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Building a Conceptual Framework for Determining Individual Differences of Accessibility to Tourist Attractions

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Abstract

This paper introduces a conceptual framework for determining individual differences of accessibility to tourist attractions. The framework includes three components: factors affecting accessibility to tourist attractions; the individual characteristics of tourists, such as age, gender; and other explanatory variables that assist in explaining why accessibility to tourist attractions varies. This research indicates that measures of accessibility should include not only commonly used factors such as socio-demographic variables and distance, but also the facilities available at various attractions, management and operational aspects relating to the attraction (what we term “functions”), and the infrastructure used to move between specific attractions (what we term “connectivity of networks”). A case study of the Ningaloo Coast Region was conducted to identify individual difference in evaluation of accessibility to tourist attractions. We show that the evaluation of accessibility varies among tourist groups due to their spatial abilities, individual values and needs, and preparatory set.

Keywords: Individual differences, tourist characteristics, accessibility to tourist attractions, spatial ability, preparatory set, individual needs and values

Building a Conceptual Framework for Determining Individual Difference in Evaluation of Accessibility to Tourist Attractions

1. Introduction

Accessibility is the ability of tourists to conveniently reach their destination. Understanding differences among tourists in their evaluation of accessibility to tourist attractions is critical to the tourism industry, especially for managers who intend to improve the image of their attractions (Israeli, 2002). People are different in many ways: behavioural, cultural, and physical. Tourists can be grouped or distinguished based on their motivations for visiting a destination (Park & Yoon, 2009), the distances they travel to get there (Cai & Li, 2009), their spatial movement within the destination (Lew & McKercher, 2006), their cognitive and affective responses to the attractions (San Martín & Rodríguez del Bosque, 2008), their choice of tourist destinations (Hough & Hassanien, 2010), their cultural attitudes to tourist attraction systems (Richards, 2002), and their buying and consumption behaviours (Kamaruddin & Terengganu, 2008; Odunga, 2005). The essential issues should be addressed when including the study of individual differences in research, suggested by Cooper (2002):

- What individual differences of tourists should be considered in the framework of accessibility study?
- Why do these differences influence the accessibility to tourist attractions?
- How do individual differences of tourists influence their accessibility to tourist attractions? For example, how does spatial ability of tourists affect accessibility to tourist attractions?

The objective of this paper is to develop a conceptual framework for the study of individual differences among tourists in evaluating accessibility to tourist attractions. This framework provides insights into how tourist's preferences and behaviours are likely to vary with respect to tourist accessibility and why accessibility to tourist attractions could vary individually. A case study of the Ningaloo Coast region in Western Australia was conducted to identify individual difference in evaluation of accessibility to tourist attractions. This study can provide deep understanding of accessibility to attractions from the tourists' perspective.

2. Attractions and accessibility

Before describing the components of the tourism attraction accessibility conceptual framework, it is important to clearly define what is meant in this paper by 'attraction' and 'accessibility'. Attractions are the central elements of tourism activities (Connell & Page, 2011; Richards, 2002), and play a significant role in tourists' decision-making (Gee, Makens, & Choy, 1989). Tourist attractions are "all those elements of a 'non-home' place that draw discretionary travellers away from their homes" (Lew 1987: 554). MacCannell (1976) had previously systematised the attraction system into three elements: a tourist, a sight (a site that can be visited), and a maker (information, name and image idea of the site). Leiper (1990) adapted MacCannell's definition to synthesise the well known "Tourist Attraction System" framework which consists of three elements: the tourist, the nucleus and the marker. The tourist refers to travellers seeking leisure related activities. The nucleus is the central point of focus for tourists that includes a specific place and its characteristics. Finally, markers relate to information about the nucleus that stimulate tourists to visit a specific place (Leiper, 1990). In this paper, we consider attractions as a nucleus, or single site situated within a small-scale

geographical area, such as a national park in a city. It is most likely based on a single key feature or at least perceived by tourists as such. The attractions can be either paid or un-paid ones. (Mill & Morrison, 1985; Page, 2011; Weidenfeld & Leask, 2012). A destination is an area that might include a collection of attractions. These tourist attractions can be similar or different and could serve a role of shaping the image of destinations (Weidenfeld, Butler, & Williams, 2010).

There are many types of tourism attractions. According to Lew (1987), tourist attraction typologies tend to be set according to the following perspectives: ideographic, organisational, and cognitive. The ideographic perspective concentrates on the definitions and descriptions of attractions. The organisational perspective emphasises their spatial development and capacities, while the cognitive perspective focuses on tourist experiences and perceptions. Leask (2012) developed a model of classification of visitor attractions based on the concept of dynamic sectors of the tourism industry where the attractions may be natural or built, free or paid, national or international or for local or regional markets. Page (2011) defined three ways for understanding the scope of attractions: 1) natural or man-made; 2) nodal or linear in character; and 3) locations, permanent attractions and special events. As with earlier conceptualisations, tourism attractions are key to garnering tourist attention and influencing travel to a specific place.

Accessibility to tourist attractions is a relative concept, where the personal characteristics of the tourists may influence the perceptions of what is considered accessible (Jensen, Iwarsson, & Ståhl, 2002). For example, elderly tourists may believe an attraction in a mountain area that can only be reached on foot is inaccessible, while young and physically fit tourists perceive the attraction as accessible. However, the personal characteristics of tourists regarding accessibility to attractions cannot be explained until motivational characteristics are used to assess the effect of each personal characteristic. Based on the above example, elderly tourists may visit the attractions in a mountain area seeking relaxation and to enjoy nature, while young tourists may seek adventure and discovery of unexplored places. Hence— their motivations for visiting an attraction influence their evaluation of its accessibility. Indeed, to achieve useful results from the evaluation of accessibility to attractions, it is critical to recognise the characteristics of the tourists who use them.

Based on the definitions of tourist attractions and accessibility, the following section examines the main components of the framework for understanding and measuring accessibility to tourist attractions (see Figure 1).

3. The Conceptual Framework

The description of the conceptual framework includes three parts. The first part outlines the demographic characteristics of tourists that may relate to accessibility; including gender, age, education and income, tourists. The second part of the framework outlines cognitive and conative variables such as the spatial ability of tourists, individual needs, and value and preparatory set which explain why tourists have a certain perception of accessibility to tourist attractions. The third part discusses the accessibility measures with three categories: 1) tourist attraction functionalities 2) tourist attraction facilities 3) transport network and modes used to reach the attractions (Alkahtani, Xia, & Veenendaal, 2011).

3.1 Demographic characteristics

An individual's perceptions of the accessibility to tourist attractions may differ according to their demographic characteristics. According to Lew and McKercher (2006), there are two groups of tourist characteristics that affect their spatial behaviour, such as accessibility: "time-budgets" and psychological desires. Time-budgets include trip length, visit length and time value; psychological desires are represented by the tourist's motivations and interests. Cooper (1981) investigated the space-time patterns of tourists on the Channel Island of Jersey. He found that two factors influence tourists' spatial patterns: their socio-economic characteristics and their age. He notes that younger tourists tend to seek adventure more than older tourists. Wealthy tourists prefer to visit unique attractions, whereas low-income tourists visit only common attractions. D. G. Pearce (1988) argued that tourists organise their daily activities based on their available time at the destination, and that this controls their behaviour patterns. Debbage (1991) investigated the impact of tourists' socio-economic status and the space-time limitations on their spatial behaviour, concluding that space-time restrictions affect tourists' behavioural patterns more than any other factor. More recently, Xiao-Ting and Bi-Hu (2012) confirmed this finding. Hwang and Fesenmaier (2011) found that the unplanned en-route decisions were significantly related to the number of attractions visited and the duration of a given trip. Trip and traveller characteristics have significant indirect relationships to the number of unplanned attractions visited. Xia developed a series of studies on modelling spatio-temporal movement of tourists using Markov and semi-Markov chain methods. The developed models were used to predict tourist movement, measure attractiveness of attractions, understand the relationships between tourist demographic characteristics and their movement and design tour packages (J. C. Xia et al., 2010; J. C. Xia, Zeepongsekul, & Arrowsmith, 2009; J. C. Xia, Zeepongsekul, & Packer, 2011). The following subsections discuss characteristics of tourists that could affect their evaluation of accessibility to attractions.

3.1.1 Gender

A nominal gender theory (masculine vs. feminine qualities) in terms of tourism and leisure activities forms a theoretical base for distinguishing the leisure patterns and tourism activities engaged in by men and women, where the differences between males and females are not biological so much as conceptual (Henderson, 1996; Xie, Costa, & Morais, 2008). For instance, Smith (1987) reports differences in leisure behaviours in Scotland which can be summarised as follows (Shaw & Williams, 2002, p. 64, p. 64): females may be involved in fewer leisure activities than men, are less interested in physical activities, and take part in more social and cultural events. Leisure time, in fact, is one of the vital reasons that drive individuals to get involved in tourism and recreational activities, thus avoiding the monotony of daily life and its challenges (Mannell & Iso-Ahola, 1987). Consequently, gender differences within tourism activities are a significant variable. Given such general preferences in the use of leisure time, men and women may have different perceptions of various tourism activities. Such gender-shaped perceptions of tourism activities are further shaped by other variables: social stereotypes or cultural backgrounds may play a significant role in determining the types of activities which men and women may feel comfortable engaging in (Reisinger & Turner, 2003p.169).

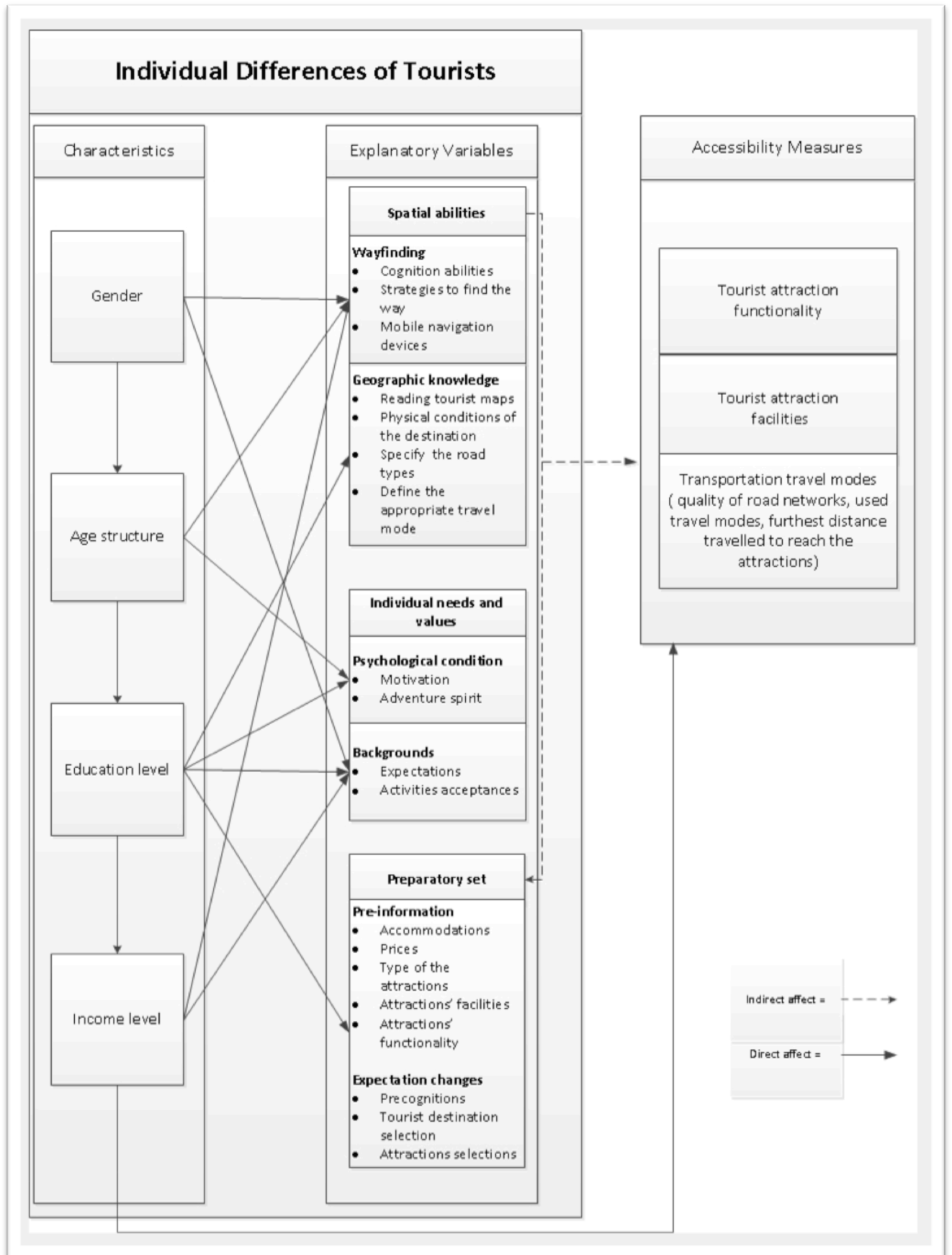


Figure 1: The Conceptual Framework of Tourist Individual Differences in Relation to Evaluating Accessibility to Tourist Attractions

Social pressures may be joined by physical differences. For instance, the different spatial ability of males and females, such as way-finding strategies, may affect men's and women's perceptions of a tourist attraction (C. A. Lawton, 2010; Silverman & Choi, 2005; Soh & Smith-Jackson, 2004; Westover, 1986). Given this, it is likely that gender based perceptions of the accessibility to attractions are shaped differently by the intermediate factors of spatial behaviour and social background.

3.1.2 Age

The age of tourists may influence their decision-taking, behaviours, motivations, recreational activity patterns, perceptions and expectations, and expenditure (Fesenmaier & Lieber, 1987; Glover & Prideaux, 2008; Raymore & Scott, 1998; Shaw & Williams, 2002; Thornton, Shaw, & Williams, 1997; Unbehau, Pröbstl, & Haider, 2008). Consequently, the age of visitors may have an influence on evaluation of the accessibility to an attraction, owing to the elements which are changeable from one age group to another (Shaw & Williams, 2002). Age related elements may include variations in the level of physical ability, financial status, experience, the spirit of adventure, and the sense of responsibility.

3.1.3 Educational level

The educational level of tourists may also influence their behaviours, needs, cognitive images, preferences and decisions to visit attractions, to undertake certain tours, and to take safety precautions when visiting tourist attractions (Alan, 1998; Beerli & Martín, 2004; Beerli, Martín, & Josefa, 2004; J. S. Chen, 2003; Dodd, 1998; Richins, 2000; Vogt & Fesenmaier, 1998). Education may affect perceptions of accessibility through a number of elements, such as the ability of a tourist to gain appropriate pre-information about a attraction, motivation and adventure spirit. In addition, the tourists' geographic knowledge, such as reading tourist maps and understanding physical conditions of the attraction to verify the physical and human attributes of the tourist attraction might be varied according to their education levels.

3.1.4 Income level

The income level of the tourist may have a major impact on the tourist's consumption behaviour (Divisekera, 2010), and is an important determinant of the attractiveness and competitiveness of one tourist attraction over another (Cracolici & Nijkamp, 2009; Omerzel, 2006). The positive correlation between income and affordability can be expressed as follows: when the tourist's income is high then the tourist may be able to afford trips to higher cost tourist attractions. The income of a tourist may also influence elements of choice related to certain spatial behaviours. These elements include expectation to the trip, activity acceptances, the affordability of different travel modes, and the possession of navigation devices. For example, wealthier tourists can easily acquire hire cars and navigation tools, which allow them to use space differently from those who cannot afford such luxuries. Consequently, affluence may cause individual differences in evaluations of accessibility to tourist attractions.

3.2 Cognitive and Conative Variables

Cognitive and conative variables may explain the individual differences between tourists in their evaluation of accessibility to tourist attractions. In terms of the conceptual framework, these variables are viewed from three perspectives: spatial abilities, individual needs and values, and preparatory information set.

3.2.1 Spatial abilities

Spatial ability can be defined as “the cognitive processes involved in locating targets in space, perceiving distance and directional relationship and mentally transforming objects with respect to their position or orientation in space” (Carol A Lawton, 2010, p. 317). It generally consists of two aspects from a geographical perspective, geographic knowledge and way-finding ability. These two general aspects may be influenced by a range of factors in relation to the demographic characteristics of the tourist. For example, the educational level of a tourist also may have an impact on geographic capability, while gender, age, and income level may have an impact on way-finding. This study therefore intends to consider differences of the tourists in spatial skills when assessing tourists’ perceptions of the accessibility to tourist attractions.

- *Geographic Knowledge*

In this conceptual framework, geographic knowledge refers to those acquired skills that usually increase a tourist’s ability to determine the geographic facts of a given attraction before visiting it. Such skills may give the tourist a special acquired acuity, called geographic sensation or cognitive ability. The acquired geographic knowledge includes the ability to read tourist maps efficiently; to determine the patterns of spatial distribution of attractions in the attraction; to calculate distances between attractions; to identify the physical condition of the attraction and landscape; and discerning road types, the transportation situation, and consequent appropriate travel modes (Golledge & Stimson, 1997). These abilities are more pronounced in tourists with high levels of education. In fact, tourists with higher education are best able to meet attraction information needs (Pyo, 2005) and may garner previous knowledge about the accessibility to attractions; they may not be surprised by unexpected difficulties when visiting an attraction; and their perceptions about accessibility may remain more positive than is seen in those who lack geographic skills. Furthermore, geographic knowledge may enable educated tourists to read the spatial reality of the area and identify the pull factors they were aware of before approaching the attraction.

- *Way-finding ability*

The way-finding ability of visitors is very important in terms of accessibility to resources such as tourist attractions and shopping centres (Dogu & Erkip, 2000; Kwan, 1999; Mondschein, Blumenberg, & Taylor, 2008; Walmsley & Jenkins, 1992). Way-finding has two major components: decision making and physical movement. Way-finding ability saves time and helps in choosing appropriate roads leading to a specific attraction. It also permits the adoption of rational movement patterns to best enjoy the attractions on offer (J. Xia, Arrowsmith, Jackson, & Cartwright, 2008).

Way-finding varies according to personal attributes, especially gender and age (Mohd & Xia, 2010; J. Xia, Packer, & Dong, 2009), as well as with income level. Males display more ability for way-finding than females (Hegarty, Montello, Richardson, Ishikawa, & Lovelace, 2006; Lawton, 1994). Lawton and Kallai (2002) confirmed this, adding that men prefer to find their ways through tangible indications such as the “cardinal directions” or the position of the stars or the sun in the sky. Women prefer way-finding instructions “landmark-based route information” (Lawton, 1994; Mohd & Xia, 2010). If way-finding strategies differ, then evaluations of accessibility may also differ. For example, women may pay more attention to signs or landmarks than men (Kirasic, Allen, & Haggerty, 1992; J. Xia et al., 2009). Because way-finding strategies are different between males and females, they could perceive accessibility differently. For example, lack of signs or landmarks at an attraction could lead to more difficulties for females than males and therefore, females could evaluate accessibility to the attraction lower than males.

Xia et al. (2009) reported similar differences based on age, from a study conducted at the Phillip Island Park, Australia. Several basic elements affect the way-finding abilities of tourists for a tourist attraction based on their age structures: working out distances from the origin to the destination (accommodation to attraction) does not appear to be affected by age (Kirasic & Bernicki, 1990), but locating landmarks to navigate to an attraction is (Kirasic et al., 1992) as older people usually forget more easily than younger people do; and the ability to conceptualise a destination’s layout (tourist attractions functionalities and facilities), may decrease with age (Naveh-Benjamin, 2000). Age, then, has an indirect influence on differences of the tourists when evaluating accessibility based on the tourist’s way-finding abilities.

3.2.2 Individual’s needs and values

In a broad sense, individual needs and values may affect an individual’s perceptions (Golledge & Stimson, 1997). Every individual has needs, which arise partially from his/her values. Figure 2 illustrates how individual values take shape from childhood through interrelated factors such as the individual’s cultural values and social background. Such values are often characterised by long-term stability. While an individual’s needs are a product of societal, cultural values, they are also a product of subjective factors and internal requests. These personal factors and inner requests emerge under the influence of interrelated factors. Motivation factors are related to the education environment, the financial situation, age, etc. (Hsu, Cai, & Wong, 2007). Motivation requests may be to seek new knowledge, adventure, enjoyment and relaxation, and to improve skills (Hsu et al., 2007; P. Pearce & Lee, 2005). Values can be considered a static framework, while individual needs form changing patterns within it.

Pearce and Lee (2005) argue that the rationale behind a tourist’s need to engage in tourist activities is as follows:

- Discovering unknown places: “seeking new environmental experiences”.
- Discovering new cultural features: “cuisines, dressing-style, historical objects, events, etc”.

In general, a tourist’s motivations to visit nature based attractions such as the Ningaloo region can be summarised as follows (Azam, 2010; Davis, Banks, Birtles, Valentine, & Cuthill, 1997; Jones, Wood, Catlin, & Norman, 2009; Schianetz et al., 2009):

- Relaxation, quietness, and the enjoyment of natural features;
- Improving skills, such as diving and snorkelling;
- Fostering knowledge about the fauna and flora, for example;
- Seeking natural experiences;
- Satisfying the quest for adventure and the desire to discover anonymous places; and
- Securing one’s personal safety.

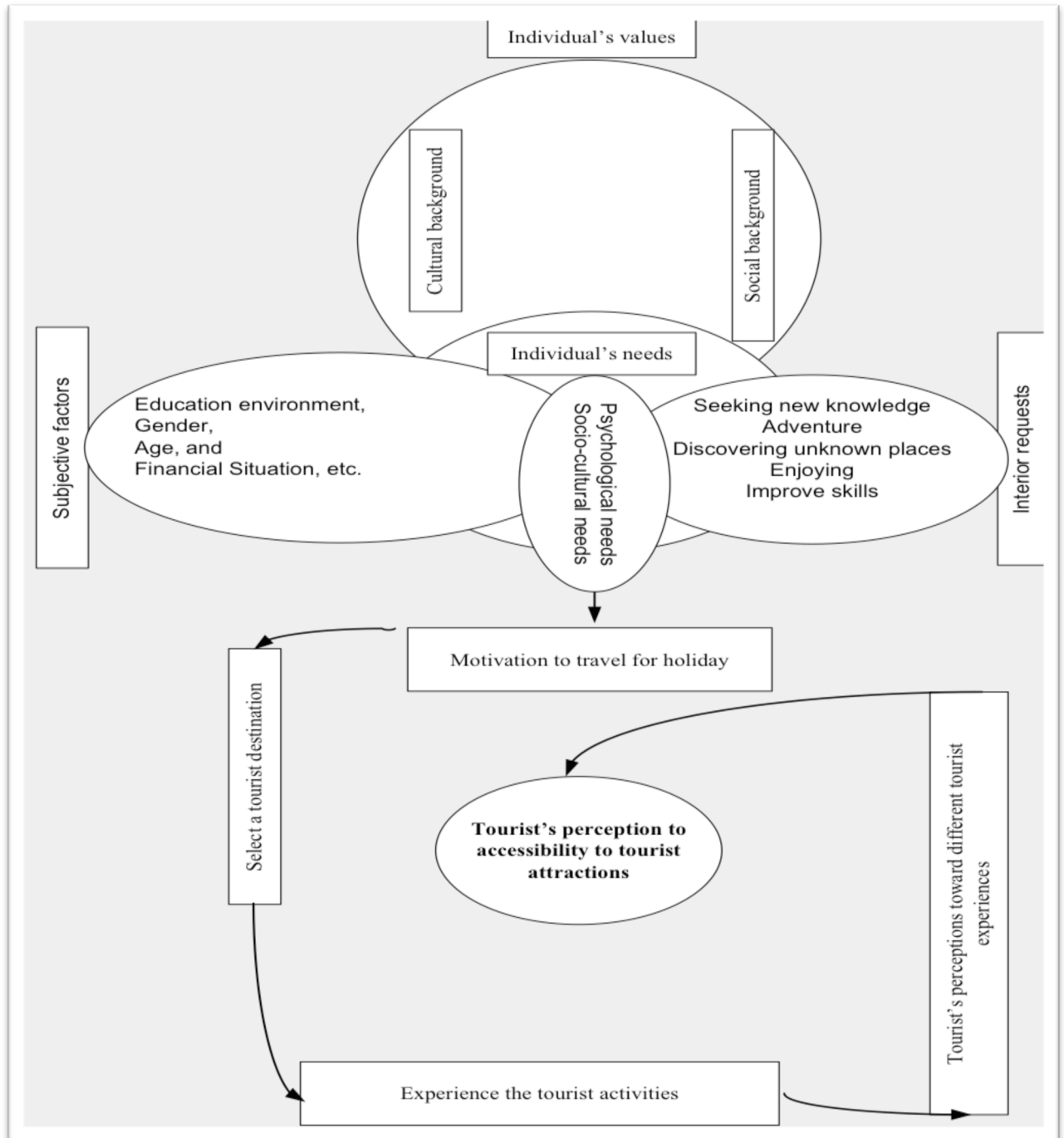


Figure 2. The individual’s needs and values.

These needs can be related to tourists' subjective factors (demographic characteristics). For example, older tourists may visit the area for relaxation and quietness, and younger tourists to build new relationships through collective activities. An individual's motivations for travel may be influenced by interaction between socio-cultural needs and psychological needs (see Figure 2). Prentice, Witt, and Hamer (1998) explored the influence of a tourist's reason for visiting a particular location, as well as their previous experience. They found that experienced tourists may have a closer and more communicative relationship with the local community, while a tourist who plans to visit only relatives or friends limits their communication to this specific group. Fennel (1996) examined the movement behaviours in two groups of tourists in different regions of Shetland, and found that their space-time behaviour differed according to the infrastructural capacity of each region. In addition, Shovel and Raveh (2004) used the co-plot method to categorise the relationship between tourist trips and attractions in the inner sector of Jerusalem. They concluded that previous experience and the duration of stay in the city have greater influence on the tourists' spatial behaviour than any other factors.

The psychological needs of an individual may also play a vital role in attraction management, where psychological variables such as motivation and the spirit of adventure are influenced by a tourists' previous cognition of a particular experience (San Martín & Rodríguez del Bosque, 2008). In the same light, the background of tourists, including their education level, imposes different needs that can affect their preferences and perceptions at any attractions (Dale, Marvell, & Oliver, 2005). As a result, needs and values can be discussed in relation to psychological factors that guide the individual's behaviours in terms of space, emotion, rationality and decision-taking. Moreover, individual socio-cultural factors may influence the tourist's expectations about available activities at a given location and the decision to engage in them.

3.2.3 Preparatory information set

The preparatory set, or the expectations and anticipations formed prior to practicing an activity or visiting an attraction, has an influence on tourists' perceptions (Golledge & Stimson, 1997, p. 43). Figure 3 illustrates how the preparatory set affects a tourist's perception of accessibility. It is clear that perception follows sequential steps: prior information, anticipation, selection of destination, and selection of attractions at the destination all lead to the perception of accessibility of those attractions. Prior information is obtained from different sources: the Internet, tourist centre brochures, tourist agencies, newspapers, television, or friends (Urry 2002). The information obtained beforehand enables a tourist to anticipate and visualise the destination (Golledge & Stimson, 1997; Ye & Tussyadiah, 2011). Any pre-information includes accessibility as a core issue.

The tourist's anticipation creates an initial image of the attractions' facilities and functionalities, including a visualisation of the quality of the road network connecting the attraction with accommodation, and the transportation modes available. If the image meets expectations, the tourist decides to spend time at that destination (Ryan, 2002; Urry, 2002). In this sense, anticipation does not have the same meaning as expectation. Anticipation occurs before a tourist obtains information about a destination (P. Pearce, 2003, p. 28), while expectation is usually built on previous experiences (Hinch & Higham, 2004, p. 141). At first, the tourist's expectation appears as part of the anticipation stage; but it takes individual shape when the tourist acquires information about the destination. Anticipation is usually essential in the selection of a given tourist destination by a visitor.

By anticipating, a tourist can plan for the journey and identify preferred activities (Hinch & Higham, 2004; P. Pearce, 2003), proof that anticipation influences spatial behaviour at a tourist destination (P. Pearce, 2005, p. 10) and the attractions of the destination are almost always identified, and even booked, before the journey takes place. Tourists' anticipation may include precognition and pre-expectation of all the tourism elements of a destination, including accessibility to selected attractions. By the time the tourist arrives and starts enjoying the activities, perceptions concerning accessibility to tourist attractions may already have been formed. Not only does the anticipation stage help tourists to prepare their trips, but the resulting perception, whether positive or negative, may be a result of a comparison between what was anticipated and what was actually experienced, (Y. Chen, Zhang, & Qiu, 2013; Pizam, Neumann, & Reichel, 1978). The preparatory set, then, deals with pre-information and anticipation, which may guide spatial behaviour to visit particular attractions.

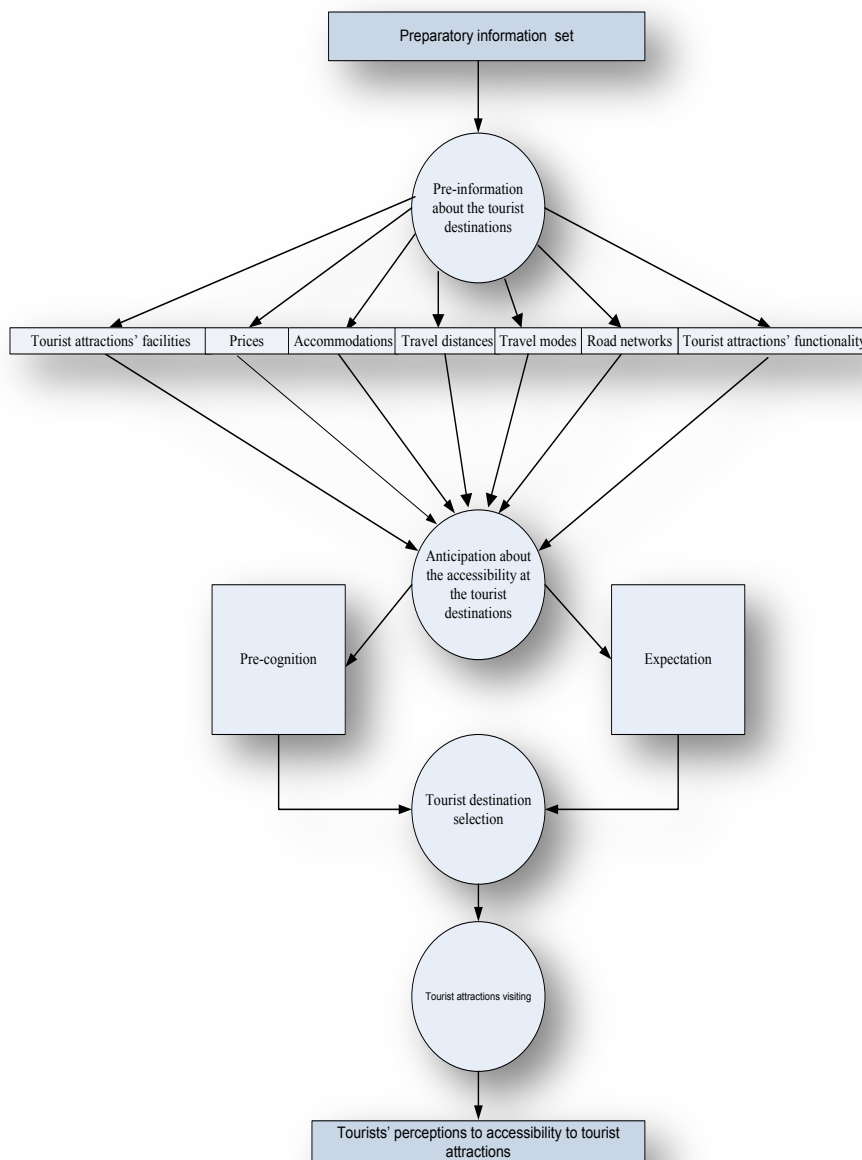


Figure 3. Preparatory information set influences on the tourist's perception of accessibility to tourist attractions.

Tourists' personal characteristics may have an impact on their ability to structure any pre-cognition of, and expectations about, a tourist destination and its attractions. This affects the selection of a destination and of the attractions to be visited. Theoretically, all personal characteristics affect the preparatory set in different degrees; however, the impact of a tourist's education level may be more acute, especially when it comes to the formation of a tourist's perception of accessibility to the attractions factors.

3.3 Factors Affecting Accessibility to Tourist Attractions

Accessibility is a feature of tourism systems where the tourist travels from a point of origin (e.g. place of residence) to experience an attraction (Uysal, 1998). Origin and attractions are isolated from each other unless they are interconnected; from a spatial perspective, road networks provide that connection, and so become a core element in accessibility studies. Tourism travel is influenced by supply-push and demand-pull factors (Sandro & Uysal, 2006). The supply-push factor is represented by elements offered to attract tourists, such as services, infrastructure, communications, utilities, and activities (Kozak & Rimmington, 1999). The demand-pull factor is represented by tourists, who benefit from the supply-pull. Therefore, tourist attractions are supply-side. Factors affecting the accessibility are related to attractions and transport systems, because tourists tend to judge the efficiency of tourist attractions and transport systems by the perceived ease of access.

Accessibility factors related to tourist attractions are part of the supply-side organisation that makes visitor access easy (Lew, 1987; Swarbrooke & Horner, 2007; Wilson, Fesenmaier, Fesenmaier, & Es., 2001). These include tourist attraction functionality and facility factors. Functionality factors include the management or operational activities that are implemented so that tourist attractions can function adequately, such as staffing, opening hours, direction signs, entrance fees, car parking capacity, the presence of websites and the production of brochures (Swarbrooke & Horner, 2007). Tourists also expect certain basic facilities and services to be available at attractions (Bansal & Eiselt, 2004, p. p.50; Urry, 2002) such as shade, toilets, drinking water, and picnic sites, and their lack may mean potential tourists choose to go elsewhere (Cornwall Council, 2006; Priskin, 2001).

In addition, accessibility to an attraction is affected by transport systems (Khadaroo & Seetanah, 2008). Road networks are part of the infrastructure used by tourists to reach an attraction. Consequently, the quality of the road networks positively or negatively affects access (Brabyn & Skelly, 2002). In general, the geographic accessibility to any tourist attraction can be influenced by availability of transport modes. The travel modes normally used by tourists to visit attractions within a certain area are cars, buses, bicycling, walking, trains, trams, taxis, ferries, and motorbikes (Dickinson & Robbins, 2007; Lew & McKercher, 2006). The choice of mode affects the furthest distance which tourists are likely to go to reach an attraction. Therefore, the transport system components fall into three categories: the quality of the road networks; the modes of travel used to reach the attractions; and the distances covered in reaching the attractions.

4. Case study of Ningaloo Coast Region

The conceptual accessibility framework was applied in a case study of the Ningaloo Coast Region to identify individual differences and their significance in tourists' evaluations of accessibility to tourist attractions in a remote natural area.

4.1 Study area

The Ningaloo coast region in Western Australia stretches 300 kilometres and includes the towns of Carnarvon, Coral Bay and Exmouth that serve as the main service centres for tourism in the region. The region is isolated, lying about 1,200 kilometres north of Perth, the capital city of Western Australia (Figure 4). The Ningaloo region has a residential population of about 8,800 (Australian Bureau of Statistics, 2006), mostly living in the towns of Carnarvon, Coral Bay, and Exmouth. The three towns have distinct characteristics in terms of form and function. Carnarvon is the largest town, with a population of about 6,300, and is located at the southern end of the region. While it is located on a main highway and hosts a significant number of tourists, it is quite a distance from the reef and has limited attractions. The second largest town, Exmouth, has a population of about 2,400 and is located 350 kilometres north of Carnarvon. Exmouth is not on the main highway but tourism is a significant component of its economy. It is a main gateway for Ningaloo Marine Park and Cape Range National Park as major attractions. Coral Bay is a small town of about 200 residents, located between the two main towns of Carnarvon and Exmouth and exists solely due to tourism (Jones et al., 2009).

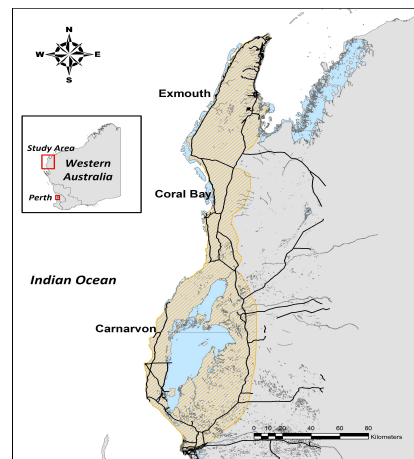


Figure 4 Map of the Ningaloo coast region

The climate of the Ningaloo Coast region is arid to semi-arid (Burbidge, McKenzie, & Harvey, 2000). Maximum temperatures reach 45°C in January, plummeting to minimums of 9°C in July (Payne, Curry, & Spencer, 1987; Western Australian Planning Commission, 2004). There are two general seasons: hot summer and a mild winter. The hot summer season extends from October to April, while the milder winter season extends from May to September (Western Australian Planning Commission 2004). The Ningaloo Coast region was World Heritage Listed in 2011 based on its exceptional natural beauty and recognition of its significant natural habitats for conservation of biological diversity demonstrated by the presence of a diverse range of marine and coastal species (UNESCO, 2011). The region hosts a range of economic activities including commercial fishing, mining, agriculture, pastoralism, and tourism (Jones et al. 2009). Tourism activities in the region are mostly nature-based, including: wilderness outback adventures, whale watching, snorkelling, and swimming with dolphins (Jones et al. 2009). The unique and rare collection of natural values recognised by World heritage listing form the foundation for tourism as an important source of income in the region (Jones et al. 2009; Western Australian Planning Commission 2004). Access to tourism attractions varies from remote coastal camping on pastoral stations to more accessible national parks and town caravan parks, resorts and hotels. Figure 5 illustrates the major attractions in the Ningaloo coast region. The blue colour shows the lake area

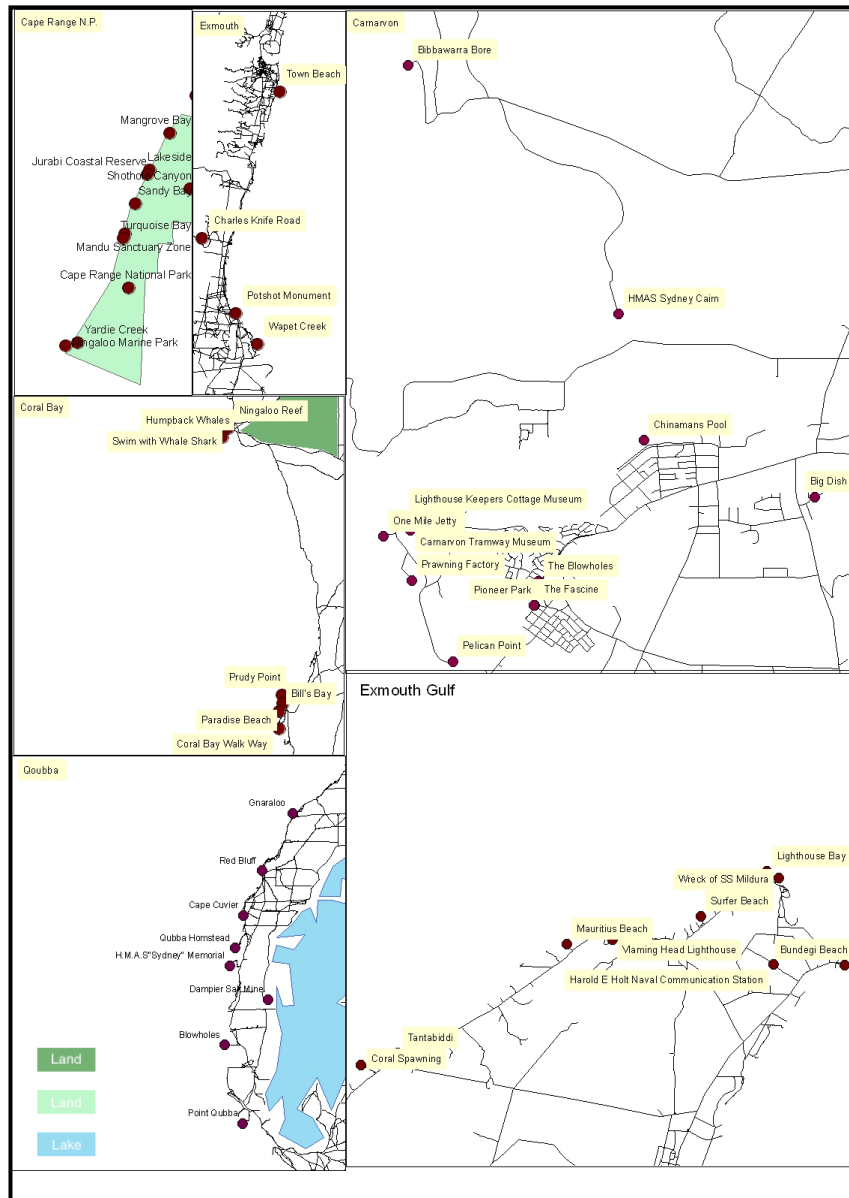


Figure 5 Map of the major attractions in the Ningaloo coast region

4.2 Data collection and analysis

Data collection was carried out among non-resident visitors staying in the three main towns in the Ningaloo Coast region. A total of 500 questionnaires were distributed among the three study area zones, targeted at individual visitors 18 years and older. A combination of multiple choice and open-ended questions were designed to gather information on three areas: tourist attraction, transportation and tourists. We asked respondents to evaluate the attractions they visit in terms of function, facilities and transportation (see table 1). The collection occurred over two months during the peak visitation season, from June to the end of July 2009. The survey used a self-administered mail back method where the questionnaires were left in accommodation receptions areas in the three towns. ANOVA and the t-test were used to find the significant differences between tourists in evaluating the accessibility factors based on their personal characteristics.

Table 1 The examples of functional and facility factors of attractions

Functional factors	Facilities
Staff numbers and their helpfulness	Car parking area accessible and adequate
Tourist attraction's ability to cater for tour groups and individuals	Tracks and paths accessible and adequate
Car parking capacity	Signs to direct the visitors within attraction accessible and adequate
Entrance fees	BBQs, picnic area accessible and adequate
The day on which attractions open	Toilets accessible and adequate
The months in which attraction are closed	Rubbish bins accessible and adequate
The opening hours	Places to sit accessible and adequate
Clear and helpful directional road signs nearby attractions	Shades accessible and adequate
Clear opening hours sign displayed at the attraction entrance	Gates accessible and adequate
Availability of brochures about attraction at accommodations and tourist centres	Water drinking facilities accessible and adequate
Availability of internet website for the attraction	Existence of accessible information centre within attraction
Necessity of pre-booking to visit the attraction	Food outlets accessible and adequate
	Disabled facilities sufficient and accessible
	Public transportation accessible and adequate

4.3 Results

A total of 302 useable questionnaires were returned, 113 (37.4%), 71(23.5%), and 118(39.1%) from Carnarvon, Coral Bay and Exmouth respectively. Results are presented and discussed in an aggregated form and with reference to the three distinct town locations within the study area. Results are presented in several parts based on the conceptual framework including; demographics and how they relate to perceptions of, attraction functionalities, attraction facilities, and road transport networks

4.3.1 Tourist attraction functionalities

Males and females both considered tourist attraction functionalities to be relatively efficient when accessing attractions across the whole study area. Both men and women generally reported good experiences with the available functional factors in accessing the attractions in each zone. Nevertheless, there are slight differences between males' and females' evaluation of tourist attraction functionalities, specifically in Coral Bay and Exmouth (see Figure 6).

In Coral Bay, women believed attraction functionalities were less effective in providing ease of access than did the men: 16% of females compared to 11% of males. The converse was true in Exmouth: 18% of males and 16% of females. In general, the functionalities in all zones were evaluated to be efficient ease of access by both men and women.

Regarding the age structure of the surveyed tourists in each zone, the general efficiency of this accessibility factor on the tourists' access to the attractions can be seen in Figure 6. A

meticulous investigation reveals relative differences between age groups when evaluating this accessibility factor. Despite the minimal differences between age groups on the effect of functionalities on access to attractions in Carnarvon, older tourists, 50 years and more, believed this factor impacted negatively on their access to attractions more than did tourists of different age groups. 15% and 14% of tourists aged 50–59 years and 60 years and more respectively, rated the efficiency of this factor on their ease of access as low or very low. In contrast, 11%, 9%, and 11% of tourists aged 18–29 years, 30–39 years, and 40–49 years respectively held this view.

In Coral Bay, as the age of the tourists increased the perceived ease of access provided by the attractions' functionalities steadily decreased. For example, 52% of tourists aged between 18 and 29 years considered this accessibility factor to be efficient, while only 27% of tourists aged 60 years and over felt the same. In contrast, the Exmouth results demonstrated the opposite relationship where 42% of the youngest tourists, 18–29 years, stated that the function was efficient and more, while 52% of tourists 60 years and over stated the same.

In terms of education, tourists with lower education levels showed greater dissatisfaction with the efficiency of functionalities on their access to attractions than those with higher education. In Carnarvon, but also to a lesser extent in Exmouth and Coral Bay, respondents showed dissatisfaction with this factor's effect on access to attractions as their education level became higher, as can be seen in Figure 6. In Carnarvon, 8% of the surveyed tourists with tertiary degrees graded this factor low or very low, as did 17% of tourists with high school qualifications. In contrast, 15% and 18% of tertiary educated respondents surveyed in Coral Bay and Exmouth graded this factor low or very low, while 13% and 14% of those with high school qualifications did so.

When grouped by income, tourists in the different zones show general satisfaction with the functional factors, especially in Carnarvon and Exmouth, as can be seen in Figure 6. In Carnarvon, the surveyed tourists were generally satisfied with the attractions' functionalities; those with incomes of more than AUD48,000, showed more satisfaction than the other tourists. As in Carnarvon, tourists in Exmouth expressed general satisfaction with attractions' functionalities. It can be clearly seen that this satisfaction increased as income decreased.

In Coral Bay, the respondents show noticeable differences in their evaluation of the impact of attractions' functionalities on their ease of access, as shown in Figure 6. Tourists with the higher income levels, more than AUD48,000 yearly, considered this factor inadequate more than the others did. About one fifth of the tourists earning more than AUD60,000, and more than one quarter of those tourists earning between AUD48,001 and AUD60,000, evaluated this factor as very low or low. This dissatisfaction reduces among tourists with lower incomes: only one tenth of those earning between AUD36,001 and AUD48,000 evaluated this factor as very low and low. The perceived efficiency of the tourist attractions' functionalities in the zones generally increases as tourists' income decreases, a trend most noticeable in the Coral Bay zone.

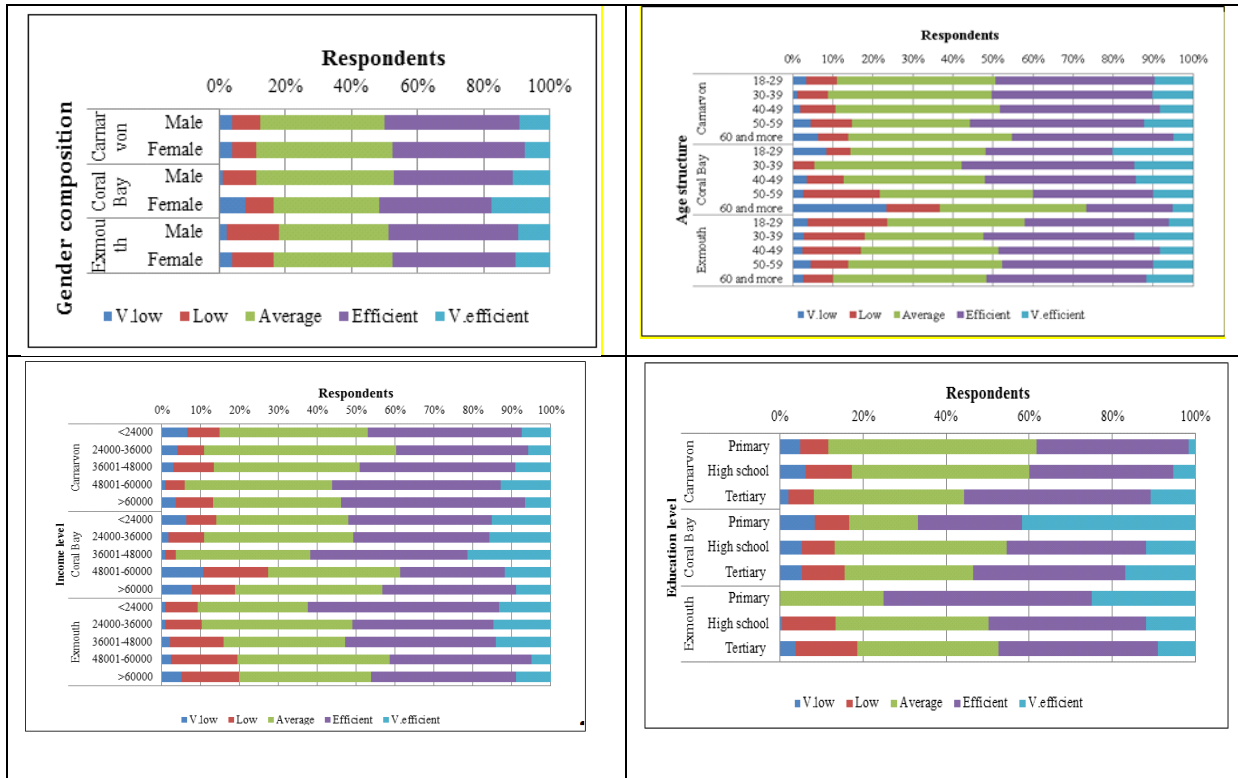


Figure 6 Evaluation of the efficiency of the tourist attractions' functionalities based on the respondents' gender, age, income and education levels in the study area zones

The null hypothesis that *there are no differences between the tourists in evaluation tourist attraction's functionalities based on gender, age, education, and income* is supported by the t-test, with regard to gender, at a confidence level of 5%, where P is (0.738) for the surveyed tourists in Carnarvon, (0.931) for the tourists in Coral Bay, and (.081) for the tourists in Exmouth. ANOVA indicates acceptance of this hypothesis with regard to tourists' age at a confidence level of 5%, with P -value at (.490) for the surveyed tourists in Carnarvon, (.070) for those in Coral Bay, and (.320) for those in Exmouth. ANOVA does not fully accept the hypothesis with regard to tourists' education in the different zones at a confidence level of 5%. For tourists in Carnarvon, ANOVA indicates rejection with P -value. at (0.001). For Coral Bay and Exmouth, ANOVA accepts the hypothesis, with P -value. at (.580) and (.189) respectively. For income, ANOVA also indicates partial acceptance of the hypothesis. For the tourists in Coral Bay, ANOVA indicates rejection of the hypothesis, with P -value. at (0.050). In Carnarvon and Exmouth, ANOVA indicates acceptance, with P -value. at (.220) and (.060) respectively.

4.3.2 Tourist attraction facilities

As can be seen in Figure 7, both males and females experienced difficulty in ease of access because of the available facilities in all zones. There are relative differences between genders in evaluating the impact of facilities on their access to attractions in two study area zones, Carnarvon and Coral Bay. In Carnarvon, males show relatively more dissatisfaction with the current facilities than the females. More than one third of males (compared to 30% of females) stated that the impact of the tourist attractions facilities on their access to the attractions was low or very low. Similarly, 37% of males and 30% of females in Coral Bay believed the positive impact of the facilities on their access to attractions was limited.

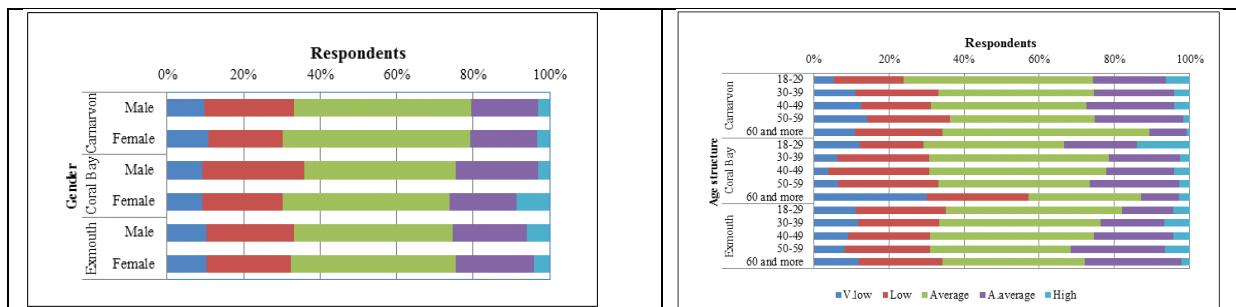
No noticeable differences can be seen between the tourists based on their age structure in the various study area zones. Only the oldest tourists, 60 years and plus, show more dissatisfaction with the available tourist attractions facilities, particularly, in the Coral Bay zone.

As can be seen in Figure 7, 58% of the oldest tourists (representing 33.6%, 7% and 8.5% of the respondents in Carnarvon, Coral Bay, and Exmouth respectively) believe that the impact of the tourist attractions facilities on their access to the attractions was low or very low. This is in line with the observation mentioned in the previous section, but it becomes clearer in the Coral Bay zone. In general, to improve the accessibility to the attractions for different age groups, the tourist attractions facilities should be improved in all study area zones.

Disregarding those tourists claiming only a primary education, dissatisfaction with the impact of facilities is shared by tourists of all education levels, with no relative differences, as shown in Figure 7. 35%, 29%, and 29% of the tourists in Carnarvon, Coral Bay, and Exmouth respectively with high school education stating that the impact of the facilities was low or very low, compared to 30%, 35%, and 34% of those with tertiary degrees.

When categorised by income, respondents display general dissatisfaction, apart from two cohorts that show a notable contrast: those in the income levels AUD24000 to AUD36000 and AUD60000 and more. This was so across all three zones. Figure 7 shows that Carnarvon and Coral Bay tourists who earned AUD24000 to AUD36000 believed that the facilities impacted negatively, very low and low, more than their counterparts in Exmouth. Meanwhile, 37%, 38% and 27% of tourists in this income category, in Carnarvon, Coral Bay, and Exmouth respectively, agreed. Some differentiations between the study area zones are discernible: in Carnarvon, the impact of this accessibility factor generally increased as tourists' income decreased. Its impact generally increased as tourists' incomes increased, in both Coral Bay and Exmouth.

The null hypothesis, *there are no differences between the tourists in the evaluation of tourist attraction facilities based on gender, age, education, and income*, was supported in all zones by t-test results relating to tourists' gender, at a confidence level of 5%, where *P*-value is (0.768) for the respondents in Carnarvon, (0.276) for those in Coral Bay, and (.839) for those in Exmouth. ANOVA on the other hand, shows acceptance of the hypothesis in terms of the tourists' age and education at a confidence level of 5%. For age, ANOVA indicates acceptance in all zones, where *P*-value is (.0600), (.190), and (.9560) for tourists in Carnarvon, Coral Bay, and Exmouth respectively. For education, *P*-value is (.235), (.924) and (.386) for Carnarvon, Coral Bay, and Exmouth respectively. For income, ANOVA indicates partial acceptance, reject the hypothesis in Exmouth, where *P*-value. value is (0.020). In Carnarvon and Coral Bay, ANOVA supports the hypothesis, with *P*-value at (.430) and (.80) respectively.



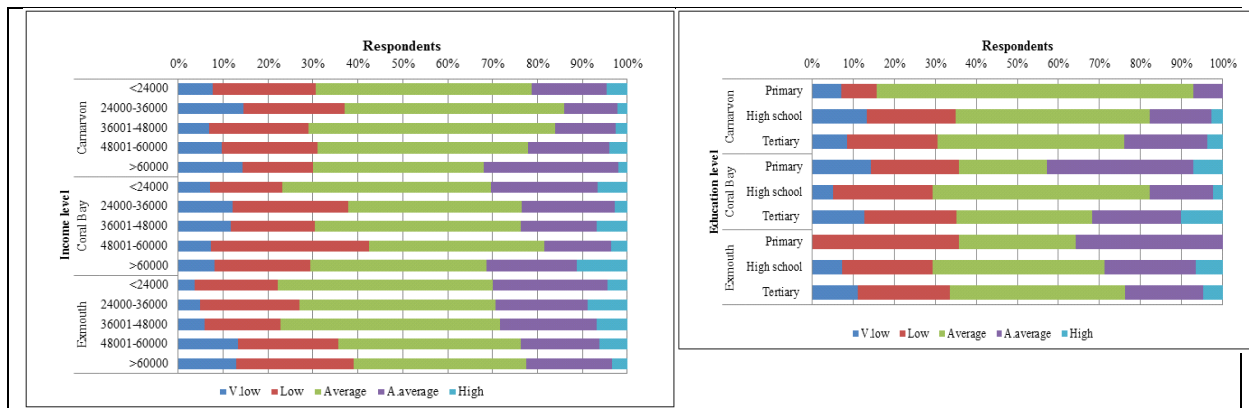


Figure 7 Evaluation of the impact of the tourist attractions' facilities on the tourists' access to the attractions based on the respondents' gender, age, income and education levels income levels in the study area zones

4.3.3 Quality of the road networks to reach the attractions

Generally, more than half of the males and females in each study zone evaluated the quality of the road networks as good or excellent, as shown in Figure 8. Both males and females in Carnarvon evaluated the road networks lower than did their counterparts in Coral Bay and Exmouth: 55% of males and 53% of females considered the roads good or excellent compared to 64% and 61% of males and 58% and 61% of females in Coral Bay and Exmouth respectively. The males in Carnarvon tended to find the networks very poor or poor more than did the females. The females in Exmouth found the quality very poor or poor more than did the males. The road networks in general, offered good access to attractions in each zone.

When considered by age, tourists showed relative differences over the quality of road networks, as can be seen in Figure 8. In Carnarvon, the youngest tourists showed less satisfaction than older groups, where two fifths of the tourists evaluated the roads as good or excellent. Tourists aged 40–49 years showed more satisfaction than other tourists in Carnarvon, with 71% believing that the road networks were good or excellent.

In Coral Bay, tourists aged 30–39 showed more satisfaction with the road networks than the others, with 76% of these tourists stating that the networks were good or excellent. Tourists aged 50 and older showed less satisfaction, with 30% considering their quality to be good or excellent. None of those aged 60 and more thought the road networks to be of high quality.

In Exmouth, the youngest tourists, aged under 29, and the oldest aged 50 years and older, showed relatively more satisfaction with the quality of the road networks than other tourists. Those tourists 60 years and older showed the most satisfaction. Satisfaction with the roads generally decreases as age increases in both Carnarvon and Exmouth, while in Coral Bay satisfaction generally increases as age decreases. There are exceptions to this trend in both Carnarvon and in Exmouth, as can be seen in Figure 8. In Carnarvon, the exception is that the network quality decreases for tourists, 60 years and older, while in Exmouth, tourists under 29 show most satisfaction.

Exmouth tourists with tertiary degrees showed more satisfaction with the quality of the networks than those with high school education; in Carnarvon, the converse holds. In Exmouth 13% of tourists with tertiary degrees considered the road quality very poor or poor, while only 4% of those with high school education held that view (see Figure 8).

The various income cohorts in Coral Bay and Exmouth also evaluated this accessibility factor differently than their counterparts in Carnarvon, as can be seen in Figure 8. In Coral Bay and Exmouth, satisfaction with the quality of the road networks generally increases as income decreases, but in Carnarvon satisfaction increases as income also increases. For example, 45% of the Carnarvon tourists in the lowest income cohort, and 68% of those in the highest cohort, believed the road networks to be good or excellent. In Coral Bay, 67% of the lowest cohort and 43% of the highest agreed. In Exmouth, 80% of the lowest cohort and 50% of the highest felt this way.

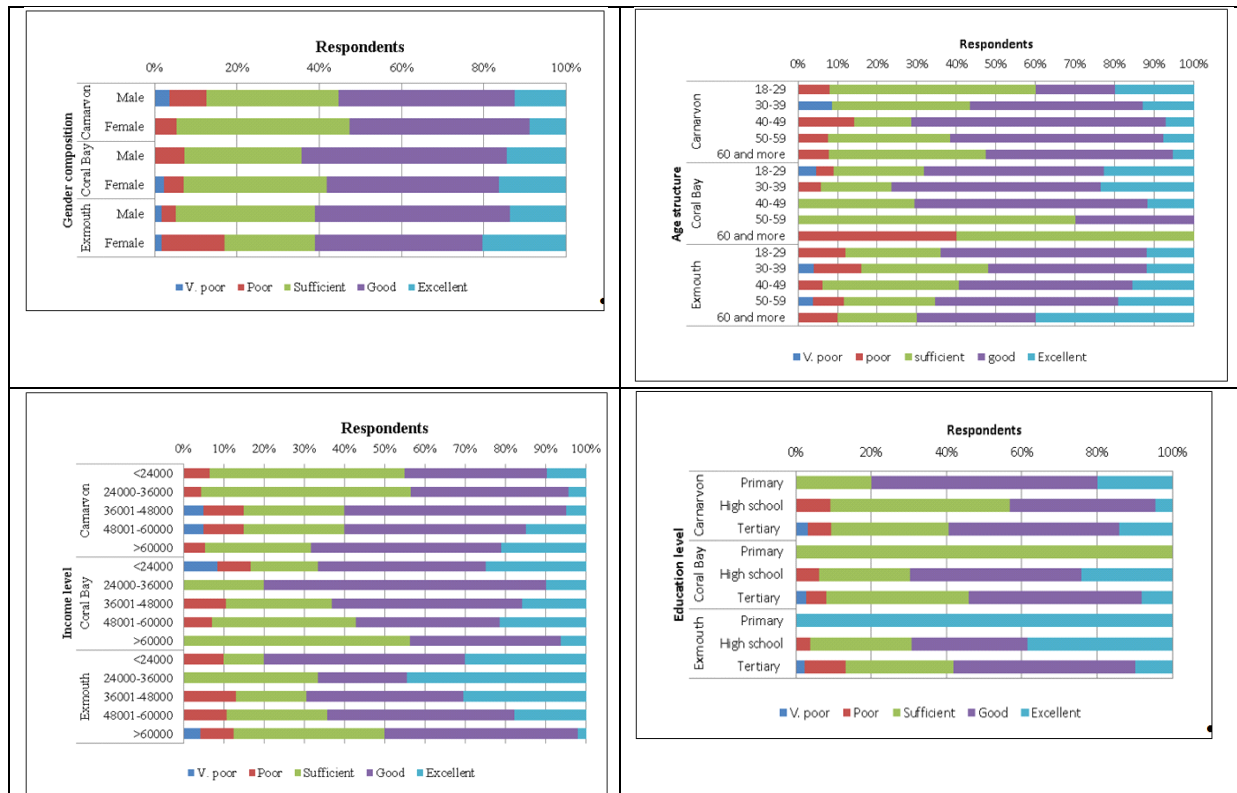


Figure 8 Evaluating the quality of the road networks from the accommodations to the attractions based on the respondents' gender, age, income and education levels in the study area zones

The null hypothesis, *there are no differences between the tourists in the evaluation of the road networks from accommodation to tourist attractions based on gender, age, education, or income*, was supported by t-test results in all zones, in relation to gender, at a confidence level of 5%, where P -value is (0.786) for Carnarvon, (0.429) for Coral Bay, and (.767) for Exmouth, ANOVA accepts this hypothesis in relation to age at a confidence level of 5%, with P -value at (.280) for Carnarvon, (.330) for Coral Bay, and (.600) for Exmouth. However, ANOVA only partially accepts the in terms of education. ANOVA accepts the hypothesis in both Carnarvon and Coral Bay, where P -value is (.0235 and .924) respectively. In Exmouth, P -value is (.015). Regarding income, ANOVA again show only partial acceptance. For tourists in Exmouth, ANOVA indicates rejection of the hypothesis, with P -value at (0.040). ANOVA supports the hypothesis, with P -value of (.178) and (.070) for Carnarvon and Exmouth respectively

5. Discussions and conclusions

This paper presented a conceptual framework by which the individual differences of tourists, such as, age, gender, income, education, can be seen to affect how they perceive the accessibility of tourist attractions, and how and why these differences may lead to certain decisions. The framework was implemented using a case study of the Ningaloo region, Western Australia. Existing research has been limited to studying the individual differences of tourists and its impact on accessibility of tourist attractions. This study contributed to the current literature by developing a systematic procedure to investigate what, how and why individual differences affect tourist perception of accessibility to tourist attractions. In the theoretical part of study, it identified the tourist characteristics including demographic variables and spatial cognitive and conative variables, such as spatial ability, individual needs and value, preparatory information set, could influence accessibility measure and developed frameworks (Figure1-4) systematically analysed the relationships between tourist characteristics and accessibility to tourists conceptually based on the literature. It also implemented the theoretical framework in a case study to validate the method and identify the difference. Section 4.3 discussed the important findings of differences from the empirical part of the study.

5.1 Gender difference or not

There were no significant gender differences in evaluating accessibility in the whole region and each of its zones. However, the findings indicate that males were slightly more dissatisfied than females with the quality of the road networks to attractions in Carnarvon, while females were slightly more dissatisfied in Coral Bay and Exmouth. These differences could be the result of other differences such as spatial cognitive ability, which varies from one tourist to another based on age (Xia et al. 2009). Eby and Trombley (2004) indicated that spatial cognitive abilities can decline with increasing age. In our study, older males formed 53% of the respondents in Carnarvon; females formed 80% and 60% of the older surveyed tourists in Coral Bay and Exmouth. Therefore, such factors as gender and age might influence respondents' evaluation of the roadways. Certainly, younger tourists rated the roads more highly than other cohorts. However, as highly-educated and wealthy tourists have different expectations of the activities, facilities, transportation, and so on to be found in tourist attractions, these areas should be improved to gain their approval.

5.2 Age difference or not

There were no significant gender differences in evaluating accessibility in the whole region and each of its zones. Generally, in Coral Bay, older people evaluate accessibility lower than younger people.

5.3 Education difference or not

Tourists in Carnarvon showed significant differences in their evaluation of attraction functionalities, based on their education. Even though tourists with different education levels had good access to attractions based on their functionalities, the attractions were rated relatively more accessible to those with tertiary education. Tourists' evaluation of functionalities is influenced by their expectations and pre-experiences. Often, pre-information about attractions shapes the initial image, or precognition, about their functionalities. This creates mental anticipation about the attraction (Golledge and Stimson 1997), so that the tourist arrives with a pre-image and pre-expectation of what will be found there (Pearce 2003). Therefore, the tourist's evaluation of functionalities is an outcome of the comparison between expectation and experience (Pizam et al. 1978).

The attractions in the Ningaloo Coast region are mainly nature-based (Jones et al. 2009). A tourist's need to visit such tourist attractions is commonly to discover unknown places, seeking new environmental experiences (Pearce and Lee 2005). According to Maslow (1943), discovering natural features such as fauna and flora can be related to the need to attain self-esteem by educating oneself and developing new horizons through new experiences. Tourists with tertiary education in Carnarvon may show more satisfaction and tolerance than less educated tourists because the attractions meet their needs and expectations better.

5.4 Income difference or not

Tourists in Coral Bay showed significant differences on functional accessibility based on their income and in Exmouth, facility accessibility differed significantly between income groups. There was dissatisfaction with this factor among the tourists with an income of AUD48001 and higher, compared to tourists on lower income, but there is no clear trend concerning accessibility with regard to income and the functionalities of attractions. Meanwhile, tourists, especially those with high incomes, have high expectations of functional elements that will make their access to attractions more convenient; hence, the higher the income of tourists, the higher their dissatisfaction in Coral Bay. In addition, tourists with high incomes usually have had experience with other tourist destinations and have a specific idea of the tourism level that is acceptable to them. One aspect of this acceptable tourism level is represented by the accessibility factors. The evaluations of such tourists may be more critical than that of tourists with lower income levels, less travel experience, and lower expectations. This demographic distinction becomes important in Coral Bay where there are some attractions whose functionalities and facilities are still to be improved.

In general, individual differences in accessibility to attractions, in terms of the function, facility and network connectivity of attractions, were identified in the case study. However, not all types of differences were found and some differences were found in one zone but not other ones. This indicates that the some individual difference types are more significant than the other, such as education vs. gender. In addition, the difference could be location specific, which depends on the nature of the attractions. This paper only touched upon the tip of iceberg in terms of individual differences of accessibility to attractions. Many more studies are needed to really understand the relationship between tourist characteristics and their accessibility to attractions. The next stage of this research project is to collect further evidence to support the framework, especially on explanatory variables, by conducting in-depth interview of groups of identified in this study and to develop quantified models to predict people's behaviours.

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