1.0 INTRODUCTION

An ability to innovate is widely regarded as adding to the competitiveness of organisations and destinations (Tseng, Kuo and Chou, 2008; Paget, Dimanche and Mounet, 2010; Nicolau and Santa-Maria, 2012; Mei, Arcodia and Ruhanen, 2012). Yet, estimating the scale of innovation in tourism is problematic (cf. Hertog et al, 2011; Camison, 2011; Krizaj, 2012; Orfila-Sintes, Crespi-Cladera and Martinez-Ros, 2005). This reflects significant unresolved differences of opinion on how it should be measured and on the factors that influence its form in various sectors, locations and over time (e.g. Arta and Acob, 2003; Hjalager and Flagestad, 2012; Sorensen, 2007; Carlisle et al, 2013). As a result, recent reviews of the literature on innovation in tourism have all highlighted the need for more theorising and empirical research on almost all aspects of the phenomenon (e.g. Hall and Williams, 2008; Tejada and Moreno, 2013; Williams and Shaw, 2011). Hjalager (2010:9), for example, in this journal made a 'plea that tourism innovation is addressed in multiple ways and with several methodological approaches…(and there is a specific need for research on)… how innovation processes take place in tourism enterprises and organisations, including what types of capacities and incentives they draw on'. This paper responds to these calls by examining one dimension of innovation at the level of the organisation; the ability to identify, acquire and use external knowledge to innovate, namely absorptive capacity (Cohen and Levinthal, 1990).

There is often an acknowledgement in the tourism literature that knowledge and the acquisition of knowledge via networks plays a vital role in innovation (Scott, Baggio and Cooper, 2008; Shaw and Williams, 2009; Xiao and Smith, 2006). In other words, the capacity

of organisations to garner and use external information for innovative purposes is a fundamental part of an explanation of organisational innovation (Cooper, 2006; Dwyer and Edwards, 2009; Gallego, Rubalcaba and Suarez, 2013; Koostopoulos, Papalexandris and Ioannou, 2011; Zahra and George, 2002). Related concepts been used to interrogate small and medium sized enterprises (SMEs) as well as larger organisations (Fogg, 2012; Harris, McAdam, McCausland and Reid, 2013; Tejada and Moreno, 2013). Further, there is emerging evidence that tourism enterprises are particularly dependent on external knowledge, such as that which may be gleaned from suppliers, especially when compared with businesses in other sectors (Williams and Shaw, 2011; King, Breen and Whitelaw, 2012). Following the development of a validated instrument for its measurement, this paper reports the findings of a survey into levels of absorptive capacity within the British hotel sector and considers the implications of the findings for how absorptive capacity should be theorised in tourism. The hotel sector is considered an interesting testbed because it contains a diversity of ownership and management arrangements yet shares fundamental aspects of the service offer.

Even though many commentators remain critical of the over-reliance on research informed by manufacturing contexts (e.g. Hall and Williams, 2008), there is now an emerging body of work on innovation that recognises tourism's peculiarities and incorporates them into their theorising (e.g. Decelle, 2004; Camison and Monfort-Mir, 2011; Williams and Shaw, 2011). In similar vein, the research reported in this paper draws upon those aspects of the mainstream literature on absorptive capacity that are applicable to tourism and, as becomes clearer later, refines them to take account of what is already understood about tourism enterprises and the environments within which they operate.

2.0 LITERATURE REVIEW

2.1 The role of absorptive capacity in innovation

The opening paragraph of Lane, Koka and Pathak's (2006: 833) highly regarded review of absorptive capacity encapsulates the essence of the concept and its significance:

> Absorptive capacity is one of the most important constructs to emerge in organisational research in recent decades . . . (it) refers to one of a firm's fundamental learning processes: its ability to identify, assimilate, and exploit knowledge from the environment. These three dimensions encompass not only the ability to imitate other firms' products or processes but also the ability to exploit less commercially focused knowledge, such as scientific research. Developing and maintaining absorptive capacity is critical to a firm's long term survival and success because absorptive capacity can reinforce, complement, or refocus the firm's knowledge base.

Recent research suggests that absorptive capacity makes a positive contribution to financial performance but that the relationship between levels of absorptive capacity and financial returns are nonmonotonic and that the former may even be harmful to performance at high levels (Wales, Parida abd Patel, 2013).

A systematic review of the literature on innovation in service sector businesses (Carlborg, Kindstrom and Kowalkowski, 2013) confirms the almost complete absence of research into the absorptive capacity of hotels and other tourism businesses in spite of the extensive 'mainstream' (notably manufacturing) literature. Valentina and Passiante's (2009) study is

one of the few to examine absorptive capacity in tourism. Their research on small and medium sized enterprises (SMEs) suggests that participation in formal networks is valuable if the knowledge gained from this activity can be shared effectively within the firm. Weidenfeld, Williams and Butler (2009) have also signalled the importance of absorptive capacity to innovation in tourism organisations. Though not the central focus of their work, they point out that the absorptive capacity of organisations is influenced by organisational structure, human capital and management practices (see also Cooper, 2006).

There are, however, dissenting perspectives. Notwithstanding their promotion of the concept, Lane et al (2006) for example, argue that the theoretical advancement of absorptive capacity since it was originally proposed has been limited. Instead, they suggest that it has been reified to the extent that it is rarely examined critically even though the term is used loosely on occasion and in different ways, without definition or qualification.

Other commentators have even questioned the centrality of knowledge as the basis for competitive advantage. Alvesson and Spicer (2012:1195), for example, challenge what they consider to be the 'one-sided, widely shared, and rather grandiose portrait' of the competitive firm inevitably being associated with the effective mobilization and utilisation of its cognitive capacities. In some cases, they suggest that 'functional stupidity' - characterised by a lack of reflexivity, a somewhat narrow focus and an environment where few justifications are required for decisions - can provide significant organisational benefits. These include certainty, decisiveness and predictability, all of which, they argue, enable the productive functioning of the firm.

Some studies of tourism enterprises have also cautioned against an uncritical focus on external knowledge acquisition as though it inevitably leads to innovative behaviour. Guisado-Gonzalez et al's (2013) recent research shows that the purchase of technological knowledge from outside the firm, for example, does not necessarily result in enhanced innovation. Indeed, their analysis of Spanish hospitality companies' purchase of technology suggests that knowledge acquisition of this kind is not only a poor indicator of innovation but may lead to a negative effect on innovation. Such findings are not unique to tourism (Gebauer, Worch and Truffer, 2012).

The discussion of absorptive capacity that follows notes but rejects the contrasting criticisms identified above for three reasons. Firstly, the fundamental challenge to the role of knowledge in innovation is countered by the weight of increasingly robust theorising and empirical evidence. To do so does not imply that external knowledge is part of a neat linear process of innovation (Van de Van et al., 2008). Indeed, it is proposed that while knowledge is interpreted (and created) within the structure of an organisation, it is constitutive of the structure rather than contingent (Staber, 2013). Secondly, it is not claimed that focusing on knowledge, or for that matter absorptive capacity, is the sole or exclusive way of interrogating innovation. As Lichenthaler and Lichenthaler (2009) have argued, absorptive capacity may be one of several capability-based capacities that influence innovation. Finally, the model of absorptive capacity discussed below represents a significant refinement on what was originally proposed by Cohen and Levinthal (1990). When conceptualised appropriately, there is a strong *a priori* case for supposing that absorptive capacity is a valuable means of examining an aspect of innovation within enterprises in tourism.

2.2 Dimensions of absorptive capacity

Zahra and George's (2002) highly cited contribution provides a valuable refinement of Cohen and Levinthal's (1990) initial theorising by conceptualising absorptive capacity as a dynamic capability. Seen this way, absorptive capacity is neither an organisational asset (a static notion which equates to a firm's knowledge base and fails to incorporate the processes by which knowledge is captured and used) or a substantive capability (which, in this context, would encompass the process by which organisations gather external information and the competencies they use for its utilization for competitive purposes) (Roberts, Galluch, Dinger and Grover, 2012). The dynamic element refers to an organisation's ability to reconfigure its substantive capabilities (Nieves and Haller, 2014). Though the distinction is not always neat, even conceptually (Helfat and Winter, 2011; Hine et al., 2013), as Sun and Anderson (2008: 134) point out, 'a dynamic capability … reflects the ability of an organisation to respond to strategic change … by reconstructing its core capabilities'. Thus, to borrow Katkalo et al's (2010:1178) words, 'whether the enterprise is currently making the right products and addressing the right market segment, or whether its future plans are appropriately matched to consumer needs and technological competitive opportunities, is determined by its dynamic capabilities'. Within this context, Zahra and George (2002) propose four capabilities or dimensions of absorptive capacity: acquisition, assimilation, transformation, and exploitation.

The first capability is a firm's ability to identify and acquire knowledge from external sources. Three attributes – namely, the intensity, speed and direction of effort – can influence the quality of acquisition. The second capability is an organisation's ability to

assimilate new knowledge. In other words, its processes for interpreting the knowledge acquired in strategic terms. Where external knowledge is based on heuristics not understood by the enterprise, comprehension will be limited. Thus, as external knowledge is often specific to particular contexts, interpretation will be flawed unless those contexts are understood. The third capability is entitled transformation. The essence of this dimension is that newly acquired and assimilated knowledge is combined with existing knowledge to provide a new understanding. Zahra and George (2002: 190) argue that 'the ability of firms to recognize two apparently incongruous sets of information and then combine them to arrive at a new schema represents a transformation capability … It yields new insights, facilitates the recognition of opportunities, and, at the same time, alters the way the firm sees itself and its competitive landscape'. The final dimension is exploitation. Although it is acknowledged that exploitation may occur by happenstance or serendipity, the capability referred to here implies the presence of procedural mechanisms that enable organisations to refine current initiatives or begin new ones; in other words, to innovate and sustain their businesses (Easterby-Smith, Grace, Antonacopoulou and Ferdinand, 2008). Each of these will be mediated by the organisation's dominant logic and routines. The former refers to the way resource allocations are made in light of managers' conceptualisations of the business (Kor and Mesko, 2013). The latter, though recognised as playing an important role in enabling or hindering innovation and change, remains contested and under-researched (cf Feldman, 2000; Katkalo, 2010; Salvato and Rerup, 2011). How such factors influence absorptive capacity may also vary between single and multi-unit operations (Hansen, 2002; Garvin and Levesque, 2008).

The four capabilities are divided by Zahra and George (2002: 190) into two complementary categories – potential and realized absorptive capacity – to form 'a coherent dynamic capability that fosters organisational change and evolution'. As is illustrated in Figure 1, this comprises the core of the model of absorptive capacity they develop. The remainder of the model is comprised of factors that enable or limit the extent of absorptive capacity or its consequences.

Past successes or failures in searching for external sources of knowledge and the learning associated with such activities are considered important antecedents to absorptive capacity (Nieves and Haller, 2014). Further, diverse sources of knowledge that complement existing understanding are seen as contributing to the development of absorptive capacity. Vasudeva and Anand (2011) go further by drawing a distinction between latitudinal (related knowledge) and longitudinal (unrelated knowledge) components of absorptive capacity. Zahra and George (2002: 193) also highlight the role of activation triggers. These are events that 'encourage or compel a firm to respond to specific internal or external stimuli'. For example, poor organisational performance or radical innovation elsewhere may precipitate a crisis requiring management action (see also Foss and Lindenberg, 2013) . Clearly, the seriousness of the activation trigger will influence the intensity of the re-action and will offer direction to the search (Van de Ven et al., 2008).

FIGURE 1 ABOUT HERE

Social integration mechanisms are required for potential absorptive capacity to be realised. These overcome the potentially structural, cognitive, behavioural and political barriers that

might exist within an organisation and prevents knowledge sharing and the development of mutual understanding (Gersick and Hackman, 1990; Reich, Gemino and Sauer, 2013; Hogan and Coote, 2013). Todorova and Durisin (2007) emphasise the broader contribution of social integration, extending its importance to beyond connecting potential and realised absorptive capacity. The importance of social integration to knowledge sharing among employees is already recognised in the tourism literature (Chen, 2011) as well the management literature more generally (Hau, Kim, Lee and Kim, 2012). Zahra and George (2002) present varied evidence to suggest that systematic and formal mechanisms for knowledge sharing are more efficient and effective than informal approaches. They also highlight the importance of learning from past experience which subsequently influences such factors as the timing of investment in external searching as well as on levels of investment. Differences in performance between organisations – or the same organisation over time – are often accounted for by the ability to learn from past experience.

The final aspect of the model, labelled regimes of appropriability, refers to an organisation's ability to maintain the competitive advantage gained from its absorptive capacity. Strong regimes of appropriability are, therefore, those where the costs of imitation are high or where 'isolating mechanisms' (such as secrecy) make imitation difficult because there are few 'knowledge spillovers' to competitors.

It is important to emphasise that simply increasing knowledge does not inevitably increase innovation or business performance. The theoretical propositions on which this research is predicated hold that absorptive capacity (as an independent variable) has an impact on innovation (Gebauer, et al, 2012; Fosfuri and Tribo, 2008) which will be translated

differently into performance depending upon, *inter alia*, the conditions of particular markets (Jansen, Bosch and Volberda, 2005).

2.3 Measuring absorptive capacity

Significant research effort has been expended on measuring abortive capacity over the past two decades. Most often, unidimensional measures have been used such as levels of expenditure on research and development or the number of research staff employed (Escribano et al, 2009). Such approaches may be revealing when undertaken as part of wider studies of innovation in certain sectors or to establish cross-sectoral perspectives on particular aspects of investment in innovation. They are inadequate, however, for those interested in interrogating the conceptually separate aspects of potential and realized absorptive capacity. Moreover, they are evidently inadequate for exploring absorptive capacity in services such as tourism where innovation does not arise from heavy investment in research and development (Hjalager, 2010; Shaw and Williams, 2009; Hall and Williams, 2008).

This paper builds upon an alternative approach developed concurrently in a number of recent studies (Jimenez-Barrionuevo, Garcia-Morales and Molin, 2011; Flatten, Engelen, Zahra and Brettel, 2011; and Camisón and Forés, 2010). The approach utilises a multi-dimensional scale to measure the absorptive capacity construct which differentiates between the four components (acquisition, assimilation, transformation and exploitation) and therefore between potential absorptive capacity (acquisition and assimilation) and realized absorptive capacity (transformation and exploitation).

In these studies the authors identify the items which they suggest would adequately measure the key dimensions of absorptive capacity and then test the validity of the resulting scale, refining the items based on this analysis. Although all provide valid and generaliseable scales, the numbers of items, focus of questioning and sampled population, differ in each. Jimenez-Barrionuevo et al (2011), for example, drawing on previous studies, developed an eighteen item scale (fifteen of which were found to have very high factor loadings for the construct). By contrast, Flatten et al (2011) produced a list of 53 items from 33 studies which, after testing and validation, were reduced to fourteen that reliably measured the construct. Camison and Fores (2010) produced a 19 item scale which was reduced to 16 after consideration of factor loadings.

The use of previous empirically tested scales provides the necessary content validity in all of these studies. Where they differ, however, is not merely in the wording of the item statements but in the guidance to respondents on what should be considered when answering, slightly altering the perspective of each. For example, Camison and Fores (2010) ask for the responses to be considered relative to the organisation's direct competition using a scale ranging from far 'worse to far better than our competition'. Setting the items within a competitive context helps the respondent to gauge the positive or negative aspects of the firm's response whereas asking in isolation may lead to overly positive responses or such a variety of interpretations that the scale is made invalid. Jimenez-Barrionuevo et al (2011) set the context of responses through a scenario (more applicable to the first two components, acquisition and assimilation) asking respondents to think about one organisation with whom their firm has had significant contact in the last three years in relation to gaining information or knowledge. This is suitable when first validating the

instrument but may be limited in its ability to then measure absorptive capacity as only one situation is being considered rather than the wider operations of the firm. Flatten et al (2011) provide instructions to those completing their questionnaire which may steer responses towards particular aspects of each dimension, potentially distorting the results. For example, they use three items to measure exploitation which tend to emphasise technology. Yet, as Delmas (2011) argues, many studies have overemphasised technology and managerial functions at the expense of social and regulatory aspects. Table 1 summarises recent approaches to measuring the antecedents of absorptive capacity using multi-item scales highlighting their relative strengths and weaknesses.

TABLE 1 ABOUT HERE

In order to create a similarly valid scale for application within the UK hotel sector, existing scales and their related survey instruments were assessed within the context of the literature on absorptive capacity within the service sector. By combining aspects of these validated scales, which are themselves based upon previous empirical studies, and refining the items to reflect the peculiarities of tourism organisations, provides an appropriate starting point for the development of a scale which has both content validity and is, *prima facie*, more applicable to tourism. Much of the previous research has only studied what are deemed to be innovative (manufacturing) firms or innovative (high tech) sectors. The aim of applying the instrument to a large sample within the UK hotel sector is to validate and refine the scale as well as to measure the absorptive capacity in this neglected sector.

3.0 RESEARCH DESIGN AND METHODS

An initial research instrument based on those discussed above was developed and then used as the basis for informal interviews with five senior practitioners. Their responses, comments and suggestions helped to refine the questionnaire and render it more suitable for tourism businesses and to provide content validity. The resulting instrument was then piloted among 100 randomly selected hotel managers (with a twelve per cent response rate) and further stylistic refinements were made, ensuring that the wording was less ambiguous and that terminology was a better fit with that used in the sector.

The research instrument was designed to gather data on the four conceptual dimensions of absorptive capacity. As can be seen in Appendix A, the key features of the survey instrument include the use of a five point Likert type scale (as in similar studies eg Lane and Lubatkin, 1998; Szulanzki, 1996 and Delmas et al, 2011). The seven point scale used by Jimenez-Barrionuevo et al (2011) and Flatten et al (2011) was rejected on the basis that it might be more difficult for respondents to distinguish between the points and would add little in terms of data accuracy. A combination of scene setting and competitor comparison was used to provide respondents with a clearer focus and these were adapted for each of the four absorptive capacity components. A larger number of items were included in the scale initially in the knowledge that these were likely to be reduced through factor analysis. This also ensured that the items that were significant in previous generaliseable scales were not assumed to be the only ones of importance within the hotel sector. The scale used in the full study, after pre-testing and piloting, consisted of thirteen items for acquisition, fifteen for assimilation, sixteen for transformation and eleven for exploitation. Further

single item construct validity questions were added to triangulate data as well as questions on the firm's characteristics (size, age, type).

The questionnaire was sent to a database that contained 4554 contact email addresses of senior managers working in UK hotels during June 2013. Following the low response rate to the pilot study, it was decided to survey the complete database in order to achieve the required number of responses for meaningful analysis. The estimated variability in the population (relating to the issue being researched), confidence level and level of accuracy required suggested a minimum sample size of 200. This would provide sufficient data to undertake both scale validation and refinement, and to assess absorptive capacity within this sector. From the 3732 sent (4554 minus the email 'bounce backs' due to invalid addresses) 331 were returned and 259 of these were usable, giving a response rate of 7%. Although low this is not untypical for research conducted in this sector (Keegan and Lucas, 2005) and was large enough to undertake the required analysis.

Non-response was investigated in terms of size and type of organisation but no pattern was discerned. Ten non-responders were contacted to ascertain their reasons for not participating and these were found to relate to closure of the business, lack of interest in the subject area and a lack of time to complete the questionnaire. The sample was also tested for non-response bias using the extrapolation method (Armstrong and Overton, 1977) comparing the earlier and later responses. This technique assumes that the last to respond are the most similar to non-responders and can therefore be compared with the earlier sample to assess any differences. The results indicated no significant differences between the two sub-samples. Although non-response is a significant issue in surveys of this

type the response rate is in line with other studies and the range and type of response appear to adequately reflect the sector. Tables 2 and 3 summarise the sample.

TABLES 2 and 3 ABOUT HERE

It was important to elicit responses from senior managers rather than junior employees even though this probably reduced the response rate. Such participants are more likely to have the breadth of knowledge required to complete the questionnaire and, in practice, play an important role in shaping the organisational culture within which innovation takes place (Thomas, 2012). The majority of previous studies have targeted CEOs for this reason, although Flatten et al (2011), in their two samples, were able to assess the difference between responses from CEOs and from employees and found that these were not significant. The letter introducing the project and inviting participation asked those completing the questionnaire not to answer questions unless they had direct experience of the items being asked about. Although this would also reduce the quantity of data available, the anticipation was that it would strengthen its validity (Jimenez-Barrionuevo et al., 2011).

4.0 ANALYSIS AND FINDINGS

Initial analysis of the data was concerned with assessing the reliability of the scale using both exploratory and confirmatory factor analysis. This allowed for the refinement of items for inclusion and enabled a comparison to be made between the findings from this sample and the theoretical dimensions of absorptive capacity discussed earlier; acquisition, assimilation, transformation and exploitation.

Analysis of each of the items suggested that the negatively worded statements had led to some confusion (indicated by their negative correlations with other items even after reverse coding). Respondents did not always recognise the negative phrasing within the banks of largely positively worded items so to avoid error these five items were excluded from the scale. Several items were found to have extreme means and/or low variance (suggesting a positive response bias or a poor ability to differentiate between views). These were ASU7 'cross-department meetings to share new information and solve problems'; TRU2 'regular interdepartmental meetings'; TRU3 'new operations meetings highly effective'; TRU5 'important data transmitted regularly to all units'; TRU6 'all units informed quickly when something important happens'; TRU12 'employees can use knowledge in their practical work'; EXU2 'processes for all kinds of activity are clearly known' and EXU6 'support new service idea development'. These were also excluded from the scale.

The remaining 41 items were then tested for scale reliability, resulting in a Cronbach's alpha score of 0.93. Although this would suggest reliability (Cronbach's alpha> 0.9), scales with a large number of items tend to have higher alpha scores, thus reliability is not proven. The output also states that the deletion of any one item will not improve this measure and is, therefore, unhelpful in creating a more parsimonious scale. Moreover, the inter-item correlations suggest that there are groupings of items within the overall bank. However, with this type of analysis alone it is not possible to know whether these groupings reflect the four dimensions of absorptive capacity or other factors.

Principal components analysis (a form of factor analysis suitable for this type of ordinal data) was performed to further investigate each item's fit. The resulting table of communalities from extracting one component is shown in Appendix 2 and suggests that most items share variance with the extracted component but that five share less than 10% of variance with the extracted component. These can be considered for exclusion from the scale. Analysis of a principal components scree plot (not shown), however, confirmed that the scale measures more than one construct as only 23.3% of the variance in the data is explained by one component.

A principal components analysis restricted to two components using varimax rotation was then performed. The rotated component matrix in Appendix 3 shows the relation between each item and the two components. The two components explain 36.8% of the variation in the data and consideration of the items in each grouping shows some similarities with the components of absorptive capacity identified in previous studies. The first component (darker shaded area) includes the majority of statements that relate to 'use' of information/knowledge without a distinction being made between assimilation, transformation and exploitation. The second component (lighter shaded area) clearly relates to acquisition only.

This initial factor analysis suggests that the items are either not adequately distinguishing between assimilation and transformation or that within the hotel sector these activities are difficult for practitioners to separate. Exploring the data further for potential and realised absorptive capacity also identifies clear differences between this and other studies. The results confirm that two factors are at play but that these are acquisition of knowledge and

a broad category 'use' which incorporates elements of assimilation, transformation and exploitation. Running the same factor analysis with those items that are similar to the Jimenez-Barrionuevo et al (2011) study (ie deleting those that require competitor comparison) results in similar findings. The four expected factors (acquisition, assimilation, transformation and exploitation) do not emerge from the data. This suggests that absorptive capacity is qualitatively different within the hotel sector.

4.1 Structural equation modelling

In order to test this revised two factor model, confirmatory factor analysis was undertaken using structural equation modelling. Using AMOS 20, the maximum likelihood method was selected. This requires data normality, a sample size of 200 or more and data that can be treated as continuous (Blunch, 2013). The five point Likert scale used meets the requirements for continuous data (Nachtigall, Kroehne, Funke and Steyer, 2003) and tests of skewness and kurtosis showed that all variables, other than three, were within acceptable limits of normality (Tabachnick and Fidell, 2013). The maximum likelihood method within AMOS has the advantage of being able to manage missing data through estimation of the means and intercepts. This option allows the maintenance of an appropriate sample size which would be reduced if each case with missing data were excluded.

Table 4 summarises the results of the possible models explored using maximum likelihood. The measures of fit chosen recognise that models are only approximations and that perfect fit is, therefore, highly unlikely (Hox and Bechger, 1999). The CFI (comparative fit index) is a relative measure of fit assessing where the model is placed between the saturated model (maximum fit) and the independence model (maximum constraints) as well as taking into

account the degrees of freedom (Blunch, 2013). A model with good fit will have a CFI greater than 0.9. The RMSEA (root mean square error of approximation) is a 'badness' of fit measure which also allows for a measure of model parsimony. An RMSEA score of 0.05 and below is considered a good fit and above 0.1 should be rejected (Mueller and Hancock, 2008).

TABLE 4 ABOUT HERE

The process began with one factor (absorptive capacity) and all the remaining items (after removal of those with negative wording). Reduction in the items based on the regression weights and square multiple correlations led to a revised model but with little improvement in fit (see Appendix 4). Next, the four factor model was explored and a similar process of item removal followed. The estimated correlations between the four factors confirmed the need to explore a two factor model with significantly higher correlations between the three factors, exploitation, assimilation and transformation (all above 0.78) and lower correlations between these and acquisition (all below 0.37). Although all correlations are significant (to be expected if they are components of the single concept absorptive capacity), the correlations give some indication that 'acquisition' is a separate component whereas the other three may combine to a related but separate concept (see Appendix 5).

This further confirmed the findings from the exploratory factor analysis and suggested trial of a two factor model. The hypothesised two factor model was tested and, with item reduction, the best fitting model had fifteen items which loaded significantly on the two factors (see Table 3 and Appendix 6). Further item reduction did not improve the model fit.

Although the CFI is not at the level of 'good fit (0.95) it is close to an acceptable 0.90 and the RMSEA measure is below the reject level of 0.1 although not at a good fit level of 0.05. Using SPSS to check the resulting items in the scale for reliability gives Cronbach's alpha of 0.887 which suggests acceptable reliability. The value of the scale is, therefore, worth pursuing; although far from perfect, it appears to have some potential for assessing the absorptive capacity construct in hotels.

TABLE 5 ABOUT HERE

A consideration of each item shows that the factor 'acquire' is comprised of items that emphasise knowledge acquisition via personal relationships (an issue identified by others in different contexts e.g. Inkpen and Tsang, 2005; Thomas, 2012). In this light, it is appropriate to re-conceptualise absorptive capacity in a manner that separates the acquisition of knowledge from its use. This will be undertaken following a discussion of the value of the refined instrument and its limitations.

Although the revised scale has an acceptable measure of reliability (Cronbach's alpha) exploration through SEM confirmatory factor analysis has shown that it is far from a perfect fit with the data. In assessing the criterion validity of the final fifteen item scale, two summated measures were created using the mean score of the items related to 'use' and the same for those indicating 'acquire'. These scores were then correlated against the more direct measures asked in the survey. These were 'How many organisations does your organisation learn from?'; 'How do you rate your organisation's ability to acquire and assimilate knowledge?' (potential) and 'How do you rate your firm's ability to transform and

exploit knowledge?' (realised). The results of these correlations are given in Table 6. Again, we can see that 'acquire' is connected with external organisations and less with the firm's internal abilities. 'Use' correlates well with the more direct question responses in both the potential and realised absorptive capacity realms. There is also a significant correlation between 'acquire' and 'use'. There is some evidence for criterion validity and further evidence of the appropriateness of the two factors.

TABLE 6 ABOUT HERE

The data were examined further using the summated scales of 'acquire' and 'use'. Anova analysis showed no significant differences in the 'acquire' score dependent on type of business, age of business, role of respondent or size of business. This was similar for the 'use' score although the number of bedrooms (size of the business) did appear to have some impact (Levene statistic 0.023).

5.0 CONCLUSIONS AND IMPLICATIONS

The data analysed for this paper do not confirm the reliability of the scales developed by previous researchers using similar items (ie Camison and Fores, 2010; Delmas, Hoffman and Kuss, 2011; Jimenez-Barriouevo, Garcia-Morales and Molina, 2011; and Flatten, Engelen, Zahra and Brettel, 2011). Neither do the data reaffirm Zahra and George's (2002) four hypothesised components of absorptive capacity or indeed the existence of a delineation between potential and realised absorptive capacity. It seems, therefore, that absorptive capacity needs to be re-assessed and conceptualised differently if it is to have application in tourism. Figure 2 below provides a re-conceptualisation of absorptive capacity drawing on

the research reported in this paper and other recent contributions relating to aspects of innovation among tourism enterprises.

FIGURE 2 HERE

The model dispenses with the notions of potential and realised absorptive capacity and simplifies its components to acquisition and use. It retains the role of experience (as has been discussed, several studies in tourism have highlighted its importance in varying contexts) and the need for mechanisms of social integration to ensure that knowledge is used effectively. 'Triggers of activation' are re-theorised as making a potentially positive contribution to the use of knowledge rather than its acquisition. If, as this and other studies discussed in the literature review suggest, the most valuable sources of knowledge are relational, it is likely that they emerge from established networks. These sources of knowledge are emphasised in the model. The intensity of use of this acquired knowledge will be conditioned by the circumstances facing the firm (the activation triggers).

There are potentially important practical implications for policy-makers seeking to enhance the innovative behaviour of tourism businesses arising from this study. Although the results confirm the importance of business relationships for knowledge acquisition, they also show that simply developing and promoting business networks within destinations, or even on a broader spatial scale, will not necessarily lead to innovation. To encourage innovative behaviour, policy-makers may need to extend their reach to the activation triggers that prompt organisational utilisation of external knowledge rather than simply expanding opportunities for acquisition. This is challenging because the policy tools available,

especially at the level of the destination, are limited and there are few, if any, precedents. To that extent, it suggests a high degree of 'policy imagination' is required, preceded by appropriate research. Policy interventions to support social integration within organisations, perhaps arising from training or knowledge exchange activities, would also require strategies to engage businesses that have proved somewhat elusive to date.

This study inevitably suffers from limitations. The sample size enables robust statistical analysis but cautions against exaggerated claims. Replication would increase the confidence with which observations might be made and perhaps enable more finely grained analysis, notably taking into account contrasting ownership arrangements. That the study was undertaken exclusively with British hotels also militates against making claims that are overstated. An international comparative study would enable greater scrutiny of the theoretical observations made here and lead to more easily generalizable findings.

The implications for future research of the foregoing analysis are twofold. Firstly, a similar survey should be undertaken using the items identified above. Such studies would ideally be conducted internationally and encompass several sectors. That way, temporal, spatial and sectoral comparisons could be made relative to absorptive capacity. This would result in more meaningful discussions of levels of absorptive capacity than is possible at the moment. Secondly, as the findings of this project suggest that 'assimilation', 'transformation' and 'exploitation' are conceptually inadequate for capturing the way knowledge is converted into innovation in tourism enterprises, an alternative and complimentary approach might be beneficial. Thus, undertaking detailed qualitative case studies examining the complexity of the processes for converting knowledge to innovation is advocated. Following such

research, it may then be possible to re-theorise more fully that element of absorptive capacity and devise a mechanism for its measurement.

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