

Coworking in the Digital Economy: Context, Motivations, and Outcomes

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Abstract

The number of self-employed, freelancers, and remote workers has risen steadily; simultaneously a range of collaborative shared workspaces - coworking spaces – has emerged rapidly in which these individuals ‘work alone together’. However, existing research is skewed towards the community aspect of coworking, treated largely as an end in itself and investigated by qualitative approaches only. We argue that this represents only a partial account of coworking. Thus in addressing the basic research question of why people who no longer need to work together apparently choose to do so (for at least part of their working lives), we delineate inputs (social and environmental factors), outputs (community, interaction and knowledge sharing) and outcomes (innovation, growth) of coworking and investigate these quantitatively for the first time. Data was collected via a questionnaire survey of coworkers across two coworking spaces in South East Wales, UK. We find that coworkers report enhanced levels of innovation, despite this typically not being an explicit motivation. Finally we discuss potential limitations of the study, possible policy implications, and fruitful areas of further research such counterfactual surveys of those presently not using coworking spaces, multivariate and longitudinal methods to further explore the causal relationships between inputs, outputs and outcomes.

Keywords: Coworking; remote working; knowledge economy; innovation; proximity

1. Introduction

Back in 1980 Alvin Toffler coined the concept of the Electronic Cottage (Toffler, 1980); this was essentially the idea that people, particularly those engaged in ‘knowledge work’ would in the future be less bound to a traditional workplace as technology increasingly made working elsewhere possible. Nearly forty years later, and while tele-working is not as ubiquitous as Toffler might have envisaged, data from the Office for National Statistics in the UK (Labour Force Survey) does show that there are now more than 4.5m self-employed workers, or 15% of the employed workforce. Moreover, around 17% of the UK employed labour force is now engaged in some form of remote working, a steady increase of 4 percentage points from 1997 (Felstead and Henseke, 2017). Similar trends are observed in Europe (Eurofound and ILO, 2017) and in the US (BLS, 2016). Thus while we should keep in mind that there are still 25m people in standard employment in the UK, an increase in self-employment of more than 1m since the turn of the millennium (and 15% since the beginning of the economic crisis) in combination with the upward trend in remote working suggests that significant changes are occurring when it comes to the nature of employment and related modes of working.

Returning to Toffler, he commented that when advanced information and communication technologies became ubiquitous people would “no longer need to huddle” (p215), i.e. that physical proximity would become largely redundant in the process of undertaking knowledge work. This scenario was in turn developed enthusiastically some decades later, perhaps most notably by Thomas Friedman (2005) who argued that ‘The World Is Flat’; such a narrative has an intrinsic appeal- armed only with a laptop, anyone wherever they are can take part in the global economy, which in turn serves as a meritocratic level playing field for their talents. There is however a significant body of evidence available (see for example Glaeser, 2011) that workers are actually carrying out many of their activities in ever closer proximity to one another, and that the outcomes of these activities (innovation,

economic growth) are becoming more concentrated across space rather than less. Similarly, a number of convincing critiques of the flat world hypothesis have been put forward (perhaps the most comprehensive being that of McCann, 2008). So on the one hand footloose or mobile working is on the increase, while on the other, the forces driving, and outcomes deriving from proximity are increasing. Reconciling these apparent contradictions would seem a potentially fruitful field of research.

To this end we present an empirical investigation focused upon the spaces within which these workers can increasingly encounter each other when not working at home, in a regular office, or otherwise itinerantly – coworking spaces. Coworking involves entrepreneurs, freelancers and telecommuters (working either for themselves or for other firms), who in the words of Spinuzzi (2012) work ‘alone together’ in a variety of shared collaborative workspaces. Thus we use the word coworkers – people who use coworking spaces – as a single collective term, while acknowledging different motivations and drivers may be involved (Spinuzzi, 2012; Mitev et al, 2018). The basic research question we seek to investigate is why do people who in the words of Toffler no longer need to huddle apparently choose to do just that, for at least part of their working time? In order to do this, as recommended by Butcher (2018) we aim to consider both individual level motivations for coworking and the broader socioeconomic context within which these are manifested.

This is a burgeoning literature on the coworking phenomena, but significant gaps remain. For example the work of Brown (2017) focuses on the role of peer to peer support; conversely it reaches the conclusion that formal collaboration is a rarity in such environments. This is however a rather dichotomous interpretation which largely ignores interaction which has an economic or business-focused motivation but which stops short of formal collaboration. This is an issue we seek to address in this paper. Moreover, we develop our line of enquiry by asking coworkers to quantify actual outcomes related to innovation and business growth derived from their coworking; at the time of writing no other published study of coworking (to the best of our knowledge) has sought to do this. Moreover the work of Spinuzzi (2012), while seminal, is restricted to investigating the 'desired benefits' identified by coworkers rather than tangible outcomes, and, as per the vast majority of empirical coworking studies, employs a purely qualitative approach a quantitative methodology is adopted here. Similarly, the idea of 'community' is a key focus for the majority of coworking studies; further work by Spinuzzi et al (2018) suggests that the majority of coworking spaces do not actually represent a purely new form of (community based) organisational model but rather hybrid structures which incorporate elements of market-based activities also. Thus although authors such as Garrett et al (2017) argue that a sense of community is an organisational asset and investigate how it might arise in a coworking environment, we suggest that a purely community-focused approach remains an incomplete account of the coworking phenomena. Again this is something the present paper aims to address by conceptualising community not as an end in itself, but an output of coworking along with knowledge exchange and collaboration which may in turn facilitate tangible outcomes such as innovation and growth.

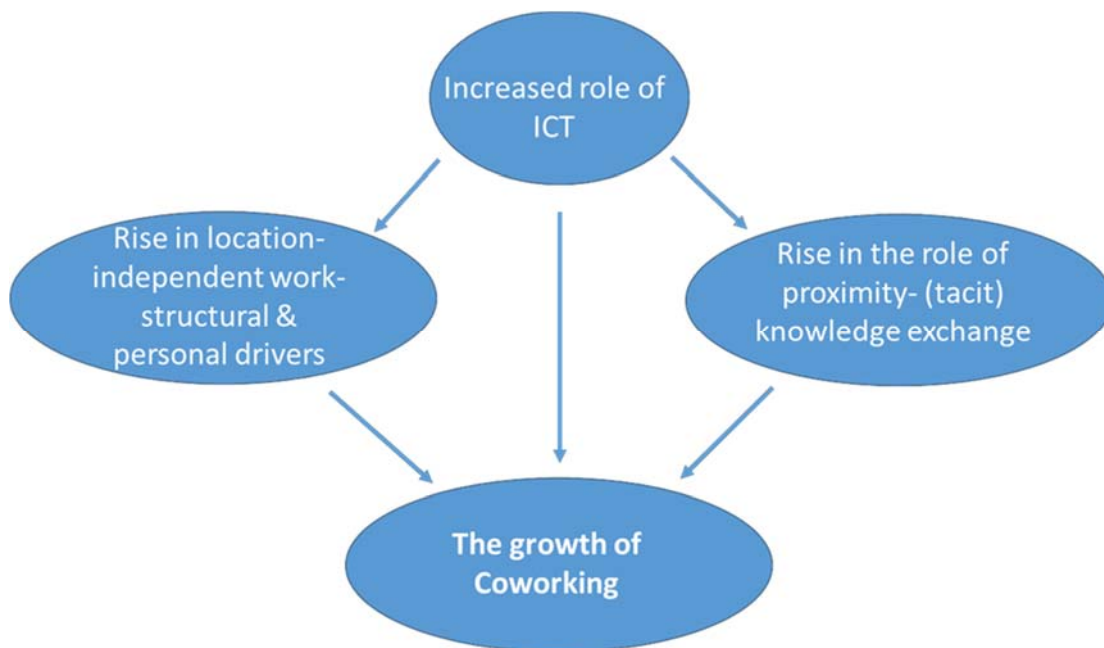
The paper therefore proceeds as follows; firstly we provide a brief overview of recent trends in self-employment and remote working, i.e. as the supply-side for coworkers. We then move on to a review of the coworking phenomena itself, with a brief literature review focusing on the roles played by community, proximity and knowledge sharing in relation to the question as to why people cowork. From this an analytical framework (Figure 4) is developed on inputs, outputs and outcomes to and from coworking, and investigated using a questionnaire survey instrument distributed to users of two coworking spaces in Cardiff, UK. Following the analysis of the results thereof, implications are

discussed, with the potential weaknesses of the present study noted, and directions for future research explored.

2. Context

The broader context for these developments is the growth of the knowledge economy and the role of ICT. An upward trend in remote working would seem to suggest at least some truth in the ‘death of distance’ hypothesis (Cairncross, 2001), while simultaneously as noted above there is irrefutable evidence that the rise of the globalised knowledge economy has seen an accelerated polarisation (Ehrenhalt, 2012) of outcomes and apparently ever-increasing forces of agglomeration. In deconstructing the ‘Flat World’ thesis, McCann (2008) makes the convincing argument that rapid improvements in ICT have actually increased the quantity, variety and complexity of knowledge involved in economic activity, in turn increasing what he terms the spatial transaction costs involved in its use. As much of this knowledge is non-routine or tacit in nature, high levels of face-to-face interaction are thus required to maintain effective exchange relationships. Developing this point, Berger (2013) specifically discusses the efficacy of word-of-mouth communication as being more targeted and more trusted than other forms – and by its nature this of course largely occurs face-to-face.

Figure 1: Coworking- a contextual framework



Source: authors' own elaboration

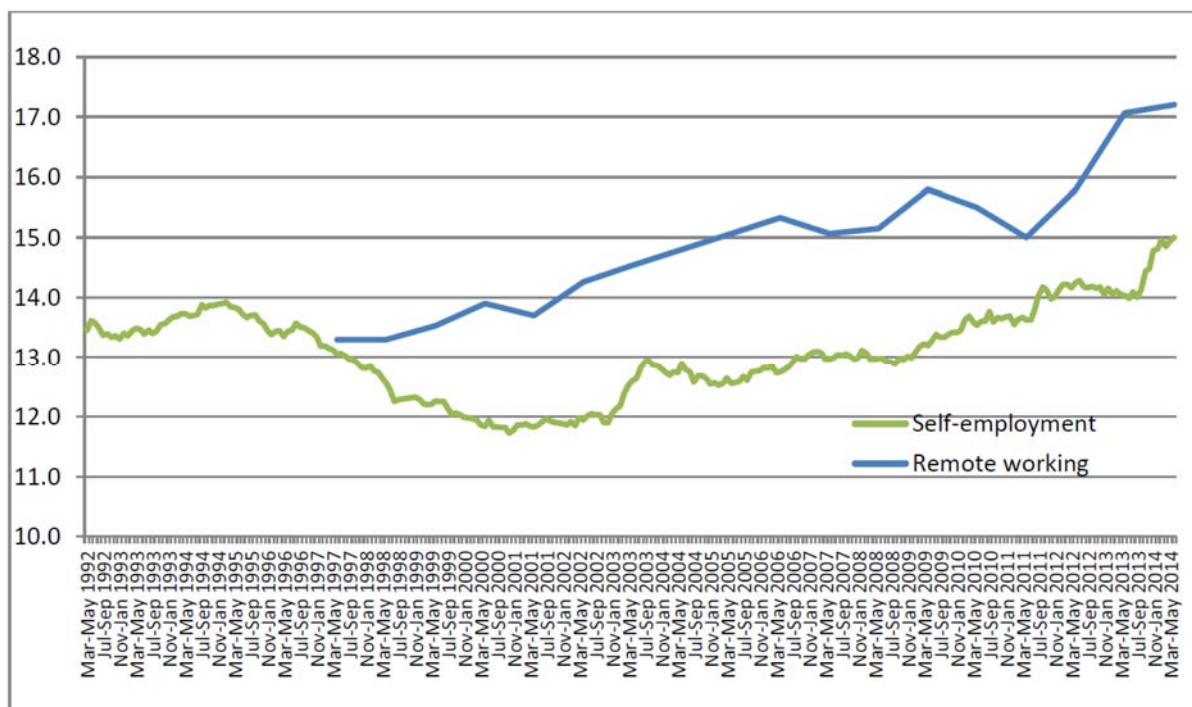
Such cumulative and self-reinforcing positive externalities are an extension of those described by Marshall (1890) and developed by Porter (1990) i.e. deriving from thick labour markets, specialised producers and niche service providers in dense networks of both collaboration and competition. However, in modern cognitive-cultural capitalism they are also blended with spillovers at the individual (i.e. rather than firm or industry) level derived from diversity and variety of experience

(Frenken et al 2007; Florida, 2002; Clifton, 2008). Thus the economic geography literature emphasises the role of proximity for knowledge generation, transmission, and innovation; Boschma (2005) suggests that spatial proximity facilitates interactive learning by strengthening the other dimensions of proximity (social, cognitive, organisational, institutional). These facilitate opportunities for face-to-face interaction, as described (for example) by Scott (2014). In turn, the evidence suggests that these interactions mainly take place on an informal or untraded basis (as per Storper, 1995). In summary, Figure 1 presents a contextual framework for the empirical investigation of coworking that we present in this paper, linking the drivers of increased location-independent work within a knowledge based economy which proximity and the exchange of tacit knowledge play a key role. The specific research questions to be investigated in relation to coworking itself are developed subsequently in Section 4.

3. Potential coworkers: self-employment, remote working, and freelancing

In this section we provide an overview of the inter-related developments in self-employment, remote working, and freelancing¹ – these are the primary groups from which coworkers are drawn (albeit not exclusively so, as more flexible work regimes may increasingly provide employees of larger organisations with the opportunity and the motivation to cowork) and thus suggest the term 'location-independent work' as a shorthand for the group of people we can conceive this as constituting the supply-side of coworking.

Figure 2: The rise in UK self-employment and remote working (% of all in employment)



Source: Labour Force Survey, data adapted from Felstead and Henseke (2017). Remote working defined as working mainly or partly away from the premises of the employer.

Figure 2 shows remote working and self-employment trends in the UK since the mid-1990s. Following the recession of the early 1990s, self-employment declined as firms began to take on workers again

¹ In their 2017 study Stam and van de Vrande (2017) identify around half of coworkers as solo self-employed or 'solopreneurs'.

(falling below 12% in the early 2000s) - i.e. many individuals pushed reluctantly into self-employment or freelance work returned to the conventional labour market once the economic situation improved. There is also a larger context of structural change with many previously vertically integrated activities subject to outsourcing (Clifton, 2001; Gottfredson et al. 2005), such that they take place in more loosely coordinated value chains rather than within single organisations. Notwithstanding the above, we should of course keep in mind that the single largest group of the self-employed by industry is to be found within construction, and that the majority of self-employment remains home-based (Mason and Reuschke, 2015).

However, following the 2007-09 crisis self-employment is still rising, and rapidly so in recent years, to above 15% of the labour force in the UK. Despite the well-documented rise in precarious forms of employment (as per notorious 'zero-hours' contracts, see for example Woodcock, 2014) which may indeed constitute 'false' self-employment, this would seem to indicate a more fundamental shift to new ways of working and work organisation (this is supported by Labour Force Survey data in the UK showing that the two occupational categories with the highest increases in self-employment during this period to be managers, directors and senior officials and professional occupations). On this point, Figure 2 also shows the trend in remote working (defined as working mainly or partly away from the premises of the employer) in the UK from 1997 (the earliest point at which consistent data is available) up to 2014. This shows a steadily increasing trend, albeit with dip in 2001, from just over 13% of the employed labour force to over 17% in 2014. Moreover, these trends are by no means restricted to the UK (see for example Eurofound and ILO, 2017; BLS, 2016). As noted by Felstead and Henseke (2017) this is somewhat at odds with more exaggerated claims around the 'death of the office', but is steady nonetheless. The work of Felstead and Henseke (2017) represents the first (to our knowledge) robust attempt to analyse the underlying factors contributing to the growth of remote working. To do so they control for three factors – the shift towards the knowledge economy, the rise of flexible working, and the changing demographics of the workforce. Essentially, their analysis shows that only one third of the increase in remote working is explained by these three factors (as they specify them). In other words, the remaining two thirds is either explained by factors other than those outlined above, or the increase in remote working reported in the official statistics is an overestimation. This is a theme to which we return later in this paper.

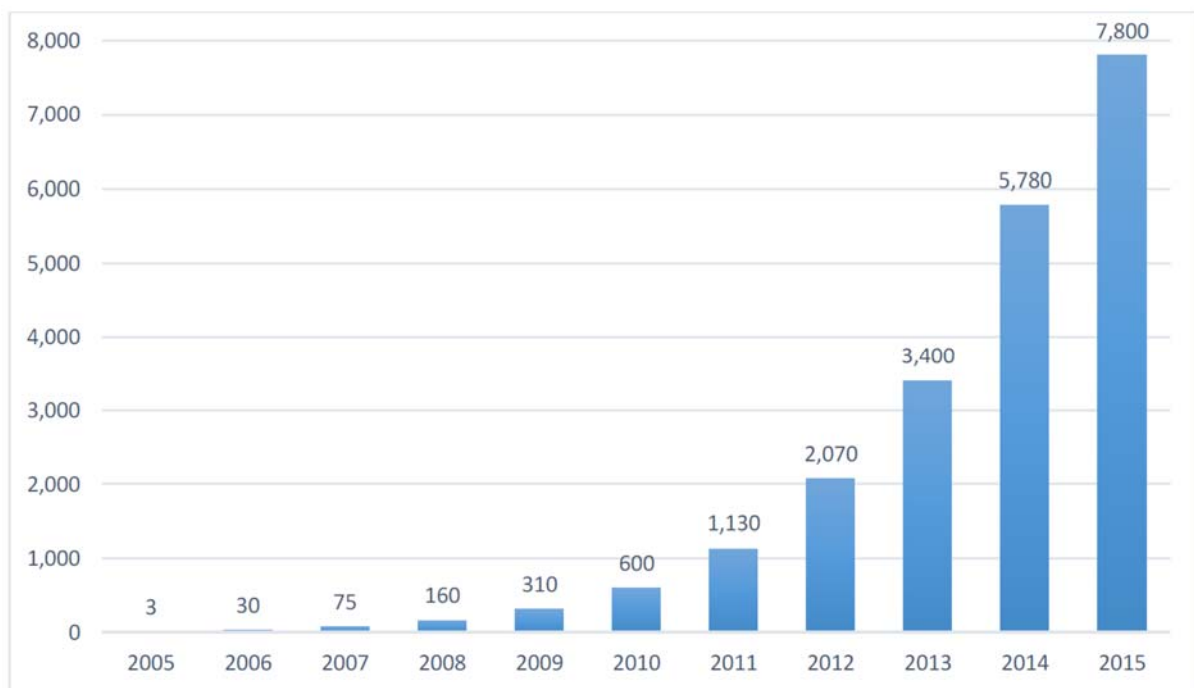
Just under half of the 4m businesses without employees in the UK can be defined as freelancers (Department for Business Innovation and Skills, 2016), representing an 82% increase between 1992 and 2014 (Kitching, 2016). Freelancers have variously described as independent professionals (Bögenhold et al., 2014), contractors (Barley and Kunda, 2006), free agents (Pink, 2001), 'lone eagles' (Beyers and Lindahl, 1996), 'knowmads', 'solopreneurs' and even 'lattepreneurs' (Dunstan, 2015). They work particularly in occupations in the creative and media sectors including journalism, television and radio, film, publishing, photography, public relations, translation, design, art, and music (Kitching, 2016). Friebe and Lobo (2006) have referred to this group as 'digital bohemians', who reportedly view themselves as nodes in a network (flexible, mobile and ad hoc), rather than cogs in a bureaucratic system (Fisher, 2008; Waters-Lynch et al (2016). Given the increasing ubiquity of digital activities it is however increasingly hard to define these in relation to specific sectors.

4. The Coworking Phenomena

In the absence of a regular workplace freelancers and other remote workers can either rent their own office – which will be expensive and for many tasks probably not necessary – or they can work at home, with the various distractions and blurring of work/domestic boundaries that this entails

(Crosbie and Moore, 2004; Gold & Mustafa, 2013; Mason and Reuschke, 2015). Indeed, as Shepherdson (2009) argues, managing the separation of work and home in the absence of clear material or spatial distinction has in many cases largely become the responsibility of the worker. This in turn of course begs the question as to where else these work activities are being carried out. One option might be to use existing 'third places' (Oldenburg, 1989) – a local coffee shop for example. Although often convenient these will inevitably have drawbacks of their own, not least the somewhat random set of encounters to be found therein. And so the idea of coworking has arisen. Coworking involves 'working alone together' (Spinuzzi, 2012) in shared, collaborative workspaces in which the emphasis is ostensibly on community, relationship, productivity and creativity, but also providing the freedom to work independently in a non-routine, creative way. There are of course also practical aspects, with cost-savings through shared space and facilities argued to be an important driver in the wake of the 2007-09 crisis (Merkel, 2015).

Figure 3: The growth of coworking globally (total number of spaces)



Source: Deskmag 2015, via Waters-Lynch et al (2016)

Figure 3 shows the exponential growth in the number of coworking spaces globally since 2005, as reported by Deskmag (2015). Deskmag estimates that as of 2015 there were approaching 8,000 coworking spaces in existence worldwide, accommodating a total of over half a million coworkers. Relatively, this is still a small number of course, but one which is significant and growing; thus we can interpret coworking as a kind of natural experiment within emerging models of work organisation. According to the Deskmag Survey (2012), the main reasons why people join a coworking space is to be part of a community, followed by interaction with others, flexible work styles, and serendipitous encounters, discoveries and opportunities. Deskmag has an agenda to actively promote coworking; other researchers have though reported mutual trust and the sharing of common core objectives and values between members (Brown, 2017; Merkel, 2015; 2018). Coworking spaces may also potentially create an atmosphere of 'organisational encouragement' (Amabile, 1997; p40) that supports creativity via active information flow and the constructive judgement of ideas. In summary, Waters-Lynch et al

(2016) conclude that coworking is differentiated from other forms of shared workspace (and serviced offices in particular) by the social interactions and collaborative activity offered as a key aspect of its value proposition (with a strong emphasis on the role of the 'membership community' (as per Frost, 2008; Botsman and Rogers, 2011; Parrino, 2015; Liegl, 2014; Bilandzic and Froth 2015). The basic point here is that coworking is about more than simply sharing physical space and the formal aspects thereof.

Putting it another way, coworkers need to be both 'good-neighbours' and 'good-partners' (Spinuzzi 2012: p36). Related to this, Mitev et al (2018, p11) highlight the potential for coworking spaces to facilitate the 'collecting' and 'donating' of tacit knowledge. This echoes Butcher (2018) who notes that little is actually known regarding how learning occurs in coworking spaces, or indeed the detail of what is actually learned. Capdevila (2014) offers one of the few accounts of coworking practice that attempts to link explicitly to underpinning rationales of innovation and knowledge exchange; thus he conceives coworking spaces as 'microclusters' that enable knowledge transfer among members from a network –based perspective. However, in common with Mitev et al (2018), no direct empirical evidence is provided as the extent to which this is happening or indeed how.

It was noted earlier that Spinuzzi et al (2018) actually suggest that most coworking spaces are hybrids incorporating aspects of both community and the market. Thus we can interpret them as intermediate forms of economic organisation i.e. existing somewhere between the hierarchies and markets of Williamson (1985). Moreover, as an open innovation rationale (Chesbrough, 2003) suggests that future success depends upon the effective management of a dynamic innovation ecosystem rather than via either formal hierarchies or indeed pure markets, coworking would seem to have an important role to play as entrepreneurship is increasingly understood as a collective rather than individual endeavour Butcher (2018). Returning explicitly to the role of community, (Garrett et al, 2017) identify a sense of community as an asset at the organisational level, associated with higher level of satisfaction and performance. In exploring how this might be constructed within shared workspaces they identify collective actions focused around endorsing, encountering and engaging. Conversely- as Kim and de Dear (2013) have shown, the simplistic or unmanaged use of open-plan working space is unlikely to achieve significant interaction gains while at the same time having considerable disadvantages (loss of privacy, noise and disturbance). Finally, we make the observation that the coworking literature has neglected the question as to why coworkers might favour a particular coworking space to use, or at least conflated it with broader questions regarding why people chose to cowork in general. There are likely to be overlapping but potentially differing answers to these questions which may reveal a more nuanced picture, of potential use to both coworking space providers and indeed policy stakeholders.

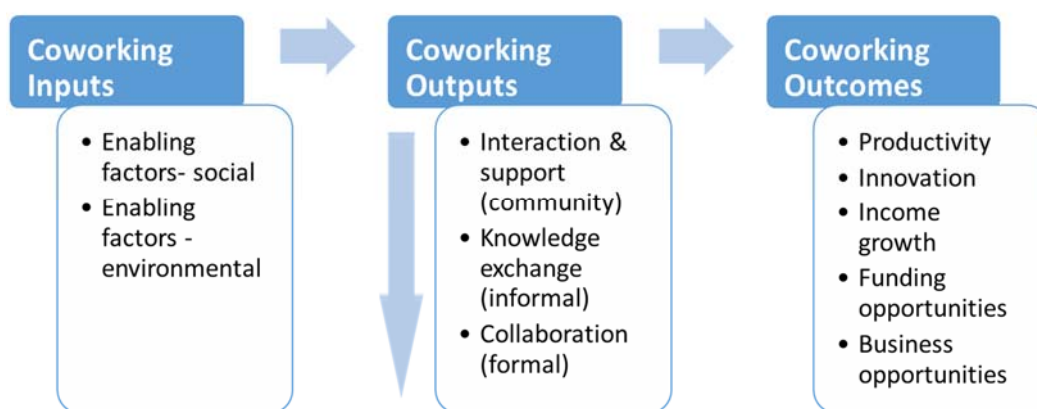
5. Research questions arising

The sections above have outlined the growth of coworking in the light of changing employment structures, i.e. increased levels of self-employment and remote working. The broader context for these changes has been the increasing demand for context-specific or tacit knowledge, which is associated with the ongoing sophistication of information and communication technologies. This in turn has heightened the returns to proximity and face-to-face knowledge exchange in particular. Investigating the coworkers directly - location-independent workers who work alone together in shared collaborative workspaces- offers an opportunity for light to be shed here. Thus the overarching research question we seek to address is why do people who are typically not constrained by either the fiat of an employer or by the nature of the capital equipment they use apparently choose

to work in close proximity to others, for at least part of their working time?² More specifically - to what extent do the potential explanations represented schematically in Figure 1 seem to be at work? To this end we aim to consider both individual level motivations for coworking and the broader socioeconomic context within which these are manifested (as per Butcher, 2018).

Previous studies have addressed related questions – but only partially so, and almost exclusively using qualitative methods. Therefore an important research gap remains. To address this we identify key factors highlighted by the coworking literature and categorise them as variously Inputs, Outputs and Outcomes, where inputs are thought to facilitate the coworking environment, and outputs are factors which are hypothesised to arise from a functioning coworking space but which are not ultimately outcomes for the individual co-worker in relation to their work-related activities. Finally, the question regarding the outcomes of coworking is considered directly, via data from the coworkers on productivity but also relating to innovation and income, and more generally regarding perceptions of access to future opportunities. Therefore the present study is differentiated from previous investigations of coworking which have rather conflated these input and output factors, leading to somewhat circular or tautological lines of enquiry, and largely neglected altogether the issue of outcomes. This is particularly relevant with regard to the concept of community in coworking spaces, which is a predominant feature of other studies, albeit an incomplete one when considered as an end in itself rather than a factor that can facilitate quantifiable improvements knowledge sharing which in turn can ultimately raise productivity, innovation and income. To this end Figure 4 presents our analytical framework for considering these issues.

Figure 4: Analytical framework



Source: authors' own elaboration

More generally, in investigating interaction and knowledge sharing the research question is posed as to the functioning of micro-clusters as per Capdevila (2014). If these do exist we would expect also to find evidence of productive and innovative outcomes. Moreover, given the literature review outlined in previous sections, coworkers would be expected to report the informal sharing of tacit

² They may well continue to work at home or indeed in other third spaces in parallel.

information, and the role of face-to-face interaction (Scott, 2014; Storper, 1995; McCann, 2008). In summary, the following hypotheses for investigation can be outlined:-

- Coworking Inputs: enabling factors are expected to be present, with the social factors more important than environmental ones (i.e. those based on hard infrastructure).
- Coworking Outputs: community, informal interaction and knowledge sharing are expected to be presented and rated as important. Formal collaboration to be less so.
- Coworking Outcomes: productivity, innovation (as the more direct outcome from micro-clustering) and to a lesser extent income growth will be identified as deriving directly from coworking activity. Future opportunities will be identified as less direct outcomes given the timescales involved.

Moreover, the coworking literature has also neglected the question as to why coworkers might favour a particular coworking space, or at least conflated it with broader questions regarding why people chose to cowork in general. Thus a basic two-stage model is proposed within which the decision to cowork is taken followed by a choice as to which coworking space to use. The exact nature of this decision process will be determined by a range of environmental and individual factors which may be either positive (pull) or negative (push), and by the range of potential coworking alternatives available. This is an issue we also seek to investigate.

6. Methodology

The research questions developed in the preceding section were addressed via a survey of coworkers – i.e. active users of a coworking space. In order to investigate these issues, a 36- question survey instrument was developed and implemented. This sought to elicit responses regarding motivations for using coworking spaces, patterns of usage, alternative work options, the perceived benefits and drawbacks of coworking, sharing knowledge and collaborative activities, innovation and growth related outcomes. Demographic information (age, gender, level of education, occupational status and industrial sector) was also requested. The majority of questions were of standard Likert-scale self-rating type (agree/disagree, degree of importance and so on) or ‘tick all that apply’ from a fixed-choice menu generated using the key themes emerging from the literature review. For such questions an additional free response of ‘other- please state’ was added in order to capture additional options not anticipated a priori (these are only reported in the results where they represent a significant proportion of the overall response). The survey was designed to be administered online using the Qualtrics tool.

The study was undertaken in South East Wales, UK. The region is more densely populated than the rest of Wales, with a larger proportion of the workforce identified as professionals (22 percent vs. 18.8 percent) and as associate professionals (15.9 percent vs. 13.7 percent) than across the UK as a whole. The same proportion of businesses in South East Wales are categorised as micro SMEs as the UK average (88% of firms between 0 and 9 employees), with levels of self-employment also similar (around 15% of the workforce).³ A key methodological advantage of this location was the embeddedness of the authors within the local networks needed to access the coworking community. Coworkers were contacted during 2015/16 via the two main coworking space providers in the region, anonymised in the results as SW1 (single large facility in Caerphilly, immediately to the north of Cardiff

³ Occupational data from the Annual Population Survey, Self-employment from the Labour Force Survey Firm size data from the Office for National Statistics (ONS) UK Business: Activity, Size and Location publication, all data for 2016

but effectively part of the Cardiff agglomeration, the economic driver of the region) and SW2 (operating a number of smaller facilities within the study area albeit with users primarily within Cardiff itself). Other differences in the nature of the two coworking spaces were identified a priori: SW1 is in receipt of some public funding to provide developmental support for selected members, and operates a more overtly facilitative approach to its members. Conversely, SW2 is a cooperative enterprise which receives no funds directly from public sources, whose 'do it yourself' methods are indicative of both resource constraints and the ethos of the founder. These differences served as a lens through which to investigate the factors outlined in Figure 4, and the questions regarding differentiation once the initial decision to cowork has been taken.⁴ Where appropriate results were analysed to investigate whether these varying inputs translated into observable differences in coworking outputs and outcomes.

The original intention had been to obtain membership lists to facilitate the direct emailing of individual survey links, however this proved not to be possible. Data collection therefore relied on personal site visits and snowballing, augmented by Social Media (LinkedIn and Facebook) distribution. A local research presence thus played an important role in generating survey responses. Based on information from the coworking space providers, in combination with on-site observations and knowledge regarding the capacity of the venues, it was estimated at the time of surveying that the population of regular coworkers in South East Wales was in the region of 220 people. However, besides fixed membership options, providers do offer a range of more flexible and/or temporary access options, meaning that the exact number, including both regular and occasional users, is harder to estimate. In total, 76 completed questionnaires were returned (SW1:26, SW2:50), representing 34% of the total population of regular coworkers located South East Wales as estimated above. Results from the survey are reported in the following section, with data analysed via Excel and SPSS as appropriate using Chi-Squared tests, and for non-parametric data (i.e. deriving from Likert scales) the Mann Whitney U test. In addition, where applicable analysis by coworker's age, gender, sector and occupational status was undertaken. The nature of the study (sample size, response) means multivariate approaches were not appropriate; however the range of bivariate analyses employed to explore inputs, outputs, and outcomes at the level of the individual coworker allows for considerable insight to be obtained.

7. Results

7.1 Survey respondents - overview

Just under half (46%) of respondents identified themselves as either freelancers or self-employed, the rest as employees of SMEs, similar to the results of Stam and van de Vrande (2017).⁵ Around half of the coworkers were engaged in ICT based activities, with a further 30% split evenly between the professional services and arts and entertainment sectors. As might be expected, respondents represented a young demographic, with 60% aged under 33. Moreover, in excess of 70% of all respondents were educated to at least degree level, demonstrating very high levels of human capital. With regards to gender, 70% of the coworkers were male; this suggests a remarkable male-dominance, even in the light of a self-employment rate for men that is almost double that of women (UK Parliament, 2018). The vast majority of respondents (76%) possessed memberships for full access suggesting that the survey captured mostly regular coworkers; indeed 85% attended most days each

⁴ Thus for the purposes of this study we discuss SW1 and SW2 as distinct single entities.

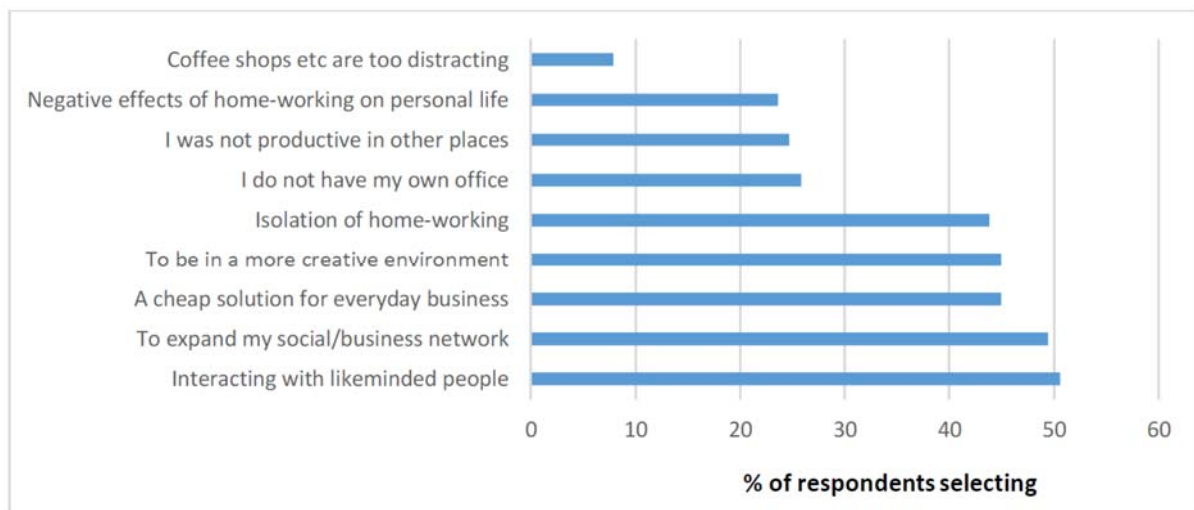
⁵ The following analysis includes all these responses as coworking practice itself was the key focus of the study; see also comment in concluding section in relation to further research.

week. Over two thirds of respondents stated they expected to remain regular users of the current space of at least one year. This may reflect the relative lack of choice (at the time of surveying) regarding other local coworking options. Around half stated that their previous regular workplace had been their home, while 80% identified home as their most likely alternative workplace now, followed by coffee shops or similar (43%).

7.2 Choosing to cowork and choosing a coworking space

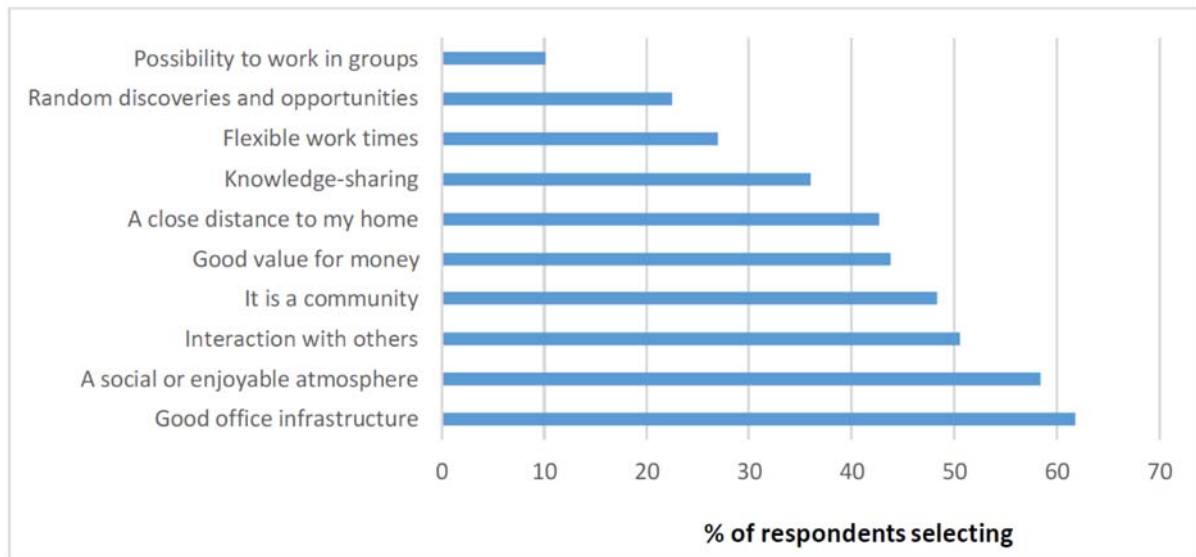
Figure 5 shows the reasons for coworking, listed in ascending order of popularity. The question asked is reflected in the title of figure, the response categories shown also derive directly from the options listed in the questionnaire. The first five reasons (i.e. from the distracting environment of coffee shops and the like to the isolation of home-working) appear to centre on what can be summarised as negative or ‘push’ factors. Conversely the positive motivation or attraction factors emerge as those more commonly identified by coworkers, with around 50% identifying networking and interaction, with 45% citing a ‘creative environment’. Practical aspects are also acknowledged, with reference to coworking as a ‘cheap business solution’ also by 45% of coworkers.

Figure 5: Why did you chose to cowork?



Source: authors' own survey, n=76

Figure 6: Why did you choose your current coworking space?



Source: authors' own survey, n=76

Moving from the decision to cowork per se to the choice of a particular space, results are shown in Figure 6. It can be seen that the most popular responses broadly reflect the expected importance of both social and environmental enabling factors here – office infrastructure and social atmosphere are the most common responses, with interaction, community, value for money and proximity to home also featuring. Conversely, with regard to the potential outputs from coworking- fewer respondents explicitly stressed collaborative working in groups. Serendipitous or random discoveries were cited by just over one fifth of respondents, with direct reference to knowledge-sharing by 36%. These therefore appear important considerations, but not the most common factors cited directly in the choice of a particular space. Differences between users of SW1 and SW2 were investigated; this was done using the Chi-Squared test. The citing of office infrastructure, flexibility, closeness to home, interaction with others, community and random discoveries were not found to differ significantly (i.e. $p > .05$). Conversely, social atmosphere and knowledge-sharing were more important for the coworkers of SW1, while those of SW2 were more likely to highlight value for money. Whilst acknowledging there were only two coworking options to choose from, this implies the former group (i.e. no significant differences between SW1 and SW2) can be regarded as 'hygiene factors', i.e. ones that are expected to be present at a functioning coworking space, while the others (i.e. social atmosphere and knowledge-sharing) serve as differentiators.

7.3 Coworking inputs

Having examined how often enabling factors were cited in coworking space choice, attention is now turned to ratings of their importance; these are shown in table 1, also indicating significant differences SW1 and SW2. In combination, social factors are rated as significantly more important than the environmental ones, although there is variation within this for the individual factors. The single most highly rated factor was the social or enjoyable atmosphere of the space in question. In comparing SW1 and SW2, all social factors were rated as significantly more important by the coworkers of SW1 indicating that they are recognised as important inputs to coworking within that space. The aim of running the test was to see which factors (physical environment, community, facilitative conditions) have greater effect on how people perceive the space. Comparing SW1 against SW2, suggests that

SW1 users rank their experience of their fellow members, the community, networking opportunities and of events (social, professional) as being substantially more important than those of SW2. This might suggest that coworkers may perceive SW2 as closer to a serviced office, providing fairly good office infrastructure, than an explicitly collaborative space emphasising social values.

Table 1: Coworker's rating of enabling factors (environmental and social)

| | Average rating of importance(Total) | Average rating of importance (SW1) | Average rating of importance (SW2) |
|---|-------------------------------------|------------------------------------|------------------------------------|
| Overall design of the space (Environmental) | 7.35 | 7.54 | 7.20 |
| Meeting facilities (Environmental) | 7.32 | 7.33 | 7.30 |
| Events (Environmental) ** | 5.63 | 7.08 | 4.62 |
| Community (Social) ** | 7.66 | 8.69 | 6.96 |
| Networking opportunities (Social) ** | 7.41 | 8.73 | 6.68 |
| Other members (Social) ** | 7.21 | 7.96 | 6.72 |
| Atmosphere (Social) * | 8.42 | 8.81 | 8.18 |

Source: authors' own survey, n=76

NB. Ratings on a 10-point scale from 'not important' to 'extremely important', 2-tailed Mann Whitney U test comparing SW1 and SW2 (*significant at 5% ** significant at 1%)

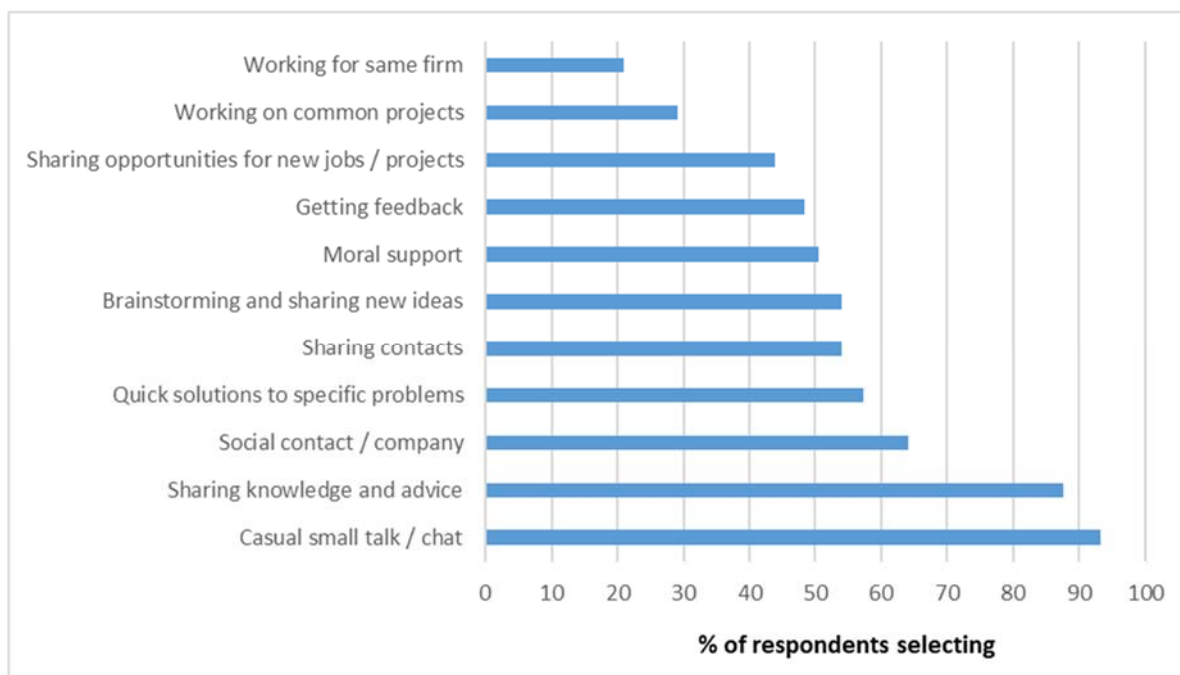
Mean Social factor score = 7.67, Mean Environmental factor score = 6.8 (significant at 1%)

In addition to coworking space used, analogous tests were run on all the factors in table 1 using gender, age and sector (ICT vs others) as the grouping variables. Events (5%) and atmosphere (1%) were rated as significantly less important by ICT coworkers, with no other significant results found. This suggests that these types of interaction are less important for the activities of ICT-focused coworkers.

7.4 Coworking outputs

Attention is now turned to the outputs of coworking as outlined in Figure 4. Overall, the results summarised in Figure 7 suggest that the coworking activities are resulting in outputs of interaction and mutual support (feedback, moral support), and informal knowledge exchange, with 93% of the coworkers engaging in casual small talk and chatting while 88% share knowledge and advice. Conversely, more formal types of collaboration between coworkers (working for the same firm, or on the same projects) were much less commonly reported, a result which is in accordance with what might be expected from the coworking literature. Although the establishing of causality is beyond the scope of this study, moral support was significantly and strongly correlated ($\phi > 0.3$, $p < .01$) with the both brainstorming and the sharing of knowledge and advice, which is suggestive of the association with the presence of community activity and knowledge exchange.

Figure 7: What type interactions do you have with fellow coworkers?



Source: authors' own survey, n=76

Variations in the nature of coworker interactions between SW1 and SW2 were tested using Chi-Squared; users of SW1 were more likely ($p < .05$) to highlight being involved in formal collaborations (common projects and firms), but also the provision of moral support. None of the other factors varied significantly between SW1 and SW2. These limited differences may be reflective of the greater focus on nascent enterprise at SW1, with coworkers more likely to be interacting at an early stage of developing a business. This is a speculative conclusion which would require further research. Analogous tests were undertaken by age, sector and gender, with the only significant result being younger coworkers being more likely to provide feedback to and receive if from their peers.

7.5 Coworking Outcomes

Table 2 summarises changes in a range of outcome variables as identified in Figure 4, reported by survey respondents. Overall coworkers report high levels of innovation, increased turnover, and also a high levels of anticipated future opportunities in terms of funding and business opportunities. Similarly, improved levels of productivity, self-rated on a 10 point scale, are identified. These results suggest that the inputs and outputs of coworking identified are being successfully translated into outcomes by the coworkers in our sample at a very high rate. Of course there is the lack of a direct counterfactual here – which in itself suggests a future research direction – but in general these results in relation to innovation, growth and productivity are significantly higher than might be expected in a general sample of SMEs and/or remote workers (Centre for Cities, 2018; BIS, 2014).

Table 2: Outcomes since commencing coworking

| | Overall | SW1 | SW2 |
|--------------------------------------|---------|-----|-----|
| Innovation (new product or service)* | 49.9% | 65% | 42% |
| Increased turnover | 31.7% | 35% | 30% |
| New funding opportunities** | 33.0% | 58% | 20% |
| New business opportunities | 26.5% | 35% | 22% |

| | | | |
|------------------------|------|------|------|
| Productivity (rating)* | 7.82 | 8.35 | 7.59 |
|------------------------|------|------|------|

Source: authors' own survey, n=76

NB. Productivity rating on a 10-point scale from 'much worse' to 'much better', 2-tailed Mann Whitney U test comparing SW1 and SW2. Chi-Squared test for other variables (*significant at 5% ** significant at 1%).

Consistent with the approach adopted above, significant differences in the profiles of SW1 and SW2 were investigated in relation to coworking outcomes (Chi-Squared test apart from productivity rating for which Mann Whitney U test was used). Users of SW1 were more likely to have introduced a new product or service (i.e. innovation), accessed new funding opportunities, and have experienced higher levels of productivity. In summary, this result means that the coworking space (SW1) whose users rank the interaction experience with their fellow members, the community, networking opportunities and the importance of events (social and professional) more highly, is also the one in which there is greater evidence of more positive outcomes. Conversely, although there is greater evidence of a strong sense of community at SW1, there is less evidence of variation in other coworking outputs (i.e. knowledge sharing) between SW1 and SW2. This suggests that observed differences in coworker's success measures between spaces are more related to the rate at which outputs are translated of into outcomes – rather than the variation of outputs per se.

Differences in coworking outcomes were also examined with regard to age, gender and sector. A potentially interesting result here is that female coworkers were significantly more likely to report that they had become more productive; as noted earlier, homeworking can blur domestic and professional responsibilities with potentially detrimental effects in both spheres (Mason and Reuschke, 2015). The survey revealed female coworkers to be no more likely to have been previously based mainly at home than their male counterparts – this suggests that the prior working environment is in itself not associated with the observed higher productivity improvement for women. However, it may be that working from home is (all other things equal) more detrimental to women's productivity than to men. An alternative but not mutually exclusive explanation is that coworking offers more potential benefits to women, i.e. over and above removing higher levels of distraction. This is an area where further research is needed.

The only significant result with respect to age was that members under the age of 33 are more likely to realise better funding opportunities from coworking ($p < 0.01$). This might be because younger coworkers are more likely to be in the start-up phase of business development. Finally, With regards to professional activity, the Chi-Squared test confirmed that non-employees (entrepreneurs or freelancers) are significantly more likely ($p < 0.05$) to experience increased income in coworking spaces than employees of other companies. No other significant differences were found in relation to outcomes when comparing these two groups. This seems logical given that employees have less scope to translate improved performance into to increased income, at least in the short run.

8. Discussion

In general, results confirm the role of coworking spaces as a context for the exchange of tacit knowledge, facilitated by opportunities for face to face interaction, as described (for example) by Scott (2014). In turn, the evidence presented here suggests that these interactions are mainly, but not exclusively, taking place on an informal or untraded interdependency (Storper, 1995) basis for knowledge sharing. Following on from this, there is a clear indication from the data that improved productivity, innovation and income are then forthcoming. Of course, we do need to remember that

coworkers are, as yet, a relatively small subset of remote workers. Table 1 suggested that coworkers value more of the social elements of the coworking space (community, other members, and atmosphere) over the facilitative and physical elements. On this point, although Waters-Lynch et al (2016) have posited coworking spaces as new forms of collectivism and cooperation, Spinuzzi et al (2018) suggest that the majority of coworking spaces do not actually represent a purely community based organisational model but rather are hybrid forms. It may be therefore that coworking is an emerging means by which social capital is leveraged for business aims, rather than via the more traditional clubs and societies as investigated by Cooke et al (2005). This can also be reconciled with the findings of Butcher (2018) more generally – the community aspect constitutes what he terms ‘learning to cowork’, which in turn allows ‘coworking to learn’ – the accessing of knowledge and ultimately the realising of business-related outcomes.

When comparing the two groups that make up our sample (i.e. coworkers of SW1 and SW2), in general the results show greater observed differences regarding the ultimate outcomes of coworking (innovation, productivity) than its outputs (interaction, knowledge exchange). This suggests that variations at the level of the individual centre upon the translation of outputs into outcomes, rather than the generation of outputs per se. Previous research has examined the role of community hosts (e.g. Merkel, 2015; Brown, 2017) but not with specific regard to this question. Boschma (2005) suggests that spatial proximity facilitates interactive learning by strengthening the other dimensions of proximity (social, cognitive, organisational, institutional), so it may be that some kind of curation or enablement (as opposed to ‘compulsory’ facilitation) could reinforce this proximity effect at the coworking space level.

In developing the comparison the two spaces, results suggest that the presence of the social environment (community, other members and atmosphere) and the facilitative tools (events and opportunity to network) have a more powerful effect on how people perceive the space and what conditions they consider more important, in SW1. Amabile (1997, p40) defined such an environment that encourages ‘...creativity through the fair constructive judgment of ideas...mechanisms for developing new ideas... and a shared vision of what the organization is trying to do’ as organizational encouragement. These outcomes are consistent with the differences in the over-arching philosophies of the two spaces alluded to in Methodology section, with the management of SW1 stressing the value of mentoring and capacity-building and the provision of a supportive community, while those of SW2 highlight the importance of self-reliance and bottom-up activity. This, in turn, is a reflection of the funding regimes and business models involved; SW1 receives funding from the Welsh Government as part of its entrepreneurship support policies, while SW2 relies totally on self-generated revenues. Thus, the observed differences may be a reflection of the different roles played by the spaces within the entrepreneurial ecosystem. Moreover, it could be argued that as around half of SW1’s clientele is not presently paying directly for their use of the space, they may be inclined to have a less critical viewpoint in general and be less likely to make a direct connection between the space they use and business outcomes.

Reflecting back on the results of Felstead and Henseke (2017), it could be that the rise of remote working that is not explained by the knowledge economy, labour force demographics and so on, is (partially at least) a statistical artefact of people captured as remote workers in the official data when in many ways they are not – i.e. using coworking spaces for at least some of their working time such that they are away from ‘regular workplaces’ by traditional standards. This would be not an increased desire for actual remoteness per se, but rather of atomistic workers seeking new forms of connection. As Felstead and Henseke (2017) note, there is a blind spot in the remote working data in that delineates between home or conventional workplace only, which disregards how the use of the

'conventional' workplace might be changing. Developing this point regarding the false dichotomy, it is reasonable to argue that different types of space are being utilised for different sets of sub-tasks that make up the working lives of freelancers and remote workers. When these sub-tasks take place within a single location – whether traditional office or indeed the home – they are not revealed in the data. Conversely, with the increasing availability of coworking spaces, these tasks may now become increasingly spread across distinct physical spaces. The idea of the 'extended workplace' suggested by Martins (2015) is consistent with such an interpretation. Results also confirm that coworking spaces serve as a shared venue for people with different types of employment status – self-employed, entrepreneurs and freelancers as per Stam and van de Vrande (2017). Thus they 'collide' here (Mitev et al, 2018) rather than residing permanently in the isolation of the electronic cottage. However, results also showed that entrepreneurs or freelancers were more likely to experience increased income than employees of other companies. Employees will have less scope to translate improved productivity and innovation into increased income, at least in the short run. Perhaps in the longer they may choose to spin-out of their existing companies; thus future longitudinal research could examine the influence of coworking on start-up rates.

There was some evidence from the survey of respondents reporting the need for more space for 'play' but also for privacy and self-reflection, which would suggest some mismatch between demand and provision in these areas and thus the sub-optimal design of the physical space. Moreover, half worked predominantly at home before becoming a regular coworker, while 80% of regular users listed home as their most likely alternative workplace, suggesting a shifting of sub-tasks but begging the question as to why there is apparent demand for private space when such tasks be home-based. Perhaps this reflects a reluctance to use the home even for apparently suitable work-related activities which blur the boundaries of professional and domestic spheres.

Essentially, the analysis of Tofler (1980) disregards the social life of information (to use the words of Brown and Duguid, 2000), as indeed does much of the later analysis of remote working, which tends to just see it as the shifting of tasks in isolation from work to home. The paradox is that the knowledge economy that has enabled these shifts actually requires at least as much – and probably more – huddling than in the previous economy due to the role that this plays in the innovation process; as noted by Morretti (2012) increasing returns to innovation is the key driver of the knowledge economy. With specific regard to coworking, this has arisen at the intersection of the digital (knowledge) economy, increasing self-employment and other forms of flexible and remote work, because the people engaged in these activities utilise resources from both physical and the virtual networks. This requires sufficient proximity to allow access to the appropriate physical hubs for (say) two or three days each week – in other words it is possible to be based further away than if access was required every day, but not too far. In this way it is feasible to have functioning coworking spaces outside the core, but they need to be usable for a critical mass of workers to make them viable, not just financially but in terms of the externalities that they can provide i.e. the interactions and spillovers. So in this way we can propose a new kind of 'bounded locational independence', which serves to reconcile increasing remote work and the increasing value of proximity.

9. Conclusions, future trends and further research

The number of freelancers, self-employed and remote workers has been increasing steadily; simultaneously, a range of collaborative shared workspaces - coworking spaces – has emerged, with numbers growing exponentially in recent years. Despite this rapid growth, we have argued that the body of academic research on these developing work environments represents at best only a partial

account of their function. Coworking spaces provide people who, in the words of Alvin Toffler, no longer need to ‘huddle’ with facilities within which to apparently do just that- begging the question as to why. In investigating these issues, knowledge spillovers- the exchange of tacit information facilitated by face-to-face contact – appear to play an important role, but one which may not be the primary (or at least explicit) motivation for coworking. Community related and other social factors are rated highly by coworkers; previous studies however have emphasised the community aspect of coworking as largely an end in itself, and while authors such as Butcher (2018) and Capdevila (2014) have discussed learning and innovation they do not really seek to unpack the relationship between community and knowledge exchange in coworking spaces. In this study we argue that a sense of community within coworking spaces is important not just as of itself, but for facilitating cooperation between coworkers, and thus the collaboration and knowledge sharing which we can think of as the outputs of coworking. These in turn can lead to the outcomes of innovation, growth and increased productivity. Previous studies have not explicitly sought to distinguish between these aspects, and have been restricted to predominantly qualitative methodologies. Indeed, outcomes have largely been neglected altogether.

The study has also sought to confirm via the coworkers themselves which infrastructure – both social and environmental – is important in choosing to cowork and in choosing a particular coworking space. This two stage approach allows factors that are expected to be present at a functioning coworking space to be conceived as ‘hygiene factors’, with others serving as differentiators, which in turn provides a rationale for the comparison of coworking spaces- in our case SW1 and SW2 only – but one which could be extended. We should however be wary of using such approaches to define one coworking space as intrinsically ‘better’ than any other. As we have seen from our sample different spaces possess different sets of resources and constraints (for example SW2 operates without public funding) which in turn implies that we should expect different outcome profiles. There is a broader implication for further research here around different spaces doing different things for different people, whether this is by coworker profile (as per our initial investigations of sector, gender, age) or indeed regarding what might be appropriate policy interventions in differing places, across varying economic contexts, and in relation to which outcomes should be prioritised.

Further research should aim to increase sample sizes in order to more effectively tease out nuances around personal factors such as gender, sector, age, employment profile and so on but also to allow comparison across coworking space locations (urban vs suburban, core vs periphery, cross-nationally and so on) to gauge the relative importance of individual and structural factors and how these may impact upon the relationship between coworking inputs, outputs, outcomes. Moreover, although a prima facie case has been established in the present research, larger datasets would facilitate the investigation of causality across inputs, outputs, outcomes more directly, potentially via multivariate techniques and/or longitudinal analysis rather than a purely cross-sectional approach. They may also allow the comparison of freelance and self-employed coworkers with those identifying as SME employees in order to explore potentially differing motivations and outcomes.

There are clearly a number of implications for further research given the emergent nature of coworking and the relatively small scale of the study reported here. The coworking phenomenon is still very much in the growth phase, as such a shakeout in the market might be expected in next few years; as provision grows users will ultimately ‘vote with their feet’. Moreover, findings from the survey highlight a very young demographic of coworkers suggesting further growth via cohort effects is to be expected, although possible life-stage effects may mitigate. Thus a longer time frame will allow for a more systematic evaluation of the factors associated with coworking success (or failure), measured either in terms of the revealed preferences of users (i.e. via the market) or directly by

empirical research (surveys, ethnographic studies, business performance data). Indeed, there is an argument if we assume coworkers are exercising rational choice that the best way to classify / interpret the function of any given coworking space is by surveying the users directly.

As Waters-Lynch et al (2016) have noted, there is already some blurring of distinctions with serviced office providers such as Regus extending their offer, conversely there are 'corporate' or franchise-based coworking spaces (such as We Work) entering the market but also a growing trend of home-based coworking (Financial Times, 2018). A relevant question here then becomes where is value created and captured (Jacobides and Billinger, 2006) within coworking spaces? The pioneers of coworking operated an open-source or crowd-funded model to avoid proprietary claims on intellectual property; to a degree, coworking individuals will create and capture their own value, but of greater interest is the potential value created in collaboration and interaction. This in turn raises questions around such issues as who will retain IP in the future: individuals, collaborators and/or the coworking space itself? The present study has shown that innovations are occurring as a result of coworking, but there still remains a need to unpack details of how these actually arise, what specific products and services are involved - and how they go on to perform in the market. An innovation biographies approach (Butzin and Widmaier, 2016) focused on coworking spaces could be a valuable contribution here.

The survey results provided evidence for the role of interactions and spillovers within coworking spaces, but less so of actual serendipity which is hard to capture – results suggest some kind of facilitation or coordination is needed. Qualitative research on the nature and role of community manager / host would be a useful addition here. Also with regard to working patterns, as Felstead and Henseke (2017) suggest, there may be different results for different types of remote workers. These cannot however be unpacked in the official statistics as they are presently collected, suggesting the value qualitative research on a sample of remote workers (and possibly a justification for more sub-categories within the labour force data). The work of Felstead and Henseke (2017), consistent with Bloom et al. (2015) and also Kelliher and Anderson (2010) also suggests that remote workers tend to work longer hours and work more intensively. However they also report higher levels of job-satisfaction and wellbeing more generally, although there are negative effects – typically around stress and difficulty unwinding. Further research could thus follow up the well-being / self-exploitation aspects of remote working by asking these kind of questions of coworkers – or perhaps coworking can mitigate some of these potentially negative aspects in relation to its 'core values' i.e. (openness, community, collaboration, sustainability and accessibility as per Schuermann, 2014). If so it would be expected that coworking space users would have better reported job quality, *ceteris paribus*, than non-users. Developing this point, a criticism of the research presented here could be that it is skewed towards the 'satisfied customers' of coworking spaces. Thus further research could focus on non-users, exploring the barriers they may face. On a related point, our variables related to outcomes (innovation, income) are self-rated by the questionnaire respondents, and thus may be subject to various issues of prestige-bias or other perceptions that are not necessarily highly-correlated with more objective measures of performance. Further research could address this by obtaining appropriate secondary data, and via the triangulation of quantitative data with related qualitative information. Moreover there may be other remote workers who would benefit from 'huddling' but are unable to do so for other reasons – perhaps they have a regular employer but do not have adequate facilities they can use for collaborative activity even if they want to – using a coworking space is not a costless exercise. If self-funding, such individuals may be unable to justify this expense even if they perceive a benefit, whatever their employment status. Our results also revealed a gender imbalance (72% of respondents were male); are more women 'discouraged' coworkers than their male

counterparts due to domestic responsibilities, or indeed the prevailing culture (or at least the one that is perceived) in spaces that they may otherwise use?

Returning to the broader picture of potential future developments, as Storper (2013) describes, previous waves of technical and social change have seen a concentration phase of around 30-40 years, followed by spatial equalisation as underpinning technology matures. We are not seeing this yet in the current phase – so there is something about this paradigm that makes the agglomeration effects particularly strong. However when equalisation does come this is likely to have profound effects on the nature of work organisation in the digital economy. Storper also notes that, apparently paradoxically, in the knowledge economy informal advantages are becoming more important - being in the right networks, getting the right internships, knowing the right people and so. This suggests a further as yet unexplored potential role of the coworking space – as a capacity-builder for informal networks and social capital beyond the space itself. Many coworking spaces offer a reciprocal affiliation or passporting type arrangement with other spaces, which could serve as a vehicle for developing the strength of these ‘weak ties’ as per Granovetter (1973). Again, this is an area worthy of further exploration.

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