numbers there is less precision on estimated status in any given year. But the overall estimate of persistence of status is just as strong, with an implied intergenerational correlation of 0.74.

The data for 1980 are still based on the occupations of people born 1915–1959. An estimate of the social status of the surnames closer to the present comes from looking at the fraction of voters who are reported as students. This is a measure of the social status of those aged in their early-twenties in 1980. In the working paper version of this paper (Clark et al., 2020), we show the fractions of voters reported as students by benchmark period. The elite surnames always have a higher fraction reported as students. Even in 1980 the percentage of voters with elite surnames who were students was double the percentage of voters whose surname was Smith.

Table 2
Intergenerational correlation between educational status and different surname groups, 1870–2017.

Surname group	Period	Correlation(30-year intervals)	Correlation(10-year intervals)
Elite surnames	1900–2017	0.70	0.72
Elite British surnames	1900–2017	0.70	
Colonial Doctor surnames	1870–2017	0.76	0.76
Colonial elite surnames	1870–2017	0.92	

4. Estimating mobility rates from surnames and education in Australia

A second way we can use surnames to estimate social mobility rates, which has the advantage of carrying these estimates all the way to the present day, is to measure relative rates of degree completion at Melbourne and Sydney Universities by elite surnames compared to common ones. This has the advantage that most bachelor graduates are aged in their early twenties, so will be tightly aligned into generations. We have records of all those receiving degrees from Melbourne University 1857–2017, and from Sydney University 1853–1985. Elite surnames were defined as those held by less than 200 people in the voting rolls of 2014 where someone with that surname got a degree from Melbourne or Sydney before 1900.

As Clark et al. (2020) show, to measure the implied educational status of a surname relative to the mean we need to know just four facts.

(a) The overall frequency in each generation of each target surname.
(b) The frequency distribution of target surnames among degrees from the Melbourne or Sydney Universities.
(c) The share of the population such degree recipients represented in each generation. That is, how exclusive an elite Melbourne and Sydney degree recipients were in each generation.
(d) The estimated variance of the target surname educational status compared to that of the population.

Applying this alternative method to the university data yields strikingly similar results to the estimates of mobility based on occupational status. We measured the intergenerational correlation for education status using a number of different groups of rare high-status surnames. These included (a) rare elite surnames defined as above as having completed a degree before 1900 where less than 200 people now hold the surname (b) rare elite British surnames pre 1900, to check for ethnic sub-group persistence, (c) rare colonial doctor surnames, reflecting an above-average occupational status in the pre-1870 period; and (d) rare colonial elite surnames measured as rare surname that appeared in the Australian Dictionary of Biography for individuals who died before 1875. We use generational intervals of 30 years starting in 1870 or 1900: 1870–1899, 1900–1929, 1930–59, 1960–89, 1990–2017. In some cases, where the data were sufficiently rich, we observed the intergenerational correlations using decadal intervals. The results are summarized in table 2. We see consistent strong intergenerational correlations across different high-status surname groups, and across different interval measures. For full results, see Clark et al. (2020).

5. Accounting for immigration

One issue that arises for an immigrant society such as Australia is the assumption that all holders of the rare elite surnames in 1900–2017 descended from Australian families in the nineteenth century. Since the end of World War II, the annual permanent migrant inflow into Australia has averaged 0.7 percent of the resident population – making Australia one of the most open countries to immigrants during this period. It is reasonable to assume that at least some new immigrants with elite rare surnames arrived after 1900. So might the measured persistence of status just reflect the arrival of high status relatives of the nineteenth century Australian elite from less mobile societies abroad?

We have two reasons to think that immigration will not distort much the surname estimates derived above of status persistence rates. The first is that even though Australia was a society of significant immigration, particularly after 1946, the share of immigrants by generation was generally still modest. Suppose our elite surnames included an average proportion of immigrants throughout. Then as we compare occupational status across the benchmark years 1903, 1928, 1954, 1980, 2014, the share of new immigrants in each cohort would be 10% (1928), 8% (1954), 17% (1980), and 21% (2014).[4] We are mostly observing persistence rates in the domestic Australian population. Also the underlying persistence rates in one of the major sending countries, England, in these years was around 0.75. So when we estimate a persistence rate in the years 1900–2017 in Australia of 0.75 also, the amount of distortion potentially coming from higher persistence in the sending countries among the migrant population is modest. Migrants cannot explain the high observed persistence rates.

The second reason migrants will not influence the estimates much is that by focusing on rare elite names in 1870–1899 as measured from the 2014 electoral role we are selecting rare surnames with few new migrants after 1900. Thus if we measure the share of the

[4] Population and immigration data 1903-2015 are from the Australian Bureau of Statistics, *Australian Historical Population Statistics, 2016*, https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/3105.0.65.001I-Note12016. National Archives of Australia, More People Imperative: Immigration to Australia, 1901–39 Research Guide, The pattern of immigration to Australia 1901–39. (Sources: Official Year Books of the Commonwealth of Australia; A G Butler, Official History, Australian Medical Services, 1914–18, Vol III, 1943). http://guides.naa.gov.au/more-people-imperative/gallery/image001.aspx

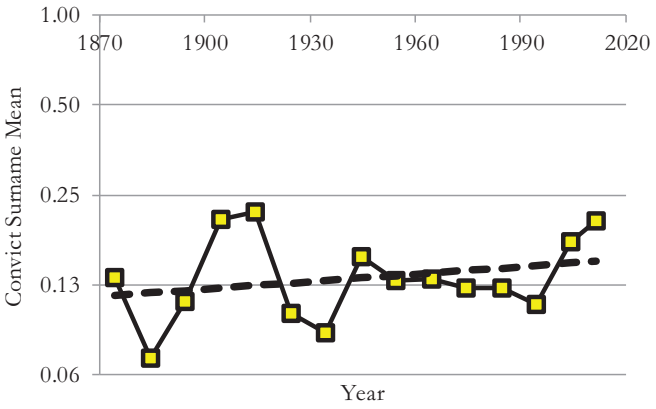

Fig. 2. Average status of Tasmanian convict rare surnames, 1870–2017. *Note:* the figure shows the implied average status of rare convict surnames, measured as the implied deviation of their educational status from that of "Smiths", measured in standard deviation units of educational status overall.

rare elite surnames in the 1903 electoral roll compared to 2014 we find that share declined by 46%. That decline is what would be predicted if there were no migrants with these surnames in the years 1903–2014. So by selecting these rare elite surnames we have effectively selected a set of surnames where there were no new migrants in the years after 1900. Thus the persistence rates measured above for these surnames are identifying the social mobility rates of a mainly domestic Australian elite.

6. Estimating the upward mobility of lower-status surnames

All the above groups we have measured mobility for are social elites, where we are measuring their rate of regression to the mean. What about lower class members, and their rates of upward mobility? In an attempt to measure this we utilized a list of convicts in Tasmania. Tasmania had two classes of convict: all persons transported from the UK to Tasmania 1804–1853, and all persons within Tasmania sentenced to the convict system up to 1893. Together these convicts constituted 76,000 people. Again we selected those with rarer surnames, measured as having 200 or fewer people holding the surname in 2015. Then, as with the colonial doctors, we measured the implied average status of these surnames 1870–2017 through their relative representation at Melbourne and Sydney universities. Fig. 2 shows the results.

Surprisingly the rare surnames of the Tasmanian convicts are actually modestly overrepresented at Melbourne and Sydney universities relative to common English surnames throughout all decades. One possible explanation may be found in studies that have compared the human capital of convicts transported to Australia with the overall British population. Measured in terms of occupational skill (Nicholas and Shergold 1988) or and numeracy (Meinzer 2015), there appears to be some evidence of *positive* selection in the human capital of convicts who were transported to Australia.

Even more surprising the convict descendants show no sign that average status over generations is converging to mean status, which is what we observe with other elite groups in Australia, and indeed almost everywhere. This result may be just because they are so close to average status that measuring such regression is difficult.

Another factor is the lack of stigma attached to former convicts. Farmer James Ruse, designer Francis Greenway, and businessman Solomon Wiseman were among those who enjoyed status and wealth upon concluding their sentence. One of Australia's most elite schools, Sydney Grammar, was founded by convict Laurence Halloran. Australia's first postmaster was former convict Isaac Nichols, while Tasmania's main newspaper, *The Mercury* was co-founded by former convict John Davies. We therefore regard the convict analysis as providing insights into the selectivity and upward mobility of this particular group, but not to the broader question of long-run intergenerational mobility in Australia.

7. Interpretation

From 1870 to 2017 we observe in Australia an underlying rate of social mobility, measured through the persistence of occupational or educational status among surnames, that is consistently low. The great-great-great-great grandchildren of the medical pioneers in Australia, for example, graduating from university after 2010, six generations later, show an implied educational status that is still about 0.2 standard deviations above the mean for descendants of UK immigrants. The underlying correlation of social status is 0.7–0.8. That correlation is as high now as in the 1870s. That correlation is also as high as in England and in the USA.

How do we reconcile these estimates with the self-image of Australia, as presented in the introduction, as a class free open society? And how do we reconcile this with conventional estimates of the father-son occupational status correlation in Australia which suggest it is low by international standards?[5] We look at occupational status 1903–1980, while the current intergenerational

[5] Corak (2013), Leigh (2007), Huang, Perales, and Western (2016), Mendolia and Siminski (2016).

income elasticities for Australia are also estimated using occupations to infer incomes. In this sense, the approaches rely on similar data.

However, conventional estimates of social mobility are all biased to some degree by the measurement errors embodied in any measure of social status: income, wealth, occupational rank, or years of education. Such errors bias estimated intergenerational correlations towards 0, suggesting greater social mobility than is actually occurring. In particular the estimated persistence rates for earnings in Australia, because they are estimated from average occupational earnings, are likely biased downwards compared to estimates for other countries which rely on actual earnings estimates for parent and child. The correlation between occupational status and average earnings by occupation in a country like Australia is actually modest: for the recent occupational status scale AUSE106 and earnings in 2016 the correlation was only 0.58. Occupations thus provide a noisy measure of earnings, and any such noise will reduce intergenerational correlations.[6]

But even if we could measure earnings or occupational status perfectly, we would still likely observe that the correlation of parent and child is lower than the correlation observed across subsequent generations. This is because underlying status is transmitted strongly across generations, but within each generation there is a random component linking underlying status and the actual achieved status of a person. With such a structure the correlation between parent and child in social status is always lower than the correlation that describes mobility across multiple generations. There is no longer any unitary measure of social mobility rates. You can have low rates of persistence of status comparing parent and child, but still very strong persistence across subsequent generations, and at the level of family lineages or social classes.

With this structure the social system behaves as though it has a longer memory of family status. The predicted status of children depends not just on the parents, but also on the grandparents, uncles, aunts and other relatives. In high status lineages, large short-term declines in status by a child tend to be corrected in the next generation, the grandchildren. For lower class families large upward movements in social status tend also to get corrected in the next generation.

Another feature that should be emphasized is that our data do suggest there will be complete social mobility in Australia, if we wait enough generations. The descendants of the Colonial elite are becoming more average with each passing generation, and will eventually be completely average in status. However, this process is taking a very long time. The holders of rare elite surnames in Fig. 1 had an average occupational status 1.54 standard deviations above the social mean in 1904. With an intergenerational correlation of 0.75 in occupational status their average status will lie within 0.1 standard deviations of the social mean by the generation of 2204. It takes about 10 generations, 300 years, for such an elite set of families to become effectively average.

But overall this study of the persistence of status among elite Australian surnames suggests that while Australia and England may show different rates of status persistence in the short-run, their long run mobility rates are very similar. That is, inheritance of status from parent to child may be looser in Australia. But inheritance of status across the second, third and fourth generations is very similar across both societies. So social elites persisted just as strongly in Australia as in England 1870–2017. Australia in many ways has been just as immobile a society as its sclerotic colonial parent England.

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[6] Both Leigh (2007) and Mendolia and Siminski (2016) adjust for this problem by also running their occupation-based technique on US data, then taking benchmark income-based intergenerational elasticities from the US literature (eg Solon 1992; Mazumder 2005) to derive a measure of the downward bias of the methodology. This bias estimate is then used to scale up the Australian estimate. However, the reliability of this approach turns on the accuracy of published estimates of the US intergenerational elasticity. If the benchmark US intergenerational elasticity estimates are too low, then using them to correct for bias in the Australian studies will produce an underestimate of the Australian intergenerational elasticity.

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