



'I'll just text you': Is face-to-face social contact declining in a mediated world?

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Abstract

The rise in the network society might lead to a decline in face-to-face contact as people substitute it with more mediated forms, or an increase in both face-to-face and mediated contact as complements, with unknown consequences for social support. This article examines trends in social contact, mediated contact (phone, online, etc.), and social support in 2002, 2006 and 2010, using aggregated ABS General Social Survey data. Results show an aggregate decline in face-to-face contact and rise in mediated contact in Australia between 2002 and 2010, but no aggregate decline in perceived social support, and a strong positive individual-level association between both forms of contact and social support. There are, however, signs of an emerging class-based digital divide, with low-income older men and less educated respondents reporting lower levels of mediated contact and social support by 2010.

Keywords

ageing, class, digital communication, digital divide, gender, social contact, social support

The last few decades have seen a great increase in mediated communication in most societies. This transformation has occurred in the context of the rise in the 'network society' (Castells, 2000), or the propensity for more spheres of social life and action to be mediated through real and virtual (digital) networks. Castells (2000) notes that a

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defining aspect of modern society is the increasing importance of networks in mediating human interaction. Nowhere is this more visible than in the increased use of digital technologies and social media to interact socially with others. In 1994, only 4% of Australian households had internet access (ABS, 1999). By 2010, Organisation for Economic Co-operation and Development (OECD) figures placed Australia relative to other countries such as the UK and Canada with 79% of households connected; an increase from 32% in 2006 (OECD, 2012).

This rise in internet connectivity has also coincided with the proliferation of mobile phone use and technology and, subsequently, mobile internet connections. In 2015, wireless broadband connections via a mobile device accounted for 47% of all Australian internet subscriber access connections (ABS, 2015), up from 40% in 2010 and 17% in 2008 (ABS, 2011). These figures do not take into account mobile internet subscriptions. There are almost 21 million mobile handset internet subscriptions in Australia as of June 2015 (ABS, 2015).

Australians have well and truly embraced the idea of connecting with others 'anywhere and at anytime' (Wellman, 2004b: 28). Such a transformation raises the questions of whether digital interaction now serves as an easy substitute for face-to-face contact; whether the rise in the former has come at the expense of the latter; and what the impacts of such a change would be on social support.

Many studies examining the interactions between mediated contact and social contact have indicated that the changes in social ties and network composition accompanying new communication technologies are viewed negatively only inasmuch as they are seen to be non-traditional (Wang and Wellman, 2010; Carrasco et al., 2008; Rettie, 2008; Quan-Haase and Wellman, 2004). Wellman and others reject a dichotomized either/or position between mediated communication and face-to-face contact (Haythornthwaite and Wellman, 2002: 35; Wang and Wellman, 2010; Wellman, 2004a: 123). Quan-Haase and Wellman (2004) argue that the 'fear' that the internet is socially alienating is 'unwarranted', and argue that it serves an 'everyday' role in facilitating social and community ties (Quan-Haase and Wellman, 2004: 318).

Conversely, Nie et al. (2002) find evidence of a substitution or 'displacement' (2002: 230) effect for time spent among Americans using the internet at home, whereby time spent on the internet meant a loss of time spent in face-to-face social contact. They hypothesized that the rise of information technologies may have the effect of, 'reducing the number and meaningfulness of emotionally gratifying face-to-face human interactions' (2002: 240). However, this study was conducted when the social capacities of the internet were far less pervasive (preceding the launch of Facebook in 2006, for example).

It is unclear whether these changes in mediated communication have had an impact on general feelings of social connectivity and support, especially among adults within the Australian context. It is important to recognize that social contact and social support are not interchangeable (Patulny and Morris, 2012). Social support should also be examined in its own right, because of the important connections identified in several studies between social support and mental health and wellbeing (Cacioppo and Hawkley, 2003; Hawthorne, 2008).

It is also unclear whether social support is garnered more successfully through regular, personal face-to-face interactions than it is through mediated interactions. Gottlieb

and Sylvestre (1994) point to the importance of routine transactions as the mortar of personal relationships, whereby everyday face-to-face interactions such as conversation and physical proximity facilitate an ongoing sense of rapport between parent and child; an approach that may be extended to close relationships more generally. However, the rise in mediated interactions ‘anywhere and at anytime’ (Wellman, 2004b: 28) may then help foster routine relationships *differently* (if not necessarily better or worse) than more traditional means that typically require greater investment of time, emotion and self-presentation management (Rettie, 2009). Mediated communication may ease the difficulties in establishing routine interactions, rather than serving to undermine them.

This article examines the changing trends in the use of mediated forms of communication such as phone, text and email in Australia, using the 2002, 2006 and 2010 waves of the Australian Bureau of Statistics (ABS) General Social Survey. It will determine whether face-to-face contact is declining and mediated contact increasing in Australia, and whether there are any associated changes in perceived feelings of support.

Face-to-face vs mediated contact in fostering social support

Existing literature suggests that face-to-face contact has a generally positive effect on social support, though the effects of mediated contact are mixed. While social contact is generally positively associated with social support among the same groups of people (Patulny and Wong, 2012), this is not a universal principle. Patulny and Morris (2012) find that Australian public housing residents were significantly more likely to lack social support, despite being no more likely to lack social contact with people in their neighbourhood.

It is likely that new forms of mediated communication are being used to facilitate network ties, and subsequently form avenues for social connection and support (Boneva and Kraut, 2002; Grieve et al., 2013; Quan-Haase and Wellman, 2004; Rettie, 2008; Wei and Lo, 2006). Rettie (2008: 297) for instance finds that mobile phones increase the availability of social support because they facilitate immediate contact, and social network maintenance and growth regardless of time and location. Miller (2011) notes the importance of Facebook for helping people who are housebound and those lacking in mobility to connect with others. Grieve et al. (2013: 606) also find in their Australian study of Facebook that it offers positive social connections, albeit distinct from the social connections maintained through face-to-face contact.

However, few studies use large-scale data to explicitly link increased use of these new forms of mediated communication with increased levels of *support* – not just increased connectivity. The few existing studies show mixed results. Wangberg et al. (2008) analyse cross-European survey data and find that internet use is positively correlated with social support and (via modelled structural pathways) improved health, though it is unclear whether respondents are using the internet specifically to engage with others socially. However, Pollet et al. (2011) look at instant messaging and social network site use among adults, and find no positive relationship between online socializing and offline network size or emotional closeness.

Furthermore, while it is well established that, on aggregate, users of mediated communication find they have stronger networks ties, it is not clear how this functions for different groups of people. Certain key groups of people are at greater risk of lacking

face-to-face social contact, mediated contact and support. Gender, age and class are particularly important categories in this regard.

Gender has been linked to social isolation and a lack of support in several studies. Scholars have suggested that women might lack the time to spend socializing, as they spend more time balancing work and family commitments (Andersen et al., 2006). While international studies have produced mixed results about gender (Gray, 2009; Ogg, 2005; Wellman 1992), several Australian studies find that Australian men have poorer social support networks and higher levels of loneliness (Flood, 2005; Franklin and Tranter, 2008; Heady and Warren, 2007). Patulny (2012) finds that among separated men, fatherhood is associated with greater social contact, but less social support and efficacy in decision-making related to family and friends.

Age is also an important factor in social disconnection. Collegial networks, particularly among men, are vulnerable to decay from changing or losing jobs and retiring. Patulny (2009) finds that Australian men are likely to experience reduced social engagement after retirement (compared to women who experience an increase in social engagement), and Patulny and Wong (2012) find that single, middle-aged men are more likely to be socially disconnected. Berry et al. (2007) find that older women have significantly more contact with friends and extended family than older men in Australia, with women reporting more frequent social contact with all types of people except workmates.

Age and gender differences in social connections are potentially exacerbated through a digital divide, where some groups have a lower opportunity of access to new (communication) technologies (ABS, 2004). A number of studies find gendered patterns in the use of mediated forms of contact – such as phone use – in maintaining social contact with others, with men less likely to make use of such methods (Franklin and Tranter, 2008; Wei and Lo, 2006). ABS Census data (2004) showed a positive relationship between income and education and internet and computer uptake, but a negative relationship with age.

Education is also a key socio-economic factor for understanding the digital divide, as well as social disconnection and support. Bourdieu (1986) makes the clear connection between education and social networks in outlining the links between cultural and social capital in reinforcing class boundaries and advantages. Higher levels of social exclusion and lower levels of social connection have been found among those socio-economically disadvantaged on the basis of income, employment and education (Saunders et al., 2007; Stone et al., 2003). Education is a particularly important indicator in this regard, both as an indicator of real and potential social connections (Putnam, 2000; Wangberg et al., 2008), and as a key factor in the digital divide (Wellman, 2004b: 24). However, higher education may also have a countervailing effect on social contact, in that it is also associated with professional jobs and working long hours. There has been an intensification of work practices and work hours in recent decades following reforms aimed at improving competition, efficiency and flexibility, which suggests that the work might not be the place it once was for finding caring and supportive friendships (Sennett 1998; van Wanrooy and Wilson, 2006).

In sum, the literature suggests that social contact and support are generally likely to be positively associated, and that key groups of people, such as older men and the socio-economically disadvantaged with poorer levels of education, are more likely to lack both

social contact and mediated/digital contact. However, it is unclear whether social contact is declining as mediated contact increases in society or whether these two forms of contact are positively associated at the individual level. That is, whether these new forms of mediated contact serve as a substitute for face-to-face contact, or as a complement. It is also unclear whether mediated contact positively predicts social support; and how these trends and associations differ for those key groups of people identified as at risk of lacking social and digital contact, such as older males and those with lower levels of education. Our hypotheses for this article are therefore as follows:

- H1: Face-to-face contact is declining as mediated contact is increasing in Australia
- H2: Perceived social support is positively associated with face-to-face contact, but not mediated contact
- H3: Perceived social support is declining in Australia, as Australians substitute mediated contact for face-to-face contact
- H4: The decline in face-to-face contact and perceived support is more acute among key groups, such as males, older people, and those with lower education levels

Data and method

The dataset used in this study was comprised of the 2002, 2006 and 2010 General Social Survey (GSS), conducted by the ABS. The GSS is a nationally representative sample of the Australian population, which asks questions about social contact with and support from others. Data was gathered in face-to-face interviews conducted using a randomized multi-stage area sampling technique of individuals aged 18 and over,¹ with a final weighted sample of 43,913 people (totals are lower for the regression models due to missing data on predictor variables).

Three key variables were used to capture self-reports of social contact and social support. These were derived from a series of questions in the survey, with responses coded into intuitive yes/no binary assessments. The questions, scales and recoded categories are as follows:

Face-to-face contact – how often have you had any contact with family or friends that live outside the household: this was derived from a series of binary and ordinal questions asking about face-to-face contact, and recoded into whether the respondent had *less than weekly* face-to-face contact with these persons (y/n). This item appeared in all releases of the GSS: 2002, 2006 and 2010.

Mediated contact – how often have you had any of these other types of contact with family or friends who do not live with you: this was similarly derived from a series of binary and ordinal questions asking about mediated contact. Types of mediated contact were grouped into two categories:

1 – ‘New’ mediated contact (NMC) types: mobile phone for calls, mobile phone for SMS, internet such as email or chat rooms.

2 – ‘Old’ mediated contact (OMC) types: fixed telephone, and mail (including cards) or fax.

Table 1. Sample sizes and proportions for contact and support variables, GSS 2002–10.

	2002	2006	2010	
	%	%	%	
Face-to-face contact				
Less than weekly	16.18	20.69	20.99	
Old mediated contact (OMC)				
No letters weekly	–	68.97	76.10	
No landline calls weekly	–	9.26	23.12	
Less than weekly any OMC	–	8.04	20.00	
New mediated contact (NMC)				
No email/chat/social media weekly	–	52.89	40.44	
No mobile calls weekly	–	24.61	17.82	
No SMS weekly	–	49.46	36.19	
Less than weekly any NMC	–	18.84	12.78	
Lacks support/confidant/favours		12.85	12.96	
Total N	13,667	14,425	15,821	43,913

Responses were recoded into whether the respondent had *less than weekly* contact with non-household persons using any form of NMC (y/n), and another variable for whether the respondent had less than weekly contact with non-household persons using any form of OMC (y/n). These items were not in the 2002 version of the GSS. As such, analyses pertaining to these variables were restricted to the 2006 and 2010 waves of the GSS.

Social support – this measure was compiled from three separate items; lacking someone to confide in, lacking support in a time of crisis, and having no one to ask small favours from. This variable was coded as ‘lacking support’ when respondents reported lacking at least one of these three forms of support.

Results

Descriptive statistics and preliminary analysis

Weighted total sample sizes and key independent variable category proportions by GSS wave are shown in Table 1.

These figures show that the proportion of people having less than weekly face-to-face contact with family and friends significantly increases between 2002 and 2006, from 16% to 21%, and then stabilizes between 2006 and 2010. One-way ANOVA testing indicates that the increase in the proportion of people without weekly face-to-face contact is significant between 2002 and subsequent years ($p < .000$), although not between 2006 and 2010. There is also a decline in the use of older mediated forms of communication (OMC), with the proportion using these forms less than once a week jumping significantly from 8% in 2006 to 20% in 2010. This is largely driven by the decline in the use of landline phones over this period (jumping from 9% to 23% non-weekly use).

Conversely, there has also been a significant decrease in the proportion of people not using any form of new mediated contact (NMC) weekly, which dropped from 19% in 2006 to 13% in 2010 ($p < .000$). This is driven by an increase in the use of all three forms of NMC, though the biggest declines in non-usage are in email/chat/social media, and texting (drop of 13 percentage points each).

However, while there has been a clear shift away from the traditional and towards new forms of mediated communication, there has been no change in social support over the period from 2006 to 2010. In each period, the proportion of people lacking support remained constant at 13%.

Regression analyses

We next undertook regression analysis to examine the simultaneous influence of important covariates on the face-to-face and mediated contact variables.² The binary nature of all dependent variables mandated the use of logistic regression, and results are reported as marginal effects at the means (ME) in Tables 2 and 3. The independent variables were also coded into a series of binary dummy variables (0 or 1). Each ME shows the effect of a one-unit change in the independent variable – essentially a change from a ‘no’ (not being of that category) to a ‘yes’ (being of that category) – on the probability of the dependent variable also being a ‘yes’.

The key independent variables used in the analysis account for gender, education and age, as these are key groups identified in the literature as risking social isolation and a lack of support. In order to clearly identify the combined effect of gender and age,³ and any changes over time pertaining to these variables and to education, dummies were coded for all combinations of older (55+) and younger (less than 55-year-old) males and females in 2002, 2006 and 2010. Dummy variables were also created for those with a lower level of education (less than Year 12) in each of these years.

Other socio-economic controls included in the models were marital status, immigrant status, income, and housing status. Categories were omitted to create a reference category of a female in 2006, aged under 55 years, without children, working between 1 and 34 hours, of low income, educated at Year 12 level or higher, Australian-born, who lives in private housing. This reference category was chosen as it can remain constant across models using all three waves or restricted to 2006 and 2010 data, and also as a point of comparison for the hypothesized differences for older, male, and lower educated groups. Although model fit statistics such as Nagelkerke pseudo r-squares are fairly low, likelihood ratio tests show improvement of the full model from both a null and a constrained model without the full set of controls (results available on request).

The first series of regressions (as shown in Models 1–3, in Table 2) reveal important findings concerning gender and education in terms of contact with others. Model 1 shows the marginal effect of various gender, age and education variables in predicting having less than weekly face-to-face contact. There are no significant differences between the reference category of younger women (aged under 55 years) in 2002 and any other category combining women and age. By contrast, there are significant differences for men. Younger men (aged under 55 years) are 3% more likely to have less than weekly face-to-face contact in 2006. Older men (aged 55 and over) are even more likely to lack weekly

Table 2. Logistic regressions: likelihood of no weekly contact by lack of other types of weekly contact and demographic categories (only key categories shown) – marginal effects (ME) and standard errors (SE).

Independent variables	Logistic regression models													
	(1) Less than weekly face-to-face contact		(2) Less than weekly face-to-face contact		(3) OMC Less than weekly use		(4) OMC Less than weekly use		(5) NMC Less than weekly use		(6) NMC Less than weekly use			
	ME	SE	ME	SE	ME	SE	ME	SE	ME	SE	ME	SE		
Less than weekly:														
Face-to-face contact, 2006							0.07***	(0.02)				0.07***	(0.01)	
Face-to-face contact, 2010							0.03*	(0.01)				0.07***	(0.02)	
OMC use, 2006			0.12***	(0.03)								0.02	(0.01)	
OMC use, 2010			0.06**	(0.02)								-0.02**	(0.01)	
NMC use, 2006			0.14***	(0.02)			0.03*	(0.01)						
NMC use, 2010			0.12***	(0.03)			-0.03**	(0.01)						
Females														
Under 55, 2002	-0.01	(0.01)												
Under 55, 2010	-0.01	(0.02)	-0.01	(0.02)			0.15***	(0.02)			-0.07***	(0.01)	-0.06***	(0.01)
55+, 2002	-0.02	(0.02)												
55+, 2006	-0.01	(0.02)	-0.02	(0.02)			-0.07***	(0.01)			0.14***	(0.02)	0.14***	(0.02)
55+, 2010	0.02	(0.03)	0.03	(0.03)			0.02	(0.02)	0.04	(0.02)	0.05	(0.03)	0.05	(0.03)

Table 2. (Continued)

Independent variables	Logistic regression models											
	(1) Less than weekly face-to-face contact		(2) Less than weekly face-to-face contact		(3) OMC Less than weekly use		(4) OMC Less than weekly use		(5) NMC Less than weekly use		(6) NMC Less than weekly use	
	ME	SE	ME	SE	ME	SE	ME	SE	ME	SE	ME	SE
Males												
Under 55, 2002	0.02	(0.02)										
Under 55, 2006	0.03*	(0.01)	0.02	(0.02)	0.07***	(0.02)	0.06***	(0.02)	0.05***	(0.01)	0.05***	(0.01)
Under 55, 2010	0.04	(0.02)	0.03	(0.02)	0.25***	(0.03)	0.26***	(0.03)	-0.01	(0.02)	0.00	(0.02)
55+, 2002	0.02	(0.02)										
55+, 2006	0.04*	(0.02)	0.02	(0.02)	0.01	(0.02)	-0.01	(0.02)	0.16***	(0.02)	0.15***	(0.02)
55+, 2010	0.10**	(0.03)	0.09*	(0.03)	0.15***	(0.04)	0.17***	(0.04)	0.09**	(0.03)	0.09**	(0.03)
Education												
Less than Year 12, 2002	0.00	(0.01)										
Less than Year 12, 2006	0.05***	(0.01)	0.04**	(0.01)	0.04***	(0.01)	0.03**	(0.01)	0.08***	(0.01)	0.07***	0.01
Less than Year 12, 2010	0.03	(0.02)	0.02	(0.02)	0.04***	(0.01)	0.04***	(0.01)	0.10***	(0.02)	0.10***	0.02
N	39,152		24,619		24,619		24,619		24,619		24,619	

*p<0.05 **p<0.01 ***p<0.001.

Note: All regressions are weighted to correct for sampling bias, and include the demographic controls mentioned in the data description above.

Table 3. Logistic regressions: likelihood of lacking favours, support or someone to confide in by contact types and demographic categories – marginal effects (ME) and standard errors (SE).

Independent variables	Lacks either favours, support or someone to confide in		
	(7)	(8)	(9)
	ME	SE	ME
			(10)
			ME
			SE
			SE
			SE
Less than weekly:			
Face-to-face contact			
OMC		0.12***	(0.01)
NMC			
Female			
Under 55, 2010	-0.00	(0.01)	-0.01
55+, 2006	-0.02	(0.01)	-0.03*
55+, 2010	-0.04**	(0.01)	-0.04***
Male			
Under 55, 2006	0.06***	(0.01)	0.05***
Under 55, 2010	0.04*	(0.02)	0.02
55+, 2006	0.02	(0.02)	0.00
55+, 2010	0.01	(0.02)	-0.01
Education			
Less than Year 12, 2006	0.02*	(0.01)	0.01
Less than Year 12, 2010	0.03*	(0.01)	0.02
Other controls			

Table 3. (Continued)

Independent variables	(7)		(8)		(9)		(10)	
	ME	SE	ME	SE	ME	SE	ME	SE
Unemployed	0.02	(0.02)	0.02	(0.02)	0.02	(0.02)	0.02	(0.02)
Works 35 to 40 hrs	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Works 41+ hrs	-0.02	(0.01)	-0.02	(0.01)	-0.02	(0.01)	-0.02	(0.01)
Personal income, mid	-0.03**	(0.01)	-0.02**	(0.01)	-0.02*	(0.01)	-0.02*	(0.01)
Personal income, high	-0.04**	(0.01)	-0.03*	(0.01)	-0.03*	(0.01)	-0.02	(0.01)
Household income, mid	-0.02*	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Household income, high	-0.05***	(0.01)	-0.05***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)
Migrant, arrived before 1996	0.07***	(0.01)	0.06***	(0.01)	0.06***	(0.01)	0.05***	(0.01)
Migrant, arrived 1996 or afterwards	0.16***	(0.02)	0.13***	(0.02)	0.14***	(0.02)	0.12***	(0.02)
Never married	0.00	(0.01)	0.00	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Widowed	0.01	(0.01)	0.01	(0.01)	-0.01	(0.01)	-0.00	(0.01)
Separated or divorced	0.02	(0.01)	0.02	(0.01)	0.02	(0.01)	0.01	(0.01)
Has dependent children	-0.02*	(0.01)	-0.02*	(0.01)	-0.02*	(0.01)	-0.02*	(0.01)
Public housing resident	0.06***	(0.01)	0.06***	(0.01)	0.05***	(0.01)	0.05***	(0.01)
Lone parent	0.06**	(0.02)	0.05**	(0.02)	0.05**	(0.02)	0.05**	(0.02)
N	24,619		24,619		24,619		24,619	

*p<0.05 **p<0.01 ***p<0.001.
 Note: All regressions are weighted to correct for sampling bias.

face-to-face contact, and the chances of this are increasing over time; older men are 4% more likely to lack weekly contact in 2006 and 10% more likely in 2010. Low education is only significant in predicting a lack of weekly face-to-face contact in 2006, where those who did not finish Year 12 are 5% more likely to miss out on weekly face-to-face contact. The addition of mediated contact types in Model 2 (and restriction to 2006 and 2010 survey data) does account for some of the variance in the male categories, though the increased likelihood of men aged 55 and over in 2010 to lack weekly face-to-face contact remains significant.

While the predicted probability that using NMC types less than weekly remains strong across both years; there is a reduction in the effect of less than weekly OMC use. This suggests the relationship between OMC use and face-to-face contact weakens between 2006 and 2010.

Model 3 shows the marginal effects of categories of gender, age and education on the chances of not engaging in OMC in the last week, compared to a reference category of younger women in 2006. It shows a strong pattern of decline over time for most categories. In comparing women first, younger women in 2010 have a significantly higher chance (15%) of not using OMC weekly than they did in 2006. Conversely, older women in 2006 were less likely (7%) to go weekly without using a form of OMC – the only significant lower likelihood in the model – suggesting they had the most frequent initial use of OMC. Younger men have experienced a substantial increase in the chances of not using OMC, from 7% in 2006 to 25% in 2010. Older men exhibit no significant differences from younger women in terms of OMC usage in 2006, but had a 15% increased likelihood of not using an OMC form at least weekly by 2010. Those without a Year 12 education were consistently significantly more likely not to use OMC in both years: 4% in both 2006 and 2010. These results support the findings in the descriptive statistics that people were increasingly less likely to use OMC forms weekly between 2006 and 2010. The addition of the face-to-face contact and NMC variables do not alter these findings. The change in the NMC predictor variables between 2006 and 2010 from positive to negative provides evidence of a substitution effect that NMC is having on OMC. While those who lack weekly NMC are also more likely to lack weekly OMC in 2006, by 2010 they are less likely not to use OMC. The 2006 relationship may indicate more social individuals who utilize many communications channels, while the 2010 effect may represent those who do not wish to make the switch to NMC forms which have now become the preferred contact method.

Model 5 shows the marginal effects of gender, age and education on the chances of not engaging in NMC in the last week. This shows a general movement towards increasing engagement in NMC at least weekly over time, but with substantial gender differences. Younger women significantly decreased their chances of not using a NMC form at least weekly between 2006 and 2010 (-7%). This is the only significant negative margin, suggesting this group is most likely to use NMC at least weekly. Older women in 2006 were 14% more likely to not be using NMC at least weekly, but there was no significant difference between this group and their younger counterparts by 2010, suggesting that they had, to a degree, 'caught up' in terms of closing the digital divide in social contact. Younger men in 2006 had significantly higher chances (5%) of not using a form of NMC at least weekly; but again, there was no significant difference to the reference

group by 2010. However, while the marginal effects were declining, older men in both years still had higher chances of not using NMC weekly; 16% in 2006 and 9% in 2010. There are also significant effects for those without a Year 12 qualification in both years. They are 8% more likely not to use a form of NMC weekly in 2006, and 10% more likely in 2010. These findings show a persistent digital divide in social contact for older men and those with low education. The inclusion of the face-to-face contact and OMC variables in Model 6 do not alter these findings.

The second series of regressions (as shown in Models 7–10, in Table 3) reveal the links between face-to-face contact, mediated contact and support; between gender, age and education on social support; and test how the latter associations change when controlling for the former. Models 8–10 clearly show that both face-to-face contact and mediated communication (of either the OMC or NMC kind) are significant, negative predictors of lacking support. Not having at least weekly face-to-face contact significantly increases the chances of lacking support by 12% on its own, or 11% when considered alongside the effect of the mediated communication variables. Not using either OMC or NMC weekly is significantly associated with a 9% increase in the chances of having no support. When added to a model also controlling for face-to-face contact, this drops to 8% among those without weekly OMC and 7% among those without weekly NMC.

Looking at the effects of gender, age and education on support, Model 7 shows some surprising gender differences. There were no significant differences in support among younger women in 2006 and 2010, or between older and younger women in 2006, though older women's chances of not having support were significantly lower in 2010 (-4%). Younger men had significantly higher chances of lacking support in 2006 (6%), though this was non-significant by 2010.

What is surprising is that the full model reveals no significant differences in support for older men in either year, despite the findings above showing them having greater chances of social and digital isolation. Further investigation showed that this was attributable to controlling for household income. Without this control included in the models, older men were significantly more likely to lack support: by 4% in 2006 and 7% likelihood in 2010. Furthermore, when excluding the control for household income, the lower likelihood of not having support among older women in 2010 becomes non-significant. This result suggests that low income plays an important role in the availability of social support for both older men and women. More specifically, income aside, older women are significantly *less* likely to lack social support, and older men are significantly *more* likely to lack it.

There is no gender-age group whose likelihood of lacking support changes significantly between 2006 and 2010, even with forms of contact included in the model. However, including the NMC and OMC categories does change the significance of those without a Year 12 certificate. In both 2006 and 2010, people who did not finish Year 12 had a significantly higher likelihood of having no support relative to those who did finish Year 12. When mediated communication was included in the model, this effect became non-significant for both years. Notably, including face-to-face contact in the model, either with or without the mediated communication variables, did not change this effect. Although the change in the marginal effects between models is non-significant, it

suggests that for people with a lower level of education, mediated communication is more strongly associated with feelings of support than face-to-face contact.

Overall, these findings suggest that all forms of contact are important for social support. They will not adequately compensate for a lack of other resources (such as income) in the support needs of older men in particular, but mediated contact appears to have a role to play in helping those with lower levels of education bridge a divide in social support.

Conclusion and discussion

This article set out to examine the changing trends in the use of mediated forms of communication such as phone, text and email in Australia, to determine whether face-to-face contact is declining and mediated contact increasing in Australia, and whether there is any associated change in feelings of support. We tested four hypotheses, and came to the following conclusions:

- *H1: Face-to-face contact is declining as mediated contact is increasing in Australia* – we found support for this hypothesis, in that Australians are less likely in 2006 to be socializing face-to-face at least weekly than they were in 2002. People are also more likely in 2010 than in 2006 to be using mediated forms of communication to socialize.
- *H2: Perceived social support is positively associated with face-to-face contact, but not mediated contact* – we found only partial support for this hypothesis, in that both forms of contact are strongly associated with social support in regression analyses. This supports the notion that maintaining brief and seemingly routine interactions between agents is important in facilitating supportive social relationships, even if those interactions are mediated.
- *H3: Perceived social support is declining in Australia as Australians substitute away from face-to-face towards more mediated contact* – we found no support for this hypothesis, in that there has been no reported decline in perceived social support in Australia from 2002 to 2010
- *H4: the decline in social contact and support is more acute among key groups, such as males, older people and those lacking in education* – we found some support for this hypothesis, though results are mixed and complex. Men in general are more likely to lack regular face-to-face contact and contact via OMC, and older men are particularly (and increasingly) likely to lack regular face-to-face contact. Older men are also likely to lack OMC, and are the only group more likely to lack NMC by 2010. This is indicative of a growing digital divide based on gender and age. However, this lack of contact is not directly associated with lower levels of support for men in general or older men in particular. Only household income impacts on these associations. With lower incomes, older men are more likely to lack support, and controlling for income suppresses the tendency of older women to have significantly more support. The models also reveal that those with lower levels of education are less likely to use OMC in either time period, and increasingly more likely not to use NMC by 2010, confirming a digital divide based on education. Furthermore, mediated communication *does* affect the likelihood of

having social support among those with lower levels of education, so this divide is of greater importance in this context.

A limitation of this study is the use of aggregate measures of 'old' and 'new' communication types. While this allows us to assess broad changes that have occurred with the rise in digital communication, it does not allow us to examine how the different types of communication technologies and their various platforms specifically influence perceived support. Ellison and Boyd (2013) describe the great multiplicity of social media networking sites that offer so many opportunities for interaction, and how the dynamic nature of these sites allows users to create new groups of interest around which to cohere and be social. Turkle (2015), however, warns that such capacities may instead lead to more superficial relations, shallow friendships and a lack of empathy, as individuals are able to move seamlessly between spoken and textual conversation following the endless compulsion to check messages. Such micro-level assertions are outside the scope of the current study and available data. Future studies may seek to further examine the role of such specific communication practices on perceived support at the broader social level, when appropriate data becomes available.

This study has repercussions for social policy. Evidence of social disconnection among older men in Australia has accompanied policy initiatives aimed at improving connections among older men, such as Men's Sheds and self-activation programs (Cattan et al., 2005; Findlay and Cartwright, 2002). It is potentially worth rethinking and investigating a number of policy devices in this regard. Many of the existing strategies are community based, linking young families and isolated older persons in face-to-face contact (Findlay and Cartwright, 2002). These include 'gate-keeper' projects to identify at-risk fathers and separated fathers, education, counselling, self-help and hobby (self-activation) groups in community centres, as well as mentoring, volunteering and targeted activity groups (Cattan et al., 2005).

However, the findings here suggest that both face-to-face and mediated contact play an important role in improving the social support of most – but not all – groups of people. Strategies aimed at improving the digital interaction of people with lower levels of education might prove an effective approach for improving social interaction and support. Interventions designed to improve the digital literacy of such persons around social media platforms that facilitate both digital and face-to-face interaction, such as Facebook or Meetup, may prove to be more effective than more conventional community-based activities. Specific evaluations of the effectiveness of such sites in this regard could be a useful avenue for future research.

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Notes

1. Response rates were 91% in 2002, 86% in 2006, and 88% in 2010. For more information on survey method, see the GSS User Guides available at Cat. No. 4159.0, www.abs.gov.au/ausstats

2. Analysis was conducted using Stata v 11.
3. This approach facilitates a more straightforward model and interpretation of marginal effects. Marginal effects in nonlinear models, such as logistic regression, requires a different approach than simple linear models (Karaca-Mandic et al., 2012).

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