Being Digitally Savvy

Australian Women's Access and Ability to Use Broadband

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Abstract: Research into the rates of digital inclusion over the last three years, from the Australian Digital Inclusion Index (ADII), has shown differences in digital access and abilities of women compared to men. Deploying a gendered analysis, it is possible to explore the drivers behind differences in some areas where women scored above men and in other areas below. This paper reviews data from the Australian Digital Inclusion Index (ADII) and NBN Co's Online Skills Check and Resources (OSCAR). Focusing on the perspectives of women living in regional areas, living with a disability, from low-income households and senior women allows parallels to be drawn between digital inclusion and social inequality. Understanding factors that increase women's agency remains significant in the context of also improving women's digital inclusion. Factors that increase agency are required to fulfill women's digital potential. Solutions presented to address these gaps and narrow the gender digital divide include education and capacity building to provide opportunities and support for women, the importance of social networks, addressing narratives and, finally, targeting gaps in research. A continuous theme in this paper is the importance of an inclusive approach to investing time, effort and research to address gender equality within digital inclusion.

Keywords: women, digital inclusion, ADII, Online Skills Check and Resources (OSCAR)

Introduction

When considering the topic of gender equality, there is often a focus on closing the gap across employment, education and policy, but, what about gender equality for digital technology such as the Internet? Globally, the gender gap between men and women for Internet use is closing. Within Organisation for Economic Co-operation and Development (OECD) countries, 61% of men and 55% of women were Internet users in 2005 (a 6% difference), compared to a 2% difference between men and women 10 years later (OECD, 2015). One would assume that Australia would be no different from its OECD counterparts in experiencing a digital gender divide.

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Usage of the Internet in Australia was captured by the Australian Bureau of Statistics (ABS) Household Use of Information Technology Survey 1996–2017 (ABS, n.d.). Australia also participated in the World Internet Project (WIP) from 2008 up until 2014, which was an international study on the social, cultural, political and economic effects of the Internet and which focussed on Internet users as well as non-users. During this period of research, Australia saw consistent trends on the digital participation of women. In 2013, 93% of men used the Internet compared to 89% of women (Ewing, van der Nagel & Thomas, 2014).

Following on from the WIP, the Australian Digital Inclusion Index (ADII) was developed in 2015, based on data from the Australian Internet Usage survey (Thomas *et al.*, 2021). To create a measure of digital inclusion, the ADII looked at three factors: digital access, affordability and digital ability (Thomas *et al.*, 2021). Digital inclusion can be defined as an individual's access to and use of the Internet, how this positively impacts their lives and the benefits it delivers. ADII data used in this paper relates to 2020 and 2021 research, as the index measurement had been revised and previous data is, therefore, not comparable (Thomas *et al.*, 2021).

Another resource for measuring digital ability is NBN Co's Online Skills Check and Resources (OSCAR). OSCAR (which is available at https://onlineskillscheck.com.au/) allows an individual to check their digital skills through a survey that results in a score across five levels: beginning, foundational, developing, proficient and mastery, where a higher OSCAR score means a higher digital ability. OSCAR's resource library also supports an individual to upskill their digital skills across knowledge, device usage, data, e-safety and online communication (Dimarco, 2021).

The background and context of women's use of broadband, cannot be understood without first examining the history of broadband infrastructure in Australia. In 2009, the Australian Federal Government established NBN Co to deliver high-speed broadband across the country and to support the way Australians work, learn, access health and connect with family and friends.

NBN Co's mandate is set by the Statement of Expectations (SoE) issued by Shareholder Ministers for NBN Co, with the latest statement issued on 20th December 2022. The SoE focusses on improved connectivity for regional and remote Australia by addressing access challenges (NBN Co, 2022). Compared with the previous SoE (NBN Co, 2021b), the challenges of commercial returns for activities in parts of regional and remote Australia compared to capital cities are still relevant. Because of the cost limitations and legacy telecommunication infrastructure utilised, the broadband network has resulted in a mixture of technology types across Australia and for regional and remote areas, with the latter predominantly involving fixed wireless and satellite services (NBN Co, 2015). Another important expectation on NBN

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Co, in the context of this paper, is engagement with communities and stakeholders to support programs that will increase digital capability and inclusion for all Australians (NBN Co, 2021b). The importance of understanding the history of broadband infrastructure in Australia highlights the challenges of addressing existing social inequality (Goedhart *et al.*, 2019), especially those inequalities that already exist for women in regional and remote Australia.

This paper examines the differences between digital access and ability of women in Australia when compared with men in Australia, using the ADII and OSCAR data. The data will focus specifically on groups of individuals that are classified as living in regional vs cities (metro), living with disability, from low-income households and seniors (aged 65 and over). In reviewing the data of women's digital participation and ability, other research is used to compare and discuss insights, along with the role of agency in digital inclusion. Finally, three nuanced solutions targeted at narrowing the gender digital divide include: education and capacity building for women, the importance of social networks and addressing narratives and, lastly, targeted research and programs.

Digital Participation

Improving women's Internet access over time is important, not just for enabling an inclusive digital future, but also to support the equal opportunities, flexibility and independence that life online can provide. Research on the connectivity of women, conducted by AlphaBeta found that in 2017, there was a 2.3% growth in self-employed women for regions connected to the NBN relative to self-employed women in non-NBN connected regions (NBN Co, 2018). Even before the COVID-19 Pandemic, flexible work arrangements were important to women who had to juggle both work and caring responsibilities.

The ADII shows differences in digital access scores for women compared to men in low-income households, senior women, women living with disability, regional and metro areas (Figure 1). Looking at the comparison of results from 2020, women scored less than men across digital access in all groups except for the group identified as women living with a disability (in this group, women scored 1.5 points higher than men in the equivalent group) and there was no difference between women and men in the group identified as the regional group. This gap increased again in 2021, except that women scored higher on digital access than men in the groups identified as low-income households (+3.8), disability (+3.5) and regions (+2.8). Arguably, for the groups in which women scored higher than men, these groups may experience greater social and geographical isolation and therefore rely on and understand the importance of digital access to address their individual needs. The ADII survey sample is stratified and weighted to reflect the Australian population with the 2020 sample surveyed 2,798 people and the 2021 sample surveyed 2,287 people (ADII, 2021a).

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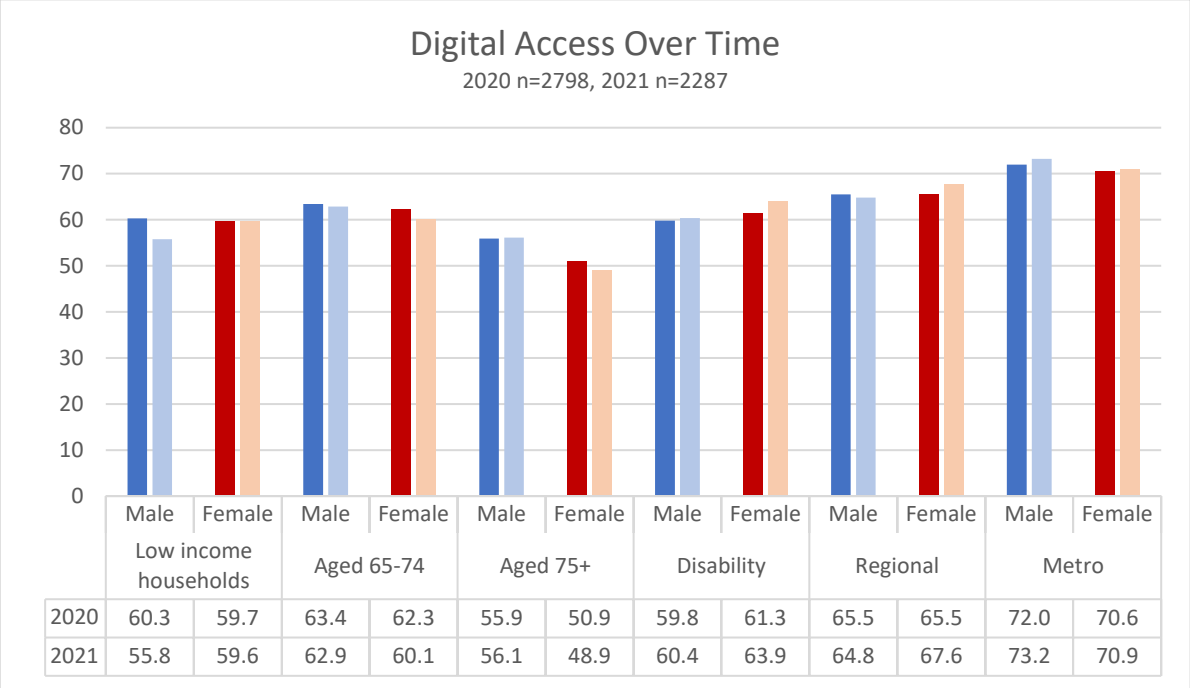

	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Low income households		Aged 65-74		Aged 75+		Disability		Regional		Metro	
2020	60.3	59.7	63.4	62.3	55.9	50.9	59.8	61.3	65.5	65.5	72.0	70.6
2021	55.8	59.6	62.9	60.1	56.1	48.9	60.4	63.9	64.8	67.6	73.2	70.9

Figure 1. Digital access across 2020 and 2021 for males and females (ADII, 2021a)

From National Seniors Australia, research on older Australians shows an increase in digital engagement, although the data focussed on gender in the context of types of devices used. Senior women used tablets and mobile devices to access Internet search engines, online banking and online government services. Seniors' comfort in using digital technology has declined over time (Orthia, Maccora & McCallum, 2022). Verbatim comments referenced in this report had respondents feeling 'forced' into the use of digital technology, while the COVID-19 pandemic had accelerated this through the use of QR codes, online shopping, and access to government services (Orthia, Maccora & McCallum, 2022).

According to the *Digital Australia 2022* report (Brand & Jervis, 2021), female participation in video games is 46%, an increase of 8% since 2005. For senior women who play video games, play time was longer for those aged between 55-84 compared to men (Brand & Jervis, 2021). Interestingly, these results are not represented in the ADII scores for seniors aged 65+ as digital access has decreased over time. One explanation for the difference in these results is how senior women access video games, which may not need broadband access as game subscription services make up 48% of game households (Brand & Jervis, 2021). A limitation with this research is how 'players' were defined, as being a person who play computer or video games, regardless of the device used to access the games. The *Digital Australia 2022* data included 1,204 Australian households, randomly sampled, with age, gender, and geographic representation consistent with population proportions (Brand & Jervis, 2021).

Recent research commissioned by NBN Co (KPMG, 2022) surveyed 2,021 Australians on their values, attitudes to, drivers of, and barriers to digital participation. When asked about their

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preferences, more women indicated that they preferred to conduct day to day activities online than men did (KMPG, 2022). When grouped by gender, the insights provide a different behavioural profile between women and men. Although men rated their capability of Internet use higher, generally, they preferred face-to-face methods, were more nervous on data security and did not see the value in doing things online. Affordability of the Internet was a rated as a more significant impediment by women than by men (-3%), while women preferred to use the Internet to communicate more than men (+7%) (Table 1). Although there is a small difference in results between men and women's participation, as well as a variance in sample size, the data was tested and resulted in a low false discovery rate (the expected proportion of errors resulting in a false positive) and therefore the means are statistically significant.

Table 1. Digital participation values and attitudes between women and men from the digital participation research (KPMG, 2022)

	Male n= 835	Female n= 1186	Gender-Gap
Self-rated capability of Internet use	79%	77%	-2.0%
Strong preference to conduct day to day activities online	49%	51%	2.0%
Easily afford Internet connection in my current budget	72%	69%	-3.0%
Communicating via the Internet - sending and receiving messages	82%	89%	7.0%

Prevention from doing more online	Male n= 835	Female n= 1186	Gender-Gap
I prefer face to face methods	36%	32%	-4%
I'm nervous about doing more online because of data security	24%	23%	-1%
The companies I interact with do not have an online offering	13%	11%	-2%
My budget prevents me from upgrading my Internet connection	10%	12%	2%
My Internet is too slow	11%	10%	-1%
I don't see the value in doing things online	11%	9%	-2%
My Internet connection is unreliable	9%	10%	1%
I am not sure where to go to learn new online skills	7%	8%	1%
I am not confident in using the Internet	6%	6%	0%
Don't have the technology required	5%	6%	1%

Research from ADII and others referenced in this paper provides insights into the attitudes and preferences of men and women for which differences and similarities can be compared and validated. Social factors are more important to women's digital participation seen in both ADII (Table 2) and the digital participation research (Table 1). A poll of Australian women showed that 30% of respondents had experienced online abuse and harassment (Amnesty International, 2018). The lack of digital participation and engagement of some women could be due to the impact of abuse and harassment on social media. ADII's data on life online

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revealed that a higher percentage of women were accessing health services (+9.6%), interacting with people or content to feel connected to community (+7.1%) and keeping in touch with family or friends (+4.2%) (Thomas *et al.*, 2021). In summary, the common themes from the above research on digital participation is the value of the Internet for strengthening wellbeing and social connection for women.

Digital Ability

When measuring an overall digital ability score, the ADII considers the following factors: operational basics and advanced skills, information navigation, social, creative and automation skills. Results from the 2021 ADII report (Table 2) indicate that women consistently score lower than men across all digital ability areas except for social. The digital participation research (KPMG, 2022) also found a greater percentage of women prefer to communicate via the Internet than men.

Table 2. Digital ability gender-gap. From 'Measuring Australia's Digital Divide: Australian Digital Inclusion Index: 2021' by Thomas *et al.* (2021), Australian Digital Inclusion Index (Copyright 2021 by Australian Digital Inclusion Index)

	National	Male	Female	Gender-Gap
Digital Ability	64.4	65.4	64.0	-1.4
Operational basic	73.1	74.7	72.1	-2.6
Operational advanced	64.4	66.4	63.2	-3.2
Information navigation	62.8	64.4	62.1	-2.3
Social	63.0	61.9	64.8	+2.9
Creative	55.6	56.8	54.9	-1.9
Automation	67.4	68.3	66.8	-1.5

Gender differences of ADII digital ability scores from 2020 and 2021 show comparable results to those for digital access. In the results for 2020, women scored less than men for digital ability except for women living with a disability (+1.4). Results from 2021 show women in low-income households (+6.5), living with a disability (+15.3) and regional areas (+4.7), with higher digital ability scores compared to men. The largest growth in digital ability compared to the previous year is with women living with a disability (Figure 2).

There is a lack of comprehensive national data on the accessibility of goods, services and facilities that use Digital Communication Technology (Farthing *et al.*, 2021). Assistive technology is designed to support people with a particular disability to perform a task, for example a screen reader for assisting a person who is blind, or who has a vision impairment, to read the content of a website. The Australian Human Rights Commission (Farthing *et al.*, 2021), identified several problems with inaccessibility, which further hinder digital inclusion for people living with a disability.

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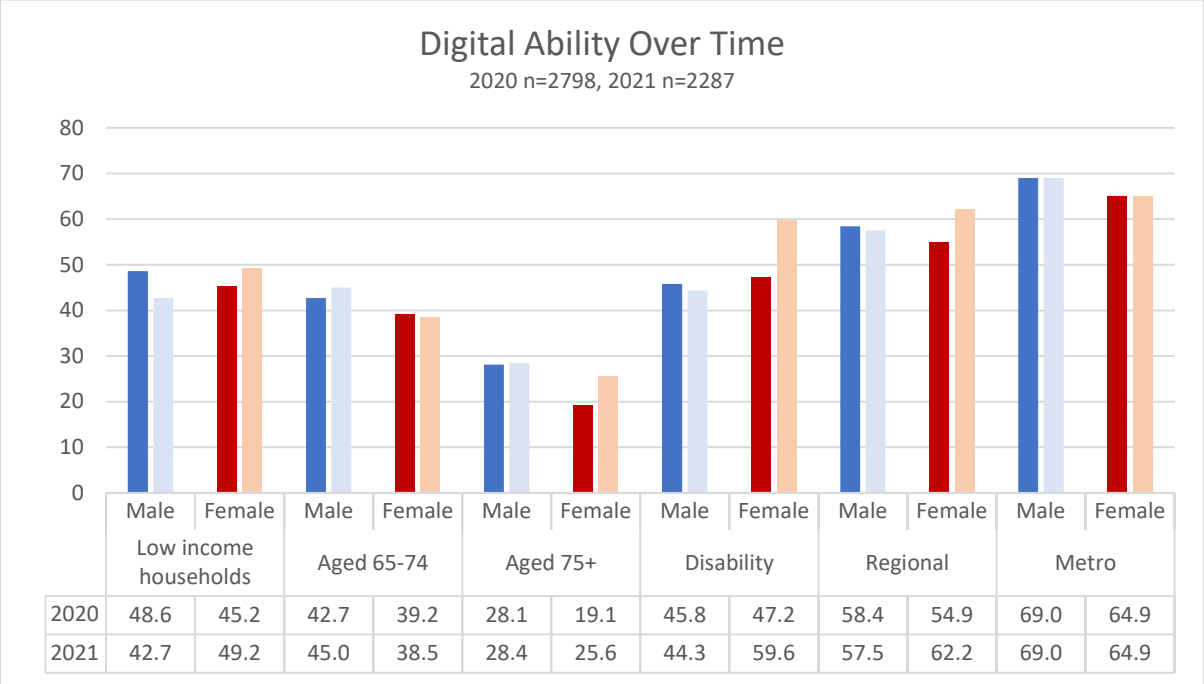
Results from the ADII report in 2020 had ranked the group of people living with a disability as fifth amongst the groups with low digital inclusion compared to the Australian average (Thomas *et al.*, 2020). Low-income households and individuals over the age of 65+ were also listed in the top 5 groups with low digital inclusion. If we look at women's digital ability (Figure 2) the lowest scores are senior women and women from low-income households. Although the 2020 and 2021 ADII reports are designed to be a summary of the findings, commentary and insights on the gender-gap is brief.



	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Low income households		Aged 65-74		Aged 75+		Disability		Regional		Metro	
2020	48.6	45.2	42.7	39.2	28.1	19.1	45.8	47.2	58.4	54.9	69.0	64.9
2021	42.7	49.2	45.0	38.5	28.4	25.6	44.3	59.6	57.5	62.2	69.0	64.9

Figure 2. Digital ability across 2020 and 2021 for males and females (ADII, 2021b)

The OSCAR survey measures an individual's online knowledge, device usage, data and e-safety skills and online communication to be able to provide an overall score. Digital ability is the accumulation of learning digital skills and knowing when to use them. It is important to note, although ADII and OSCAR assess different factors when measuring digital ability and online skills, there are shared themes such as an individual's knowledge level, operational and device navigation and online communication skills. The sample size for OSCAR is comparable to ADII, although OSCAR data is selectively sampled through targeting groups and individuals that are likely to have engaged with the OSCAR survey through NBN Co. The survey also relies on voluntary responses and could be subject to self-selection bias; when individuals who choose to participate in the survey differ from those who do not.

Within the OSCAR data (Figure 3), men scored higher in all categories for online skills, except for regional women in 2022 (+1). Comparing with ADII data, regional Australian women scored much higher than men across digital ability in 2021 (+4.7), compared to the previous year (-3.5) (Thomas *et al.*, 2021). When assessing OSCAR scores with the overall average score

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for women as a benchmark (68.0 in 2021 and 65.6 in 2022), only women living in metro areas have a higher digital ability score. It is important to note that the sudden decrease in scores for these women from 2021 to 2022 is likely to be attributable to the difference in sample size.

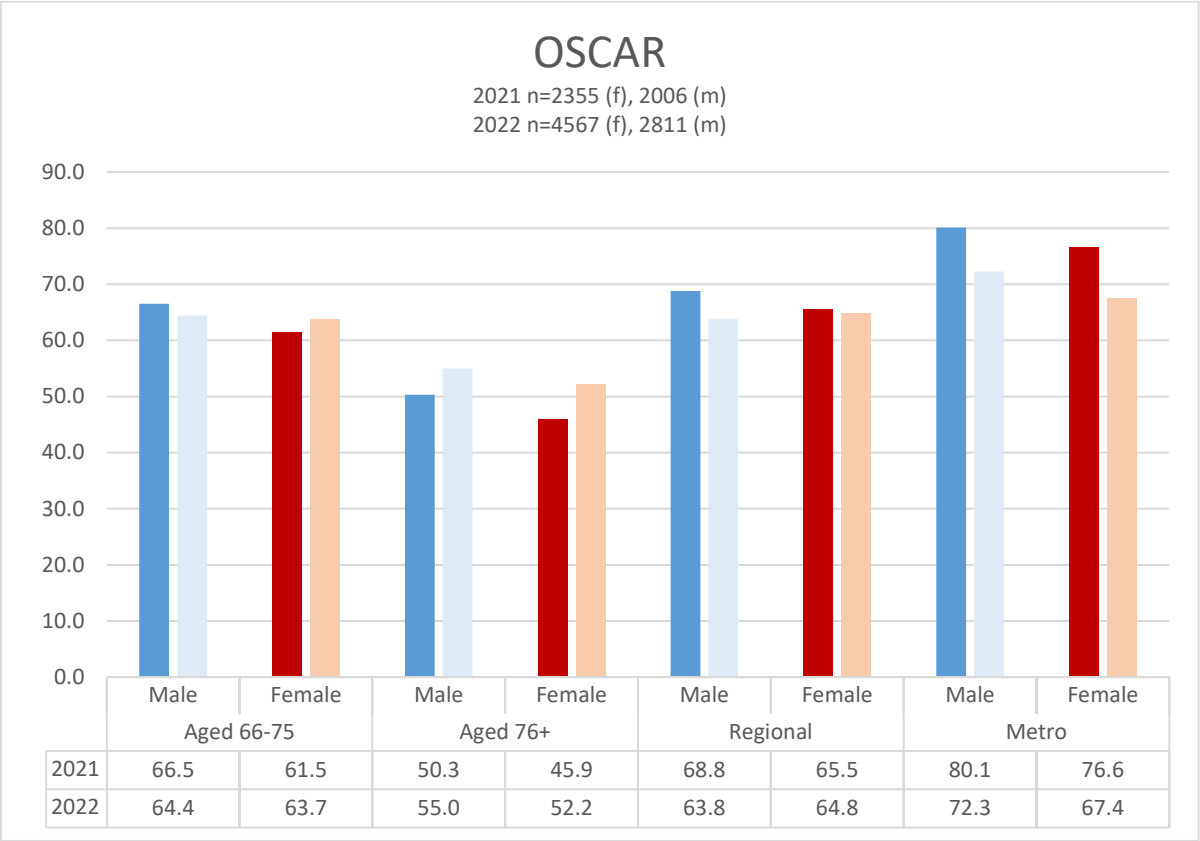

Figure 3. Online skills across 2021 and 2022 for males and females (OSCAR, 2022)

Table 3. Importance placed on digital skills and tech adoption by gender (OSCAR, 2022)

	Male		Female		Gender-Gap	
	2021 n= 1992	2022 n= 2751	2021 n= 2338	2022 n= 4482	2021	2022
Digital Skills Importance	79.1	78.7	81.5	82.0	2.4	3.3
Technology Adoption Importance	44.2	34.5	26.4	24.2	-17.8	-10.3

Table 4. Competency areas by gender (OSCAR, 2022)

	Male		Female		Gender-Gap	
	2021 n=1984	2022 n=2734	2021 n=2330	2022 n=4439	2021	2022
Online knowledge	74.4	71.6	72.4	70.8	-2.0	-0.8
Device usage	74.0	69.4	67.8	65.8	-6.2	-3.6
Data and eSafety	74.4	70.6	69.6	68.2	-4.8	-2.4
Online Communication	74.8	72.2	75.0	73.6	0.2	1.4

Drivers behind OSCAR scores also include valuing digital skills and technology adoption and when looking at the gender differences based on these drivers, women placed great importance on digital skills, while men placed a far greater importance on technology adoption (Table 3).

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Women scored less than men for online knowledge, device usage and data and eSafety (Table 4) although the gap has decreased when compared to the previous year. These results align with the lack of importance placed on tech adoption for women seen in Table 3.

When comparing digital ability from ADII with OSCAR data (ADII 2020, 2021 and OSCAR 2021, 2022), regional women scored higher than regional men in the most recent result compared to the previous year. Women 75 years of age or older have the lowest digital ability scores when compared with scores for women overall, thus being some of the most digitally excluded Australians. Considering these trends between ADII digital ability and OSCAR, women with the least digital ability are senior women and the greatest digital ability being women living in capital cities. The OSCAR data is likely not entirely representative of the Australian general population, but, given the similarities with the ADII data (which is representative of general population), an argument can be made that OSCAR data is significant even considering the sampling limitations. The OSCAR survey does not include questions on disability or income so these groups cannot be compared with the ADII. Overall, women scored higher in online communication than men, and understand the importance of digital ability and skills to successfully communicate and effectively navigate online.

The Role of Agency in Digital Inclusion

ln this context, agency is defined as individual actions, capability and practices which positively influence, determine and shape an individual's desired outcomes and experiences. The agency of women is a determining factor when assessing their participation in digital inclusion. Furthermore, taking the level of agency into consideration allows the identification of nuanced factors that drive fulfilment of women's digital potential. Becker's (1985) research on human capital, labour and gender is relevant in understanding the challenges for women to be digitally included. In his research, married women would invest less in market human capital due to their primary responsibilities for housework and childcare compared to married men, regardless of the same amount of time spent in the labour force (Becker, 1985). Domestic responsibilities create an occupation divide between women and men, as women seek work that is less intensive and provides more flexibility (Becker, 1985). Helping family institutions to promote female agency, will ultimately help advance women's positions in labour force participation, human capital formation and political participation; all critical factors for economic development (Dilli, 2017).

There is a relationship between agency and social structures that needs to be considered because women who possess agency have that agency constricted by social structures which give greater privilege to men, and that are continuously being reproduced and reinforced by individual actions that form part of society. Casey *et al.* (2021) discusses the focus and

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amplification in the press of mental health and wellbeing of male farmers during droughts. While this ultimately shadows the long-standing issue and impact on rural women's emotional, physical and social wellbeing. Women in drought-impacted regional Queensland applied entrepreneurial bricolage, by using digital technologies that were often self-taught, providing them with an off-farm income (Casey *et al.*, 2021). Casey *et al.* (2021) explains entrepreneurial bricolage to mean 'agents using any resources that come in handy, improvising and testing solutions, accepting imperfection, and constructing the existing practices as open to re-interpretation', relying considerably on the feedback of the relevant stakeholders. O'Grady (2005) relates Michel Foucault's 1979 work to study the effects of power at an intra-subjective level and how it holds relevance for women in understanding the importance of the role of self-policing on identity formation. Without addressing the role of power and knowledge on an individual's capacity, unwanted power relations will not change (O'Grady, 2005). This point is relevant in understanding that negative relationships women may have with themselves affirms social and cultural factors that declares women as vulnerable.

Women (and men) that are at risk of digital exclusion are those living without support such as low-income households. Research from Accenture (2023) draws on insights from 2022 data, information on services over the NBN network, international broadband prices, Australian household characteristics and the results from a bespoke consumer survey. From an affordability perspective, access to the NBN network appears to not be a prohibiting factor, with the average Australian spending $16.90 a week on a service, or 1.1% of the average weekly household income of $1,600 post tax (Accenture, 2023). Nevertheless, the Australian Communications Consumer Action Network (ACCAN, 2019) argues that over one million low-income households are at risk of not switching over to an NBN service because of cost. For households that earn less than $31,199 per annum, only 18% of males and 17% of females found their NBN service unaffordable (Accenture, 2023). Compared to men, more senior women and regional women found an NBN service less affordable (Table 5).

Table 5. NBN affordability gender-gap (Accenture, 2023)

	Male		Female		Gender-Gap Unaffordability
	Affordable	Unaffordable	Affordable	Unaffordable	
Income <$31,199 households n= 109 (m), 169 (f)	50%	18%	43%	17%	-1%
Aged 65+ n= 253 (m), 154 (f)	63%	9%	62%	10%	1%
Regional n= 256 (m), 309 (f)	61%	8%	52%	12%	4%
Metro n= 538 (m), 690 (f)	62%	12%	51%	9%	-3%

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A safe way for women to provide collegial support can be closed online groups, communities and platforms. Nan Berrett, an older South Australian woman setup an online platform called 'Silverpreneurs', which aims at supporting older women in regional and remote communities across Australia to start their own small business (Bottrall, 2019). Having access to high-speed Internet has provided opportunities and confidence for women to start small home-based businesses. Another example of an initiative that enables regional women in business is the 'innovate with NBN' grants program, which NBN Co offers in partnership with the Regional Australia Institute. Applications for the "women in regional business" category have trended up over time, with "women in regional business" making up 18% of total applications in 2020, 30% in 2021 and 32% in 2022. Previous winners have built apps to extend their business online and expand businesses into new locations (NBN Co, 2021a; Williams, 2022). In these examples, women in regional Australia have demonstrated ability, resilience, and engagement to embrace digital technologies and tap into a different rural female endeavours that are distinct from traditional agriculture and farming roles.

Dilli (2017) believes that research on the role of female agency in the household suggests the gender differences in educational attainment. Women with more bargaining power within the household have an increased likelihood of school enrolment of children. Dilli (2017) noted that women participation in the labour market varied due to the use of different forms of agricultural practice, different per capita incomes and specialisation in female-friendly industries and differences in cultural beliefs about the appropriate role of women in society. Testa (2017) explains that the relationship of recognition and power is understood in terms of social power, for an individual's capacity to enable action and affirm a quality or value in some specific way.

Social power has positive and negative effects on other agents (Testa, 2017) such as those active in the public sphere of social media. Benhabib (1997) argues that the public sphere, especially in social media, has become a place for anonymous conversation, discourse and debates, which encourages inappropriate speech and can lead to negative effects on the regard for, and thus lower participation of, women and marginalised groups.

Maintaining a voice (and power) while expanding upon capacity of women, can be key to enabling digital engagement (Testa 2017). Greater representation of feminist voices through online, social media and the news, strengthens feminist discourse (Casey & Watson, 2017). By providing and sharing stories online, women can support each other and enable other women to seek and access digital opportunities.

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A Pathway Forward

Based on the research and insights discussed, the following reoccurring themes can be turned into solutions to narrow the gender digital divide.

Education and capacity building to provide opportunities and support

Deliberate focus on upskilling of digital ability across different cohorts is an investment that results in economic benefits. The OSCAR tool is one example to increase skills and awareness. Another example is the *Shaping Connections* platform that helps older Australians increase their knowledge of ICT and develop improvement strategies (Shaping Connections, 2021).

The eSafety Commissioner provides information and awareness on online safety, in its capacity as Australia's independent regulator. The recent *Online Safety Act 2021* (Cth) protects Australians across most online platforms and forums where people can experience abuse or be exposed to harmful content. The Tech Council of Australia advocates for the policy, research and engagement of the tech-enabled sector and in doing so, strongly encourages investment in digital skills for women (Tech Council of Australia, 2022). Simple activities such as the utilisation of online forums and platforms, versus enquiring in person or over the phone, have demonstrable savings for companies and service providers. Connection to the Internet is not the only singular factor to ensure digital inclusion, but people require adequate skills and knowledge to use the Internet (Thomas *et al.*, 2021).

The importance of social networks and addressing narratives

There are well-established narratives of inequality for people living in regional areas compared to in the cities. Kate McBride, a researcher and Parliamentary Liaison Officer for the Australia Institute, referred to regional Australians as the 'forgotten people' (Australian Broadcasting Corporation Q+A, 2022, 0:58), and for that to change, there needs to be increased agency for regional Australians to be decision makers in the investment of services for regional and remote areas. Reinforced narratives of life in regional Australia are perpetuated by mass communication media. Media enterprises are required to broadcast Australian content on commercial TV as the Australian Communications and Media Authority (ACMA) have set transmission quotas for at least 55% Australian content (ACMA, 2022). Reality television series such as *The Farmer Wants a Wife* (2007), and *Outback Truckers* (2012) actively reinforced narratives of life in regional Australia. They appeal to audiences by focusing on the hardship and perspective of Australian males in the outback (although more recently some series have attempted to introduce female perspectives). Series like these examples show how mass communication media has the power to maintain narratives that reinforce gender roles and inequality.

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Casey and Watson (2017) comment on the risk of naming oneself as a feminist and having the ability to speak out in contemporary media, which would attract online harassment and abuse for women. According to Hootsuite (2022) *Digital 2022* report, 46.1% of social media users are female. An example of content used as an educational tool is the use of photography to show the role women play in farming and agriculture, which again, challenges the masculine stereotypes within Australian farming (Di Iorio, 2022). To move forward, addressing the intersection of social networks and feminist narratives is critical, especially the pervasive rural and regional female narratives in the media. Doing so will ensure social networks are spaces for diversity, inclusion and empowerment.

Targeted research to address gaps and dive deeper into focus areas

There are fundamental risks with statements made from research that is only representative only at a macro level. An example of this is from the *Digital Nation Australia 2021* report, which states that women in Australia follow the global trend of being less digitally included than men. Although this is based on the national average of women from 2020 ADII data, there is a different perspective when probing deeper into the factors that make up digital inclusion. This paper highlights that women living with a disability have higher digital access and ability compared to men. The differences between men and women's digital access and ability differ again in the 2021 ADII results.

Researchers have the challenge of addressing gaps in data, like the Australian Bureau of Statistics (ABS) discontinued Household Use of Information Technology Survey and the 2021 ABS Census, which did not include questions on Internet access. The ADII (Thomas *et al.*, 2021) also highlights gaps in the capture of First Nations digital inclusion, due to an inadequate sample of survey data. A separate initiative is seeking to address this data issue, it is called Mapping the Digital Gap, conducted by the ARC Centre of Excellence for Automated Decision-Making and Society at RMIT University (ADII, 2023). This program aims to work with around eight to ten remote communities to generate a First Nations Index score and track changes in digital inclusion over a four-year period (2021-2024).

Averages from the OECD countries observed different Internet usage between genders, as men listen more to web radios, watch web TV, play and download games, films or music, sell goods or services, create websites or blogs and download software more than women (OECD, 2015). For Australian women Internet users in 2012, 77% conducted online purchases, 73% used e-banking, 69% used social networking and 59% used the Internet for travel and accommodation (OECD, 2015). Gaps in data need to be addressed by asking women and men questions about how they use the Internet at a granular level, while encouraging researchers to present more findings by gender.

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Conclusion

The results of surveys, the creation of capacity building tools and research on digital inclusion over the last three years indicates a greater focus on closing the digital divide, which is ultimately beneficial to groups that are digitally excluded, men and women alike. Women are changing the way they access and participate digitally, especially regional women. Constant opportunities to utilise digital abilities are needed, to stay relevant in an ever-changing digital landscape. There needs to be a continued focus by government, industry and services providers on research which explores the specific factors that contribute to particular groups of women being digitally disadvantaged, such as senior women and those from low-income households. Further efforts to address digital inclusion will continue to result in increased economic development, further social connection and engagement. This is particularly important when observing the gap between digital ability for low-income households compared to other categories; suggesting a need to deeply invest in digital access, training, and engagement for low-income households.

Women and men have made progress towards closing the digital divide. Being conscious of the varied boundaries and limits of agency held by intersectional groups of women, is critical for understanding the factors that contribute to the gender digital divide. Positive results stem from advocacy, awareness and capacity building by organisations and programs that further enable women's agency in digital access and ability. A continuous theme outlined in this paper is the importance of investing in time and effort to address gender equality, not just within digital inclusion, but also for the benefits of an inclusive approach for society as a whole.

In addition, there is a need to address negative risks from increased digital activity (such as the security of personal data, exposure to scams and online harassment). This is particularly relevant for those most vulnerable to exploitation. This paper provides a foundation for researchers to continue to address research gaps and track progress on digital access and ability of Australian women. Conducting such research in a more nuanced way will help develop a collaborative and integrated approach to increasing equality of digital participation.

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