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Australasian Journal of Market Research

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All full members of the MRSA and the MRSNZ receive a complimentary subscription to AJMR as part of their membership.

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  Editor, AJMR
  Mt Eliza Business School
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  St Kilda Road Post Office
  Melbourne Victoria 3004
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Using cluster analysis for market segmentation - typical misconceptions, established methodological weaknesses and some recommendations for improvement

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Abstract
Despite the wide variety of techniques available for grouping individuals into market segments on the basis of multivariate survey information, clustering remains the most popular and most widely applied method. Nevertheless, a review of the application of such data-driven partitioning techniques reveals that questionable standards have emerged. For instance, the exploratory nature of partitioning techniques is typically not accounted for, crucial parameters of the algorithms used are ignored, thus leading to a dangerous black-box approach, where the reasons for particular results are not fully understood, pre-processing techniques are applied uncritically leading to segmentation solutions in an unnecessarily transformed data space, etc.
This study aims at revealing typical patterns of data driven segmentation studies, providing a critical analysis of emerged standards and suggesting improvements.

Keywords: cluster analysis, data-driven market segmentation

Introduction
Market segmentation is one of the most fundamental strategic marketing concepts. The better the segment(s) chosen for targeting by a particular organisation, the more successful the organisation is assumed to be in the marketplace. The basis for selecting the optimal market segment to target is a (number of) segmentation solution(s) resulting from partitioning empirical data. Therefore the quality of groupings management chooses from is crucial to organisational success and requires professional use of techniques to determine potentially useful market segments. Thus, the methodology applied when constructing (Mazanec, 1997; Wedel and Kamakura, 1998; Dolničar and Leicht, 2001) or revealing (Hailey, 1968; Frank, Massey and Wind, 1972; Myers and Tauber, 1977; Aldenderfer and Blashfield, 1984) clusters from empirical survey data becomes a discriminating success factor and potential source of competitive advantage.

This review focuses exclusively on (1) post-hoc (e.g. Wedel and Kamakura, 1998), a posteriori (e.g. Mazanec, 2000), or data driven market segmentation (e.g. Dolničar, 2002; Dolničar, forthcoming) as compared to a priori (e.g. Mazanec, 2000) or commonsense segmentation (e.g. Dolničar, forthcoming), and (2) clustering techniques, because they were the first family of techniques that was applied to search for homogeneous groups of consumers (Myers and Tauber, 1977), but mostly because they still represent the most common tool used in data driven segmentation (Wedel and Kamakura, 1998, p. 19). The aim is to reveal standards of conducting data driven market segmentation studies, critically review them and provide - where possible - recommendations on how segmentation studies can be conducted in a more scientific manner.

The data set underlying this review consists of 243 publications in the area of business administration where data driven segments were identified or con-
structured (Baumann, 2000, a list can be obtained from the author). A set of relevant criteria determining the quality of a cluster analytic segmentation study was defined and all those publications were then coded into an SPSS data set according to those criteria. These relevant criteria can be grouped into (1) factors related to the data set used (including the sample size, the number of variables used as segmentation base, the answer format and data pre processing), (2) partitioning-related considerations (including the clustering algorithm applied, the procedure chosen to determine the number of clusters and the underlying measure of association), and finally (3) stability and validity considerations.

The findings will be reported separately for each one of those areas and will include a review of standards in practical segmentation (based on the analysis of the data set described above), the discussion of associated methodological concerns and recommendations (where to the author's knowledge better solutions exist).

Results

DATA SET: sample size and number of variables

No matter how many variables are used and no matter how small the sample size, cluster analytic techniques will always render a result. This fact – combined with a lack of published rules about how large the sample size needs to be in relation to the number of variables used as segmentation base – is very deceptive and leads to uncritical partitioning exercises. Given that the number of variables used (the segmentation base, for instance the responses of tourists to 10 travel motive statements) determines the dimensionality of the space within which the clustering algorithm is searching for groupings, every additional variable required an over-proportional increase in respondents in order to fill the space sufficiently to be able to determine any patterns. With high numbers of variables (high dimensional space) and only few respondents (few data points scattered in this space) it typically becomes impossible to detect any structure. The reason is that respondents are different from each other and do not usually show density groupings in this space, which potentially could be detected.

The data driven segmentation reality with regard to sample size and number of variables used is illustrated in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Sample Size</th>
<th>Number of Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>698</td>
<td>17</td>
</tr>
<tr>
<td>Median</td>
<td>293</td>
<td>15</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1697</td>
<td>11.5</td>
</tr>
<tr>
<td>Minimum</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Maximum</td>
<td>20000</td>
<td>60</td>
</tr>
</tbody>
</table>

According to these descriptive figures derived from the data set the smallest sample size used for the purpose of a published market segmentation study contains no more than 10 respondents. The maximum sample size used amounts to 20000. On average, about 700 respondents are included, however, the median value is below 300 and one fifth of all studies contain no more than 100 individuals.

Those sample sizes themselves are not problematic. The methodological problems occur when sample sizes are too small for the number of variables used, as explained before. Table 1 contains the same descriptive information for segmentation variables, indicating that the
number ranges from ten to 66, with an average of 17 and a median of 15 pieces of information used for the grouping task.

Again, the number of variables itself does not automatically cause methodological problems. The crucial factor is the relation between sample size and number of variables. In order to gain insight into this relation, the correlation measure is computed and a simple X-Y plot of the data is provided in Figure 1.

Figure 1: X-Y plot of sample size and the number of variables used

With regard to the correlation measure it would be hypothesized that large sample sizes will be strongly associated with high numbers of variables, which would be visible in the X-Y plot by a linearly or non-linearly increasing function from the bottom left to the top right corner. Clearly, no such formation can be determined in Figure 1. The correlation measures (Pearson's and Spearman's) consequently render insignificant results. This means that there is no systematic relationship between the sample size and the number of variables used as segmentation base in the publications reviewed. Even in cases where only very small sample sizes are available clustering techniques are applied using large numbers of variables. This is methodologically highly problematic.

To the author's knowledge there is only one author who explicitly provides a rough guideline for the required relation between the number of subjects to be grouped and the number of variables to be used: Anton Formann states in his 1984 book on latent class analysis that the minimal sample size should amount to $2^k$, where $k$ represents the number of variables in the segmentation base. Preferably, however, Formann states, $5^2$: respondents should be available. This is obviously a very strict rule that disqualifies most published empirical data driven segmentation studies. It might not always be practically feasible to have such large sample sizes. In such cases, the number of variables to be used has to be very carefully chosen.

**DATA: Data pre-processing**

Cluster analytic procedures do not require data pre-processing per se. Nevertheless, it seems that a standard of data pre-processing in the context of cluster analysis for market segmentation has emerged: almost a third (27 percent) of the studies included in the review data set use factor analysis to reduce the original variables to fewer underlying factors before partitioning the respondents. Although the reasons for factor analysing as well as the percentages of explained variance were not coded in the data set, the popularity of this sequence of conducting data driven segmentation is surprising, as (1) it is not clear why - if the questionnaire was properly designed - it would be desirable to reduce the information to underlying dimensions, and (2) typically the explained variance in such empirical data sets is not very high. This essentially means that by conducting factor analysis before the partitioning, (1) segments are revealed or constructed in a space other than was initially chosen (factors rather than the variables that were chosen as relevant for defining potentially attractive segments), and (2) a high amount of information (half of it if 50
percent of the variance is explained by factor analysis) contained in the original data set is disposed before even initiating the grouping process. Or, as Arabie and Hubert (1994) put it ten years ago, 'tandem' clustering is an outmoded and statistically insupportable practice because part of the structure (dependence between variables) that should be mirrored by conducting cluster analysis is eliminated."

The situation is similar in the case of using standardization as a pre-processing technique (this is done in nine percent of the studies investigated). Data should not be standardized routinely before clustering. If the variables used as segmentation base are equally scaled, there is no reason for standardizing (Ketchen and Shook, 1996).

To sum up, data pre-processing should not be treated as part of a standard procedure, a clustering routine. It should only be used if there is a necessity to do so (for instance, unequaly scaled variables, no influence on the questionnaire resulting in a huge amount of variables that needs to be reduced, an excellent factor analysis result with high explained variance) and the researcher has to be aware that - when pre-processing techniques are applied - the resulting clusters are determined in a transformed, not the original data space. This has to be taken into consideration when interpreting the segments.

PARTITIONING: clustering algorithm applied
Cluster analysis is a term that refers to a large number of techniques for grouping respondents based on similarity or dissimilarity between each other. Each technique is different; has specific properties, which typically (this is assuming that the data does not contain strong cluster structure) lead to different segmentation solutions. As Aldenderfer and Blashfield (1984, p.16) say: "Although the strategy of clustering may be structure-seeking, its operation is one that is structure-imposing."

It is therefore very important to carefully select the algorithm that is to be imposed on the data. For instance, hierarchical procedures might not be feasible when large data sets are used due to the high number of distance computations needed in every single step of merging respondents. Single linkage procedures are known to lead to chain formations (Everitt, 1993). Self-organising neural networks (Kohonen, 1997; Martinetz and Schulten, 1994) not only partition the data but also render a topological map of the segmentation solution that indicates the neighbourhood relations of segments to one another. Fuzzy clustering approaches relax the assumption of exclusiveness (e.g. Everitt, 1993), and ensemble methods use the principle of systematic repetition to arrive at more stable solutions (e.g. Leisch, 1998 and 1999; Dolničar and Leisch 2000 and 2003), just to name a few of the distinct properties different techniques have.

In practice, two techniques seem to dominate the area of data driven segmentation, as shown in Tables 2 and 3: k-means if the researchers choose partitioning techniques and Ward's if hierarchical clustering is used. It can also be seen that partitioning techniques and hierarchical clustering are equally popular with almost equal usage proportions: 46 percent and 44 percent. Among hierarchical studies, 11 out of 94 do not specify the linkage method used. More than half of the remaining studies use Ward's method. The other techniques like complete linkage clustering, single linkage clustering, average linkage clustering and nearest centroid sorting do not enjoy this extent of popularity. Among the partitioning algorithms, k-means emerges as winner in terms of frequency of use (76 percent). Sporadically, other types are applied.
Table 2: Frequency table of linkage methods (agglomerative hierarchical clustering)

<table>
<thead>
<tr>
<th>Method</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>single linkage</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>complete linkage</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>average linkage</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>nearest centroid</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>sorting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>not stated</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>multiple</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3: Frequency table of partitioning clustering methods used

<table>
<thead>
<tr>
<th>Method</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>k-means</td>
<td>68</td>
<td>76</td>
</tr>
<tr>
<td>not stated</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>RELOC</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cooper-Lewis</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>neural networks</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Once again, no interrelation between data characteristics and algorithm chosen can be detected. Despite the limitations of hierarchical methods when applied to large data sets because of distance computations between all pairs of subjects at each step, ANOVA indicates that neither sample size (p-value = 0.524) nor number of variables (p-value = 0.135) influence the choice of the clustering algorithm.

The choice of the clustering algorithm is a very crucial decision in the process of segmenting markets based on empirical data. Unfortunately, there is no single superior algorithm that can generally be recommended. The researcher has to make sure that the algorithm is suitable for the data and the purpose of analysis and reflects the hypothesis or prior structural knowledge about the data set.

PARTITIONING: Measure of association

Seventy three percent of the empirical segmentation studies do not mention the measure of association that underlies the partitioning process although this measure is a most central parameter determining the outcome of a segmentation study. Among the authors who do explicitly mention which measure of association was used or is implemented in the clustering algorithm of their choice, 96 percent use Euclidean distance. While Euclidean distance is an adequate measure for metric and binary data, its application to ordinal data is problematic as assumptions are made about the ordinal scale (for instance, equal intervals between the answer categories) that most likely cannot be assured, particularly on an inter-individual level. Given that half of the empirical segmentation studies included in the data set explored in the present study ask respondents to answer in ordinal manner (14 percent use metric, 9 percent binary data), the unquestioned use of Euclidean distance becomes an area for potential future improvement of segmentation studies. Distance measures have to be chosen in dependence of the data format.

PARTITIONING: procedure chosen to determine the number of clusters

One of the oldest unsolved problems associated with clustering is to choose the number of clusters (Thorndike, 1953). Although all parameters of a clustering procedure influence the results obtained, the number of clusters chosen obviously represents the single strongest influential factor. A number of approaches have been suggested in the past to make an optimal choice regarding the number of segments to derive (Milligan, 1981; Milligan and Cooper, 1985;
Dimitriadou, Dolnicar and Weingessel, 2002 for internal index comparison and Mazanec and Strasser, 2000 for an explorative two step procedure, but so far no single superior procedure can be recommended.

While this in itself is bad news for market researchers and industry interested in determining attractive market segments to target, it is even more concerning that almost one fifth of the authors of the empirical studies investigated do not explain how they decided on the number of clusters. Half of them used heuristics (like graphs, dendrogramms, indices etc.) and approximately one quarter combined subjective opinions with heuristics. Puresly subjective assessment was applied in seven percent of the studies only.

Looking at the distribution of the final number of clusters chosen, the authors' preferences becomes quite clear: 23 percent choose three clusters, 22 percent four and 19 percent five clusters. No interrelation with any data attribute is detected. This means that independent of the problem, the number of variables, the number of respondents, the nature of the segmentation base and other factors, three, four or five clusters emerge from two thirds of the studies conducted.

Although there is no single optimal solution for determining the best number of clusters to choose, two generic approaches can be recommended: (1) clustering can be repeated numerous times with varying numbers of clusters and the one number that renders most stable results can be chosen, or (2) multiple solutions can be computed and selection is undertaken interactively with management.

**STABILITY AND VALIDITY**

If clustering is about detecting natural clusters that exist in the data (Aldenderfer & Blashfield, 1984), stability of the solution is guaranteed, as all algorithms are likely to reveal the clusters structure correctly. If, however, it is not assumed that natural groups exist in the data (Mazanec, 1997; Wedel & Kamakura, 1998), clustering becomes the process of creating the most useful segments. One reasonable criterion for determining the usefulness of segments is to give preference to solutions that are stable, that can be revealed repeatedly. Stability thus becomes a major issue in data-driven market segmentation as compared to the a priori approach (Myers and Tauber, 1977).

Stability has not been examined by 67 percent of authors included in the data set used in the present study. If stability was investigated, the split-half method (15 percent), analysis of hold-out-samples (4 percent) and replication of clustering using other techniques (5 percent) were applied most often.

With regard to stability and validity, the recommendations for future empirical data-driven segmentation studies are clear: results should be validated in as many ways as possible (e.g. by discriminant analysis on background variables and by multiple repetition of the actual clustering procedure with different numbers of clusters and different algorithms.).

**Conclusion and Implications**

The study demonstrates the existence of both common misconceptions underlying and routine procedures for conducting market segmentation studies: (1) cluster analysis is typically conducted by computing single groupings. Partitioning algorithms were applied repeatedly in only five percent of the studies under investigation. This indicates that the explorative nature of cluster analysis is not typically accounted for. (2) Segments are usually revealed or constructed using cluster analysis in a black-box manner. This is supported by the observation that
most of the parameters of the partitioning algorithm applied are not critically questioned. Instead, pre-prepared algorithms are imposed on the available data, even if they are inappropriate for the data at hand.

This leads to a number of obvious implications for the future improvement of empirical data-driven segmentation studies: parameters of the algorithm have to be critically reflected and chosen and computations should be conducted repeatedly to reduce the proportion of "random results". Such random results tend to be over-interpreted as the best representation of the data in reduced space, which typically is not the case. Increased awareness of the fact that cluster analytic techniques will always render a result is needed. Thus, (1) thorough understanding of the procedures, (2) careful harmonization of algorithms and the data at hand and (3) transparent reporting on studies conducted are necessary to improve the quality of empirical data-driven market segmentation studies.

Future contributions to the field of market segmentation by means of cluster analysis embrace all improvements in the methodology that support researchers in optimising the crucial decisions: choice of algorithm, number of clusters, algorithm parameters, optimal ratio of variables to sample size etc. For the time being the best way of dealing with these issues is to critically question each step and transparently report on the results to ease the interpretation of the value of a particular segmentation solution.

References


Convergent Interviewing: A Structured Approach to Defining Market Research Problems

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Note: I wish to thank Godwin Nair, Chad Penny and the reviewers for their valuable comments and insights to earlier drafts of this article. Special thanks go to Gerd Haberkorn and Terry Kempnich from Enhance Management.

Abstract
Convergent interviewing is an iterative method for analysing interview data, primarily in organisational change and development processes. This article explores how convergent interviewing can be used in other ways and areas that can (a) benefit particularly inexperienced qualitative market researchers when investigating a new, relatively unknown field of research or industry; and (b) assist in developing or refining a research project or problem. Convergent interviewing offers a relatively uncomplicated but rigorous method to assist researchers. Based on the experiences of numerous researchers over the past ten years, this article discusses three major issues that arise when utilising the convergent interviewing technique and recommends several adjustments to the technique.

Keywords: Convergent Interviewing, Qualitative Research, Research Problem, Research Project

Background
Interview data is a major source of information for qualitative researchers, which is collected through methods dominated by focus groups and in-depth interviews. These methods are often used in combination with observational and ethnographic techniques. The following discussion is concerned with the application of a special in-depth interviewing technique for market researchers, called convergent interviewing (CI). The discussion is of particular benefit to market researchers learning their "trade", especially those new to undertaking qualitative research. It also provides a justification for what most experienced market researchers would do naturally when confronted with an ill-defined research area or problem.

Market research projects are quite different to academic research in that they are undertaken to benefit clients by providing them with customised knowledge, rather than further knowledge in general. Therefore, projects often tend to be narrow in scope (concerning method, size, costs and timeframe) and aimed at understanding and making sense of a very specific and clearly defined research problem in order to support a client's decision-making processes. Commercial projects differ from academic ones, which are often loosely defined and require clarification throughout the early stages of the project. Whilst academic researchers tend to use mainly academic literature (commercial confidentiality usually restricts accessibility) to review knowledge in previously researched fields, private organisations and market researchers tend to use their experience and tacit and explicit knowledge as a starting point and context for project and problem definition. Furthermore, they

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may screen a variety of theoretical sources such as marketing and consumer theory or social sciences (Imms & Eraut, 2002).

As a first step, organisations usually prepare a research brief outlining background to the business problem and the outcomes required from the research, in relation to the budget and timeframe. Then a briefing meeting between key members of the organisation team involved and the researchers is called to discuss and develop or refine the research problem, issues and questions. Finally, a research proposal is agreed upon providing the rationale for the research project.

However, there are situations where both clients and market researchers lack the experience, tacit knowledge, basic understanding and context needed to clearly define the research problem, the kind of information it will produce, measurable research outcomes, and, most importantly, the ways in which the results could be used to facilitate decision-making processes. In such a situation, some initial ‘exploratory digging’ is required to explore, clarify and define the core research issues and relevant questions. At this stage, group and individual interviews with consumers, whether companies or individuals, are inappropriate because there is still a need for a better understanding in order to elicit core issues. This is where CI, a relatively structured approach to in-depth interviewing, can assist. The CI technique provides quick results by filling many of the unknown gaps that often exist in the early stages of a project. Identical to in-depth interviews (often referred to as executive interviews in the industry), the interaction during convergent interviews is directed and purposeful, not conversational (Sayre, 2001). The result of the process enables market researchers to confidently go back to the client with a recommendation to focus the remainder of the research project (either qualitatively or quantitatively) on one or more of the identified issues.

**Introduction**

Some market research projects begin with a broad field of possible topics and end with a focused approach, a process that comprises several tasks and gradually leads to a "progressive reduction of uncertainty" (Philips & Pugh, 1994, p. 72). That is, market researchers engaging in investigating new research areas may find it difficult to establish a focus on their research project early into their investigation. Indeed, there are instances where researchers find it problematic to settle on a specific research problem and approach because they may not initially know what questions to ask or how to concentrate their initial research efforts. Until researchers ask the relevant questions, they cannot get the information they are seeking. Apart from initial discussions with clients and the preparation of research proposals, there is little guidance about how to deal with the uncertainties involved in a given research problem, particularly in a new area of research or industry sector. However, the progressive reduction of uncertainty is essential for the completion and success of any research project.

Until now, there have been very few scientific studies that have utilised the strengths of the convergent interviewing (CI) technique as part of their research methodology (Gatfield, Barker & Graham, 1999; Hastings & Perry, 2000; Rao & Perry, 2002; Simons & Thompson, 1998). Also, there seems to be only one recently published book on marketing research methods (Carson, Gilmore, Perry & Gronhaug, 2001) that addresses the advantages of CI in order to explore new research issues concerning emerging business phenomena. The purpose of this article is to outline three core issues, based on the knowledge and practices of several researchers (e.g. Hastings 2000; Healy 2000; Miyachi 2002; Riege 1997; Nair 1998; Teale 1999), in the course of trying
to refine an initially broad research problem, positioned in mostly unfamiliar research territory, with the CI technique. Although CI can be used in the planning stages of a survey within a well-established area, this discussion will focus on how CI is useful to develop and refine a research problem, as CI’s exploratory nature can be more effective and rigorous than other qualitative methods tend to be. CI’s description also can be an integral part of the review process of secondary sources in order to formulate research issues that, further down the track, can be tested with another methodology such as a survey. Alternatively, its description can be stage one of the two- or three-wave data collection process of a research project. This article highlights how CI can manage large amounts of information without overloading an interviewer’s capabilities, which may be an issue for relatively inexperienced researchers.

The following discussion is presented in three sections. The first section briefly describes the CI process. The second part discusses three issues of particular importance to practitioners and academic researchers: (1) the importance of prior knowledge before commencing a new research project; (2) the specific nature of agreements and disagreements arising after each interview to find research gaps; and (3) additional ways to using CI as a tool to refine the research problem of a research project. The final section outlines the core benefits and limitations of the CI technique.

**What is convergent interviewing?**

CI is an in-depth interview technique for collecting, analysing and interpreting qualitative information about experts’ experiences, knowledge, opinions, and beliefs through the use of a number of interviews that focus or converge on important research issues. But while it has been developed and used primarily for organisational change and development interventions, CI also is useful for exploratory research in areas lacking an established methodology or theoretical foundation. Indeed, CI can uncover the dimensions of a research area in situations where methodologies or theories may already be established but not yet known to, or fully understood by, the researcher. The flexibility and power of CI is threefold and lies in a:

1. Combination of CI’s unstructured content of research issues, as unstructured questions during the interview process do not determine the answers;
2. Structured process, that is CI’s use in rigorous data collection and analysis can reduce suspicions of bias which are often attached to qualitative research, in particular in-depth interviews; and
3. Dialectical analysis allowing researchers to refine questions after each interview, seeking convergence and divergence on core research issues (Dick, 1990).

At first, each interview is almost completely unstructured before than incorporating more specific questions added by the interviewer as s/he conducts more interviews and becomes aware of the differences in opinions, beliefs and attitudes that may exist. That is, later interviews start in the unstructured way of earlier ones but become more focused and structured as the interviewer learns more and more about the core issues of the research problem. Thus CI has a cyclic nature, which allows the refinement of both questions and answers, and even the method, over a series of interviews or "successive approximations" (Dick, 1990, p. 3). These approximations occur because the research process is a sequence of distinct activities repeated in and after each interview (i.e., research design, data collection, data analysis and interpretation).

At the end of each interview, a detailed summary (about 1-2 pages long) of the core issues raised is compiled and ranked. The flexibility of CI arises out of
this continuous refinement (after each interview) of the research content and process. After the first interview, the researcher initially develops a tentative interpretation of the data obtained. As the research proceeds, probe questions are devised to test the pattern of agreement or convergence (i.e., whether interviewees agree that a particular topic or area is a core issue). It is important to note, however, that disagreement or divergence among interpretations by experts should not be discarded (see also Chrzanowska, 2002, p. 17). Probe questions test the convergence where data tends to agree with previous data. Conversely, where data seems to disagree with previous data, the interviewer asks the respondent probe questions in order to explain these disagreements. ‘Disagreements’ do not mean that respondents simply did not mention an issue in the interview, as the issue may not have been in their train of thought at the time, and had the interviewer prompted a response they may have agreed it was an issue. Additionally, experience has shown that new issues may arise in a later interview, requiring newly developed probe questions to test them. The series of interviews terminates when a stable pattern of clear agreements or disagreements on core issues emerges between all or most of the interviewees, and where the differences in opinions, beliefs and attitudes can be explained.

**Why is convergent interviewing useful to market researchers?**

The attraction of CI for market researchers lies in the rigorous but flexible processes it provides to narrow down a project’s focus in its early stages by talking with knowledgeable people, and accessible experts in a particular field. Market researchers initially draw upon their own knowledge and experience as well as those of their clients. Furthermore, they also may need to refer to experts within a given industry. These processes are clearly set out by Dick (1990) and their use can be described in a project as an indication of a researcher’s analytical skills before the review of available literature and secondary data, or even research design, significantly develops. Moreover, the necessary interview skills can be learned (e.g., see Armstrong, 1965, pp. 28-31), and practised over two or so days. An example of an outcome of the CI process is provided by the list given in Table 1, which shows the ten most important field data issues in the broad and, at the time, scarcely known research field of international marketing in travel and tourism. Whilst there existed extensive literature on marketing strategy and relationship marketing (business-to-business and business-to-consumer), very little was known about how travel and tourism organisations (e.g., Qantas and the Australian Tourist Commission) co-ordinated their strategic approaches to marketing Australia as a tourist destination in key European markets. Before conducting in-depth interviews with managing and marketing directors of airlines, federal and state tourism organisations, and tourism intermediaries, core issues needed to be explored in order to clarify what had or had not been in marketing Australia overseas. The list of broad research issues in Table 1 was derived from five highly experienced senior executives within the travel and tourism industry (Air New Zealand [2], Flight Centre, Qantas, and Tourism Queensland) and two senior academics, both of whom were experts in the tourism field (one each from Griffith University’s Tourism Centre and Queensland University of Technology). Expert knowledge and opinions on this project provided a platform for refining research issues and questions and the research design.

In brief, CI is an iterative technique for collecting, analysing and interpreting large amounts of unstructured and rich interview data in less researched and established areas of study. The semi-
Table 1: Important issues extracted from interviews about the marketing of the ‘Australia brand’ in key European markets

<p>| | |</p>
<table>
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<tbody>
<tr>
<td>1</td>
<td>Leading role of the Australian government and state/territory authorities in promoting the Australia brand overseas (Partnership Australia strategy)</td>
</tr>
<tr>
<td>2</td>
<td>Lack of strategic approach and clear identification of marketing strategies based on industry and market position</td>
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<tr>
<td>3</td>
<td>Identification of core market segments offering high long-term profitability</td>
</tr>
<tr>
<td>4</td>
<td>Provision of a generally wider product/service range resulting in a competitive edge over many South-East Asian destinations</td>
</tr>
<tr>
<td>5</td>
<td>High level of awareness and desire of the Australia brand, but relatively low conversion rates due to its perception as a “once in a lifetime” destination</td>
</tr>
<tr>
<td>6</td>
<td>Overall lack of identification with products/services and core icons causing confusion mainly in the distribution channel</td>
</tr>
<tr>
<td>7</td>
<td>Importance of more rigorous market research providing a better basis of the overall strategic approach</td>
</tr>
<tr>
<td>8</td>
<td>Recognising airlines as not only primary means of transport for long-haul travel but also important promoters of Australia in foreign countries</td>
</tr>
<tr>
<td>9</td>
<td>A need for the development and improvement of the Australian infrastructure</td>
</tr>
<tr>
<td>10</td>
<td>Better recognition of the tourism industry’s significance due to its large impact on the Australian economy</td>
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structured interview procedure is relatively economical and straightforward to administer, and can be quickly taught to inexperienced interviewers.

How much prior knowledge is necessary?
The first core issue is the application of CI in (1) quickly familiarising market researchers with research issues in unknown areas or unfamiliar research territory; and (2) in assisting market researchers in the early research stages of a project to further develop or refine a research problem and/or clearly identify core research issues. A common concern among researchers is how much prior knowledge is necessary before starting the interview process. On the basis of his experience in organisational change and development, Dick (1990) recommended to start interviewing without any prior knowledge of the area of research at all. However, applications of the CI technique in various management and marketing areas over the last ten years indicate that at least some prior knowledge is required irrespective of a researcher’s experience. Indeed, at an early stage of a (new) research project, many market researchers, particularly when investigating new areas of research or unfamiliar industries, have only vague notions of their research project or problem. At this point, researchers need to gain some prior knowledge by doing some initial secondary data and literature research, brainstorming and mind-mapping, and discussing their initial ideas with other market researchers, clients or academic researchers knowledgeable in the area of research. This exploration of expert knowledge can assist in five respects. Firstly, it increases confidence in conducting initial interviews, as researchers are not forced to deal with completely unknown areas. The interviewer thus becomes an involved part of the research collection and analysis of qualitative and quantitative data. Secondly, an initial stage of the CI process is the opening question,
which follows a general introduction of the interview. Prior knowledge assists in designing an appropriate opening question that can keep the respondent talking without asking many additional questions. Thirdly, prior knowledge helps to establish rapport and maintains interview dynamics with the respondent because the interviewer is able to share their concerns and sometimes contribute, without using leading questions or evaluating answers, to their understanding of issues. Fourthly, selecting the CI technique in the early stages of a research project provides some prior theory for the development of a structured or semi-structured guide of interviewer questions in later stages of the research, for example, in-depth interviews, focus groups or quantitative research methods. Finally, prior knowledge of not only the theoretical field of research but also of the industry environment and dynamics further assists in the selection of an appropriate sample, that is, deciding the type of people to interview, whom to talk to (selection of interviewees), whom to talk to first (timing of interview), and how many people to talk to (number of interviewees). In organisational change and development, a steering committee of people from the organisation under research may help in answering these planning questions. However, a steering committee may not be feasible in most CI exercises because of time and cost constraints. These issues are discussed later.

In brief, some experience or prior knowledge in the area of research is necessary in order to apply CI and better focus on a research problem and objectives. Researchers conduct interviews preferably shortly after an initial review of various sources of secondary information has started. Exactly how soon the interviewers begin after various data have been reviewed depends on how focused the research project and problem really is, and how much prior knowledge the researcher can assemble from available data sources.

Agreements vs. disagreements to find core research issues

During the CI process, agreements and disagreements on certain research issues will emerge, which in turn may be related to important issues about developing and refining the research project and problem. The process of eliminating disagreements and focusing only on agreements is called 'convergence' - the key to Dick’s (1990) initial process of CI. This initial procedure discarded disagreements entirely, and did not probe them in later interviews. However, the method needs to be adapted for marketing problems or research dealing with new or relatively unknown research areas or industries. Based on the experiences of numerous researchers, who have used the CI technique as part of their research over the last 10 years, less important issues discarded in the earlier interviews often came up again in the later interviews. For example, an issue that was mentioned once in the first interview might not come up in the next four interviews, but then it may appear again from interviews five to ten. Therefore, disagreements should not always be discarded, but instead be considered a subject of probe questions in all interviews. When both agreements and disagreements are used to arrive at core issues in relation to the research problem, the number of probe questions will increase and therefore care must be taken to ensure that the whole interview process and interpretation of data remains manageable. This requires some experience on the part of the interviewer or possibly even further training. Market researchers usually have some prior knowledge of the area under investigation, which assists them in assessing the importance of disagreements and deciding whether to follow up on them or discard them so as to limit the probe questions to a reasonable number.

The final interpretation stage of data utilises both agreements and disagreements. Consider the following example: In one research study, seven intervie-
wees raised ten issues. Table 1 showed a list of the ten most important issues for operators in the Australian tourism industry in marketing Australia as a destination in European markets. The interview analysis in Table 2 gives an overall picture of the agreements and disagreements between the interviewees and also the frequency with which issues were raised. In Table 2, the letters refer to the seven interviewees and the numbers to ten major issues identified in the prior reading and by the first interviewee. For example, if an issue had not been raised until the third or fourth interview, a complete set of entries would not have been possible and blanks would have appeared in the top right hand corner.

Table 2 also illustrates that issues 1, 3, 5, 8 and 9 had total agreements. Furthermore, while issue 7 had total agreement, respondent 3, however, believed that his/her organisation always had been aware of the significance of rigorous market research in foreign markets and that this view was based more on firm-based approaches than combined industry ones. In contrast, issue 4 had fifty percent agreement and fifty percent disagreement, with one respondent being undecided. Issue 6 showed fifty percent agreement and fifty percent undecided/unfamiliar with the issue, while one respondent disagreed. Issue 10 had over fifty percent being not familiar with it and the rest agreeing on its importance. Table 3 gives an overview of the ‘agreements’, ‘disagreements’ and ‘not familiar with the issues’ with the percentage against each issue.

The information in Tables 2 and 3 was useful in further analysing the structuring and writing a research proposal, and also the justification of an appropriate research design. For example, based on relationships between the issues, core issues were categorised into three main groups as shown in Table 4. Even though issues 2 and 3 had disagreements, which might have led to their exclusion in the usual CI processes, their inclusion added texture to the analysis. For example, issue 2 was related to issue 1 and so could be added to group 1 and assisted in understanding the core issues involved.

Furthermore, the inclusion of disagreements in the process allowed an illumination of some other dimensions of the research problem. According to Dick (1990, p. 24), these dimensions are presumed to be known at the beginning of the research, as indeed they may well be in organisational change and development studies where the influence of
dimensions such as gender or department are well-known. However, in less specific research areas or industries and new fields, the dimensions are mostly unknown beforehand. In the previous example, Tables 1 and 2 allowed the dimensions of the issues to unfold as the research progressed. That is, the continued inclusion of disagreements in the process may have illuminated issues affecting the research project and outcome. In brief, disagreements should not be discarded because they could be relevant to the refining of the research problem.

**Alternative ways of conducting convergent interviews**

This section outlines four alternative ways of utilising the CI technique, highlighting how they differ to CI's standard procedure in terms of sample selection, opening question, use of tape recorders, and interpretation of data. Firstly, care needs to be taken to ensure that the sample is as heterogeneous as possible, that is, the purposive sampling principle of maximum variation is recommended (Patton, 1990). This means market researchers put together small but extremely varied sample of knowledgeable people, consisting of either only practitioners from private and public organisations, or a mixture of practitioners and academic experts. However, only selecting a representative and heterogeneous sample is not enough. An important part of sampling for CI is selecting the right first person to interview. This person should not merely be representative, but more importantly be someone who can direct the researcher to others who are familiar in the area of investigation, that is, the principle of snowball or chain sampling is appropriate (Patton, 1990). Therefore, for most projects, it often is essential that the first interviewee be a key industry figure who is very familiar with the generic topic and industry sector (domestically and/or internationally), the research problem and core issues involved, and their possible implications. The only danger to this approach is that particular insights that might have been gained from such a figure will be missed, since at such an early stage in the project, the researcher is usually just starting to come to terms with the industry or topic. For inexperienced market researchers or researchers with little knowledge in the area of study or a given industry, it may be more advantageous to gain this insight from some ‘less important’ interviewees, and leave the best ‘industry expert’ to last, a time when the researcher is likely to be more familiar with the topic and variety of views on the issues. The minimum number of interviewees recommended is twelve (Dick 1990, p. 25). However, it appears to be possible for stability to occur with fewer than twelve subjects. In one study, for example, the data began stabilising and converging after only six interviews, while others only required seven or eight interviews to reach convergence and for core issues to emerge. This outcome suggests that the sample size should be data-driven, rather than pre-determined, and that the sample may increase or even decrease as the interviews proceed.

Secondly, Dick (1990, p. 30) suggested an opening question of “What do you see as the strengths and weaknesses...?”. After trials with alternatives to this question in various research projects related to the areas of tourism marketing, entering foreign markets, brand equity, franchising, or advertising, an alternative opening question of “Please tell me the story of your experience of ...” proved more effective. Alternatively, given the objective of identifying core issues, a simple “What do you believe are the issues...?” may be just as effective. This is because respondents did not have to intellectualise or justify themselves, but merely tell a ‘story’ of their experience and background. This distinction is particularly important in areas where researchers do not want respondents to rationalise their answer, for example,
studies dealing with brand associations or images, which are entirely subjective. On this broad and non-threatening basis, later questions that probed for explanations or justifications were more acceptable and easier to answer. Another strategy that was developed to manage the interview session within the scheduled time was to highlight the opening question by printing it in large bold capital letters on a piece of paper and placing it before the interviewees for their reference. This acted as a non-verbal reminder to the interviewee, which worked quite well.

Thirdly, Dick (1990) did not use tape recorders in interviews but instead used his self-designed memory system, which involves memorising 20 key words and reconstructing the interview immediately after it. However, other authorities on qualitative research suggested that in-depth interviews are best tape recorded (Patton, 1990; Stewart & Cash 1991; Strauss & Corbin, 1990). In addition to enhancing the accuracy of the data collection process, the use of a tape recorder permits single interviewers to be more attentive to the interviewee by maintaining eye contact and showing interest in what the respondent is saying. Tape recorders also help develop a researcher's database before s/he interprets the data in order to identify various important themes. Moreover, replaying the tapes (it is recommended to do this shortly after the interview) allows interviewers to triangulate their data for correcting and expanding their notes of the interview.

Finally, Dick (1990) recommended that the interviews be conducted by at least a pair of interviewers, working independently but in parallel with each other. He also advised the use of a steering committee for sample selection and feedback on the interpretation of data. For researchers with limited resources and time restrictions, these investigator triangulation methods are unlikely, which adds further justification for the use of tape recorders.

In brief, the four points mentioned above indicate additional ways of better utilising Dick's (1990) CI technique and standard procedure.

Benefits and limitations of convergent interviewing

There are ten core benefits of the CI technique that can assist market researchers in trying to find the 'right' research questions for the research problem:

1) Structured process:
A very structured approach that can handle 'messy', unstructured qualitative content in a way that can be understood and described by a market researcher investigating a new or relatively unknown area of research or industry environment. The process assists in obtaining convergence or divergence on core issues in the initial stages of the project.

2) Access tacit knowledge:
Allows market researchers to get inside people's minds and access tacit knowledge on specific subjects and issues by gaining insights into people's opinions, thoughts, attitudes and beliefs in a particular field.

3) Focus on core research problem quickly:
Allows market researchers to deal with and clarify unknown or new subjects and issues relatively quickly; thereby narrowing down the research focus in new or unknown research areas or an area/industry lacking established theoretical support or prior experience or knowledge.

4) Continuous refinement:
Interviews seek continuous refinement of key issues in a short period of time. The step-by-step process involved is relatively straightforward and can be learnt in one or two days. Major steps involve:
* Deciding who to interview first and thereafter and how many people to interview (the process alone deter-
mines how many but at least six are suggested; * Contacting people, setting dates and times, designing and structuring some initial questions, determining the opening question; and * Repeating the process in and after each interview: revising research design, data collection, analysing, interpreting and prioritising key issues raised.

5) **Time-saving:**
CI can save time because the key stage of establishing an initial research topic or problem is completed earlier in the research project.

6) **Flexibility of technique and sample size:**
All relevant research issues can be identified and explored and immediately analysed for agreements and disagreements on established and emerging issues - after each interview, helping to determine at what point data collection can cease. The usual recommended range of interviews for marketing management projects is between six and twelve, although more than twelve interviews may be necessary. Note that it is not suggested that the market researcher or research firm should undertake 6 to 12 convergent interviews as part of the (unpaid) research proposal.

7) **Subjectivity:**
CI seeks to uncover much detail on new issues, and also probe issues of incongruence. In other words, the process allows for the immediate probing of answers about established and emerging issues in a particular research area (seeking agreements and disagreements of respondents’ opinions and beliefs during each interview).

8) **Networks of practitioners, public policy makers and academics:**
Establish an ‘invisible college’ (Rogers, 1983) which can assist greatly in conducting further research as part of future research projects in the same area.

9) **Interview organisation:**

Market researchers have better access to geographically dispersed experts than in group settings such as focus groups. Also, as with in-depth interviewing, the process offers greater confidentiality and anonymity than a group discussion (e.g., interviews can be conducted in a location convenient to the expert).

10) **Research capabilities:**
Researchers develop early confidence in their research topic, understand the research problem earlier, enhance their research capabilities, and increase their awareness of the importance and manageability of the research project.

Market researchers also need to be aware of some limitations of the CI technique that are similar to limitations of qualitative research. The following list highlights seven restrictions researchers should be aware of:

1) **Budget constraints:**
CI is a precursor to further qualitative and quantitative research. However, many clients may not be keen to pay for a series of convergent interviews just to establish the questions for more in-depth interviews or focus groups.

2) **Interviewer bias:**
Similar to other face-to-face interviewing techniques, a potential interviewer bias can occur during convergent interviews. The quality of the research outcome depends on the versatility and quality of the interviewer. Basic training is necessary to develop listening and probing skills, open-mindedness, sensitivity to non-verbal indicators, ability to create trust and empathy, and a good level of focus. In addition, interviewers should be trained in how to contact respondents, arrange for a time and appropriate setting for the interview, conduct semi-structured face-to-face interviews, probe important issues, conclude interviews, and maintain data quality when analysing the infor-
mation obtained. Also, it seems important that inexperienced market researchers gain adequate prior knowledge about the topic, industry sector, or product category under investigation by reviewing the related literature.

3) **Prior knowledge**

Researchers should be somewhat knowledgeable about the research field in order to contribute meaningful information to the CI process. A broad and brief initial review of easily accessible secondary information sources and other secondary data sources - such as annual reports, internal company reports of clients, statistical industry data, and so on - will not make anyone an expert, but can help with the familiarisation of core issues in respective fields and the provision of some deeper insights into current research issues, which can then be probed further during the convergent interviews.

4) **Validity and reliability of CI**

Validity and reliability issues need to be overcome, due to the small sample size of CI. Rao and Perry (2002) offered some suggestions on how to address construct validity, internal and external validity, and reliability to enhance the credibility and trustworthiness of convergent interview outcomes.

5) **Access to expert knowledge**

Industry experts from private and public organisations, as well as academic experts, may be too geographically dispersed and difficult to access.

6) **Time and costs**

The interviewing process can be time-consuming - interviews usually last between one and two hours or can be even longer. Costs will depend on accessibility and recruitment cost of experts and number of interviews, which may range from six to twelve. That is, the length of the CI process depends on how early core issues emerge and most importantly converge.

7) **Data interpretation**

Expert opinions and beliefs may vary from what they would do and what is really feasible in practice.

In brief, it seems clear that the advantages of utilising CI largely overshadow its drawbacks. The process of developing and establishing a research problem, leading from an initially broadly defined research problem to a more focused refined research problem and appropriate research questions, is illustrated in

**Figure 1. Process of developing a research problem (with core issues discussed in shaded ovals)**

![Diagram of research process](image)
CI is useful in helping to develop and refine a research problem in a new area of research or industry environment where market researchers are lacking experience or have little or no prior knowledge. The CI process is particularly helpful for market researchers in writing research proposals when they want to make executive or in-depth interviews a more saleable proposition by referring to the rigour of and academic basis for convergent interviewing. The major issues raised and discussed in this article should be given consideration. Firstly, it is necessary to have some prior knowledge in the area of research before trying to develop and refine a research topic and problem. Secondly, disagreements should not be discarded because they may be relevant to the refining process of the research problem. Thirdly, some alternative ways of conducting convergent interviews that should be used along with the standard procedure need to be considered. Finally, benefits and limitations of the convergent interviewing process are outlined.

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SEGMENTATION ISSUES IN ONLINE MARKETING

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Abstract
This paper examines the literature on the behaviour of various demographic segments towards the Internet as a marketing tool. It also takes a look at two new segmentation models proposed to online marketers that are different from conventional segmentation approaches. Typically marketing theorists used certain bases to break down the market place into manageable consumer structures using variables such as: Geography, Demography, Psychography, and Behaviour. The 'New Age' Internet Marketing theorists propose the use of certain Hybrid variables in dissecting the consumer market place. Two of these new segmentation concepts are highlighted, one by Mary Mooney that is titled 'Technographic Segmentation' and the other one by the research firm Keig & Company. The paper also reviews the changing demographic trends in Internet usage to search/shop for products. Research now indicates that the Internet is now a viable tool for many other demographic segments in the population, not just the young male as the case was when it was first introduced to commercialisation. The changing demography has created enormous opportunities for marketers. The face of the Internet consumer is in for a radical makeover now in the present and the future. Hence this paper considers the changing 'human face' of the Internet consumer.

Back to the future
Electronic shopping is not a new concept; few would envisage that in 1888 Edward Bellamy in “Looking Backward” spoke of a pipeline distribution system connected to resident’s homes, controlled by the US government. Along with Bellamy, Doody and Davidson (1967) made contributions some 80 years later. These thinkers have been considered the soothsayers of electronic retailing (Doody and Davidson, 1967). In a seminal paper aptly titled “Next Revolution in Retailing”, the latter two authors articulated a vision of electronic shopping that incorporated a flexible, yet comprehensive shopping and distribution system for grocery products, ethical drugs, and sundries. In addition to presenting what has turned out to be a reality 35 years later, with businesses of the likes of Peapod in the US and Wishlist.com in Australia, Doody and Davidson presented implications of their vision in the context of structural changes in marketing channels and a new role for advertising and packaging. Others extended the visions of Doody and Davidson, in sharing the belief that electronic shopping would become a dominant method of shopping (Burke, 1997; Alba, Lynch, Barton, Janiszewski, Lutz, Sawyer, and Wood, 1997).

“Face Off” - The changing face of online consumers
In the USA nearly 10% of the population is aged between 16 and 22 years, of which nearly half are online. Generation Y as they are termed control approximately US$37 billion in personal income, and may influence double that amount.
through adult spending (Bellman, Lohse, and Johnson, 2000). In Australia Internet access by the 18-24 year old group is as high as 70% (Gervay and Lin, 2000). It has now been found that there is a strong trend of change in the demographic make up of online consumers, shifting towards the "baby-boomers" and senior citizens (Lunn, 2000).

Contrary to the widely held notion that older Americans are separated from the Internet and e-commerce, the "digital divide," the research company Media Metrix have found that Americans born before 1984 are the fastest growing population on the Web (Szmigin and Carrigan, 2000).

Hakuhodo Institute of Life and Living (HILL) is a research organization that is attached to Japan's second largest advertising agency. HILL found revelations that go against the normal anecdotal evidence, that older Japanese were more comfortable in expressing feelings to a family member via email, rather than across the table. Nowhere is the situation more alarming than in Japan with the graying of its population. By 2025 people above 65 years will make up 29% of the Japanese population. Older Japanese men fear playing Game Boy or Sega not because they do not know strategic moves but are afraid to lose on a PC. The same older men can be seen in droves at Pachinko Parlors, as they are more familiar with the larger Electronic Monitors (Lunn, 2000).

In the year 2000, there were more Americans aged over 65 years than teenagers, households headed by people over 55 years have twice the assets of households headed by the 35-54 year group. According to statistics from the US, the 45-54 year age group spends 17% more than the average household on a per-capita basis, and further the 55-64 year age group spends 15% more than the average per-capita in the USA (Ernst & Young 2000). It has been tradition that marketers tend to focus their energy and resources on the younger Generation X than on older consumers. Broadband advertisements tell the story. In findings it was revealed that older people do not only surf the net, they buy on the net. A recent study indicated that those over 55 are more likely to buy books, stocks and shares and business equipment than the average adult web user. Older people view advances in technology such as the Internet as key in life long learning. In the same context it is worth noting that there are reportedly more Internet users over 50 than under 20 with 19% of all users aged 50 years and older in the USA. In an ongoing research program since 1997 sponsored by the Wharton Forum on Electronic Commerce called the Wharton Virtual Test Market (WVTM), it was found that in 1999 the median age of the WVTM member is 29 years, just younger than the overall population median 30-34 years (Rose, 2000).

In their ongoing study of the Australian demographic market, The National Office for the Information Economy (NOIE) came up with very interesting findings. Though Internet access is greatest for the 18-24 year old, the 55+ age group has increased by around 76% over the last two years (NOIE, 2000). The nearest increase is the 25-39 years old, however the 55 plus age bracket beat them by some 20%. When it comes to the big picture, it seems age will make little difference in how users view the Internet. In a study of consumers it was worth noting that respondents across all age groups stated that the Net would play an increasingly important role in their lives. The only time age differences will show is when users discuss what they use this medium for. The younger 18-24 may purchase Metallica through Napster, while the surfer who is 55 plus will want to purchase a miniature die-cast car for their collectibles (Roidan, 2001).

In a Media Metrix study it was found that
there were more women than men online for the first time in the Internet's history. The study surveyed 55,000 users and found that 50.4 percent of the current users are women and 49.6 percent men. Women using the Internet grew at almost 35 percent from May 1999 in contrast to the men's segment, which grew by 22 percent. It was also of interest to note that women have different motivations for using the Web. At the top of their list was convenience shopping to make their lives efficient and productive. Just as women dominate in most brick-and-mortar channels, they are quickly assuming a greater role in the virtual world. They are already 50% of online shoppers in the US, 41% in Australia, 38% in Canada, 31% in UK, 24% in France, and 15% in Italy (Ernst & Young, 2000).

In Australia, the gender gap is rapidly closing with 41% females accessing the net in the twelve months to February 2000, this compares to 46% males during the same period in time. It was only three years ago that females were a minority online. Predictions were made then that they (females) would grow at twice the rate. Three years hence the US is experiencing levels similar to Australia in regards to gender (Ernst & Young, 2000). In a study conducted in Santiago, Chile where the study samples were classified into three socioeconomic segments, where segment 1 corresponded to the upper middle class, segment 2 the average middle class, and segment 3 the lower middle class stratum, it was found that in segment 1 83.8% of Internet users were male whilst 16.1% were female users, in segment 2, 66.7% men and 33.3% women used the Internet, however in the lowest socioeconomic segment in this study, 44.4% males used the Internet while there were 55.6% female Internet users (Mendoza and Alvarez, 1997).

Studies from most industrial nations clearly indicate that the greater the personal income the more likely the individ-

ual will have access to the internet and shop online. In Australia 73% of people who access the Internet for information and to shop online earn $80,000 or more (NOIE, 2000). Gadeib (1996) in a cross national study found US and German Internet users had significantly higher income and were also better educated. Three years later the higher income was downgraded to above average socioeconomic status. A year later a study in the US found that the digital divide in the context of income was rapidly disappearing. Though households with income of US$25,000 and under make up only 10% of the Internet population, the numbers have sky rocketed by 50% over the past year (Ross, 2000).

Segmentation Approach - Tradition to Post-Modernism

In conventional studies in marketing, the common variables used for the purpose of segmenting the marketplace are: Geography, Demography, Psychographics, Socio-culture, Use-related, Use-situational, Benefit, and hybrid approaches that could include one and more of the above (Kotler, Brown, Adam, and Armstrong, 2001).

Forrester Research (quoted in Moshal 2000a) is of the view that classical models in segmentation are outdated in structuring the marketplace. Accordingly with the introduction of the Internet, marketers need to consider new paradigms and updated models in segmentation to structure the marketplace. Forrester proposes the validity of their "Technographic Segmentation Model" in determining structures of the marketplace and further in accessing online consumption behaviour.

Hence the "Technographic Model" proposes that traditional variables in segmentation like age and income could be sidelined in place of robust variables for electronic marketplaces such as the ones mentioned below.
a) Attitude determines technology use:
The "Technographic Segmentation" model stresses the issue of attitude/s towards technology and divides consumers into two camps: technology optimists and pessimists.

b) Motivators
Forrester (refer to Modhal, 2000b) made some amazing findings when they interviewed people to find out reasons for them to go online. One stated that he was a tin soldier collector and made use of the Internet to broaden his collection, another needed to learn about household chemicals that helped with his job, a third was organizing her local senior center social schedule online. They concluded that three factors acted as motivators for online users: Career, Family, and Entertainment acted as motivators for online users, and could be combined with demographic data to identify segments shown in Table 1.

Keig & Co, a marketing research organization, identified six factors that act as differentiators to enable them to create their hybrid model of online market segmentation. The six factors are: (a) Consumers' level of interest and attitude

<table>
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<tr>
<th>Table 1. Definitions of Technographics segments:</th>
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<tbody>
<tr>
<td><strong>Digital Hopefuls</strong></td>
</tr>
<tr>
<td>1) Family oriented technology lovers with low incomes</td>
</tr>
<tr>
<td>2) promising future market for low cost PCs</td>
</tr>
<tr>
<td><strong>Fast Forwards</strong></td>
</tr>
<tr>
<td>1) high income, career oriented technology adopters</td>
</tr>
<tr>
<td>2) driven careerist, time-strapped, often in dual income households</td>
</tr>
<tr>
<td>3) leading users of business and productivity software</td>
</tr>
<tr>
<td><strong>Gadget Grabbers</strong></td>
</tr>
<tr>
<td>1) lower-income consumers focused on tech-based entertainment</td>
</tr>
<tr>
<td>2) Nintendo/Sega games</td>
</tr>
<tr>
<td>3) buyers of low cost, hi-tech toys</td>
</tr>
<tr>
<td><strong>Handshakers</strong></td>
</tr>
<tr>
<td>1) successful professionals with low technology tolerance</td>
</tr>
<tr>
<td>2) dealmakers and executives</td>
</tr>
<tr>
<td><strong>Media Junkies</strong></td>
</tr>
<tr>
<td>1) high income entertainment oriented individuals - not PC-savvy</td>
</tr>
<tr>
<td>2) visual consumers</td>
</tr>
<tr>
<td>3) TV lovers</td>
</tr>
<tr>
<td>4) early adopters of satellite TV</td>
</tr>
<tr>
<td><strong>Mouse Potatoes</strong></td>
</tr>
<tr>
<td>1) high income entertainment focused technology consumers;</td>
</tr>
<tr>
<td>2) those dedicated to interactive entertainment, especially on a PC</td>
</tr>
<tr>
<td><strong>New age Nurturers</strong></td>
</tr>
<tr>
<td>1) affluent believers in technology for family and education</td>
</tr>
<tr>
<td>2) least served group of future technology consumers</td>
</tr>
<tr>
<td><strong>Sideline citizens</strong></td>
</tr>
<tr>
<td>1) low income technophobes</td>
</tr>
<tr>
<td>2) the least receptive audience for any technology</td>
</tr>
<tr>
<td>3) technology laggards</td>
</tr>
<tr>
<td><strong>Techno-strivers</strong></td>
</tr>
<tr>
<td>1) up and coming believers in technology for career advancements</td>
</tr>
<tr>
<td>2) students or young professionals</td>
</tr>
<tr>
<td>3) of low income segments, this group has the highest percentage of computer ownership</td>
</tr>
<tr>
<td><strong>Traditionalists</strong></td>
</tr>
<tr>
<td>1) high income, family minded individuals suspicious of technology</td>
</tr>
<tr>
<td>2) Midwestern and small-town (USA) with little technology beyond VCRs</td>
</tr>
</tbody>
</table>

Australasian Journal of Market Research | Volume 11, Number 2 | November 2003 | 29
to technology; (b) Relationship with home and family; (c) Time poor or time rich; (d) Extent to which they have an information or entertainment focus; (e) 'Active' or 'Passive' consumers ('seek what they want' Vs. 'take what is available'); (f) Degree of an individuals' interest in communication and being part of a community. The organisation suggests that their six factors could have been used in modeling the behaviour of individuals during the introduction of the television, the video recorder, or pay television. Based on the six factors, the organisation created the five segments in the online marketplace: Technophiles, Gatherers, Hunters, Pragmatists, and Technophobes as shown in table 2.

Conclusion:
The study of segmentation as part of consumer behaviour in an online environment is at its infancy stage. Empirical evidence is yet to demonstrate whether online shoppers can be placed in neat boxes for the purpose of segmenting them. In particular, online segmentation is interwoven around many complex issues. Although the young and adventurous were supposedly the online segment, current research suggests that the Internet shopper is likely to be the older individual with disposable money. Variables such as convenience seeking, innovation, impulse buying, and variety seeking are also considered in marketing literature as being relevant in the process of segregating and segmenting online consumers. Research in specific areas, such as travel and tourism, suggests that the Internet travel shopper is likely to be between the age of 26-55, have a higher income, and be employed in management, a professional, or in a computer related occupation.

As can be seen, variables such as demography, geography, and psychographics are relevant as bases for segmenting the online shopper/searcher.

<table>
<thead>
<tr>
<th>Table 2. Technographic online segments</th>
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<tr>
<td><strong>Technophiles</strong></td>
</tr>
<tr>
<td>1) technology end in itself</td>
</tr>
<tr>
<td>2) early adopters, technology way of</td>
</tr>
<tr>
<td>the future</td>
</tr>
<tr>
<td>3) time poor use time for technology</td>
</tr>
<tr>
<td>4) Mostly male, white collar, under 40</td>
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<tr>
<td><strong>Gatherers</strong></td>
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<tr>
<td>1) fascinated by what technology can do</td>
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<tr>
<td>2) want to stay in touch with others will</td>
</tr>
<tr>
<td>waste time in understanding new tech</td>
</tr>
<tr>
<td>3) want to be informed and entertained</td>
</tr>
<tr>
<td>4) white collar age 25-50</td>
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<tr>
<td><strong>Technophobes</strong></td>
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<tr>
<td>1) comfortable in the most familiar territory</td>
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<tr>
<td>2) think technology is taking over</td>
</tr>
<tr>
<td>3) technology is for the young, we will adopt it last</td>
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<tr>
<td>4) blue collar 45 + heavy users of traditional media</td>
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<tr>
<td><strong>Hunters</strong></td>
</tr>
<tr>
<td>1) similar to technophiles but benefit driven</td>
</tr>
<tr>
<td>2) adopt technology at work then home</td>
</tr>
<tr>
<td>3) information focused on technology/media</td>
</tr>
<tr>
<td>4) male white collar, age 25-50</td>
</tr>
<tr>
<td><strong>Pragmatists</strong></td>
</tr>
<tr>
<td>1) similar to gatherers less fascinated with technology</td>
</tr>
<tr>
<td>2) less involved need prompts to use technology</td>
</tr>
<tr>
<td>3) see benefits from a practical sense</td>
</tr>
<tr>
<td>4) focus on home and family, blue collar 40-55</td>
</tr>
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</table>
Hence new models will need to use these conventions as a launch pad for their segmentation approaches.

The implications for business managers are substantial. No longer are simple analyses of demographic or geographic profiles sufficient for identifying and segmenting a target market. The above research shows that a complex web of factors defines different categories of consumers. If marketing strategies are to be successful, especially for new marketing mediums such as the Internet, they will need to use segmentation models, such as those described above, which use a combination of demographic, geographic and psychographic information.

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Conceptualising Brand Salience using Memory Theory

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Abstract
The concept of brand salience, or brand accessibility in memory, has been prevalent in the area of brand research for several decades. Brand salience has been driven by memory theory and psychological research, but debate has continued over the structure of memory systems, the way in which consumers undertake memory search, and what they do with brand information once it is retrieved. With the rise in prominence of brand equity, brand salience has been subsumed into the awareness category, as an operationalisation of recalling information. Brand salience is important to managers as it will have an impact in determining which brands are considered for purchase by customers and which brands are purchased.

Introduction
The typical definition of brand salience is "the prominence or level of activation of a brand in memory" (Alba and Chattopadhyay, 1986). This is an operational definition of brand salience that refers to the ease of accessibility of the brand in a consumer's memory. In order to make a brand salient, a manager must make this brand one of the first recalled by consumers in a search of internal, long-term memory. This paper questions that model, addresses the issue of the role of brand salience in the model of brand equity, and discusses the need for a more representative measure of brand salience.

Definitions of brand salience
Embedded within the framework of brand equity is the concept of brand salience, which Keller (2001) defines as "aspects of the awareness of the brand e.g., how often and easily the brand is evoked under various situations and circumstances." Keller proposes a model of customer based brand equity in which brand salience is the building block to brand equity, where a salient brand possesses both depth and breadth of awareness.

An example of salience in the fast-moving-consumer goods industry would be soft drinks. When a person enters a purchase situation for soft drinks, the initial search will be of their memory and prior experiences. This search will yield numerous options. A person may be a loyal Coca-Cola drinker and so will consider this brand when purchasing. However, other brands may also be considered by the purchaser, this may be situation dependent (brands available,
location, who they are with, time of day) or due to other factors. The person will bring a group of brands, usually between four to seven, to their consideration set.

Depending on who they are with, what they intend to do with the product and a variety of other factors, including external cues, the brands the person calls to the consideration set will vary. Being a loyal Coca-Cola drinker, this may be the most prominent brand in the consideration set, but it will be screened upon entry for suitability to the situation, favourability, and uniqueness. If Coca-Cola is the first brand recalled, it may inhibit the person's ability to consider other brands. Once a brand is recalled to memory it is replaced and available for further consideration, but the act of recall has itself heightened the brand's likelihood of further recall.

Another brand of cola may be recalled at the same time as Coca-Cola, but due to prior bad experience or unfavourable associations eg the word Diet, the brand may not be placed in the consideration set, but may be rejected and not considered for further recall. This would make the brand non-salient due to the lack of positive associations. The time between salient brands will also be important, the longer it takes a person to think of a brand name the less likely it will be the brand will be chosen. For fast-moving consumer goods the choice process may take mere seconds (Dickson and Sawyer, 1986) and so it is important that a brand be the most salient, or have enough positive associations to be within the group of brands in the consideration set.

A salient brand will therefore have not only vertical associations in memory, where it is considered when a category (soft drinks) is brought to mind. A salient brand will also have horizontal associations; these are the number of occasions or activities associated with the brand that assist it being brought to mind. For example, usage situations (Coke is good at parties, for lunch, at the football), with people (Coke is good with friends), availability (I can get Coke everywhere) and people (Coke is good with friends; I can consume it in public).

Definitions of brand salience range from accessibility of the brand in memory as evidenced by recall (Posovac et al., 1997), associative strength (Fazio, 1989), recall position (Miller and Berry, 1998) or position in the consumers' consideration set (Ehrenberg, Barnard and Scrivens, 1997). A further refinement of the definition has salience viewed as prominence (Alba and Chattopadhyay, 1985; 1986).

Salience: Stimulus or memory-based?
There has also been debate about the difference between brand awareness and brand salience based on recognition versus recall (Alba and Hutchinson, 1987; Rossiter and Percy, 1987). This is related to stimulus-based (Lynch and Srull, 1982) versus memory-based evocation. Recognition is reliant on stimulus-based physical cues, whereas memory based evocation refers to top-of-mind awareness or salience (Nedungadi and Hutchinson, 1985). In further support of the memory-based nature of brand salience, Nedungadi (1990) postulated that brand salience is not only engaged by cues but situations, which themselves may act as cues to the consumer. Alba and Chattopadhyay (1985) refer to absolute awareness (brands that are known or recognizable) and situational awareness (brands recalled at a particular time). This indicates both a depth and breadth of awareness for salient brands.

Importance of Increased Salience
The advantages of having a brand with increased brand salience are:
- Increased retrieval probability of that brand in consumer choice.
Consumers use the information most salient to them when problem solving. (Domke, Shah and Wackman, 1998).
• Salient brands reduce the amount of information processing effort required on behalf of the consumer (Tversky & Kahneman, 1974). For fast-moving consumer goods consumers will attempt to reduce search effort, choosing brand which are easily accessible and which have positive associations.

• Salience will also have an effect on consumer judgement. Studies have shown consumers make judgements based on whatever information is salient to them at the point of time that the decision is made (Salancik & Conway, 1975).

• Research has shown that salient information gains disproportionate amounts of attention and is recalled in disproportionate amounts (Alba et al., 1991).

• Salient brands are more likely to be perceived on a crowded shelf (Pechmann & Stewart, 1990).

• A salient brand will be recalled more often by consumers in search of internal memory, resulting in the inhibition of recall of competing brands (Alba and Chattipadhyay, 1985).

Memory theory
Our understanding of salience can be enhanced by a broader look at developments in the field of cognitive psychology. Retrieval from memory is the first stage in the brand being considered. This is an essential step to the brand being chosen. The Associative Network Model of Semantic Memory (ANMM) proposed by Quillian (1968), and refined by Collins and Loftus (1975), deals with the traces established in memory every time information is coded into long term memory. According to the ANMM, there are two types of association that can occur with information in semantic memory, horizontal and vertical associations (Brown, 1981). Horizontal association occurs when activation generated by a cue radiates out from the presented item, along pathways to other connected items, making identification easier. Vertical associations are between items and their category and are the locus of inhibition effects. Bettman (1979) proposed that the establishment of a trace is the establishment of links in memory between the new piece of information and information already stored in memory (nodes). Links between nodes have strength, which represents the importance of the node to the meaning of the concept. The associations between nodes, as determined by the links, are by their very nature, semantic (Bettman et al. 1991). A salient brand will have both horizontal associations between brands and also vertical associations as it will inhibit recall of competing brands.

Anderson (1983) proposed the theory of spreading activation, where there is a spreading out from the activated node, which activates other, relevant nodes. Once the cued concept has been activated, the activation will spread to other concepts linked to that cue, activating links to other related nodes. Accessibility in this model is seen as the strength of the cue object's link to nodes within long-term memory. Retrieval of information from long-term memory is dependent on the strength of the associations between the activated nodes. Cues are an important factor, where depending on the type of cue used, the retrieval process may be facilitated, as in the case of single category cues (Nickerson, 1985) or inhibited, as with multiple cues (Roediger, 1974). In reality, consumers are rarely presented with a single category cue to trigger recall, but are more likely to be presented with multiple cues (brands on a shelf), thus activating multiple nodes and linkages in memory and increasing the probability of recall.

Information Retrieval
The major method of information retrieval is by sampling with replacement. Proposed by Rundus (1973), sampling with replacement states that once information has been retrieved from memory it is replaced and available for further
retrieval. Once a piece of information has been retrieved it becomes more accessible and may cause inhibition of recall of other pieces of information (Roediger, 1974). When consumers retrieve information from memory, the information retrieved depends not only on accessibility but also on relevance (Baker and Lutz, 1987) and diagnosticity (Feldman and Lynch, 1988). A salient brand will not only be relevant to the problem but assist consumers, to some extent with solving the problem for which the retrieval process was activated. Retrieval is a competitive process, where information recall depends not only on the cue but also on the strength and number of related links to the concepts to be retrieved.

**Consideration Sets**

Brand salience has been strongly correlated with brand choice (Haley and Case, 1979). Prior to making choice decisions, consumers rely on internal memory stores. The most recently recalled, and most prominent brand will be the most likely choice. Due to the limited size of the consideration set, a salient alternative will have approximately a one in seven chance of being selected in the final decision, assuming a seven brand consideration set. Brand salience influences share and equity as brands that come to mind on an unaided basis are likely in the consumers’ consideration sets and therefore have a higher probability of recall and purchase (Miller and Georgiou, 1996). A salient brand will also have greater accessibility within the consideration set, and thus have a greater chance of recall from within the consideration set, whilst at the same time reducing the amount of space available for competing brands (Alba and Chattopadhyay, 1985).

Due to the limited nature of information processing in human memory, consumers typically make their choice decisions from a small set of alternatives (Hauser and Wernerfelt, 1990) and make choice decisions rapidly despite a wide range of brands on offer (Dickson and Sawyer, 1987). Consumers undertake a trade-off between the amounts of information required opposed to the amount of time available to process the task.

The development of the consideration set is vital to the retrieval process, as the brand with the greatest awareness may not be retrieved or reside long in the consideration set due to negative association that the brand carries (Nedungadi, 1990). A salient brand will carry positive associations, enabling it to gain a prominent position in the consideration set, in the transfer of information from long-term to short-term memory (recall).

The definition of brand salience also recognises the difference between available and accessible information. All information is theoretically available from memory, but only a fraction is accessible for retrieval purposes. Retrieval of brands for consideration is an important part of the choice process, and may indeed be given more weight than the evaluation stage for low involvement goods/services as evaluation may be very brief or heuristics may be used. Consumers may employ heuristics to choose a brand that they have heard of or recall first, due to familiarity and to decrease risk and effort involved in the decision making process (Bettman et al. 1991).

Keller (2001, p4) recognises salience as the first step in the model of brand equity, indicating that a “salient brand has both depth (ease of recall) and breadth (when brand is recalled) of awareness.” Thus a salient brand must have more than mere awareness and the measure of salience must be more than just simple recall or recognition but take into account a richer set of associations, situational factors, time, recall position and cues.

Brand salience is also likely to affect different consumers to different extents. It is most effective on product novices and
other vulnerable segments of the population. Experts should tend to remember non-salient information more readily, in a detailed search of long-term memory. Novices tend to find it harder to challenge advertisers’ claims and will preferentially recall salient information, especially after delay (Alba et al., 1991).

Gardial & Biahal (1985) found that at higher levels of accessibility involvement did not affect choice processing measures. In the instance where information was highly accessible in consumers’ memory, subjects with higher involvement levels undertook less processing overall, which means that they have simplified the process more effectively. Involvement, however, did affect the number of attempts to retrieve information from memory on behalf of consumers; consumers with lower involvement levels had a lower number of unsuccessful recall attempts before search was terminated (Alba & Chattopadhyay, 1986). This finding indicates that a salient brand has a much higher chance of being recalled and chosen by consumers, as well as increasing the likelihood of a salient brand inhibiting recall of competing brands.

**Measuring Brand Salience**

The role of brand salience in the development of models of brand equity needs to be reconsidered as it is currently subsumed into the awareness construct. Awareness does not adequately capture the notion of brand salience. Salience is not only a necessary precursor to brand equity but also forms an integral part of the brand equity model, a brand with higher equity will be more salient, with more associations and stronger links between associations, allowing greater accessibility. This leads to better and richer associations and thus a more prominent recall position. Brand salience does contribute to the concept of brand equity but needs to be given more prominence and the measures and definition of brand salience need to be reconsidered to capture this.

A more comprehensive definition of brand salience would utilize developments in memory theory, such as the associative network model of memory. This would provide a seamless integration of brand salience into the model of brand equity. A stronger measure of brand salience needs to be developed. Current measures of brand salience are too limited and inadequate, measuring only brand recall, but ignoring richer information that is involved with salient brands. Current measures of brand salience do not distinguish adequately between brand salience and brand awareness, nor do they capture the breadth and depth of awareness that a salient brand possesses.

Due to the nature of brand salience and the operationalisation of memory, for a brand to be salient, consumers will recall the brand name with rich associations. When a brand name with negative associations is salient, it will be recalled to the rejected set, but will not affect the overall number of brands recalled by a consumer. When developing a measure of brand salience, developments in memory theory must be taken into account. Thus, a measure of brand salience will incorporate vertical and horizontal associations, and will take into account whether the consumer is a novice or an expert in the field, as perceived level of knowledge can affect the consumers’ ability to recall information, and exhaustiveness of search processes.

Retrieval of information from memory is a competitive process, brands are not recalled in isolation, but actively compete for places in the consumer’s consideration set. Therefore, asking consumers to assess all brands at one time is a more appropriate way to measure brand salience than asking consumers to consider brands on an individual basis, as has been traditionally done. Brand salience is also a function of recall, but
with brand salience, the importance is both in times for recall, as well as position of recall. With the limited size of the consideration set, a brand recalled early and quickly will have an advantage over all other brands. In low involvement purchases, with situational pressure, the first brand recalled by consumers may be the brand chosen, because brand salience is strongly linked to choice. Therefore, a metric measure of time of recall, as well as position of recall should be put in place in order to gain a more practical measure of brand salience.

Managers need to be cognisant of the investment required to move a brand firstly into a consumer's consideration set and then gain prominence within the consideration set. A brand that has not made the consideration set may not be recalled by consumers, discounting it from any purchase activity. Further, a brand that is more salient, with more associations than other brands within the consideration set, has a greater chance of being chosen under a larger variety of situations.

Important with the measurement of salience is the need to alter a brand's positional salience within the consumer's consideration set. Managers must be aware of the cost-benefit approach of moving a brand from a later position to a primary position within the consideration set. The investment required to move a brand from fourth position to second position may outweigh the benefits. A more rigorous manner of testing the associations and benefits of the associations must be employed, rather than the reliance on recall measures.

Having awareness of a brand is an important starting point, but just as important are the associations the brand carries for the consumer and the consumer's ability to access all of this information at a point in time. A highly salient brand may decrease the ability of a consumer to recall competing brands, thus making awareness a less effective predictor of brand choice. Understanding how consumers form associations to brands and how the brand information may be used to overcome the position of a competitor is also important.

Finally, giving consumers multiple methods of encoding information is vital in altering the salience of a brand. Showing a variety of usage situations, social settings and uses for the brand, in addition to awareness building will all contribute to a higher degree of salience, and thus give a brand a chance at entering the consumer's consideration set, but more importantly gaining prominence and robustness within the consideration set.

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