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The Work-Related Affordances of Business Travel: A Disaggregated Analysis of Journey Stage and Mode of Transport

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Abstract

Sociological understanding of how business travellers make use of travel time is somewhat lacking. This paper addresses this gap in knowledge via presenting the analysis of survey-based data collected from business people travelling by plane, train and car. Through disaggregating the data by travel mode, journey stage, technology use and task type the paper provides a level of granular detail into the general patterns of business traveller's travel-time behaviours not previously provided by other surveys. Utilizing the concept of 'affordances', the paper shows how the type of work activities undertaken are shaped by the dynamic interaction between the characteristics in the travel environment, the type of work tasks undertaken and work technologies utilized in carrying out these tasks and the active choices of business travellers.

Key words: business travel, affordances, mobile technology, travel environment

Introduction

For an increasing proportion of workers the need to be mobile, travelling between different locations in order to carry out work, is becoming more common (Felstead et al 2005a). Thus, understanding how workers make use of travel time in this increasingly significant domain of work activity represents an important question. Despite the growing body of work investigating this topic (Cohen 2010, Felstead et al 2005b, Gustafson 2006, Hislop & Axtell 2009, Vartianen et al 2007) the embryonic character of this subject area means that gaps in knowledge remain. This paper addresses some of these gaps by analyzing the results of a unique set of surveys which provide a high level of detail into general patterns regarding business traveller's use of travel time on work-related journeys.

A number of contributions have shed light on this topic, typically providing qualitative insights into the micro-experiences of business travellers (Felstead et al 2005b, Laurier 2004, Ferguson 2008). However, these studies have provided limited insights into general patterns regarding the work-related behaviours of business travellers. It is such questions that are the focus here. In doing so, the paper utilizes the concept of 'affordances' (Hutchby 2001) to consider how people's work patterns are related to the character of the travel environment on different journey stages as well as the type of tasks they undertake and technologies they utilize.

The empirical data that is presented here is taken from a unique survey of UK-based business travellers undertaking work-related journeys by car, train or plane. This distinguishes between patterns in travel behaviour not only by transport mode, but also

by journey stage. The paper contributes to knowledge empirically through providing a level of detail into general patterns of business traveller's work-related-behaviour while undertaking business trips that has not previously been collected. Further, the paper makes a conceptual contribution to knowledge through utilizing the concept of 'affordances' to explain the work patterns identified.

The Growing Importance of Business Travel

Historically the need to travel has been an intrinsic element of a number of jobs, such as sales people travelling to customers, and driving/logistics staff who travel in order to transport people and/or goods. However, various economic and technological changes that have occurred in recent decades mean that the need to travel is an activity that increasing numbers of workers undertake (Felstead et al 2005a, b, Gustafson 2006, Sorensen 2011, Vartianen et al 2007). Some go so far as to suggest that the mobility of people, artefacts, knowledge, ideas etc represents one of the key defining features of contemporary society (Urry 2000). Thus, Beaverstock et al argue that, '*in economic terms, business travel now appears to be the fundamental production process in constructing and reproducing the 'Network Society' and the global, knowledge-based economy that have come to be the hallmarks of contemporary capitalism*', (2010, p. 2)

In the domain of work, managerial and professional workers have been most affected by the increasing need to travel for work. This is due to the increasing spatial dispersion of work resulting from what Gustafson (2006, p. 514) labelled the 'territorial reorganization' of organizations competing in increasingly globalized markets. Thus, for such workers, Vartianen et al suggest that, '*the contemporary work environment*

manifests itself as a mosaic of places and people, (2007, p. 11). However, the range of jobs involving (some) spatial mobility is highly diverse. Further the types of spatial mobility workers undertake are equally heterogeneous, ranging from the localised journeys undertaken by bus drivers and community care workers (see for example Wibberley 2013), through to international journeys undertaken by professionals and managers who work in multinationals (see for example, Salt 2010).

The ability to work while undertaking business trips has also been facilitated by contemporary developments in mobile information and communication technologies, which means that the work of managerial and professional staff is no longer so heavily connected to particular locations such as corporate offices (Lyons & Urry 2005, Vartianen et al 2007).

While business travellers have the potential to work while undertaking business trips, this does not mean that they either want to or are able to work. Insights into the work-related behaviours of business travellers can be found in two main sources. Firstly, travel time usage surveys represent a useful starting point. Lyons et al's (2007), who conducted a survey of UK rail passengers, found that almost 50% of business travellers worked some of the time, and 30% worked most of the time while travelling by train for work (Table 2, p. 110). Further, the two types of artefact that were found to facilitate the work of business travellers most were mobile phones and paperwork. However this study did not provide any detail on people's work patterns or the factors shaping them. Axtell et al (2008), based on research conducted on business travellers in the English Midlands, found similar work patterns. However, no equivalent studies have been done of car or plane-based journeys.

Secondly, insights into the travel-time behaviours of workers have also been provided by various qualitative case studies. These papers take a micro level perspective, being concerned with providing insights into the 'lived experience' of mobile work, the type of work activities mobile workers undertake while travelling and the challenges they face in attempting to do so (see for example Felstead et al 2005b, Ferguson 2009, Hislop & Axtell 2009, Holley et al 2008, Lassen 2006, Laurier 2004). These studies typically have been on professional or managerial workers, however some studies have also been done on non-managerial work (see, Cohen's (2010) paper on mobile hairdressers, and Hislop & Axtell's (2011) study of service engineers). While these studies suggest that mobile workers spend a significant proportion of work-related journeys undertaking various work activities, they do not quantify the general extent to which people undertake such activities. Further, the typically small and homogeneous population sizes they examine means there are limits to their generalizability. For example, Hislop & Axtell (2009) report the findings of a qualitative study on some management consultants, while Laurier (2004) analyzes the travel behaviours of a single worker.

The most extensive study of such work was conducted by Felstead et al (2005b) who present their analysis of a project that involved conducting two small surveys as well as interviews with business travellers. However, Felstead et al's (2005b) analysis did not reveal general patterns in people's work-related travel behaviour and how this was linked to the nature of the travel environment.

Work Affordances and Business Travel

In making sense of the relationship between the work patterns of business travellers and the nature of the travel environment the concept of 'affordances' is utilized. This concept initially developed by Gibson (1979), a cognitive psychologist, , who argued that people and animals relate to objects in the world through the possibilities for action (affordances) they offer. However, the concept was popularised by Norman (2002) who used it in relation to product design. Fundamentally, Norman argued that a key element of good product design is that their affordances should be readily transparent to users.

The most extensive academic use of the concept of affordances has been to understand the way information technologies are used in organizations (Sorensen 2011). In this context it has been used to understand the dynamic interaction between the features of technology and either the character of organizational structures and processes (Leonardi 2011, Zammuto et al 2007) or the agency of technology users (Hutchby 2001).

While affordances have been defined as the possibilities for action that an object offers people, it is necessary to define the concept more thoroughly. Fundamentally, the affordance of an object/artefact simultaneously has both objective and subjective characteristics, with Norman (2002, p. 9) talking about, '*perceived and actual properties*'. The objective aspect of an object's affordances relate to its '*material properties*', (Leonardi 2011, p. 153) which create real constraints and possibilities on the functionality an object offers to people, which Hutchby (2001, p. 29) refers to as its '*conditions of possibility*'. However, crucially, these material characteristics do not mechanically determine how objects are used. People's perceptions of the affordances

of an object are equally important to how objects are used, with people's perceptions being shaped by the goals they are pursuing, the social and cultural context in which they are operating and their pre-existing knowledge, values and assumptions. Thus, the perceived affordances of objects are likely to vary between people and contexts, irrespective of the invariability of an object's material properties.

The focus here is on the affordances to work that business travellers experience as they undertake work-related journeys. Hutchby (2001) argues that different, separate external features of a person's environment each have their own affordances. In line with this Zammuto et al (2007) talk about how the '*affordances for organizing*' result from the way information technology and organizational activities combine in particular ways. The most relevant example of the five 'affordances for organizing' they identify is the affordance for '*virtual collaboration*' that can be achieved when contemporary ICTs are combined with particular types of organizational arrangement. Building from this logic, for business travellers, the perceived and material work-related affordances business travellers' experience, which are the possibilities for completing work tasks while travelling, will be shaped by the dynamic interaction between the character of the tasks being undertaken, the perceived and material affordances of the physical and social travel environment, and the types of technology they utilize.

In conclusion, the focus of the paper is on two topics:

- The extent to which business travellers work while on business trips and how these patterns vary by transport mode and journey stage.
- How the perceived and material affordances to work of business travellers is shaped by the dynamic interaction between the characteristics of the specific

type of tasks being attempted and perceived and material affordances of the travel environment, and the work technologies they use.

Methodology

To collect data on business travellers' experiences paper surveys were distributed to some travellers as they undertook work-related journeys by train, car or plane. These were distributed at three locations: on inter-city trains operating in the English Midlands; at a motorway service station on the M1 motorway in the English Midlands; and at a regional airport in Southern England. The choice of these locations meant that not all types of business travellers could be examined, with the focus being on those undertaking medium and long distance journeys, typically cross regional (on the car and train-based journeys) or national and short haul international journeys (on the plane-based survey). Thus the experiences of business travellers undertaking more localized journeys were excluded from this research.

At all locations surveys were distributed by one of the authors to business travellers at a range of times over two to three days (typically between 7am and 6pm). We adopted an inclusive approach to the identification of business travellers and didn't differentiate between people in terms of dress etc. We approached travellers with the question, 'is your journey today work-related?' before asking if they would be willing to complete a survey. Travellers who agreed were given a paper survey as well as a pre-stamped, addressed envelope. Thus they were not required to complete the survey immediately. All three surveys were four A4 pages in length and could be completed in less than 10 minutes.

Vartianen et al (2007) distinguish between commuting journeys (from a person's place of residence to their work) and work-related business travel, which involves travel between different locations that people are required to undertake in carrying out their work. Our primary interest was business travellers rather than commuters. Due to the particular type of locations we utilized as well as the range of times we distributed the surveys, the majority of respondents were business travellers, but some data was also collected from commuters.

The surveys typically asked closed questions offering a limited range of responses. The first set of questions collected data on age, gender and occupation. The main focus of the surveys was on the extent to which people worked as they travelled and how conducive they found those spaces for work. In the train-based survey the focus was on the time travellers spent on-board trains. For these journeys we did not ask about time spent in train stations as we assumed this would be limited. For the surveys of car and plane-based travel, journeys were conceptualized as being made up of discrete stages, with plane-based journeys being separated into time spent at the departure airport and time spent on the plane and car-based journeys being separated into time spent driving, time spent in the car while parked at services, and time spent within service station buildings. We assumed that people were likely to spend a reasonable amount of time on each stage, and that they were likely to behave differently on each stage.

For each journey stage examined a standard range of questions were asked across all three surveys. All questions asked people about their generalized experiences across all business journeys, rather than asking about a specific journey. The first type of question

asked people about the extent to which they used a range of technologies on each journey stage for work including mobile phones, laptops and pen and paper¹. Respondents could choose between five options which were: never; a little; moderately; quite a lot; a great deal. Secondly people were asked about the extent to which they undertook independent and interactive tasks during each journey stage. Respondents had the same range of options as above. Further, interactive working was defined as, *'tasks involving interaction with other people, such as in information sharing'*, while independent tasks were defined as, *'tasks which are done individually, such as reading and writing'*. The category of independent task was intended to include work-related activities such as thinking, which may not require the use of any technology. In terms of the travel environment two separate identical questions were asked on each of the three surveys. Firstly, people were asked to estimate generally how conducive the travel environment on each journey stage was to working, with respondents having five answer options which included: very poor; poor; average; good; very good. Finally, respondents were asked the extent to which time, space or noise constraints impinged on their ability to work on each journey stage. For these questions respondents had the following five answer options: never; a little; moderately; quite a lot; a great deal.

The survey methodology utilized was successful with over 1100 surveys being distributed (511 on trains, 291 at the service station and 341 at the airport), almost 700 being returned (350 on the trains, 149 at the service station, and 182 at the airport).

The average age of respondents in all three surveys was very similar (being 42 in the train survey, 45 in the plane survey and 46 in the car survey), however the proportion

¹ In relation to the driving stage of car-based journeys, respondents were only asked about mobile use as it was assumed that they were extremely unlikely to use either pen and paper or laptops while driving.

of men and women in each survey population varied significantly. While the proportion of men in the plane and car surveys was 80%, in the train survey only 56% of respondents were male. The occupations of all three survey populations were remarkably similar, consisting almost exclusively of senior managers, managers, and professional/white collar workers, with professional/white collar occupations being the single most dominant category.

Findings: An Overview of Work Patterns and Factors Constraining Work Efforts

In this section, the aim is to provide an overview of the extent to which people engage in particular types of work activity during different journey stages of business trips as well as the key factors which inhibited people's ability to work. The most aggregated overview of the findings is presented in Figure 1. The data presented here is the average extent to which survey respondents used one of three work technologies (mobile phone, laptop computer or pen and paper) or undertook interactive or independent work tasks either 'quite a lot' or 'a great deal'. This data highlights that the two journey stages business travellers were most likely to work extensively on were when in train carriages and sitting in their cars in service station car parks. Further, the journey stage that business travellers were least likely to work on extensively was when on-board planes.

Insert Figure 1 about here

The focus now shifts to consider the factors related to each journey stage which were identified as constraining the ability of business travellers to work (Figure 2). The data

presented here focuses on the percentage of respondents identifying each factor as inhibiting their ability to work either 'a great deal' or 'quite a lot'.

Insert Figure 2 about here

Overall, this data highlights significant variations between journey stages in terms of the extent to which the factors examined inhibited people's ability to work. With respect to time spent on train carriages, constraints of space were a significantly greater barrier than constraints of noise with over 50% of respondents finding space constraints significantly inhibited their ability to work, compared to just over 20% who said the same about noise constraints. In relation to time spent at departure airports between 35 and 45% of respondents reported constraints of noise, space and time as all having a reasonably negative impact on their ability to work. In contrast, in relation to time spent on board planes, constraints of space had by far the greatest negative impact on people's ability to work with fully 70% of survey respondents reporting this to be the case, whereas only about 15% said the same about constraints of noise and time. With regard to time spent inside service station buildings, constraints of noise were most significant, with almost 40% of respondents saying that noise constraints significantly inhibited their ability to work there, while only about 20% of people said this about space and time constraints.

Data on these constraints was not collected for time spent within cars whilst parked as it was assumed that space would typically be the most significant constraint on people's ability to work. This was confirmed by qualitative comments made by survey respondents to an open question on tasks people would like to carry out but found

difficult. The most common response identified tasks requiring more space than was available. Typical of these comments was one response which said: *'laptop use: too cramped'*.

Comparing Figures 1 and 2 it can be concluded that there is not a simple relationship between the average extent to which people work and the factors identified as inhibiting their ability to work. More detailed analysis into the factors affecting people's perception of the conduciveness of the travel environment to working is done later via regression analysis.

Findings: Variations Between Journey Stage in Types of Work Tasks Undertaken and Technologies Used

The overview presented immediately above hides significant variations between journey stages in the extent to which each work-related technology is used, or the extent to which each work-related task is undertaken by business travellers. To understand these differences it is necessary to disaggregate the data summarized in Figure 1, which is done in Figures 3 and 4. As with Figure 1, these figures, only present data on those categorized as frequent users (using technologies or undertaking tasks either 'quite a lot' or 'a great deal')

Insert Figure 3 about here

Figure 3 shows the extent to which mobile phones, laptops and paperwork were used for work purposes on each journey stage. An initial observation is that with the

exception of time spent on board planes, where significant restrictions on technology use operate, people work extensively when travelling, using at least one of these technologies. However, Figure 3 reveals significant variations in the frequency of technology usage between journey stages. For example, when the use of each technology is compared across journey stages significant variations exist, with mobile phones being extensively used when people are parked at service stations (70% of respondents were frequent users), and inside service stations (39% of respondents were frequent users), but are used much less on trains, and almost not at all on board planes (25% and 1% of respondents were frequent users). With regard to paperwork, this is used most extensively on trains (57% of respondents were frequent users), and when parked at service stations (43% of respondents were frequent users), but much less so on other journey stages. Finally, while laptop use is variable, being most extensive on trains (38% of respondents were frequent users), and least when inside service station buildings (11% of respondents were frequent users), it is never the most preferred technology to be used for work. Other variations also exist in the balance of technology use during each journey stage. Thus, when people are travelling on train carriages or on planes, the technology most likely to be used is paperwork, while for the three other journey stages examined mobile phones are the most likely work technology to be used.

Insert Figure 4 about here

The survey also examined the extent to which business travellers undertook independent or interactive tasks (Figure 4). As with patterns of technology use across each journey stage, significant variations exist in the relative balance and extent to

which people undertook independent and interactive work-related tasks while travelling. Thus, while on train carriages people were very likely to undertake independent (80% of respondents frequently), rather than interactive tasks (11% of respondents were frequently), whereas when they were sitting in their cars in service station car parks they were slightly more likely to undertake interactive (49% of respondents frequently), than independent tasks (37% of respondents frequently).

The above analysis examines only those who used technologies or undertook tasks most frequently (frequent users – those responding ‘quite a lot’ or ‘a great deal’). However, for each technology and task type, travellers were categorized into two other types: occasional users (those responding ‘a little’ or ‘occasionally’) and non-users (those responding ‘never’). Data with the number of survey respondents in each of the three categories for technology use (See Table 1) and tasks type (see Table 2) is presented below.

Insert Table 1 about here

Constraints of space prevent the full exploration of this data. However, it does reveal, for all types of technology usage and task engagement, on each journey stage, significant variations in in the extent to which people undertake these work tasks or use these technologies for work. To illustrate this with one example only, consider the first row of table 1, which examines mobile phone use while on train carriages. This shows that on this journey stage, while almost half (47%) of respondents were categorized as non-users, 29% were categorized as occasional users and 25% as frequent users. Thus, on the same journey stage and faced with similar travel constraints, people’s work-related

mobile phone use patterns varied significantly. This level of variety is visible in all rows of Tables 1 and 2. The level of variety in work patterns within particular journey stages arguably highlights the degree of choice and agency that business travellers have regarding the extent to which they engage in particular types of work activity as they undertake business trips, which is an issue returned to in the discussion.

Insert Table 2 about here

The purpose of this section has been to illustrate the patterns that were found in the extent to which business travellers engage in particular types of work activity as they travel for business. The final section of the findings and the discussion which follows explore the reasons which explain these patterns.

Findings: Factors Shaping People's Work Patterns on each Journey Stage

To understand the factors that shaped the work patterns undertaken by travellers outlined above, we conducted some regression analyses to examine the extent to which the use of particular technologies or conduct of particular categories of tasks is related to how conducive business travellers find each journey stage for work. Linkages are also made between this data and data outlined in previous sections on variations between journey stage in the extent to which different tasks are undertaken and technologies are used.

Insert Table 3 around here

The dependent variable was the question ‘in general, how conducive to you find (X journey phase) for the completion of work tasks?’ which was answered on a 5 point scale from very poor to very good. Each main journey phase had a separate question about its conduciveness for work. Regression analysis was then conducted for each journey phase entering gender and age (to control for individual differences that might influence the results) alongside the use of each of the three technology types (phone, laptop and pen/paper) as independent variables (see Table 3).

In relation to car journeys, the use of pen and paper had the strongest unique influence on perceptions of how conducive a parked car was for work ($\beta = .229, p < .01$). Referring back to Figure 3, frequent use was made of both paperwork and mobile phones when stopped in one’s car at a service station. The importance of paperwork to people’s perception of the conduciveness of a parked car for working may be because this journey stage is when people are able to make phone calls that require the use of paperwork, which are calls they are not able to make when driving.

In relation to service stations, regression analysis reveals that the strongest unique influence on perceptions of conduciveness for work was the extent to which mobile phones were used ($\beta = .334, p < .01$). While Figure 3 suggests both mobile phones and paperwork were regularly used to work inside service stations the regression analysis suggests that using mobile phones was the work activity they regarded as most important to their assessment of how conducive that environment is for work. In relation to time spent inside service station buildings, the biggest constraint on people’s ability to work was noise (Figure 2). Qualitative comments on the surveys reinforce this

with noise being the most commonly referred to constraint, with one survey respondent writing, *'often can be too noisy for lengthy phone calls.'* This might explain why people were more likely to use mobile phones than laptops or pen and paper, as the portability of mobile phones means people can deal with noise constraints by moving to a quieter part of a service station, which is less feasible when they work with a laptop or paperwork. People's relative unwillingness to use laptops and paperwork in service stations may also be due to the fact that using them in service station buildings may increase the length of their break longer than they want.

In relation to airports regression analysis reveals that the use of laptops had the strongest unique influence on perceptions of airports being conducive to work ($\beta=239$, $p<.01$). Again, this fits findings from Figure 3 which illustrates strong use of laptops within this context. On the plane itself, the use of pen and paper had the strongest influence on perceptions of conduciveness for work ($\beta=300$, $p<.001$), which also supports the findings in previous figures, that pen and paper was the most frequently used medium on planes. Arguably this is related to the combined effect of the space constraints people experience (Figure 2) combined with the prohibitions that exist on the use of mobile phones during flights. Thus, in relation to technology use, this explains the almost negligible use made of mobile phones, and the greater preference people have for working with pen and paper rather than a laptop.

Both the use of laptop computers and paperwork contribute significantly to perceptions of how conducive trains are to work on ($\beta=248$, $p<.001$; and $\beta=161$; $p<.01$, respectively). The use of a laptop has the slightly stronger influence. These two technologies require some space, which fits with the finding that space was considered

a key factor when working on a train (Figure 2). Many trains also have the added benefit of a power source for laptops which might help to explain the stronger effect of this technology on this mode of transport. The limited extent to which mobile phones were used on trains can be explained by qualitative comments recorded on the surveys. These suggested that mobile phone reception on the route surveyed was very poor in places, which made it very difficult to reliably make phone calls.

The regression findings suggest that there is more flexible use of the train space for work tasks using different technologies. The use of more than one technology affects perceptions of how conducive this space/journey stage is for work. However, with the other journey stages, there is typically just one primary technology that influences perceptions of conduciveness to work. It is interesting to note that apart from in a service station, mobile phone use seem to have very little influence on perceptions of how conducive each journey stage is for work.

Insert Table 4 about here

Turning now to task type, it can be seen in Table 4 that conducting independent work generally had the most influence over perceptions of conduciveness to work of different journey stages (with Beta's ranging from $\beta = .229, p < .05$ to $.303, p < .01$) – except for service stations for which interactive tasks also had a unique influence ($\beta = .257, p < .01$). This might be due to the fact that people sometimes meet colleagues at service stations, or take the opportunity to make phone calls (which matches the finding for service stations in Table 3). In general, though, people seem to consider that conducting tasks

on their own, rather than in collaboration with others, affects how well they can work across the different journey stages.

Discussion

The data presented highlights the reasonable amount of work that business travellers typically do when travelling for work. This was true for all journey stages with the exception of time spent on planes (Figure 1). However the data highlights many variations within the data in the extent to which different types of work activity are undertaken during different journey stages. The purpose of this discussion is to use the concept of (perceived and material) affordances to make sense of these variations.

In broad terms there are two types of variation in the data, which can be linked to the distinction between the material and perceived aspects of affordances. The first type of variation in the data is differences in work patterns and constraints between journey stages, which can be explained by reference to the material dimension of the work-related affordances business travellers encounter on different journey stages. The second type of variation in the data, visible most clearly in Tables 1 and 2, are differences in the behaviour of travellers within particular journey stages, with these differences being explained by reference to the perceived dimension of the work-related affordances. The discussion examines each of these topics separately.

Variations in Work Patterns Between Journey Stages: Differences in the Material Work Affordances by Journey Stage

The perceived and material affordances to work, the possibilities people have to carry out work activities, were earlier defined as resulting from the dynamic interaction between the character of the particular tasks being undertaken, the affordances of the technologies used to carry them out and the perceived and material affordances of the travel environment. The variation in work patterns across journey stages identified can be explained by the material differences in the work affordances (or '*conditions of possibility*', Hutchby 2001, p.29) of each journey stage that result from the specific way that work tasks, technologies and the travel environment combine in each journey stage.

To begin considering how the dynamic interaction between task, technology and travel environment can combine on business trips it is useful to begin by considering the types of work tasks people undertake and the affordances necessary to effectively carry them out when travelling. A distinction can be made between two broad types of task the travellers examined attempt to undertake. Firstly are remote/electronic communication activities with geographically dispersed others (Zammuto et al's (2007) virtual collaboration). These are comparable to what have been here defined as interactive tasks. Secondly are autonomous activities which can be done in isolation from others, such as reading and doing administrative tasks such as completing paperwork. These are comparable to what are here defined as independent activities.

To be able to communicate virtually/remotely when travelling requires the use of technologies which are light and portable, predictable phone signals and relatively quiet and predictable noise levels in the travel environment. The type of technology most suitable for these activities is small mobile communication technologies such as mobile phones. If this was the case it would be expected that there would be similarities in the usage of mobile phones and the extent to which travellers carry out interactive tasks. This was found to be the case, which can be seen by comparing patterns within each journey stage of Figures 3 and 4. The differences between journey stages in these usage patterns can be explained by variations in the material extent that different journey stages provide the type of noise levels and signal predictability necessary to allow people to use mobile phones to communicate remotely. Thus, time spent by drivers within cars provides the best noise environment and the highest use patterns, and time spent in airports, where the noise environment is poorer, people were less likely to use mobile phones or carry out interactive tasks.

In contrast, to be able to undertake autonomous activities such as completing paperwork when travelling requires the use of technologies that are light and portable, combined with adequate levels of space, time and privacy. These activities could potentially be carried out using either paperwork or a laptop computer. However, as paperwork is used more frequently by travellers than laptops on all journey stages except time spent in departure airports (see Figure 3) this suggests that for travellers the material affordances of paperwork to facilitate the completion of autonomous tasks is greater than the material affordances of laptops. Further, as with undertaking interactive tasks, the variation across journey stages in the extent to which people use

laptops, use paperwork and carry out independent activities relates to material differences in the environment travellers encounter on different journey stages. Thus, as Figure 4 illustrates, the fact that travellers are most likely to carry out independent tasks when on trains, and least likely to do so when in service station buildings, within airports or on board planes is due to material differences in the nature of these travel environments. Thus, across the different journey stages examined, train carriages typically provide the environment which is most conducive to the completion of autonomous tasks, using either paperwork or laptop computers.

Variations of Work Patterns within Journey Stage: Differences in the Perceived Affordances of Each Journey Stage

Despite the dynamic interaction of the material affordances of tasks, technology and travel environment creating real possibilities and constraints for the extent to which, and way in which people can work, people's work affordances while travelling are not rigidly determined by these factors. This is due to what Norman (2002) referred to as the 'perceived' dimension of affordances. Ultimately, how people respond to and act in response to such material affordances is shaped by how they make sense of and interact with them, with different people likely to perceive the same material affordances in different ways. This thus leaves scope for the agency of actors to play a key role in shaping how they behave.

In relation to the data presented here, the agency of business travellers in shaping their behaviour is visible with variations in the way technologies are used or tasks carried out within any journey stage (Tables 1 and 2). Comparing the proportion of people who never, occasionally or frequently used mobile phones, paperwork or laptops to work, or carried out independent or interactive work tasks reveals significant differences in people's generalized behaviours. For example, Table 1 reveals that with respect to phone use on trains, over 47% of people never using their phones, over 29% saying they occasionally used their phones and about 25% of people stated they frequently used their phones. Therefore faced with the same material affordances (possibilities and constraints) regarding the use of mobile phones on trains, due to differences in how people perceive them, some choose never to use their phones, while others chose quite differently, to regularly use their phones. Such variations were visible for all journey stages in relation to all technology and task types (Tables 1 & 2).

Overall therefore, these findings have contributed to knowledge empirically through providing insights into the general patterns regarding the extent to which business travellers work while travelling for business, as well as the role played by the travel environment in shaping these patterns. The paper has also made a conceptual contribution to knowledge through applying and developing the concept of 'affordances' by showing how the travel-related work patterns revealed were due to the dynamics interaction between the material and perceived affordances to work that travellers experienced. Overall therefore, to make sense of the work-related behaviours engaged in by business travellers it is necessary to take account of the type of task being attempted, the character of the technology being utilized to undertake it, the character

of the travel environment combined with how the traveller themselves makes sense of all these factors.

Conclusions

The empirical data presented here both supplements and complements the qualitative case study data on the extent to which business travellers work when undertaking work-related trips (Felstead et al 2005b). What it provides, that these studies do not, is insights into general patterns regarding the extent to which business traveller's work while undertaking business trips, disaggregated to journey stage. In relation to the research questions outlined earlier, the paper shows how the work-related behaviours of business travellers varied significantly across different journey stages. Further, these patterns were explained through the way in which the actual and perceived work affordances of travellers on business trips were shaped by the dynamic interaction between the nature of the travel environment, the type of tasks being undertaken, and the type of technologies utilized to carry them out. This helped explain key variations in work-patterns both within and across journey stages.

It is useful to also (re)connect these findings to broader debates about both why the importance of work-related travel is related to the increasingly dispersed and globalized nature of work, and also how mobile ICTs facilitate people's efforts to work on such journeys. The paper reinforces the argument that for many managerial and professional workers, spending time undertaking work-related journeys does represent an increasingly important domain of work (Felstead et al 2005 a/b, Gustafson 2006).

For many such workers, undertaking such journeys is a regular and ongoing aspect of their work, which may help explain the general propensity demonstrated here, for people to spend a reasonable amount of their time on such journeys carrying out work tasks.

Further, research on how mobile ICTs can affect the nature of the work-life boundary broadly suggests that the use of these technologies can facilitate the intrusion of work into non-work domains such as time spent at home at evenings or weekends (Orlikowski 2007, Sarker et al 2012). The data presented here could be used to support similar arguments in the domain of work-related travel by the way in which mobile ICTs can facilitate people's efforts to work as they undertake business trips. However, it is also important to note that people are able to undertake work on business trips without the need to use mobile ICTs, as the empirical data presented here highlights the not insignificant extent to which people use paperwork to facilitate work. Thus a business traveller who carries paperwork but no mobile ICTs has as much potential to work as business travellers who do take mobile ICTs with them (albeit on different things).

There are various limitations to the analysis developed here relating to both the type of data presented, and the specificities of the populations sampled. For example, the plane-based data was collected at a small, regional airport which specialized in short haul flights, thus there is limited data on the travel behaviours of business passengers undertaking long haul, inter-continental flights. Thus, to evaluate the generalizability of the analysis developed here it would be necessary to study different types of business travellers on different types of journey.

Finally, it is useful to conclude the paper by pointing towards some potential directions for future research. Building from the data presented here, future projects could provide further insights into people's work-related technology use patterns, for example differentiating between the ways that technologies can be used, for example contemporary mobile phones could be used for making or taking phone calls, reading or sending text messages, accessing email, or internet browsing. Further, a topic worth exploring further is whether people's jobs affect the extent to which they work while travelling. Finally, while the data presented here examined people's general patterns of working while travelling, future research could drill deeper into examining variations in people's individual work patterns and the factors which explain them. What the data did not provide insights into was the attitudes, feelings and emotions of business travellers. Thus, further research which provides such insights would be useful as it would give a sense of the how happy people are to use travel time in the ways reported here, or whether they are unhappy and stressed by behaving in this way.

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Donald is a Reader in the Sociology of Contemporary Work Practices. One of his key research interests is the topic of mobile working. His research in this area focuses on two specific, overlapping themes: the extent to which business people work while travelling on work-related journeys, and the way in which mobile computer and communication technologies are used in these work activities. He has published extensively on this topic in a diverse range of journals including *New Technology*, *Work and Employment*, *Information and Organization*, *Mobilities and Transportation Research* [Part F: *Traffic Psychology and Behaviour*].

Carolyn Axtell

Carolyn is a Senior Lecturer at the Institute of Work Psychology. Her areas of interest include: virtual/remote working; perspective taking/empathy; the organisation of work/job design. She has published extensively on these topics in a wide range of journals including: *New Technology*, *Work and Employment*, *Journal of Business & Psychology*, *International Journal of Human-Computer Studies*, *Journal of Organisational Behaviour*, and *Journal of Work and Organizational Psychology*. Carolyn is also on the editorial boards for the *Journal of Occupational and Organisational Psychology* and the *Journal of Business and Psychology*.

Table 1: Work-related Technology Use Patterns on Business Trips (percentage of respondents)

	Non Users	Occasional User	Frequent Users
TRAIN JOURNEY: IN CARRIAGE			
Mobile Phone	47%	29%	25%
Pen and Paper	19%	24%	57%
Laptop computer	47%	15%	38%
PLANE JOURNEY: WITHIN DEPARTURE AIRPORT			
Mobile Phone	36%	22%	43%
Pen and Paper	48%	29%	22%
Laptop Computer	48%	23%	29%
PLANE JOURNEY: ON FLIGHT			
Mobile Phone	99%	1%	1%
Pen and Paper	48%	28%	23%
Laptop computer	71%	17%	12%
CAR JOURNEY: WITHIN SERVICE STATION BUILDINGS			
Mobile Phone	34%	28%	39%
Pen & Paper	49%	30%	22%
laptop computer	62%	26%	11%
CAR JOURNEY: WHEN PARKED AT SERVICE STATION			
Mobile Phone	8%	21%	70%
Pen & Paper	28%	28%	43%
laptop computer	56%	24%	20%

Table 2: Work-related Task Engagement Patterns on Business Trips (percentage of respondents)

	Never	Occasionally	Frequently
TRAIN JOURNEY: IN CARRIAGE			
Interactive Tasks	73%	16%	11%
Independent Tasks	8%	12%	80%
PLANE JOURNEY: WITHIN DEPARTURE AIRPORT			
Interactive Tasks	66%	23%	12%
Independent Tasks	27%	31%	42%
PLANE JOURNEY: ON FLIGHT			
Interactive Tasks	89%	8%	3%
Independent tasks	45%	29%	26%
CAR JOURNEY: WITHIN SERVICE STATION BUILDINGS			
Interactive Tasks	47%	34%	19%
Independent tasks	46%	33%	21%
CAR JOURNEY: WHEN PARKED AT SERVICE STATION			
Interactive	30%	20%	49%
Independent	32%	32%	37%

Table 3: Effect of media use on perceptions of conduciveness for work

	Car	Service Station	Airport	Plane	Train
Variable	β	β	β	β	β
Gender	-.028	.113	-.027	.061	.050
Age	.059	.006	-.039	.029	.095
Mobile Phone	-.104	.334**	.072	-.033	-.041
Laptop Computer	.117	.089	.239**	.157	.248***
Pen & Paper	.229**	.091	.101	.300***	.161**
R ²	.086*	.204***	.107**	.146***	.072***
Adjusted R ²	.050*	.171***	.078**	.166***	.056***
<i>df</i>	5,133	5,126	5,160	5,148	5,302

* $p < .05$, ** $p < .01$, *** $p < .001$ (N ranges between 127 (Service Station) and 310 (Train))

Table 4: Effect of task type on perceptions of conduciveness for work

	Car	Service Station	Airport	Plane	Train
Variable	β	β	β	β	β
Gender	.025	.032	-.055	.041	.053
Age	.010	-.026	-.067	.048	.072
Interactive Work	.060	.257**	.075	.060	.054
Independent Work	.303**	.229*	.254**	.298***	.264***
R ²	.106**	.191***	.087**	.105**	.288***
Adjusted R ²	.079**	.167***	.064**	.081**	.071***
<i>df</i>	4,136	4,134	4,163	4,154	4,309

* $p < .05$, ** $p < .01$, *** $p < .001$ (N ranges between 135 (Service Station) to 310 (Train))

Figure 1: Extent to which People undertake work tasks as they travel on work-related journeys

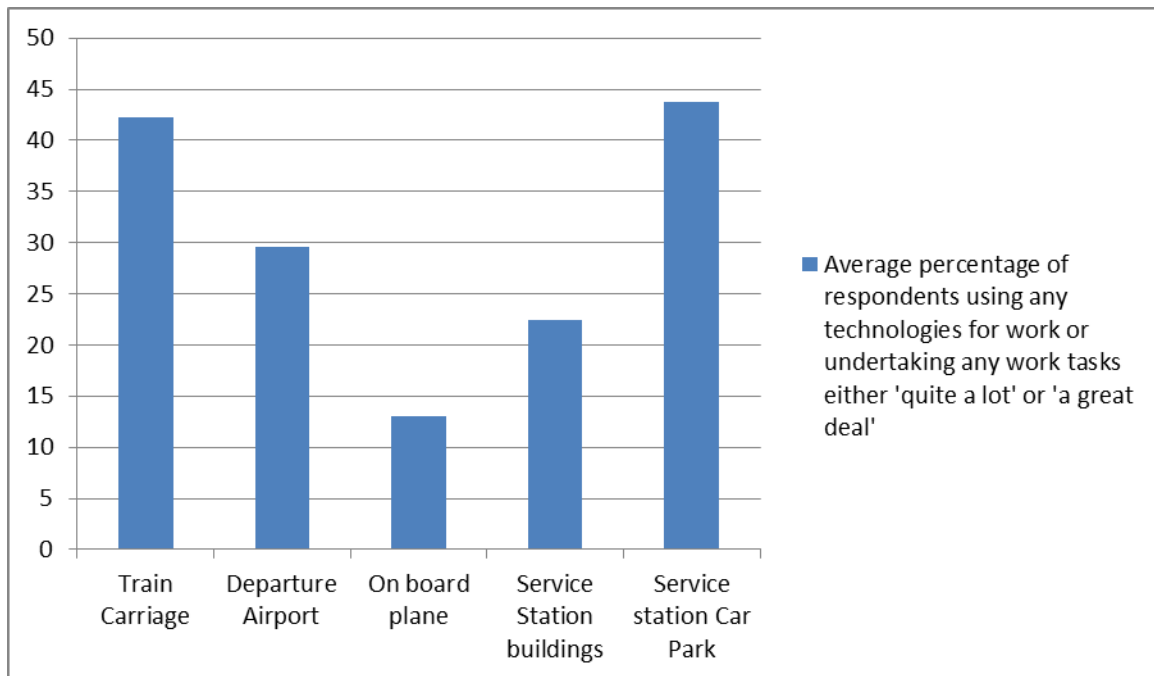


Figure 2: Extent to which space, noise and time constraints inhibit people's ability to work

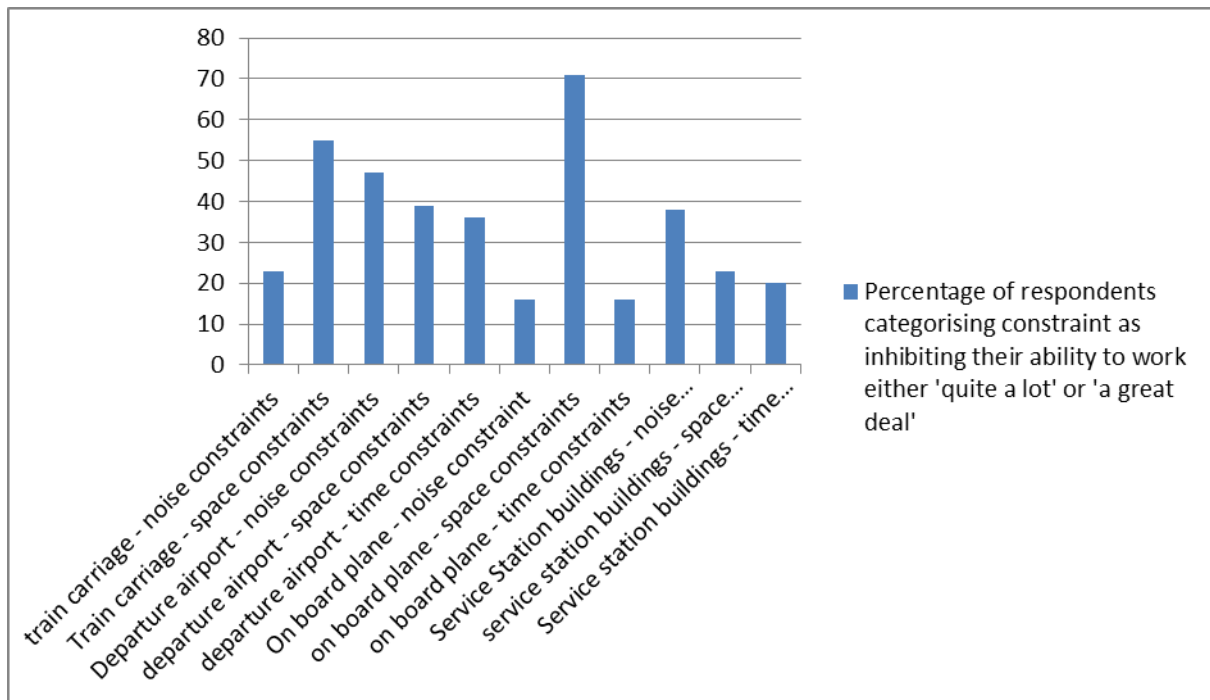


Figure 3: Work-related Technology Usage by Journey Stage (percentages are those categorized as frequent users – column 3 from Table 1)

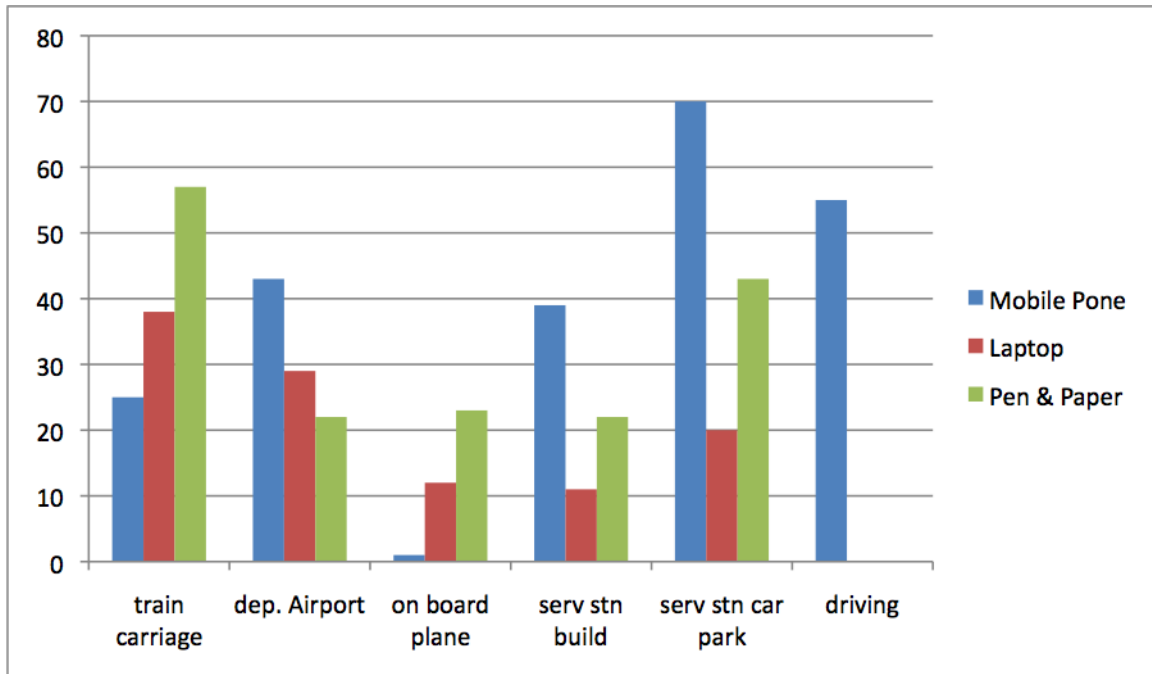


Figure 4: Frequency of Undertaking Work-related Tasks (percentages are those categorized as working frequently – Column 3 from Table 2)

