Web Design for Mature-Aged Travellers: Readability as a Design Issue

Audra Lukaitis
RMIT University, Melbourne

Bill Davey
RMIT University, Melbourne

Forecasts predict the internet will become the principle means for senior people to research, plan and book holidays. Tourism web sites are particularly interesting as the industry was one of the first to enter the world of online business and has reached a significant level of maturity. This study looks at factors web designers should consider when encouraging access by mature age travelers. A meta-study of contemporary research was conducted along with an empirical analysis of a focused group of web sites. Findings indicate that web sites resulting in transactions have incorporated better reading ease than those produced by non-commercial tourism bureaus.

INTRODUCTION

The World Ageing Population

Since the 1990s the economic and social significance of the world ageing population has been recognised by the United Nations including investigation of its "determinants and consequences" Globally the older population is growing at the rate of 2.6 % annually, this rate is unprecedented in world history, and is pervasive. By 2050 it is estimated that one in three of the population in developed regions will be aged 60 or over, where currently one in five of the population falls into this cohort. In less developed regions, the older population accounts for about 8 per cent of the population (UN, 2009).

One in four of the Australian population (25%) is aged between 55-74, a further 6% are aged 75-85 over, bringing the cohort aged between 55-85 up to just under one third of the population (ABS, 2009).

Australian Tourism

A significant $92 billion in spending is generated by Australian tourism, providing about half a million jobs and contributing 2.6% ($33 billion) of Australia's Gross Domestic Product. Tourism is "*Australia's largest services export earner*" (Tourism Australia, 2009). Well over half (62%) of all current overnight tourism spending is domestic, with international visitors accounting for 38% of expenditure; however projections for 2020 forecast a rising international tourism market (45%) with a decline in the domestic tourism spend (55%) (Australian Government, 2010). Interestingly the mature-aged visitor to Australia represents nearly one quarter (23%) of the total international market.

Clearly tourism constitutes a considerable sector of the Australian economy in breadth and scale. Domestic mature-aged tourism has a huge market share of the tourism take, with day visits numbering almost 44 million (43.8 million) "*in 2008, there were 19.7 million domestic overnight visitors and 43.8*

million domestic day visits compared to 1.2 million international mature age visitors" (Tourism Australia, 2009). Mature-aged overnight visitations have been growing at the rate of 3% per year since 2000 (Tourism Australia, 2009), therefore mature-aged tourism is an important facet of tourism research.

Domestic and International Mature-Aged Visitors in Australia

The Australian tourism authority characterises mature-age visitors as domestic or international visitors aged 55 years and over. Australian tourism is, in the main a domestic market. Since 2000, international mature age visits have been averaging an annual growth rate of 4%. Mature age international visitors represent nearly one quarter (23%) of all international arrivals, the largest percentage coming from Australia's top tourist markets: New Zealand, UK, USA and Japan. Interestingly visitors from Canada were most likely to travel as mature age visitors (Tourism Australia, 2009).

Importance of the Mature-Aged Traveller

In a report commissioned by Amadeus to investigate emerging travelling customer segments over the next 10-15 years, four important "traveller tribes" were identified: "*Active Seniors*" aged between 50 and 75, "*Global Clans*" which include global migration groups and individuals travelling internationally to reconnect with family and friends, "*Cosmopolitan Commuters*" and "*Global Executives*" (Greaves, 2008).

The Defining characteristics of the "Active Senior" are:

- *"They will be youthful and adventurous seniors*
- *They will hail from affluent regions with ageing populations including most developed countries*
- *They will be seasoned and vocal consumers of products and services, who will have travelled extensively in their younger days*
- *They will likely seek holidays with a specific focus*
- *They are likely to look at shared interest and singles holidays that cater to this specific group, with many of them having experienced relationship breakdown*
- *They will often research their journeys extensively, often doing so online, and planning well in advance to take advantage of good deals*
- *By 2020, there will be many more senior travellers from the BRIC* (Brazil, Russia, India, China) *emerging markets as their middle classes grow more affluent (Greaves, 2008:156)."*

This has important implications for the tourism industry strategically in terms of product and marketing. Clearly how the mature-aged tourist will research and book travel is of vital interest, as well as how the tourism industry communicates and deals with them.

ONLINE TOURISM RESEARCH IMPORTANCE

Google reports that general online search engines are being used by 64% of "leisure travellers" and 56% of business travellers to start their travel planning, and that the use of general search engines is "slightly more " than general travel sites; one commentator remarking that the selecting and sequencing of "key words" are of some importance (European Travel Commission, 2008). In Australia, when researching their visit, international mature age visitors are most likely to use the internet, travel agents and knowledge gained from previous visits - however, the most used research source was the internet (30%). Domestic mature-aged visitors likewise mostly use the internet and previous visits to research their holidays (Tourism Australia, 2009).

IPK International (2008) cites the internet as one of the four main drivers of global travel and tourism growth. The European Travel Commission (2008) found that 70% of USA tourists use the internet to research travel, more than half of French tourists book their travel online, and United Kingdom tourists prefer to book their holidays online.

Given that mature-aged tourists are likely to be on the increase, and that more and more older visitors are researching and booking their travel on the internet it is germane to consider the utility of tourist web sites in the light of mature-aged travelers.

CHRONOLOGICAL AGE AND COGNITIVE AGE NOT THE SAME

Declining mortality and fertility rates are resulting in increased life expectancy; today Australian men are likely to live till 79 and women 84 (OECD Health data 2009), life expectancy is expected to keep increasing.

The onset of years impacts physiology, generally there is some decline or deficit in eyesight, hearing, nimbleness and so on. Mental cognition is also affected by ageing in terms of executive functions, memory, processing, learning, flexibility, speed (Li, Lindenberger et al., 2001).

Before looking at some physiological and cognitive issues of interest it is important to note that chronological age and cognitive age is not the same thing, people age cognitively at different rates and times because of any number of variables (Eastman & Iyer, 2005).

Barak and Schiffman (1981) caution against making assumptions about chronological age groups and stress that to a degree, an individual's behavior and identity is linked to self-perceptions about "felt" or "perceived" age rather than chronological age, they distinguish between biological age, social age and social-psychological age. Biological age is a person's age in the context of their potential life span and physiological condition. Social age is defined in the context of social roles of which jobs, education, and gender are some of the characteristics; this also changes as an individual assumes different roles throughout their life cycle e.g. bread winner, mother, grandfather, widow, son, daughter, child, grandchild, worker, pensioner, retiree etc. Social-psychological age relates to an individual's self-perception about belonging to a "middle-aged", "elderly" or "old" reference group (Barak & Schiffman, 1981). Conversely, how "society" views the mature-aged also influences the behaviors and perceptions of the mature-aged (Hartley, 1994).

Vision Problems

The Australian Bureau of Statistics reports that of all health conditions the most commonly reported are eye disease (90%) *"particularly long sightedness (hyperopia 62%, presbyopia 14%), and short sightedness 35%"* (ABS, 2006).

Eye diseases and deficits are various including: astigmatism, short sightedness/myopia/difficulty seeing objects in the distance, macular degeneration (loss of central vision), other age related sight problems, presbyopia (losing the ability to focus), long sightedness/hyperopia/difficulty seeing objects close up, blindness in one eye, partial blindness in one or both eyes, glaucoma (optic nerve damage resulting in tunnel vision then blindness if untreated), cataracts (clouding of the eye lens), lazy eye/strabismus, retinopathy (retina damage, often diabetes related) and so on (McGwin, Khoury et al., 2010).

The leading cause of vision impairment in the USA is age-related, and vision deficits are expected to increase with the ageing population (McGwin et al., 2010). One in six of the population (17%) of those aged 45 years or older report vision problems even while wearing glasses or contact lenses, increasing with age. Poor vision manifests in many ways, some of which include an inability to read normal newspaper print or recognize a friend across a room (Leonard, 2002).

Cognitive Deficits

Cognitive decline is another corollary of ageing, *"basic cognitive functions, such as the abilities to activate, represent, maintain, focus and process information, decline with age* (Li et al., 2001).

Cognitive decline can manifest across an array of deficits including: reducing general cognitive speed, that is slowed reaction times, especially in situations with time constraints. Working memory also declines in that it is hard to hold information in immediate memory while acting or processing the same or other information.

Older people find it harder to stay focused on relevant information while ignoring the irrelevant, or in other words are easily distracted away from the main event. (Banks, Breeze et al., 2006; Li et al., 2001; Park & Reuter-Lorenz, 2009). This is important as retaining "*certain things in mind while avoiding distraction from irrelevant information is necessary in order to complete goals and work through problems*" (Mather, 2010). There is also a decline in "refresh" memory. "*Healthy older adults usually show deficits in particular situations such as those that require the management and coordination of multiple tasks or that involve detailed recollection of events or experiences.* (Hoyer & Bessette-Symons, 2010) Salthouse (1993) found age-related verbal deficits on tests requiring the contents of long-term memory, those with low verbal ability remembering just over half of what they read compared with those with higher verbal ability who remembered 80%.

Salthouse also found that reading comprehension was lower when text passages contained distracting material (Salthouse et al.1993:580). Interestingly, in a study of online reading behavior Nielsen (2005) found that lower-literacy users act differently in that they "plow" text, reading word by word, line by line, and cannot scan or skim text to extract meaning in the same way as high literacy readers do. With dense text low literacy readers *"often spend considerable time trying to understand multi-syllabic words",* find it too challenging and move onto the next link as reading effort is too much. There are also difficulties with the search function because of poor spelling with query terms. Nielsen cites the USA Department of Education who estimate that 43% of the USA population has lower literacy levels which apparently are comparable to most other countries with the exception of Scandinavia. (Nielsen, 2005).

It is likely that a proportion of the mature-aged will have low literacy levels too.

Readability

For the mature-aged, document literacy and the readability of documents are important issues and can enable them to go on living independently in the community (Meyer, Marsiske et al., 1993). It is equally true that document literacy and readability impact other aspects of life including leisure and holiday research, planning and bookings which contribute to general quality of life.

> *"Document literacy (Kirsch & Jungeblut, 1986) involves reading skills necessary to understand and use printed materials occurring in a variety of nonprose for mats. These formats include charts, schedules, tables, labels, and forms (Kirsch & Mosenthal, 1990). Older adults encounter such documents in their everyday lives (e.g., medicine bottle labels, directions for utilizing products, public transportation schedules, and financial documents). The opportunity to function independently in our society may rest partly on the ability to comprehend everyday documents. Level of functioning on these tasks (e.g., comprehension of medication information, managing one's finances) has been shown to be predictive of timing of institutionalization and mortality (Fillenbaum, 1985). The elderly report that the ability to care for themselves and manage their own affairs is one of their major concerns. Maintenance of independent functioning in the elderly is also of concern for society as the number of elderly continues to increase."* (Meyer et al., 1993)

Given the forecasted growth in mature-aged tourism, the increased (and likely increasing) use of the internet to research and book holidays, and the likely mature-aged related diminution and deficits in physiological and cognitive domains, the large body of research into the importance of "readability" and "comprehensibility" and how the importance of self-efficacy in literacy contributes to continuing independent and meaningful "living", the readability of tourism websites is an area of interest and has not previously been investigated in the tourism body of research.

APPLICATION OF READABILITY INSTRUMENTS

A substantial body of medical research has been undertaken into the "readability" of printed and online health care information utilizing the Flesch-Kincaid reading ease index (REI), the Flesch-Kincaid reading grade equivalent (GE) and Gunning's fog readability index (GF) aiming to establish how easy medical information is to read and understand by its audience. To work out grammatical complexity readability instruments estimate word difficulty and sentence length, calculating the average amount of words in sentences and the average amount of syllables per word applying a given algorithm.

The medical literature in this readability research area, using these "readability" instruments is vast, ranging from the readability of patient education materials from the American Academy of Orthopaedic Surgeons and Paediatric Orthopaedic Society of North America Web Sites (Badarudeen S, 2010); readability levels of health pamphlets distributed in hospitals and health centers in Athens, Greece (Kondilis, Akrivos et al., 2010); the readability and comprehension instruments used for print and web-based cancer information (Friedman & Hoffman-Goetz, 2006); an analysis of patient information on the American Academy of Otolaryngology –Head and Neck Surgery website (Greywoode, Bluman et al., 2009); print and web-based cancer information (Friedman & Hoffman-Goetz, 2006) readability standards for informed-consent forms as compared with actual readability (Paasche-Orlow, Taylor et al., 2003), readability assessment of internet-based consumer health information (Walsh & Volsko, 2008) and so the literature goes on, with literally hundreds of research studies in this investigative domain. These studies uniformly indicate that readability of web sites is a significant impediment to their effective use by those of mature age.

Given the ageing population and the growing mature-age tourism market, and given that approximately one out three mature-aged travelers or tourists use the internet to research and or book their travel, it is obviously timely to investigate the readability and understandability of some Australian and New Zealand tourism websites.

Klare (1974-1975) conducting an extensive analysis of readability formulas and their application to various documents or "text", including manual calculations and computer software (of that time) concluded that these readability estimates provide "sufficient" indications about the readability of text. Klare (1974-1975) concluded that simple word and sentence counts satisfactorily indicate the readability of a piece of writing, finishing off with the remark "*formulas provide good indices of difficulty, but do not indicate causes of difficulty or say how to write readably*". Meyers et al (1993:246) also found that "*text factors help to determine the readability and comprehensibility of text*".

More recently Friedman & Hoffman-Goetz, (2006) undertook a systematic review of readability and comprehension instruments used in print and on the web, where the characteristics of each literacy tool was analysed, including the variables and computations, required text passage length, administration time, interpretation, and strengths and weaknesses; concluding that to overcome some weaknesses related to some of the formulae and to improve reliability, multiple readability formulae be used.

METHODOLOGY

For the empirical study we selected 75 Australian and New Zealand general tourism web sites as the sample. We limited ourselves to Australian and New Zealand sites, as these two countries share similar backgrounds. Within this general sample we looked at what might be of interest to the mature-aged tourist. We carried out searches of Australian and New Zealand web sites using the Google search engine. Search terms were generated from the word "holiday" and a list of destinations obtained from statistics governing the most commonly selected destinations in New Zealand and Australia. For each generated site we considered not more than three pages. This ensured that no particular site contributed more than any other to the results. A check was also conducted to ensure that hosting organizations were not sampled twice under different URLs. We have not sought to characterize this sample as representative of universal tourism web sites, or indeed universal Australian and New Zealand tourism web sites.

On the tourism web sites we looked at the likely appeal to a broad audience segment, including the mature-aged. To this end we looked at the sites promoting more "relaxing" type holidays such as cruising, retreats, golfing, camping, caravanning, guided tours of local attractions, escorted bus holidays, scenic, heritage and cultural type tours (e.g. wineries, bird watching etc) walking, self-drive holidays rather than skiing, big game hunting, bungy jumping, white water rafting, kayaking and canoeing, cycling and or other "adventure" or extreme sport type holidays. Though, of course, this does not necessarily mean that a segment of the mature-aged would not seek out or book such holidays.

We applied readability calculation instruments including the Flesch-Kincaid reading ease index (REI), the Flesch-Kincaid reading grade equivalent (GE) and Gunning's fog readability index (GF) sourced from "Juicystudio" readability software (http://juicystudio.com/services/readability.php# readingresults).

The research question being investigated was "*is there evidence of variation in readability of web sites when adjusting for destination factors*?" We were not probability or confidence testing, no statistical hypothesis are proposed, and we were not seeking to disprove a null hypothesis in this study of tourism web sites and their relevance for the mature-aged, rather we looked at what the results might indicate generally via descriptive statistics.

INTERPRETATION OF READABILITY INSTRUMENTS

The Flesch Reading Ease Index (REI) and Flesch-Kincaid grade equivalent (GE) score, and Gunning's Fog Index (GF) were calculated for each web page.

The REI ranges from 0-100, where a higher score is indicative of more readable material. Flesch nominated "65" as a "plain English" score. The score from 0-30 is rated as very difficult, and 90-100 as very easy. (Courtis, 1995) indicated the following table as helpful in interpreting the REI scores.

TABLE 1
FLESCH PATTERN OF READING EASE RATINGS (COURTIS, 1995)

Reading ease rating	Description of style	Educational attainment level	Typical style of magazine
0-30	Very difficult	Postgraduate degree	Scientific
30-50	Difficult	Undergraduate degree	Academic
50-60	Fairly difficult	Grades 10-12	Quality
60-70	Standard	Grades 8-9	Digests
70-80	Fairly easy	Grade 7	Slick fiction
80-90	Easy	Grade 6	Pulp fiction
90-100	Very easy	Grade 5	Comics

The GE score rates a given sample text on USA grade school levels and was originally designed to assess the readability of school text books and was used by teachers and librarians. A document score of 7, means a 7th grade student can easily read and understand a given book, or text etc.

The Gunning fog index (Frequency of Gobbledygook) assesses the readability and density of text by calculating the percentage of difficult words (syllable count), and how easy a document is to read. A low score is indicative of reading ease, the higher score is indicative of reading difficulty. The ideal score proposed is 7 or 8.

Categorization of data
The data was categorized along the three dimensions of:
1. The type of organization hosting the web page - tourism authority, travel agent or holiday provider.

2. The nature of the page - a front page containing no details of holidays, a page containing lists of holidays with a link or links to details, or a page with a specific holiday that included at least price.
3. The apparent intended audience – older people or general.

RESULTS

The unsorted data showed evidence of variation across each of the reading measures:

TABLE 2
RAW DATA VARIATION

	Syllables per word	Gunning Fog index	Flesch Reading Ease Index	Flesch Kincaid Grade Equivalent
Mean	1.70	10.14	57.86	6.55
Maximum	1.92	13.52	75.57	9.94
Minimum	1.51	7.22	41.84	3.38
Range	0.41	6.30	33.73	6.56
Maximum range for the measure	na	20.00	100.00	12.00
Standard deviation	0.10	1.37	7.88	1.21

Table 2 shows that there is a large variation across the web pages for each of the reading parameters. It also shows that readability is generally moderate for these pages, coming in with an average readability similar to that of the more serious newspapers. An informal look at other types of general access pages showed much higher values than for these means. Range values of 6.3 of a possible 20 and 33 of a possible 100 hint that different web page authors have given a varied amount of attention to readability of their pages.
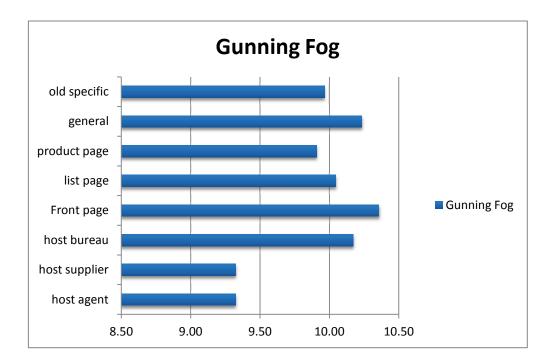
To see what effect this might have on our target group of older web users, the figures were extracted for each of the parameters of page type, web page host and apparent audience. These are shown in Table 3. Table 3 shows that there are some patterns amongst the page types. Using an exaggerated scale each of the values for reading ease yields a pattern similar to that shown in Figure 1.

TABLE 3
PAGES GROUPED BY TYPE

	Group	Host agent	Host supplier	Host bureau	Front page	List page	Product page	General	Old specific
Means	Syllables	1.69	1.69	1.7	1.7	1.7	1.69	1.71	1.68
	Gunning Fog	9.32	9.32	10.17	10.36	10.05	9.91	10.23	9.96
	Flesch Ease	55.99	55.99	57.84	57.79	57.79	58.24	57.35	58.83
	Flesch-Kincaid grade	6.03	6.03	6.59	6.61	6.51	6.55	6.59	6.48
Ranges	Syllables	0.36	0.39	0.35	0.4	0.37	0.34	0.4	0.36
	Gunning Fog	4.62	5.1	4.65	6.21	4.3	4.54	6.21	4.54
	Flesch Ease	24.57	31.22	31	33.73	23.81	27.62	33.73	27.62
	Flesch-Kincaid grade	3.98	4.16	5.09	6.56	3.31	4.16	6.56	4.16
s.d.	Syllables	0.09	0.12	0.1	0.12	0.09	0.1	0.1	0.1
	Gunning Fog	1.06	1.74	1.38	1.74	1.03	1.31	1.53	1
	Flesch Ease	6.55	9.59	8.27	9.88	6.19	7.83	8.37	6.91
	Flesch-Kincaid grade	0.87	1.33	1.29	1.6	0.8	1.26	1.32	0.98

Figure 1 shows that pages we saw as being specifically aimed at older travelers were easier to read than the general pages. Front pages with general information were harder to read than those with specifics of holidays.

FIGURE 1
TEXT DENSITY

Pages produced by tourism authorities (shown as "host Bureau" in Figure 1) were harder to read than those hosted by organizations actually selling the holidays and receiving payments.

Although there is some doubt as to the significance of these differences they appear to be understandable expressions of where a page designer might be less concerned with readability.

LIMITATIONS

Our previous work (Lukaitis & Davey, 2009) looked at a number of other factors based on Kim and Fesenmaier (2008) online first impression model. That model proposes web "hygiene" (essential) and "potential" factors that contribute to online first impression formation in the realm of web design. These "hygiene" factors related variously to content, usability, credibility and inspiration. Our study does not obviate these outcomes, but rather directs attention to an issue of specific importance – readability in the context of web access by mature aged travelers, and likely issues of relevance.

Readability formulae are useful in estimating reading difficulty levels, and text understanding, however there are obvious limitations. Readability formulae are not an exact science. The readability instruments:

- Do not take into account a reader's social or motivational factors (Meyer et al., 1993) (Friedman & Hoffman-Goetz, 2006), how and why readers are using the document, the *"specific purposes and specific context of use"* (Meyer et al., 1993:246).
- Some text are difficult to read because the content is difficult to grasp, "*ecologically valid texts, encountered in the everyday world, may also be more or less difficult due to text factors intrinsic in them*" Meyer et al (1993:246)
- "...*more difficult texts may be more difficult because they impose higher intellectual/ processing demands particularly in the domains of fluid and crystallized intelligences, and in working memory*" (Meyer et al., 1993:246).

- The readability instruments do not take into account prior knowledge, experience or familiarity with material tested
- Do not take into account visuals (Friedman & Hoffman-Goetz, 2006)
- Do not take into account layout or design or how text is styled or cued (Friedman & Hoffman-Goetz, 2006)
- Do not take into account text structure, grammar, punctuation etc. (Friedman & Hoffman-Goetz, 2006)
- Do not take into account the complexity of ideas (Meyer et al., 1993)
- Do not take into account content. For example given text can score very well after application of all instruments, but on reading be without any meaningful content
- Do not take in account "how" people are reading, whether someone is "scanning", "skimming" or actually "reading" text word by word (Nielsen, 1997).

Another obvious limitation is that we limited our search for likely web pages through using only one search engine Google.

CONCLUSION

The meta-study of contemporary research found that the world population is becoming increasingly unbalanced towards the elderly. Medical evidence regarding ageing shows that reading is significantly affected by a number of medical factors including likely mature-aged related diminution and deficits in various physiological and cognitive domains. There is a large body of research into the importance of "readability" and "comprehensibility"; and how self-efficacy in literacy contributes to continuing independent and meaningful living. Significant research has been conducted into the problem of medical web sites being less accessible by the elderly due to readability. Our meta-study showed that the *readability* of tourism websites is an area of interest that has not previously been investigated in the tourism body of research.

For this study we selected 75 Australian and New Zealand general tourism web sites which were identified using the Google search engine and using the non-paid Google ranking.

We found via a meta- study plus empirical data analysis, that readability is an issue for effective use of tourism web sites by older people. Descriptive statistics show there is variation in the readability of these sites investigated. As the pages were chosen from a very narrow field where all providers are mature, it suggests that readability of web pages is an issue that is sometimes overlooked by web page designers.

This empirical evidence suggests that readability should be a design issue for web developers. Although not conclusive, the evidence indicates that web sites resulting in transactions have incorporated better reading ease than those produced by non-commercial tourism bureaus.

In this study, of older travelers with well-known accessibility issues, it would seem sensible to apply readability measures as a design step. Given the findings of how low literacy users actually read and behave online, it would seem that it is in the interests of commercial and non-commercial websites to seriously look at readability issues. In addition to content, some further thought about the selection and application of "keywords" also need consideration.

REFERENCES

ABS. (2006). Health of Older People in Australia: A Snapshot, 2004-05, Australian Bureau of Statistics.

ABS. (2009). Population by Age and Sex, Australian States and Territories, June 2009: Australian Bureau of Statistics.

Australian Government, Department of. Resources, Energy and Tourism. (2010). 2020 Tourism industry potential a scenario for growth. Tourism Australia.

Badarudeen S. & Sabharwal, S. (2010). Assessing Readability of Patient Education Materials: Current Role in Orthopaedics. Clinical Orthopaedics and Related Research, 468, 10, 2572-2580.

Banks, J., Breeze, E., Cheshire, H., Cox, K., Demakakos, P., Emmerson, C., Gardener, E., Gjonça, E., Guralnik, J. M., Hacker, E., Huppert, F. A., Kumari, M., Lang, I., Leicester, A., Lessof, C., Maisey, S., Marmot, M., McWilliams, B., Melzer, D., Nazroo, J., Nunn, S., Pierce, M., Steel, N., Tabassum, F., Taylor, R., Tetlow, G., & Zaninotto, P. (2006). Retirement, health and relationships of the older population in England THE 2004 English Longitudunal Study of Ageing. (WAVE 2), The Institute for Fiscal Studies. London.

Barak, B., & Schiffman, L. G. (1981). Cognitive age: a nonchronological age variable. Advances in Consumer Research, 8, 602-606.

Courtis, J. K. (1995). Readability of annual reports: Western versus Asian evidence. Accounting, Auditing & Accountability Journal, 8(2), 4-17.

Eastman, J. K., & Iyer, R. (2005). The impact of cognitive age on Internet use of the elderly: an introduction to the public policy implications. International Journal of Consumer Studies, 29(2), 125-136.

European Travel Commission, O. T. M. (2008). Online Travel Market. Retrieved 26 November, 2010. from http://www.etcnewmedia.com/review/default.asp.

Friedman, D. B., & Hoffman-Goetz, L. (2006). A Systematic Review of Readability and Comprehension Instruments Used for Print and Web-Based Cancer Information. Health Education & Behaviour, 33(3), 352-373.

Greaves, D. (2008). Customer Segmentation Traveller Types and Their Needs in 2020. Trends and Issues in global tourism 2008, Part 5, 149-164.

Greywoode, J., Bluman, E., Spiegel, J., & Boon, M. (2009). Readability analysis of patient information on the American Academy of Otolaryngology–Head and Neck Surgery website. Otolaryngology - Head and Neck Surgery, 141(5), 555-558.

Hartley, J. (1994). Designing Instructional Text for Older Readers: A Literature Review.

Hoyer, W. J., & Bessette-Symons, B. (2010). The Neuroscience of Aging and Cognition in E. B. a. B. M. Editors-in-Chief: Penelope Peterson (Ed.) (pp. 340-344): Elsevier Ltd.

Kim, H., & Fesenmaier, D. R. (2008). Persuasive design of destination web sites: An analysis of first impression. Journal of Travel Research, 47(3), 3-13.

Klare, G. R. (1974-1975). Assessing readability. Reading Research Quarterly, 10(1), 62-102.

Kondilis, B. K., Akrivos, P. D., Sardi, T. A., Soteriades, E. S., & Falagas, M. E. (2010). Readability levels of health pamphlets distributed in hospitals and health centres in Athens, Greece. Public Health, 124(10), 547-552.

Leonard, R. (2002). Statistics on Vision Impairment: A Resource Manual.

Li, S.-C., Lindenberger, U., & Sikstrom, S. (2001). Aging cognition: from neuromodulation to representation. TRENDS in Cognitive Science, 5(11), 8.

Lukaitis, A. & Davey B. (2009), "Capturing the Mature Traveler: Assessing Web First Impressions", Growing Information: The Journal of Issues in Informing Science and Information Technology Volume 6, 2009, Part 2, pp. 845-853.

Mather, M. (2010). Aging and cognition. Wiley Interdisciplinary Reviews: Cognitive Science.

McGwin, G., Khoury, R., Cross, J., & Owsley, C. (2010). Vision Impairment and Eye Care Utilization among Americans 50 and Older. informa healthcare, 35(6), 451-458.

Meyer, B. J. F., Marsiske, M., & Willis, S. L. (1993). Text Processing Variables Predict the Readability of Everyday Documents Read by Older Adults. Reading Research Quarterly, 28(3), 234-249.

Nielsen, J. (2005). Lower-Literacy Users: Writing for a Broad Consumer Audience. Retrieved 6 December, 2010, March 14, 2005, from http://www.useit.com/alertbox/20050314.html

Paasche-Orlow, M. K., Taylor, H. A., & Brancati, F. L. (2003). Readability Standards for Informed-Consent Forms as Compared with Actual Readability. The New England Journal of Medicine, 348(8), 721-726.

Park, D. C., & Reuter-Lorenz, P. (2009). The Adaptive Brain: Aging and Neurocognitive Scaffolding. Annual Review of Psychology.

Tourism Australia, Canberra. (2009). Mature Age Visitors in Australia 2008.
UN. (2009). World Population Ageing 2009 - United Nations Report.

Walsh, T. M., & Volsko, T. A. (2008). Readability assessment of internet-based consumer health information. Respiratory Care, 53(10), 1310-1315.