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ARE RADIO MARKETS DIRICHLET? A STUDY INTO THE NBD/DIRICHLET, ITS EMPIRICAL GENERALISATIONS AND THEIR EXTENSION TO RADIO LISTENING PATTERNS.

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ABSTRACT

The well recognised and parsimonious Dirichlet model of buyer behaviour (Goodhardt, Ehrenberg and Chatfield 1984) has summarised a number of empirical generalisations about market structures and buyer behaviour. These generalisations have been described by Sharp, Wright and Goodhardt (2002) as:

- Differences in market share can be attributed largely to differences in market penetration
- A double jeopardy pattern emerges, with smaller brands having a lower average purchase frequency, share of category requirements, and proportion of sole buyers
- A brand's customers buy from other brands more frequently
- Sole buyers tend to be very rare, and are also very light buyers
- Heavy buyers buy more brands and are very unlikely to be sole buyers
- Brands share their customers in proportion to their market share (Duplication of Purchase Law).

Of these empirical generalisations, double jeopardy, polygamous loyalty and the duplication of purchase law are amongst the better known. They have been observed across an increasing number of product categories, countries and differing market conditions. This thesis considers whether the Dirichlet and its accompanying empirical generalisations also hold true for radio markets.

Whilst Goodhardt, Ehrenberg and Collins (1975) and Barwise and Ehrenberg (1988) have considered television and its audiences there has been very little study into radio audience patterns. Perhaps this is because many researchers consider radio to be more

like television than any other media. However, Lees (2003, 2006) has started to address the issues of radio market structures and radio audience patterns.

This thesis adopts an empirical generalist approach showing the Dirichlet model of consumer behaviour and its associated empirical generalizations appear to apply to radio markets in that they:

- Show a high correlation between market share and the brand performance measures of: cumulative audience, average time spent listening, share of category requirements and exclusive audience

- Reflect the double jeopardy pattern with those stations that have a higher market share also having a higher penetration or cumulative audience and a higher average weekly time spent listening. Conversely those stations with a low market share having a lower cumulative audience and a lower average weekly time spent listening

- Show audience duplication between radio stations that varies according to each stations' market cumulative audience, in accordance with the Duplication of Purchase Law

- Have the percentage of listeners loyal to one radio station reflecting the Dirichlet's expectation of low exclusive audience. These exclusive listeners also reflect a double jeopardy pattern with the bigger stations having more exclusive listeners than the smaller stations.

The most compelling result of this thesis is the apparent ability of the Dirichlet to describe a radio market place. Thus has managerial implications – especially to what extent a manager should take the patterns as 'normal' or seek to 'buck the trend'. The conclusion is that radio station managers need to carefully manage their station working with the market rather than trying to 'buck the trend'. This is likely to involve station managers actively promoting their stations to ensure that their station

remains salient to its current listeners while also trying to increase its awareness amongst non listeners.

This thesis has also made several contributions to knowledge about the Dirichlet. First, it has extended knowledge about the model to a new area – that of radio listening. Second, it has shown that while some radio listening seemingly violates some of the assumptions behind the model it is still robust enough to account for variations in multivariate count data in a manner that is parsimonious. Third, it has confirmed the known boundary condition that the Dirichlet does under-predict sole loyal purchase frequency.

This thesis also calls for further research into both the Dirichlet model with further extensions to differentiated product categories; and into the question of radio audience measurement. It calls for the New Zealand Radio Broadcasters Association to commission a report into the effect of introducing portable people meters as a form of audience measurement.

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1.1 BACKGROUND

Ever since the advent of grainy black and white television, pundits have been predicting the demise of radio. Yet, some 50 years later, radio still plays an important role in the daily lives of thousands of New Zealanders. In fact, it could be argued that, in terms of competition, New Zealand radio has grown at a greater rate than almost all other media except the internet (Neill and Shanahan 2005). Today the New Zealand radio market is regarded as one of the most competitive in the world (Neill and Shanahan 2005) with an average of one radio station for every 5,250 listeners, compared with Sydney's ratio of 1: 250,000 or London's 1:350,000.

Not only does New Zealand have more radio stations per head of population than most of the western world, the advertising dollars invested in radio are also relatively high. For the year ending December 2006, the New Zealand Advertising Standards Authority estimated that 269 million dollars had been spent on radio advertising during the previous 12 months. This expenditure was estimated to be 12.1% of the total advertising spent on all mainstream media during that time period; a figure that The Radio Bureau (TRB) claims is one of the highest within the developed world. In fact, during 2006, according to the Advertising Standards Authority, radio was the only mainstream media to increase its revenue – both television and newspapers showed a declining turnover compared with 2005 and in television's case with 2004 as well.

This revenue stream is reflective of the relationship that New Zealanders have with radio. Research International, New Zealand's official radio research organisation, estimates that, in spite of increasing demands on our time and an ever increasing number of media choices, 93% of all New Zealanders aged 10 years and over will

tune into a radio station over the course of each and every week. This reach is a sign of radio's unique position within the mainstream media, partly because it uses sound alone, but also because of the way people consume it. Radio is a lateral or auxiliary medium – people listen to it while they are doing something else – cooking breakfast, driving a car, at work or at play. Whilst radio has a strong weekly reach it also is a daily habit as well. Research International reports that over 72% of all people aged 10 years and over listen to a radio station at least once a day, every day of the week.

Research by New Zealand's Radio Bureau (2006) and the United Kingdom's Radio Advertising Bureau (1999) showed listeners have a subtle type of involvement or relationship with their radio station. In the United Kingdom study 43% of listeners agreed with the statement that "*I find myself talking back to the people on the radio*". Mostly this talking is private, or even mental, and goes unheard, but equally radio draws plenty of physical participation from the listeners – phone-ins, dedications, competitions, promotions, and help lines. The reasons for this high level of involvement and interactivity are complex. One of the key reasons is the relationship of trust between station and listener – the listeners feel the station is a benign power, and they won't be humiliated or ripped off, so getting involved is low-risk (The Radio Bureau 2006). Another important reason is that radio is primarily about music and talk, both of which are very personal, emotional areas – we have an instinctive reaction to music (positively or otherwise) and we instinctively tend to react to things which are said to us personally (The Radio Bureau 2006). Listeners use radio for emotional reasons – to keep their spirits up, to stop themselves from feeling bored in a car or isolated while doing daily chores. This leads to them seeing radio as a kind of friend (The Radio Bureau 2006).

This relationship with the radio is reinforced by Research International which reports the average listener spends an around 19:55 hours per week listening to the radio. Of those 19:55 hours 2:45 hours are spent each weekday and 5 hours each weekend. Not only do we listen to the radio on a regular basis and for long periods of time but we can listen to an ever increasing number of stations. In New Zealand the number of stations broadcasting has increased from 91 in 1984 to 793 in 2004 (Ministry of Economic Development 2004). Of those 793 stations 332 are commercial FM stations, 116 are commercial AM stations, and 345 are either non-commercial or

semi-commercial. Research International also reports that over half of all households in New Zealand have over 5 radio receivers and that 95% of New Zealand cars have a radio – increasing both the time and opportunity one can spend with the medium. The Radio Bureau (2006) reports that between 6 am and 6 pm more people use radio than any other medium – to the extent that 44% of the average New Zealander's media time is spent with radio. Radio has the highest share of category requirement of any media in New Zealand.

Yet, in spite of all the on going radio research, including the annual and biannual radio listening surveys, radio station managers and programmers appear to have little understanding of the structure of the radio market they work in. This is reflected in the differing networks having rebrandings and realignments designed to increase the differentiation of a station or a 'networks' profile, and consequently their audience. For example, over the last three years New Zealand has seen five networks rebranded in an attempt to differentiate them from their competitors and to improve their ratings. One network, 'Radio *I*' has, since 2002, changed its name three times - first to 'Easy *I*', then to 'Viva', and in 2007 to 'Easy Mix'. Each rebranding has been driven by poor ratings and an attempt to increase its audience share – so far without success. In a similar vein Channel Z was renamed as Kiwi FM. However, with an audience share of just 0.6% and 0.7% in two Auckland surveys, its owners CanWest Media indicated that the station would close. As part of their policy ensuring New Zealand music is played, the government granted the network access to three new FM frequencies so that it could continue operating (Maharey 2006).

In undertaking their expansion and differentiation strategies the networks are trying to promote each station as attracting an audience unique from their competitors (Tankel and Wenmouth 1998; and Keith 2004). However, in implementing those strategies the radio networks do not appear to understand listening behaviour and its impact on the structure of the radio market. The proliferation of stations has resulted in increased listener fragmentation and smaller audiences. They have not met the desired objective of increased loyalty and an increased exclusive audience. Stations are not attracting an audience unique to their station. In fact, on average less than half of a networks' audience comes from their target audience (Nelson-Field, Lees, Riebe and Sharp 2005, 2007).

New Zealand radio is regularly researched with annual or biannual radio surveys in all major marketplaces providing data for the sale of radio advertising time through the development of reach and frequency media schedules. Each network also has an ongoing programme of research into their differing formats. This research is designed to test primarily whether the format, be that talk or music, and the announcers are 'liked' by the desired target audience (Gerald Duignan, Former Deputy Head of Programming, Radio New Zealand, personal correspondence August 2007). However, there is no research that reflects the market structure and looks specifically at listener loyalty and switching between stations.

This is in contrast to the not inconsiderable research that has been undertaken over many years into consumer behaviour within fast moving consumer goods markets, industrial markets as well as repertoire and subscription markets. This consumer behaviour research has revealed (see Ehrenberg 1972, 1988) a number of market regularities, empirical generalisations and models designed to enable marketers to describe their market place and benchmark or audit their marketing activities.

Therefore, this study and its associated research focuses on the structure of the New Zealand radio market, and in particular the Manawatu radio market, investigating whether the market regularities that have been seen in both fast moving consumer goods and industrial markets may also apply to radio listening. The research also examines whether radio listening behaviour can be modelled using stochastic models of consumer behaviour. If so, then stochastic models and their associated generalisations can provide benchmarks against which radio network managers can measure their differentiation and expansion strategies.

1.2 OBJECTIVES

This research's overall aim is to apply the NBD/Dirichlet model (see, Goodhardt, Ehrenberg and Chatfield 1984) to the New Zealand radio market and explore the extent to which it can be used to predict its market behaviour. Whilst that aim was

central to the research it was divided into several research propositions that reflect the market regularities that underpin the Dirichlet. These are:

- That while radio stations' cumulative audiences differ greatly, they will differ in line with each station's market share.
- That each station's average time spent listening will be similar, but with a small double jeopardy trend.
- That each station will have a low share of category requirement in that its listeners will listen to other stations more often than they listen to it.
- That each station will have a small exclusive audience, and that those listeners will be light radio consumers.
- That the number of listeners who also listen to another station will mostly be in line with the other station's cumulative audience.
- That the Dirichlet model of consumer behaviour can be used to describe radio listening patterns.

Overall the aim and its objectives are, in taking an empirical generalist approach, to help advance the marketing management literature on issues subsumed by the NBD/Dirichlet within the context of radio listening. In so doing this thesis not only fits within the theoretical program looking at the development of empirical generalisations it also has a practical application that could assist radio station managers in their marketing decisions, and with resource allocation designed to either enhance or hold their radio audiences. For example, how loyal are one's listeners and should investment be allocated to increasing a station's exclusive audience or in attracting new listeners? How does a station compare with its competitors? What does the effect of increasing a station's cumulative audience have on its 'share of listening' and 'average time spent listening'? What are the implications for an extension of an existing radio network into a new market? These are the types of questions befitting a thesis with both academic and applied objectives.

1.3 OUTLINE OF THE THESIS

The preceding sections introduced the overall aim of and set objectives for this thesis. The thesis next reviews the academic literature relevant to empirical generalisations and stochastic models, the Dirichlet tradition and the New Zealand radio market. This is followed by an examination of methodological issues and a description of the research methods used for the data collection. The research results are then analysed and finally the implications of these results are drawn in the discussion and conclusions.

Chapter Two places the research within Ehrenberg's (1993) "Empirical then Theoretical" (EtT) approach considering empirical generalisations and the Empirical Generalisationist School before looking at stochastic modelling of consumer behaviour. Lastly, the chapter briefly introduce the NBD Dirichlet model.

Chapter Three discusses the NBD Dirichlet tradition and the empirical regularities that underpin the model. It then considers the stochastic assumptions behind the model, the various specifications, and the performance or 'fit' of the Dirichlet. Finally the chapter looks at the implications for radio markets. The primary aim of this chapter is to demonstrate the suitability of the approach rather than derive the formulae for operationalising the model.

Chapter Four looks at radio audience measurement. It considers the special nature of radio audiences and the problems presented in terms of measuring those audiences. Consideration is given to a range of methods and techniques used to measure audience size and composition before looking at the evidence of how these techniques compare in practice. The chapter discusses radio research in New Zealand and why the diary method was used in this research. Next the chapter provides an overview of the New Zealand radio industry. Following the overview this chapter looks at recent research into radio listening including a discussion on why people listen to the radio, listener loyalty and switching behaviour, and double jeopardy and radio listening. The chapter concludes with a statement of this research's objectives and associated propositions.

Chapter Five describes how the study was conducted (research instrument, procedure and sample). It discusses the pilot study before looking at the main study's methodology. It also covers the reasons why the Manawatu marketplace was chosen as the geographical area in which to undertake the research. The limitations of the research design and the reliability of the instruments used are also discussed in preparation for the data analysis.

Chapter Six presents the research's findings. It defines the terms used within the radio industry before considering the summary statistics from the data. Each of the market regularities is examined along with its implication and whether they apply to radio listening. The chapter then discusses the Dirichlet model and its predictions. The 'fit' of the model is covered along with the deviations and possible reasons for those deviations.

Chapter Seven brings together the key findings and discusses their implications for managing a radio station's audience. Concluding remarks examine future research and suggest developments for radio research in New Zealand.

1.4 SUMMARY

This thesis examines the NBD Dirichlet model and its ability to describe the structure of a market place within the context of radio listening. Thus it also investigates the extent to which the market regularities underpinning the model apply to radio listening in New Zealand and in particular the Manawatu marketplace.

The traditional diary methodology is used to gather the primary data for the study – first through a pilot study and then on to a major quantitative study. The results are analysed and the 'fit' of the Dirichlet tested. The findings are discussed in terms of their contribution to the academic marketing literature along with their implications for radio station managers. Several key conclusions are drawn, limitations are noted and further research directions discussed.

2 EMPIRICAL GENERALISATIONS AND THE NBD DIRICHLET MODEL OF CONSUMER BEHAVIOUR

2.1 INTRODUCTION

It has been argued (Uncles, Ehrenberg and Hammond, 1995) that the Dirichlet model of consumer behaviour may be the best-known example of an empirical generalisation in marketing. This chapter first considers what empirical generalisations are and how they are developed locating the research within the 'Marketing Science' research tradition. As such it forms part of a larger research programme within that research tradition utilising Ehrenberg's (1993) approach of 'Empirical then Theoretical' (EtT) within a new area (radio listening behaviour) in order to extend marketing knowledge. It then considers a range of stochastic models before introducing the NBD Dirichlet model. The research will add to an understanding of marketing in general, the importance of developing empirical generalisations, and the applicability of the Dirichlet model to radio listening behaviour in particular. It also makes a further contribution in its own right through the new knowledge it derives from this extension.

Thus, it aims to further develop the approach of describing and understanding consumer behaviour established by Ehrenberg (1959, 1972, and 1988) where a strong case can be made for research which is stochastic, heterogeneous, zero-order based, descriptive, data driven, provides new knowledge, and has managerial significance. Such research is developed from the observations and analyses of multiple sets of data and is primarily found within the Empirical Generalisationists School.

2.2 EMPIRICAL GENERALISATIONS

Many researchers (Leone and Schultz 1980; Hubbard and Armstrong 1994; Bass 1995; Barwise 1995; and Ehrenberg 1995) have claimed that the on going development of sound empirical generalisations is an important marketing research objective. This follows on from the argument presented by Nagel (1961, as cited by Bass 1995) who wrote that "science seeks to provide generalized explanatory statements about disparate types of phenomena and to provide critical tests for the relevance of the attempted explanations" (G11). Bass (1995) suggested that 'empirical generalizations' could be substituted for 'phenomena' in Nagel's definition. This substitution would mean that science would according to Bass "…then, consist of (1) empirical generalizations and (2) generalized explanations of the empirical generalizations" (p. G11).

An empirical generalisation can be defined (Bass 1995) as "…a pattern or regularity that repeats over different circumstances and that can be described simply by mathematical, graphic or symbolic methods. A pattern that repeats but need not be universal over all circumstances" (p. G11). The key to this definition is a pattern that repeats itself over different circumstances or, as Ehrenberg (1995) says, over many sets of data. An example of such an empirical generalisation is the relationship between respondents' brand 'attitudes' and beliefs as provided by Ehrenberg (1995) where he cites Dall'Olmo Riley, Ehrenberg, Barnard, Barwise, and Castleberry (1995) and an exploratory study of attitudinal repeat rates. The empirical generalisation, derived from the exploratory study, (see Dall'Olmo Riley, Ehrenberg, Castleberry, Barwise, and Barnard 1997) states that the stability of a perceptual response (known as the repeat rate RR) is predictable, based on the initial proportion of respondents giving the response at the first interview (known as the response level RL). The empirical generalisation can be described as: $RR \approx RL + 20$. For example, if 50 percent of respondents associate a radio station as playing 'easy listening music' then, under this generalisation, we would expect 70% of these respondents to state the same association in a follow up survey.

However, Bass (1995) said the pattern need not be universal over all circumstances. So, when an empirical regularity has been observed to hold across multiple data sets, and the boundary conditions of that regularity have been established (i.e. where the regularity does not hold), then a low level empirical generalisation has been established (Ehrenberg 1968). When the range of conditions under which the empirical generalisation holds increases - and the boundary conditions decrease - the empirical generalisation evolves into a law-like relationship of science (Ehrenberg 1994; Bound and Ehrenberg 1998). The establishment of such law-like relationships between variables provide context and meaning for data and it is these observable facts which are the 'building blocks of science' (Bass, 1995).

As mentioned, empirical generalisations are not hypothetical statements, but rather observed patterns which are evident across multiple sets of data and multiple studies. However, within the 'Marketing Science' tradition, it appears data analysis tends to be done in an ad-hoc manner on 'novel' theoretical speculation with little attention given to observing regularities and patterns and then describing them. Hubbard & Brodie (1992) describe this as a tradition of developing 'uncorroborated single shot studies whose virtually unchallenged findings are subsequently dismissed as well-established knowledge'. The lack of research into developing empirical generalisations has not gone unnoticed. A great deal of criticism has been given to the state of marketing knowledge, and suggestions have been made for improved methodological practice (e.g. Armstrong and Hubbard 1991; Armstrong and Schultz 1993; Ehrenberg and Bound 1993; Hubbard and Armstrong 1994; Barwise 1995; Bass 1995; Ehrenberg 1995; Armstrong, Brodie and Parsons 2001; Uncles and Wright 2004).

Despite the lack of replication in mainstream marketing, there have been significant contributions made to building descriptive findings in buyer behaviour using the alternative empirical generalisation approach (e.g. Goodhardt 1966; Ehrenberg 1966; Ehrenberg 1969; Goodhardt and Ehrenberg 1969; Weilbacher 1987; Lilien et al. 1992; Foxall and Goldsmith 1994; Hamilton, East, and Kalafatis 1997; Beal, Barwise and Collins 2004). These contributions have established predictable patterns in areas ranging from brand image data to television channel distributions and have brought together researchers with a philosophy of generating marketing knowledge.

Within the mainstream marketing research tradition this growing number of researchers is adopting what they call the 'new empiricist' approach (Sharp and Wright 1999). This group call themselves 'Empirical Generalisationists' because they place a strong emphasis on building non-cognitivist empirical generalisations about marketing and buyer behaviour.

Empirical Generalisationists appear to share common goals, methods and views about how scientific knowledge can best be developed. For example, when applying modelling techniques to their results underlying patterns in the data are first considered before those patterns are modelled to see if they can be generalised across different conditions. Instead of generating new theories by inspiration and focusing on a typically 'data first' approach, the more traditional 'Theoretical-Empirical' approach, (Barwise 1995), the Empirical Generalist school relies on successfully testing predictions, replicating these tests, and extending them to a variety of different conditions (Wright and Kearns 1998). This means researchers need access to data and often many sets of data – a problem that Rossiter (2001) claims can limit the approach taken by the Empirical Generalist School.

2.2.1 Many Sets of Data

When it comes to successfully testing predictions in 'Marketing Science', data interpretation is often discussed in relation to two main approaches. The first (or traditional) approach always treats data as new and invariably requires the creation of a new model to fit and explain particular data (Bound and Ehrenberg 1998). The inherent problem with this approach is there is no evidence to suggest these models and theories will hold against another data set, and therefore few generalisations can be made. Without generalisable results, it is almost impossible to make comparisons across studies (brand performance measures can not be determined) as well as over time (comparisons between studies conducted in different years can not be made). Conversely, the second approach, used by the Empirical Generalisationists, uses the application of prior knowledge in a particular area to determine whether known patterns fit both old and new data (Bound and Ehrenberg 1998). Prior knowledge is the knowledge of findings that have been empirically validated over a wide range of conditions and then brought together as an intuitive or formal model (Ehrenberg

2000). This effectively means that comparisons can be made between many sets of data (MSOD) by testing already known patterns. Traditional methods of research usually begin with the proposal of a theory and then rely solely on testing this, more often than not, against single sets of data (SSOD). The ability to make comparisons between many sets of data to see if they follow expected patterns or differ from the norm is a major advantage in using prior knowledge.

It is because of the use of prior knowledge that there are now many areas in consumer research where predictable patterns or law-like relationships can be found between variables (Goodhardt, Ehrenberg and Collins 1987; Uncles, Hammond, Ehrenberg, and Davies 1994; Ehrenberg 1995; Kennedy and Ehrenberg 2001; Sharp, Wright and Goodhardt 2002). Prior knowledge provides academics and practitioners with useable information on what patterns to expect in the data before it is even analysed. By providing this background information (i.e. benchmarks and expected patterns) researchers are able to give context and meaning to results. This is of particular importance when extending research into new areas such as radio listening behaviour where little systematic analysis has been undertaken.

2.2.2 Replication and Extension

A major philosophical problem in the social sciences, particularly concerning marketing knowledge, is the lack of academic research 'devoted to replicating and extending existing results, and determining the conditions under which existing theories do, *and do not*, hold' (Wright and Kearns 1998; Uncles and Wright 2004). A replication study aims to repeat the findings that were observed in a previous study or studies (Leone and Schultz 1980). Replication and extension make important contributions to social science, and testing the generalisability of an empirical pattern through replication is an integral part of developing marketing knowledge.

The purpose of a replication study is to determine the generalisability of findings when extended to different circumstances (Smith 1970). In doing so, boundary conditions can be identified that determine where theory has systematically failed and provide direction for future research and theoretical improvements (Wright and Kearns 1998). A key element to advancements in replication research is through

extension whereby the range of conditions under which the findings hold is determined and any exceptions are highlighted (Lindsay and Ehrenberg 1993). Thus, this thesis is devoted to replicating and extending existing empirical generalisations to radio listening - a market in which they have not previously been applied. In doing so it will further add to our knowledge about empirical generalisations. This research will also examine whether boundary conditions exist within those empirical generalisations. In doing so its starting point will be what is called 'significant sameness'.

The search for 'significant sameness' (Ehrenberg 1975) through the analysis of MSOD is what forms the basis for an empirical generalisation. Significant sameness looks for a common pattern that has already been empirically established in studying previous data sets. This then provides the prior model or norm against which any new sets of data can be compared (Bound and Ehrenberg 1989). Establishing an empirical generalisation does not rely on strict replication, but rather looking for 'significant sameness' across many sets of data (MSOD) preferably over a range of conditions to establish the empirical generalisation's scope (Barwise 1995). 'Significant sameness' occurs where there is some degree of generalisability between two sets of data or findings. This approach avoids isolated and uncertain findings (Lindsay and Ehrenberg 1993), and protects the literature from the uncritical acceptance and dissemination of erroneous and questionable results (Hubbard and Armstrong 1994). In doing so it supports Stern and Ehrenberg's (1997) claim that something which has held just once has hardly held at all. Therefore, a finding needs to be seen under repeated observations and/or circumstances before it can be said to be generalisable. But generalisable results depend on actively looking for them (Lindsay and Ehrenberg 1993). In actively searching for generalisable results we also find boundary conditions and as Uncles and Wright (2004) state "a good EG is one where… 'boundary conditions' are known… as the ability to articulate boundary conditions is a sign of maturity of an EG, *as* well as offering protection against vagueness and overstatement" (p 8).

A successful replication promotes confidence in the reliability of results, and as Hubbard and Armstrong (1994) suggest it strengthens the need to study whether the findings can be further generalised to different populations and product categories. A

close replication is most appropriate when the replicated research has had few, if any, other instances of replication (Hubbard and Armstrong 1994). The close replication - at the very least - increases confidence in the reliability of the original findings (Wright and Kearns 1998). The essence of any replication or extension research is the application of prior knowledge.

2.2.3 Prior Knowledge and Its Importance

Generating knowledge through combining empirical data with theory (as opposed to the use of theory in isolation) is an approach argued to achieve more for research in marketing and the generation of meaningful knowledge (Ehrenberg 1993). Developments testing theories using MSOD are taking place in marketing because they generate results which are easy to comprehend and implement. There also appears to be growing support for the idea that an important aim of academic research in marketing should be the development of empirical generalisations (Barwise 1995).

Wright and Kearns (1998) claimed that progress in marketing knowledge is achieved by:

> "…developing falsifiable theories, overcoming uncertainty through replication, attempting to extend our theories to new situations, and by identifying areas in which the theory or technique systematically fails. These failures are the primary means of identifying areas where existing theories eventually need to be modified, improved, or replaced" (P 5).

Developing 'falsifiable theories', and then proving that something is incorrect is a vital step in forming empirical generalisations. It is important to note that when developing such falsifiable theories, they are not done in isolation - rather other observations are incorporated into the theory. By undertaking a number of tests of the theory more confidence can be given to results. Also, replication and extension studies help to identify limitations that, after modification in response to the boundary conditions identified, further refine and enhance the theory. Therefore, the Empirical Generalisationist approach is much more in line with the research approach adopted by scientists in the natural sciences, such as physics and chemistry (Wright and

Kearns 1998). That is a greater emphasis is placed on knowledge that can be generalised across time and varying conditions (Ehrenberg 1966). The establishment of empirical generalisations in the social sciences holds particular relevance in the field of marketing where it appears intuition and "gut-reactions" prevail over research and analysis.

Therefore, this thesis hinges upon the use of 'formal prior knowledge' Ehrenberg (1975). The idea of collecting new data as well as analysing past data - and combining this with the use of previous knowledge - shapes the design of the research methodology. Well-grounded descriptive models (i.e. knowledge based on empirical generalisations) provide both managers and academics with benchmarks to interpret and to help in assessing the impact of marketing decisions on their brand's performance. Without them, it seems difficult to make sense of the vast volumes of marketplace data that are available today (Ehrenberg 2000). The extension of descriptive models advances theory and this thesis, in particular, advances our knowledge of empirical generalisations and their boundary conditions. A fuller discussion of the Dirichlet's boundary conditions can be found in Section 3.7.

2.2.4 Summary

This section has focussed on the importance of empirical generalisations, and how they are thought to be the basis for successful, predictive marketing knowledge. It detailed the necessity of replication and extension studies to increase the robustness and test the generalisability of a marketing law. It has highlighted the importance of a 'many sets of data' (MSOD) approach and confirmed that the search for 'significant sameness' across different countries, product categories and time, is critical for progressing marketing knowledge. In doing so it also shows the strength of empirical generalisations as 'a priori' knowledge. The research now briefly looks, from the empirical generalist perspective, at consumer behaviour modelling in general before considering a range of stochastic models. Lastly it specifically investigates what Uncles et al (1995) claim to be the best-known example of an empirical generalisation in marketing – the NBD Dirichlet model of consumer behaviour and searches for boundary conditions advancing our theoretical knowledge about the model.

2.3 CONSUMER BEHAVIOUR MODELS

2.3.1 Cognitive Tradition

In introducing cognitive models it is important to first consider the cognitive tradition. This tradition is an alternative to the stochastic tradition and in discussing it examples have been provided for illustrative purposes and not to determine the success or otherwise of that very important tradition.

The most widely recognised consumer behaviour models are Howard and Sheth (H&S) (1969) and Engel, Blackwell and Kollat (EBK) (1978). However, those consumer behaviour models cannot be described as simple, and they are difficult to verify. In fact when empirically testing the Howard and Sheth model, Farley, and Ring (1974) concluded that the estimates produced by the many varied market variables were:

> "…disappointing because there is only one statistically significant relationship between the four variables involved" and "the significance of the coefficient is somewhat surprising, since there is very little variability in the (price) series – in fact, just barely enough to permit its inclusion in the analysis." (p. 149).

It is possible that such models may actually lead to conclusions that are inconsistent with actual consumer behaviour. This claim is supported by Engel et al. (1978) when applying their model to detergent purchases concluding that:

> "It becomes difficult under this type of decision making based on strong brand loyalty to induce a brand switch through marketing efforts" (p. 38).

Engel et al. (1978) use the 'fact' that brand loyalty exists in a market to support their model. However, Ehrenberg (1972), Jeuland, Bass and Wright (1980), Uncles, et al. (1995), Bhattacharya (1997), Sharp and Sharp (1997), along with many other

researchers, all show through numerous studies of fast moving consumer goods that 100% brand loyalty to be the exception for the vast majority of consumers.

With the apparent difficulty in the utility of deterministic cognitive models, additional encouragement was given to the study of alternative models that would provide a more realistic description of consumer behaviour. The most successful area of additional study has been into the stochastic modelling of observed behaviour.

2.3.2 Stochastic Modelling

Most of the stochastic modelling in the sixties and early seventies was designed to understand how consumers behaved. The main objective was to determine whether consumers followed a Bernoulli, Markov or linear learning model. It was generally believed that if the answer to that question was known, marketing managers could then design better marketing strategies because they could more accurately estimate the buyer behaviour of each strategy. There are four main models of stochastic choice: Markov, Hendry, the Theory of Stochastic Preference, and the Dirichlet.

Markov Model

The simplest form of stochastic modelling is probably the Markov brand switching model (see Kotler 1971). The first order Markov model is an example of an *a priori* approach to brand choice. It specifies that the probability of switching between different brands depends on each specific brand, that is the probability of switching from brand A to brand B is *x*, from brand A to brand C *y*, from brand B to brand C *z*, and the repeat buying of brand A is *a*, from brand B is *b* and brand C is *c*. The Markov model also assumes that the switching probabilities (P_{ab}, P_{ac}, P_{bc}) remain the same over time. Ehrenberg (1988) summed up the essential Markovian assumption as the values of P_{ab}, P_{ac}, P_{bc} and so on, will remain the same over time, even when market shares, or the probabilities of consumers purchasing a brand in each time period, change with time.

Givon (1984) proposed a modification to the simple first order Markov model by considering the effect of only the most recent purchase on the choice of the current

purchase. It was assumed that the probability of switching to one brand from another brand is based both upon the preference for the brand being switched to, and for the preference for variety seeking. That is, the probability of switching to a brand does not depend on the brand switched from. Following on from Givon's research, Lattin and McAlister (1985) changed the analysis from a brand to an attribute level. They proposed a first order Markov model of variety seeking that accounts for similarity of products in terms of their attributes. In doing so they assumed that the probability of choosing a product is proportional to the value of its want-satisfying attributes. The Lattin and McAlister model considers the impact of a recent choice on the probability of the next choice of any particular product. It was through the analysis of the choice history of individual variety seekers that they identified those products that share many of the same want-satisfying attributes and products that have different value attributes. This model, like Givon's, assumed that the probability that an individual chooses a particular brand on a particular consumption occasion is proportional to the individual's current preference for that brand relative to other brands.

One of the underlying assumptions of both the Givon, and Lattin and McAlister models is that describing consumer behaviour and brand switching at the macro level first requires the micro level behaviour of consumers to first be understood. According to Bass:

> "Clearly, this is false. Since there are severe limits to our ability to understand individual behaviour, micro level models and theories are of very limited value in the construction of macro models. Macro models, on the other hand, are far more useful for managerial purposes of selecting values of decision variables and otherwise determining short-run strategy than micro models, since the variables dealt with …are precisely the variables of managerial relevance. Furthermore, it is far easier to understand macro level behaviour of consumers than micro level behaviour, since the randomness which characterises individual behaviour tends to be washed out by aggregation" (1974, p.19).

Vilcassim and Jain (1991) used a continuous-time semi-Markov approach to analyse in a single framework the purchase-timing and brand-switching decisions of

households for a frequently purchased product. They claim to have found that the probability distribution of inter-purchase times is not the same for various switching between brands. They claimed that although marketing mix and household demographic variables explained a large part of the variation in brand switching rates, they accounted for only a small part of the variation in the repeat purchase rates. The rates of switching between brands appeared to be due to promotional activities, such as special displays and price reductions, and were in reverse order to the share of purchases of the various brands, displaying a double jeopardy effect.

Ehrenberg (1965, 1988) and Vilcassim and Jain (1991) described the key limitations of the Markov approach. First the model assumes that consumers are homogeneous in their repeat buying and brand switching behaviour. However, the evidence shows that consumers differ in their repeat buying and switching behaviour. Second, the model assumes that the repeat buying of a brand and propensity to switch to another brand are independent of a brand's market share. Again the empirical evidence (Ehrenberg 1988) contradicts the model's assumptions with market share being a key determinant of both repeat purchase and brand switching. The model is also based on the analysis of an individual consumer's purchasing pattern within a product category. Since individual consumers buy at different rates, and have different inter-purchase time periods, their purchasing patterns will never be in a single phase. Therefore, it is impractical to aggregate the individual results to enable a comparison to be made of brand performance within a product category. Consequently, the Markov model is somewhat limiting when trying to examine consumer behaviour in markets characterised by brand competition.

Given the limitations of the Markov model as a stochastic model, this thesis now briefly considers the work of Bass (Theory of Stochastic Preference), the Hendry System and Ehrenberg (NBD Dirichlet) to illustrate some of the key ideas in stochastic preference. The main difference in these approaches to stochastic modelling are that both Bass and the Hendry System have assumed entropy or disorder as a basis for their approach - while Ehrenberg has studied purchase incidence and uses a negative binomial model

The Theory of Stochastic Preference

The Theory of Stochastic Preference (Bass 1974) is based on a modified framework of market segments or groups, and the probability of a brand being selected is derived from the brand's market share on the basis of explicit behavioural premises. The model is sufficiently general that it can be applied to a wide range of behaviours and over a wide range of conditions. The basic premise accounts for behaviours that may be caused by such random activities as stock-outs, mothers-in-law visiting or acts of nature, so that overall, the huge number of variables that can cause a particular behaviour will occur unpredictably, and over time will balance themselves out, so that the behaviours, in the aggregate, are in effect stochastic.

In testing the theory of stochastic preference, Bass (1974) conducted an experiment whereby 264 subjects were required to select a 12-ounce can of soft drink four days a week for up to three weeks, from among a range of nominated brands. The attitudes and preferences of the subjects were influenced throughout the experiment. There were six time periods when all the nominated brands were available for selection. It was from these time periods that the market shares for the brands were derived. However, even though the market shares remained relatively constant over the time periods, it was not the same people choosing the same brand each time, as there was a substantial degree of brand switching with more than half the market switching brands during each time period. Bass concluded that, since the experiment reflected frequently purchased consumer goods with relatively stable market shares and substantial brand switching, the choice process being made had to be stochastic.

In his conclusion Bass said:

> "The overwhelming weight of the empirical evidence from empirical studies of individual consumer choice behaviour supports the conclusion that this behaviour is substantially stochastic. The Theory of Stochastic Preference implies that deterministic prediction of individual behaviour would achieve very limited success. Therefore, the ideas presented here reconcile poor predictions of individual consumer choice, which have been the universal result of empirical studies. The fact that choice behaviour of individual

consumers is substantially stochastic does not mean it is fruitless to study this behaviour. It is useful to attempt to determine the major influences which determine the structure of stochastic preference" (1974, p. 18).

Hendry System

The Hendry System has been developed by the Hendry Corporation during the 1970's, in order to analyse consumer behaviour and then suggest appropriate marketing strategies in the various circumstances. It is from the study of market structures and market partitioning that a brand-switching constant (k) can be calculated, which is then used to model consumer behaviour. For a fuller discussion on the Hendry System see Bass et al. (1976), Kalawani and Morrison (1977), Rubinson, Vanhonacker and Bass (1980), and Wright and Riebe (2003, 2007),

The system is based on a zero-order effect assumption, which claims that each consumer (j) has the probability (p) of buying brand A. Thus each consumer, on each purchase occasion, chooses among a select number of brands on the basis of a constant probability vector. However, because each consumer is not assumed to have the same purchase probability of buying each brand, the system assumes a heterogeneous population of zero order consumers.

It is on the basis of the consumer market being divided into these mutually exclusive and exhaustive partitions that a brand-switching constant can be developed. This brand switching constant is based on the zero-order assumption and that switching is proportional to market share. In other words, the Hendry System is based on the assumption that switching is in fact stochastic.

Kalawani and Morrison (1977) sum up the Hendry System with a final comment, "We believe that the Hendry (and other similar approaches) are nothing more than parsimonious descriptions of consumer brand switching behaviour, albeit very useful and insightful descriptions" (P. 477).

The last of the three main models of stochastic behaviour this thesis considers is the NBD Dirichlet.

The NBD Dirichlet

The NBD Dirichlet (or Dirichlet for short) model describes how consumer products are purchased in a stationary and unsegmented market. The model, according to Ehrenberg et al.:

> "Reflects, when a purchase is made and which brand is then chosen generally appear very irregular and can be thought of 'as if at random' with specified probabilities even though individual consumers have their varying and probably deterministic reasons for doing what they do" (1999, p. 86).

It is based on the basic assumptions: that purchasing of the product class takes the form of a Poisson process for each purchaser; the mean Poisson purchasing rate for differing consumers will follow a Gamma distribution; purchasers' brand choices will also follow a Beta or 'Dirichlet' distribution across different consumers (Goodhardt et al. 1984). The Dirichlet model (Ehrenberg, Uncles and Goodhardt 2004) is also based on the assumption of the independence of purchase incidence and brand choice, because the Beta distributions of choosing a particular brand are the same, irrespective of how often a consumer buys from the product class.

2.3.2 Summary

Whilst these models of stochastic choice have their individual differences, they are all based on the underlying assumption that brand switching occurs 'as-if-by-random', and that consumers will choose from a range of products or services within their repertoires.

Since the mid 1970's discussion on these models has taken up considerable space in learned journals such as 'Marketing Science', the 'Journal of Marketing Research' and the 'Journal of Business Research'. Evaluating these models in order to ascertain which might be applicable to a new research situation – in this case radio listening - would depend on the nature of the problem being investigated and also which of those models has over time led to the development of a range of empirical generalisations.

There is only one model that meets that criteria – that is the development of a range of empirical generalisations - the NBD Dirichlet which as mentioned previously is what Uncles et al (1995) claim to be the best-known example of an empirical generalisation in marketing.

3 THE NBD DIRICHLET TRADITION

3.1 INTRODUCTION

This chapter describes the NBD Dirichlet tradition in greater detail. First, it examines the empirical regularities that are associated with the model before considering the stochastic assumptions behind the model. Second, it discusses the specification estimation and the performance of the NBD Dirichlet. Finally the implications for radio markets are covered.

The primary aim of this chapter is to demonstrate the suitability of the Dirichlet approach rather than to derive the formulae for operationalising the model. The mathematical derivations can be found in Ehrenberg (1988) and Goodhardt et al. (1984).

3.2 EMPIRICAL REGULARITIES

Previous studies of consumer behaviour have been predominantly focussed on fast moving consumer grocery markets due in part to the immense range of available purchase data which covers not only numerous product classes but also many geographical locations. However, Dirichlet studies have not just focussed on the fast moving consumer goods (FMCG) markets but also on industrial (aviation fuel, pharmaceutical prescribing, and concrete) markets (Easton 1980; Uncles and Ehrenberg 1990). Key articles in this area, (Ehrenberg 1988; Ehrenberg et al. 2004) list over 50 different product fields which have been studied at different times and in different countries over the previous 30 years, as indicated in Table 1.

Table 1: Varied Conditions for Dirichlet-type Patterns

Products and services	Time space and people
- Food, drink, cleaners and personal care	- United States, UK, Japan, Germany, Australasia, etc.
- Prescription drugs, OTC medicines	- Light and heavy buyers: demographic subgroups
- Gasoline, aviation fuel, cars PC's	- Household or individual purchases
- Retail chains, financial services, B2B	- Different length analysis periods
- TV episodes, programmes and channels	- Different points in time: 1950-2003

Brands and product variants	Market conditions
- Large and small brands	- Near-steady markets
- Pack sizes, flavours, forms, formats, etc.	- Dynamic markets (for loyalty-related measures)
- Private/own labels	- Non-partitioned markets
- Price brands	- Partitioned submarkets

(Ehrenberg et al. 2004, p. 1311).

These studies have shown how a complete picture of consumer purchase behaviour can be built up using descriptive marketplace variables and the Dirichlet model. This ongoing research has led to the development of a number of empirical regularities or generalisations which characterise Dirichlet markets. A list of these empirical generalisations or regularities is found in Table 2. They can be categorised into three main areas: brand size-related measures, brand loyalty-related measures, and brand switching-related measures. It is worth noting that none of the other approaches to consumer modelling has led to such a wide ranging body of knowledge.

Table 2: Empirical Regularities

Brand size- related measures	Brand loyalty-related measures	Brand switching-related measures
1. Penetrations differ with market share - Competitive brands' penetrations differ greatly but in line with their market share.	**2.Purchase rates are similar - Each brands' average purchase rate is similar but with a slight double jeopardy trend** **3. Heterogeneity – Individual buying rates differ greatly** **4. Sole loyals – 100% loyals are few and buy very little.** **5. Share of category requirements – each brand meets a low (average 40%) share of category requirements.**	**6. Brand duplications are similar from brand to brand but vary with the competitor's penetration.**

Adapted from Ehrenberg and Uncles (1999)

3.2.1 Brand Size – Related Measures

It is important to note that the two main measures of brand size – penetration and market share are very different. For a particular time period 'Penetration' is the ratio between 'the number of people buying the brand at least once' and 'the total number of potential customers'. 'Market share', on the other hand, is the ratio between 'the total purchases of the brand' and 'the total purchases of the category' (Ehrenberg et al. 2004; Uncles et al. 1995).

Penetrations Differ With Market Share

Penetration is the proportion of potential buyers who buy a brand or category at least once during the period of analysis, and each brand's penetration varies with the brand's market share. For instance, any differences in market share are largely due to differences in penetration. Brands with a high market share are also brands that have more customers (greater penetration) than brands with low market share. However, penetrations will differ over different periods of analysis. For instance, the shorter the period of analysis the lower the penetration. On the other hand market share will still be much the same irrespective of the period of analysis (Ehrenberg et al. 2004, Uncles et al. 1995)

3.2.2 Brand Loyalty (Behavioural) – Related Measures

Purchase Rates are Similar

Purchase rates - or how often the buyer buys the brand - are similar for all brands. Such variation that does occur is mostly a small, downward, systematic trend in line with market share. While minor deviations from this pattern do occur, major ones are rare. The reality is that the small differences between brands in average purchase frequency and other loyalty measures (e.g. share of category requirements, proportion of sole loyal buyers) all follow the well known Double Jeopardy (DJ) trend, in that small brands not only have relatively fewer buyers, but those buyers are also less loyal.

This generalisation summarises the well known empirical regularity of double jeopardy (see Ehrenberg, Goodhardt and Barwise, 1990). DJ was seen as early as McPhee (1963) and in the application to radio listening simply states that a small station will be listened to by fewer people and among those fewer people the station will be less liked than larger alternatives (see Lees 2003, 2006; and McDowell and Dick 2005). This effect can be seen across a wide range of attributes both behavioural, (e.g. purchase frequency and period to period repeat buying) and attitudinal (e.g. responses to questions about preference, Castleberry, Barnard, Barwise, Ehrenberg and Dall'Olmo Riley 1994).

Ehrenberg et al. (1990) explains why this happens:

> "For instance, suppose there are just two restaurants in town, one widely known and the other more obscure. Suppose that people who know both restaurants regard them as being of equal merit (equal in quality, service, value for money, accessibility, etc). If people are asked which is their favourite, a DJ effect is bound to occur. The reason is that of the many people who know the popular restaurant, most do not know the more obscure one exists and cannot mention it if asked for their favourite. In contrast, of the few people who know the obscure restaurant, most will know the popular one. Hence they will "split their vote" – they are equally likely to mention either restaurant as their favourite (or say "undecided") because we have supposed the two restaurants are of equal merit to those who know both. Of the many people who know the popular restaurant, most will rate it their favourite, whereas the few who know the obscure one, only about half will say *it* is their favourite. This is a classic double jeopardy effect." (p. 85).

Heterogeneity - Individual's Buying Rates Differ Greatly

Consumers are very heterogeneous in that typically only a few of a brand's customers buy it often; most buy it infrequently. The many light buyers, in general, account for only about half of a brand's sales and small brands have even more light buyers than bigger brands.

Sole Loyals are Rare and are Light Buyers

Sole loyal buying or 100% loyal buyers – the number of consumers who buy just one brand – is relatively rare and will decline over time. Not only are sole buyers rare, they are also light buyers of the brand. They often make just one purchase during the time period, and that's of just one brand. Again there are DJ effects for the small brands, in that they have fewer sole loyals and they buy even less per buyer.

On the other hand, heavier buyers tend to buy more brands, to buy more often, and are less likely to be sole loyal, showing polygamous loyalty.

Share of Category Requirements

Over a given time period, usually involving several purchases, each brand's customers will have bought from within the product category far more often than they will have bought any one brand within that category. Typically the annual share of category requirements, another loyalty measure, is not only low, but like average purchase frequency much the same from brand to brand, other than a small DJ effect. In shorter time periods, less than a year, each brand's share of category requirements will be larger. Nonetheless, a brand's customers, on average, buy other brands more often. This is because customers buy from a repertoire of brands. Hence the line attributed to Ehrenberg "Your customers are really other people's customers who occasionally buy from you."

Zero Order Assumption

One of the fundamental assumptions behind stochastic models is, as mentioned in Section 2.3.2, the zero order assumption. A zero order process is one where the brand(s) you are about to purchase will not be dependent on the brand(s) you have previously purchased. However, with radio listening that assumption may be violated in that the next radio station listened to is dependent on the station the receiver is tuned into. This is particularly important if we are looking at a relatively short time frame e.g. a day or a specific time zone but since the analysis is undertaken over seven days the zero order assumption may remain a reasonable approximation.

3.2.3 Brand Switching – Related Measures

Brand Duplications are Similar from Brand to Brand

Most of a brand's customers are multi-brand buyers in that they buy from a range of brands within their purchase repertoires. Which other brands they also buy is in the aggregate, again similar from brand to brand. This is shown in period by period repeat buying rates of a brand which is rather low and again similar from brand to brand, with a DJ effect - and in line with a brand's numerous once-only buyers in a year – they cannot be buying in every quarter. Most of these 'non-repeaters' are not lost for good, they are still 'loyal' to the brand in that they will buy it again later. It's just that they simply buy the brand infrequently.

Brand Duplications Vary with Penetration

Following on from the fact that most of a brand's customers are typically multi-brand buyers, the brands they buy are again similar from brand to brand. Brands share their customers with other brands in line with each brand's penetration. This is known as the Duplication of Purchase Law, and means, in general, consumer goods markets have been found to lack specific partitions which appeal uniquely to a specific category or segment of customers. Again the brand duplications will have a DJ effect with the smaller brands having a stronger duplication with the bigger brands.

This thesis tests whether those empirical generalisations hold true within the radio market. If they are found to hold true then this thesis will both extend the number and range of situations where those empirical generalisations have been found to hold true and therefore provide some knowledge about a market which has not been studied in this way before.

However, before testing the empirical generalisations underpinning the Dirichlet, it is first appropriate to consider the assumptions and specifications behind the model.

3.3 STOCHASTIC ASSUMPTIONS

The Dirichlet model consists of two parts, one focusing on purchase incidence and the other on brand choice. Each part can be further divided into two elements – one involved with how individual behaviour can be presented and another which describes how individual behaviours vary across the population. The Dirichlet is formed from a combination of those four elements which can each be represented as distributions, along with one further assumption about the relationship between purchase incidence and brand choice.

Each of those five elements which comprise the Dirichlet has a sound theoretical basis which in turn provides a rationale for the model. However the more practical justification for its adoption is the wide range of close predictions the model makes about how brands are purchased in an extensive diversity of marketing situations (Ehrenberg, 1988).

The Dirichlet does not predict the behaviour of individuals but yields probabilistic aggregate measures across buyers which are of direct relevance to practitioners. This is because the purchasing patterns of individuals appear sufficiently irregular so that in aggregate they can be summarised by a probabilistic model. This means that consumer behaviour is measured by how the market buys each of the available offerings, so that the unit of analysis becomes the brand. Such a formulation is of direct relevance to radio station managers as most markets comprise a very large number of listeners, and studying individual listening behaviour may not be of practical use in any case (see Chapter 4 for a brief outline of possible reasons why individuals listen to the radio).

The Dirichlet assumptions strictly apply to stationary non-segmented markets. In practice, these constraints have not proved problematic because most fast moving consumer goods markets are well established and show little overall sales trends in the time periods between about a week and a year. In addition, most FMCG markets are characterised by brands which tend to appeal to every consumer rather than an identifiable sub-set. Furthermore, most Dirichlet-type patterns continue to hold

approximately, even in more or less dynamic markets (Ehrenberg et al. 2004; Uncles et al. 1995).

3.3.1 Gamma Assumption of Population Variability in Poisson Means

The second element of modelling purchase incidence reflects the fact that individuals differ consistently in the rates at which they buy a product class. In other words, the fast moving consumer goods markets are comprised of consumers whose average rates of category purchase can be modelled by Poisson processes with different means. The purchase incidence part of the Dirichlet model assumes that these mean rates of purchase are distributed over the population according to a Gamma distribution.

The Gamma distribution has been derived from the assumptions that a consumer buys from the product class at a rate independent of each of the other consumers, and the proportion of purchases which a consumer accounts for is independent of the total of all purchases made. From these assumptions it has been demonstrated (Chatfield and Goodhardt 1973, 1975) that the distributions of the mean rates of purchase for the product class across the population must be Gamma. However, it needs to be noted that there appears to be, so far, little direct evidence to support the derivation although it is known to apply empirically to brands within a product class (Ehrenberg 1988).

Combining the means of the individual Poissons according to a Gamma distribution results in a Negative Binomial Distribution of the frequencies with which the population buys the product class. The distribution has been fitted to many product classes at the category and brand level (Ehrenberg 1988).

3.3.2 Brand Choice

As with the previous section the assumptions surrounding individual choice will be described along with how these choices vary across the population.

Multinomial Assumption of Individual Choice

The Dirichlet assumes that each time a consumer makes a purchase she/he has a certain probability of choosing each of the available brands. These probabilities are fixed over time and sum to 1. Each consumer has a set of probabilities represented by a multinomial process not too dissimilar to rolling a weighted dice (Bass 1974). Here the probability of getting a particular score is constant each time the dice is thrown, but a different result can occur. Like the throw of the dice, where the results of successive throws are independent, the brand chosen is independent of previous choices (See Section 3.3.2 Zero Order Assumption).

From the study of fast moving consumer goods, the first part of the brand choice assumption is borne out by actual consumer data, where the various brands purchased by consumers have differing shares of the consumer's total purchases (see Ehrenberg 1972). As overall brand shares are effectively constant, this supports a model with fixed probabilities.

The Dirichlet Distribution of Population Variability

Just as each consumer has a different purchase incidence probability, they also have differing sets of brand choice probabilities. For any one brand, this variation in probabilities is assumed to follow a Beta distribution, and the model assumes that the Beta distributions for each brand combine in the form of a particular multivariate Beta distribution known as the Dirichlet.

A key prediction from a Dirichlet formulation is that choice between brands should be independent, which is what is meant when describing a market as un-segmented. There is a strong parallel here with the Independence of Irrelevant Alternatives (IIA) of Luce (1959) which is a key concern for those who model choice processes as a Logit (see Jain, Bass and Chen 1990).

Essentially this concern is that these independence assumptions will not hold when the consumer is faced with choices which are asymmetric in terms of similarity. In a hypothetical market with two brands of restaurants one Thai and one French, independence may be assumed. If a second Thai restaurant was launched, the

independence assumption would predict that the market shares of the original brands would change by the same amount or in line with their existing market shares. It is reasonable to expect, however, that the shares of the original Thai restaurant would fall by a greater amount as it would be more similar to the new brand than the original French restaurant. Thus the IIA would be violated.

In practice, the validity of the Dirichlet and its independence assumptions are tested by how well it actually predicts both brand choice and purchase incidence. Where deviations from the model occur it is easy to examine individual brand data on, for instance, duplication of purchase to explore reasons why the model does not provide a good fit. This form of analysis also helps to identify the existence of sub-markets or partitioning effects, such as leaded and unleaded petrol or music and talk format radio stations. It also facilitates evaluation of the size of the effect which tends to be relatively small. It is also possible because of the Dirichlet's formulation to combine brands which appear to violate the independence assumptions in order to see whether the lack of fit is specific to a brand.

In reality this means that brand share should be effectively constant across different groups of consumers. However, the radio listening data has consistently shown that some stations have a stronger following in certain demographics than in others. Whilst each station appears to have listeners from all demographics, there are some stations with an appeal to younger listeners than others. Likewise, some stations appear to have a greater appeal to older demographics. This raises the question as to whether the assumptions of brand choice and purchase incidence probabilities are violated - or whether there are partitions in the market based on format or programming. This question will be addressed when considering the brand switching regularity and comparing the observed switching with the Dirichlet's predictions.

3.3.3 Aggregate Considerations – Stationarity and Partioning

The application of the Dirichlet requires that markets be both stationary and non-partitioned (that is, unsegmented). The specific meanings of these assumptions are discussed below.

Stationarity

Consumer purchasing behaviour is dubbed ‘stationary’ when the aggregate level of purchasing remains the same from one time period of a certain length to the next time period of the same length. However, individual purchasing will vary from one time period to another.

Ehrenberg (1988) states that stationarity is the rule rather than the exception when considering real market data. Bass and Pilon (1980) also claimed that in the long run market share is in equilibrium although it may be temporarily upset by marketing activities. Ehrenberg goes on to point out that it is unusual in practice to observe complete stationarity in a given data-set, but that in most instances the market place is one of near-stationarity. Ehrenberg (1988) goes further and adopts an arbitrary heuristic of not more than +/- 10% in the mean per-capita rate of buying - in the penetration of the brand - or in the rate of buying per buyer as signifying stationarity. In terms of the radio market, it is not uncommon for some stations to have shifts in market share of in excess of 5 percentage points between annual surveys. The reasons for these changes are many and varied, and often involve factors that are beyond the control of the marketer, such as changes in ‘on-air’ personnel. However, as Barnard and Ehrenberg (1997) comment, in the medium term most markets are near stationary most of the time. This is a view that has become increasingly supported in the literature (see Dekimpe and Hanssens 1995; Lal and Padmanabhan 1995; Ehrenberg et al. 2004).

On the other hand, the restriction of stationary markets runs contrary to many beliefs about marketing which claim the marketers’ role is to create dynamic markets. Lenk, Rao and Tibrewala (1993), Baldinger and Rubinson (1996, 1997a, 1997b) and Farr and Hollis (1997) all point out that marketing must attempt to ensure that markets are not stationary, and in doing so note that week-by-week sales of items can and do vary markedly. In response to these analyses Barnard, Ehrenberg, Hammond and Uncles (1994) and Ehrenberg (1997) recommend the use of fairly long base periods (4, 8, or 12 weeks) to make good estimates of the parameters. However, they also note that these periods need not be seen as too restrictive since any diagnostic test can be for any time period as long or as short as is required.

Barnard et al. (1994) also claim it is important to determine the time period appropriate for each analysis. The application of the Dirichlet to a particular data set requires a careful balancing act of the length of the time period under construction. If the time period is too short, short term fluctuations will be evident. If it is too long then long term trends or the growth of a brand will be missed. Ehrenberg and his colleagues provide little guidance on this point other than indicating that periods of time should be some multiple of the average inter-purchase time period. Clearly, any long term non-stationarity in the market would question the validity of a stationary assumed Dirichlet analysis.

Furthermore, in addressing the question of whether there is much point in examining 'stationary' conditions when marketing effort is directed at changing that state, Ehrenberg (1988) points out that the restriction to near stationary markets need not be viewed as particularly onerous. He points out that if any one wants to change the market, one needs first to know the market one wants to change from. To evaluate change one must compare the results with what would have happened in the absence of change.

Most radio markets, like fast moving consumer goods markets, are characterised by wide ranging promotional activities. In the fast moving consumer goods markets these promotional activities are designed to provide the consumer with some short term 'advantage'. Such promotions tend to last for short periods of time when compared to the annual benchmark of relative brand performance. Radio markets are also characterised by intense short term promotions, usually around survey time - although many stations now run listener based promotions on an on-going basis.

From the perspective of fast moving consumer goods and radio stations, marketers will be interested in knowing the effects of their promotional activities (and those of the competition), in terms of how consumer behaviour changes during and after the promotion. Here the Dirichlet can be used to compare the before, during and post promotional phases to examine whether or not any sales increase derives from more buyers than expected or from increased usage by the expected number of buyers. That

is the stationary market model provides a benchmark against which dynamic changes can be measured.

Promotional effects will make sales of a brand appear non-stationary in the short term, but even if the Dirichlet predictions for the promoted brand are affected, it does not preclude its use on the rest of the market. Consider a twenty brand product market (a position not uncommon in New Zealand radio markets) and a brand which, during a promotion, increases its share from 10% to 15% (an increase in sales or listeners of 50%). Whereas before the promotion the other 10 brands held a combined share of 90% during the promotion this would fall to 85%, but the difference per brand would be would be 0.27 percentage points. Such a small difference is unlikely to affect the Dirichlet predictions.

It is also worth considering the issue of seasonality as it is possible that some stations e.g. sport based stations may change their audiences as the seasons change and thus temporarily alter listenership patterns. Like most FMCG in general radio is not seasonal and most stations do not change noticeably during the year. However, there may be switching between stations when one station offers a specific programme not to dissimilar to when a FMCG manufacturer offers a special flavour.

Barnard et al. (1994) also claim that the empirical evidence related to short term non-stationarity shows no consistent departures. However, even if the market is shown to be non-stationary in the long run, the Dirichlet can still be used to provide approximate measures of buyer behaviour, with any consistent discrepancies showing up and highlighting the areas for further analysis. A more complex approach is typified by Fader and Lattin (1993) who attempt to incorporate non-stationarity into a Dirichlet-type modelling process.

Market Partitioning and Segmentation

Patterns modelled by the Dirichlet are said to hold between competitive brands; that is brands where the proportion of purchases given to one particular brand are independent of the distribution of the remaining purchases between other brands. If these probabilities are not independent, that is some brands compete more amongst

themselves than with other brands, then this may be evidence of a partition within the market.

Any number of examples can be given of partitioned markets. For example coffee may be partitioned into instant regular or instant decaffeinated; petrol into leaded or unleaded; and radio into possible music and talk formats or partitions. As an illustration, a person's probability of buying unleaded petrol is not independent of buying leaded petrol. If a wide market definition is used, e.g. all coffee rather than instant coffee, any submarkets will show up as systematic deviations from the main patterns and ultimately from the Dirichlet's theoretical norms. However, it will be difficult to identify which part of the variance is due to partition-specific factors and which is due to brand specific factors. Although as Ehrenberg (1995) notes, the Dirichlet can be applied to the apparent partition with the data being re-analysed as separate models.

Hutchinson and Marchant (1998) are critical of the Dirichlet assumptions claiming there are no systematic "brand positioning effects" and that "commonsense rejects this and it is right to do so" (p.31). Barnard, Ehrenberg and Scriven (1998) dispute this saying the Dirichlet describes markets which are non-partitioned but says nothing about whether a market is partitioned or not.

3.4 SPECIFICATION OF THE NBD-DIRICHLET

As mentioned previously, this chapter considers the Dirichlet's assumptions and specifications rather than re-establishing the formulae for operationalising the model. The mathematical derivations can be found in Goodhardt et al. (1984) and Ehrenberg (1988).

3.4.1 Operationalising The Model

A detailed worked example of the calculations necessary for producing theoretical Dirichlet outputs can be found in Appendix C of Ehrenberg (1988). The calculations can also be effected by using BUYER software (Uncles 1989), Dirichlet software (Kearns 2000) using the method of moments, or in Excel using maximum likelihood (Rungie, 2003).

An explanation of the estimation of the Dirichlet using the method of moments follows. In essence the procedure uses three stages:

First, the purchase incidence NBD is calculated and the sole inputs here are the number of buyers in the time period and the total number of purchases made. From these two figures the proportion of non-buyers (P_o) and the average rate of purchase (m) are easily calculated and the exponent of the NBD (k) is subsequently calculated by iteration using the identity

$$P_o = (1+m/k)^{-k}$$

From here the proportion buying any number of times is computed using the iterative formula (starting with the observed value of P_o) as follows:

$$P_r = (a/1+a) \times [1-(a-m)/ar] P_r\text{-}1$$

Where a = m/k and r is the number of purchases of the brand.

The nature of the distribution means that the tail can represent a very small number of buyers who buy very heavily and are therefore important in terms of sales. A good practical example is found in Ehrenberg (1988, p360) where one buyer (panel member 1) made 20% of the total purchases for the product class. In modelling purchase behaviour it is important to evaluate this tail which can be estimated using Goodhardt's method as described in Ehrenberg (1988, pp 339-340).

The second stage involves the calculation of the Dirichlet 'S' parameter for each item in the analysis. This parameter reflects the heterogeneity of consumers in terms of

their choice probabilities, and is derived using the previously computed purchase distribution along with the proportion not buying the item in the time period, the average purchase frequency, and the average product class purchase frequency.

The object is to find an estimate of the 'S' parameter for each brand so that the predicted number of non-buyers of the brand is very close to the observed number of non-buyers. This is achieved by starting with an arbitrary value for 'S' and generating two computational terms which aid the recursive calculation encompassing the length of the product class distribution. Once the recursive calculation has been made up to the end of the distribution, the resulting estimated proportion of the non-buyers is compared to the observed value. If the estimate exceeds the observation the process is repeated using a larger starting value for 'S' (and vice versa). This process continues until a value of 'S' is found which provides a close fit between the estimate and the observation. A detailed working example is provided in Ehrenberg (1988, pp 341 – 344) and Kearns (1999).

The estimation of 'S' is most easily accomplished by a computer using software such as BUYER (Uncles 1989) or Dirichlet (Kearns 2000), which generates a value for each item. The 'S' parameter is then derived by multiplying the 'S' parameter of each item by its market share and summing over the number of items.

As already noted, the two parameters of the NBD model are usually denoted by the exponent 'K', and secondly either by 'M', the mean number of purchases made by all consumers in the population in a given time period, or by the quantity a=m/k. Under stationary conditions, the mean 'M' in equal time periods must be the same, because of the definition of stationarity. The numerical value of 'M' in any given time period is therefore proportional to its length. The parameter 'M' therefore acts as a scale-factor, reflecting the length of the analysis period.

In contrast, the parameter 'K' in the theoretical Poisson-Gamma model is constant for different lengths of analysis or time periods. Thus 'K' is the parameter of the Gamma distribution which describes the long-run differences in the average purchasing rates of different consumers. Most of the repeat-buying formulae derived from the NBD model depend explicitly on 'K' being constant in this way.

The third stage is to derive a matrix of proportions for each item in the analysis. This matrix shows what proportion of buyers who make *n* product class purchases choose the specific item 0, 1, 2, 3, …… *n* times.

Once the theoretical calculations have been derived, these can be compared with tabulations from panel or observed data in order to validate the use of the model with a specific data set - and also to reveal specific instances where consumer behaviour deviates from the assumptions which underlie the model.

According to Rungie (2003) likelihood theory is an alternative method for estimating the parameters of the Dirichlet Model. Likelihood estimation, unlike the conventional method, requires access to the original raw unit data, is statistically more efficient and has less sampling variation. Rungie (2003) also states;

> "…the real motivation for considering it as an alternate to the traditional method of zeros and ones is that increasingly the Dirichlet Model is being used in a wide range of applications. New developments for the model are appearing, such as its generalized form in which covariates are introduced. The model is taking on greater diversity. These developments are increasingly using likelihood estimation" (p. 8).

In summary, the Dirichlet model uses market shares to generate a whole series of predictive norms about the way in which consumers buy the available brands in a product market. These predictions can be compared with actual brand performance so that analysis can focus on deviations from those established norms.

3.4.2 Explanatory Variables

Fader (1993) attempted to incorporate explanatory or marketing mix variables into a Dirichlet type model. He concluded that incorporating data on a brand display and prices did not substantially improve the model fit when compared to a 'pure' Dirichlet.

> "It should come as no surprise that the pure DM (Dirichlet Multinomial) fits notably worse than the two models with explanatory variables. On the other hand it is interesting that the incremental improvements in moving away from the pure DM model are rather modest" (Fader, 1993, p. 105).

In his article Fader does not provide the summary statistics of penetration and purchase frequency, but does report the S parameters for both models. According to Kearns (2000) from these it is possible to examine the performance of both models by comparing the observed with predicted market shares.

In all cases except the store brand, the 'pure' Dirichlet provided as good if not better predictions than the model with the marketing mix variables incorporated in it. As Fader commented, the main reason for this discrepancy (store brand vs. normal brand) lies with the store brand's limited distribution.

The easiest way of addressing such an issue is to omit the store brand from the estimation procedure and then to check the fit with other brands to see whether the problem is general or specific. If it is found to be specific to the store brand, but that the pattern is one generally found in grocery markets for all individual store brands, then the analysis needs to incorporate such a finding.

Ellis (1989) examined this problem and concluded that, store brands showed a small but consistent deviation from Dirichlet predictions which could be resolved by either correcting for limited distribution or by combining all own labels into a single entity.

3.4.3 Evaluating the Incorporation of Explanatory Variables

In essence, Fader (1993) demonstrated how the incorporation of explanatory variables changes the Dirichlet's brand parameters. However, Stern (1994) demonstrated that, while incorporating variables may improve the statistical fit with a single data set, they added little to understanding the market structure in terms of how brands are purchased – variables of relevance to marketing practitioners. The means far greater insights can be derived from analysis of deviations from the 'pure' Dirichlet predictions.

3.5 SUMMARY

The Dirichlet is a comprehensive model which describes the structure of buying behaviour in terms of purchase incidence and brand choice under stationary (or near stationary) situations. Market shares incorporate the results of past marketing actions - and this helps to explain why efforts to account for explanatory variables are unlikely to prove very productive.

Where some component of the market exhibits a dynamic (as opposed to a stationary) pattern, this can be analysed separately against the Dirichlet norms.

The output of Dirichlet modelling includes measures which are of direct relevance to practitioners, and helps to compare a brand's performance with others in the marketplace as well as with a set of norms which have an empirical and theoretical basis. This means marketers can begin to plan from a knowledge of what their market is like to see whether or not their goals are - in fact - realisable.

3.6 THE PERFORMANCE OF THE NBD-DIRICHLET MODEL

This section provides an overview of the Dirichlet's performance. It first considers the marketing literature regarding the Dirichlet findings, and then examines the fit of the Dirichlet's theoretical observations to actual observations.

3.6.1 Dirichlet Findings

As mentioned in Section 3.2 on Empirical Regularities, within a market that is stationary and non-partitioned the Dirichlet predicts a number of aggregate brand performance measures. These predictions have been developed from the stochastic

representations of purchase incidence and brand choice made at an individual level, as discussed in the previous sections.

The performance measures predicted by the Dirichlet model (such as the percent of consumers buying a brand within a certain time period, the number of purchases per buyer; the proportion buying a number of times; the proportion who are sole buyers in that they buy only one brand and their purchasing rate; the rate of category purchasing; and which other brands are bought), should be, according to Ehrenberg, familiar to many marketing analysts and practitioners. Practical applications of this information include providing interpretive norms, for both stationary and non-stationary markets, and prescriptive uses in marketing planning. Goodhardt et al. (1984), Uncles et al. (1995) and Ehrenberg et al. (2004) for instance, provide a number of illustrative applications.

Uncles et al. (1995), using US data from the 1980s, provide an illustration of the brand-by-brand similarities in a product category, in this case laundry detergent, as shown in Table 3.

This table shows the fit between the actual or observed (O) values and the Dirichlet's theoretical or predicted (T) values for brands of laundry detergent for three predictions, (households buying, purchases per buyer, and share of category requirements) from the Dirichlet. Figures for the 'Average Brand' show a close correlation between the averages of the observed (O) and the predicted (T). At the same time the differing brands show some typical variation.

Table 3: Brand Performance Measures

1985 IRI	Market Share*	% of Households Buying		Purchases per Buyer		Share of Requirements	
		O %	T %	O %	T %	O %	T %
Any Brand	100%	94	(94)	10.0	10.0	100	(100)
Tide	25*	54	58	4.4	4.1	36	35
Wisk	10*	29	31	3.4	3.2	26	25
Bold	8*	27	25	2.9	3.0	19	24
Era	6*	22	21	2.7	2.9	17	23
Cheer	5*	19	17	2.7	2.9	22	22
A & H	5*	16	17	3.0	2.9	29	22
All	5*	19	17	2.5	3.0	19	24
Fab	5*	18	17	2.7	2.9	17	22
Oxydol	4*	12	12	2.8	2.8	19	21
Solo	2*	9	8	2.4	2.7	16	21
Gain	2*	9	8	2.4	2.7	15	21
Ajax	2*	9	8	2.4	2.7	13	21
Rinso	2*	6	6	2.7	2.7	15	20
Dash	1*	4	4	2.8	2.7	24	20
Ave Brand	6*	18	18	2.8	2.9	21	23
Correlation		1.00		0.95		0.74	

(Uncles et al. 1995), (O – Observed, T-Theoretical)

According to Uncles et al. (1995), the Dirichlet model imposes a discipline on marketing planning and evaluation in that it broadly prescribes available options for marketing planning activities. This position has been disputed by researchers (Little and Anderson 1994; Baldinger and Rubinson 1996) when they ask how Dirichlet patterns in a stationary market can be of interest to marketing managers who are effectively trying to change that state. In response Ehrenberg and Uncles (1999) argue that the Dirichlet regularities provide a comprehensive context for decision making and evaluation although they do not proscribe any specific courses of action available to marketing managers. As an example, the regularity that the average buying rate of a brand hardly differs between brands, although with a small double jeopardy effect, indicates that a marketing manager who aims to increase their sales by getting existing customers to buy more often would be trying to achieve the impossible. Morrison and Silva-Risso (1995) summarise this as "…those companies planning for

a higher than average purchase frequency with their small penetration niche brand are bucking the odds more than they think" (p. G65).

Dalal, Lee and Sabavala (1984) and Schmittlein, Beammor and Morrison (1985), note that the most managerially relevant construct that results from this type of modelling are conditional expectations, namely, the expected number of purchases made in a period given the consumer purchased in a previous period. Specific examples of conditional expectations are highlighted as the probability of buying brand *x* in a time period given that brand *x* was bought in the previous period (repeat buying); the probability of buying *n*, given *n* purchases in a previous period; and the probability of buying brand *x*, given that brand *y* was bought (purchase duplications).

3.6.2 The Fit of the Dirichlet

However, while the previous examples indicate the applicability of the Dirichlet, they do not allow for a judgment to be made as to whether that application is justified. If the Dirichlet is to make a serious contribution to marketing science then it needs to provide a good fit on a wide range of data – not just a few selected cases. In discussing this issue, Uncles et al. (1994) report an anonymous commentator who was reputed to have said "the Dirichlet model is clearly not tenable in most markets", (p. 376). If such a contention was made - and is true - then the applicability of the model would be severely limited.

Morrison and Schmittlein (1988) comment that consideration needs to be given to what one measures the fit of the model across. The 'fit' could mean the predictions made by the model or the applicability of the assumptions incorporated in the model. The justification of the assumptions has been covered in the previous sections. In terms of this thesis the 'fit' refers to the fit of the predictions obtained from the model.

Morrison and Schmittlein (1988) also comment that some of the predictions may be better indicators of the quality of the model that other predictions. They use as an example the aggregate histogram of purchases may not be a very good indicator of the model's fit because deviations from the basic assumptions of the model may show up more clearly in predictions of conditional expectations rather than in the histogram of

actual purchases aggregated across consumers. More specifically, the histogram of purchases may resemble the negative binomial distribution - where as the predictions of period-to-period buying may be heavily biased. Nonetheless a qualitative justification for the goodness of the fit of the NBD/Dirichlet is provided by the many reported successes of the model established across a great variety of differing products and services (Ehrenberg et al. 2004).

One common criticism of the 'fit', as noted by Ehrenberg and Uncles (1999), is the problem of how to 'eyeball' a judgment of the fit of the model. In other words 'how close is close enough'. Ehrenberg and Bound (1993) wrote:

> "I therefore explain: Fit to us depends on not merely establishing a significant (that is probably non-zero) correlation for a single data set (SSoD). Instead it turns on the absence of systematic bias across many sets of data (MSoD) and on correlations between the observed and theoretical values generally on the order of 0.9" (p. 98).

In considering the fit of the model Ehrenberg (1975) has claimed that it is not unreasonable to expect to obtain correlations in the order of 0.9 and sometimes higher in assessing the fit of the Dirichlet (Ehrenberg and Bound 1993). However, Ehrenberg (1995) states that "we cannot expect too much from a model whose only brand-specific input is each brand's market share," (P. 96). In spite of this claim Ehrenberg and Uncles (1999) note that any discrepancies are mostly small and explicable in terms of specific case factors. Barnard et al. (1994) also repeat the claim about the efficacy of the model when they note that, given the very parsimonious calibration inputs, the Dirichlet must therefore be oversimplified (with numerable "excluded variables"), and at times biased - even in broadly stationary and non-partitioned markets. However, they go on to say that in practice the model only fails to fit when the assumptions of stationarity and partitioning are violated.

Ehrenberg (1997) goes further stating:

> "…there are large brands and small ones… plus a bit of as yet incoherent wobble", and "any deviations could be due to a variety of other marketing-mix

factors (promotions, out-of-stock, being delisted, a new flavour, repositioning, a change in sales director or in price, advertising, etc) rather than any long term idiosyncrasy in the brand's still elusive and undefined Equity", (p. 23).

However, since then a number of systematic investigations of the fit of the Dirichlet predictions have been published. The most comprehensive reporting of the model's fit, between observed (O) and predicted (T) values is provided by Ehrenberg et al. (2004) who summarise the model's fit for a range of predictions, for eight leading brands in twelve product categories, across a variety of countries as shown in Table 4.

Table 4: Annual Observed and Theoretical Performance Measures (Averages for 8 Leading Brands in 12 Product Categories).

Brands (by share)	Brand Size			Loyalty- related measures (annual)						Switching (Annual)									
	Market Share (%)	Percent buying		Purchases (per buyer)		Percent buying (5+ times)		Category purchases per buyer		100% Loyal				Percentage who also bought brand:					
										Percent buying		Purchases		A		C		E	
		O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*
A	**28**	**46**	***46***	**3.9**	***3.9***	**24**	***25***	**10**	***10***	**22**	***16***	**4.1**	***2.5***	**100**	***100***	**31**	***31***	**17**	***20***
B	**19**	**35**	***36***	**3.6**	***3.5***	**21**	***20***	**11**	***11***	**16**	***13***	**4.4**	***2.2***	**51**	***55***	**32**	***31***	**18**	***21***
C	**12**	**25**	***25***	**3.1**	***3.1***	**16**	***17***	**12**	***12***	**11**	***11***	**4.4**	***2.0***	**57**	***56***	**100**	***100***	**20**	***21***
D	**9**	**22**	***21***	**2.8**	***2.9***	**13**	***14***	**11**	***12***	**11**	***10***	**2.7**	***1.9***	**55**	***56***	**35**	***31***	**23**	***21***
E	**7**	**14**	***16***	**3.2**	***2.8***	**19**	***14***	**12**	***12***	**12**	***9***	**2.9**	***1.9***	**53**	***56***	**34**	***32***	**100**	***100***
F	**5**	**12**	***11***	**2.7**	***2.8***	**11**	***12***	**12**	***12***	**10**	***9***	**2.9**	***1.8***	**56**	***56***	**35**	***32***	**19**	***22***
G	**4**	**11**	***10***	**2.7**	***2.9***	**11**	***12***	**12**	***12***	**9**	***9***	**2.6**	***1.8***	**56**	***56***	**35**	***29***	**17**	***18***
H	**3**	**6**	***7***	**3.2**	***2.6***	**13**	***13***	**13**	***12***	**7**	***9***	**3.4**	***1.7***	**52**	***56***	**30**	***30***	**17**	***18***
Average brand	**11**	**21**	***21***	**3.2**	***3.1***	**16**	***16***	**12**	***12***	**12**	***11***	**3.6**	***2.0***	**54**	***56***	**33**	***31***	**19**	***20***

(Ehrenberg et al. 2004, P. 1312) (O= observed, T= theoretical Dirichlet predictions.)

Ehrenberg et al. (2004) go on to summarise the fits saying "…the fit for each separate measure can be summarized in two respects: (a) the virtual lack of any systematic bias, and (b) the O and T values for the individual brands also differing little (e.g., with an average deviation, or mean absolute deviation (MAD), of less than 2 percentage points for the penetration-type percentages)." (p. 1312)

A number of other studies have also analysed the fit of the model. However, they report less comprehensive results, usually involving a limited set of predictions.

Uncles et al. (1994) investigated the fit of Dirichlet predictions of average purchase frequency (*w*) and share of requirement for 310 brands with market shares of more than 1% from 34 product categories in the United States. The results of their study are shown in Table 5.

Table 5: Predictions of Purchase Frequency and Share of Requirements.

Brands	Purchases per buyer		Share of requirements	
	Observed	Theoretical	Observed %	Theoretical %
Average for 16 products with at least 10 itemised brands				
1	**3.1**	**2.9**	**39**	**38**
2	**2.7**	**2.6**	**33**	**34**
3	**2.9**	**2.5**	**31**	**33**
4	**2.4**	**2.3**	**29**	**32**
5	**2.4**	**2.3**	**27**	**31**
6	**2.2**	**2.3**	**29**	**30**
7	**2.1**	**2.2**	**25**	**30**
8	**2.1**	**2.2**	**25**	**30**
9	**2.1**	**2.2**	**23**	**29**
10	**2.1**	**2.2**	**28**	**29**
Average	**2.4**	**2.4**	**29**	**32**
Average *r*	**0.94**		**0.93**	
Average for products with less than 10 itemised brands:				
Average	**2.3**	**2.2**	**37**	**43**
Average *r*	**0.71**		**0.86**	

(Uncles et al. 1994).

In the sixteen categories with more than 10 brands, the correlations between the observed and theoretical values for the average purchase frequency and share of requirements are all high, averaging at 0.9. However, for the 18 categories with less than 10 itemised brands, correlations of about 0.7 for the predicted average purchase frequency and 0.9 for the share of requirements were reported. Uncles et al. (1994) comment that the relatively low correlation for average purchase frequency is mainly because the values do not vary much.

Bhattacharya (1997) reported that across 372 brands and 34 product categories a brand's actual share of category requirements (SCR) levels have correlations of 0.77 with Dirichlet predicted SCR's. However, Bhattacharya does not indicate what product categories were used in this study.

Another aspect of the Dirichlet's fit was investigated by East and Hammond (1996). East and Hammond examined the fit of repeat purchasing predictions over a number of analysis periods, instead of the conventional single following period. Across nine product categories East and Hammond reported an average over-prediction of repeat purchasing levels of 15 percent when following the behaviour of a group of buyers for a year. This means that 85 percent of the buyers stayed with a brand over a year, or conversely that erosion was 15%.

Other studies into the Dirichlet and its fit have been reported, although the majority have been either for individual product categories, or no data has been presented. Morrison and Schmittlein (1988) stated that the "model fits histograms of purchases extremely well, and that NBD forecasts for future purchasing patterns are often very accurate" (p. 145). Barnard et al. (1994) claimed a correlation of 0.99 for Lenk et al.'s (1993) data for the proportions of buyers buying in a subsequent period conditional on them being non-buyers, once-only buyers and two-plus buyers in the previous period. Barnard et al. also reported, using Fader and Schmittlein (1993) data, for repeat buying proportions for consecutive purchases a correlation of 0.7 and a correlation of 0.997 for share of category predictions. Ehrenberg et al. (1990) reported a correlation of about 0.7 or 0.8 across a wide range of measures in an illustrative application of the Dirichlet to the instant coffee market.

Fader and Schmittlein (1993) studied what appeared to be excess loyalty for some high share brands or brands with higher levels of repeat-buying than was predicted by the Dirichlet. They also looked at share of category requirement predictions and found that in most cases the Dirichlet under predicted loyalty. However, Barnard et al. (1994) noted the average error was only 0.1 and that it could have been due to one or two large deviations for the high share brands. Barnard et al. (1994) went on to show that the largest discrepancy was only 5 percent, for a predicted loyalty value of 72%. They concluded that Fader and Schmittlein's (1993) analysis does not seem to imply many consistent or sizeable deviations from the Dirichlet's predictions.

Most of the studies support the proposition that the predictions are unbiased. However; the two well known exceptions are the under-prediction of purchasing rates

of 100% loyal buyers (Ehrenberg and Uncles, 1999) and the over-prediction of repeat buying rates in long analysis periods (East and Hammond, 1996).

Uncles et al. (1994) and Ehrenberg et al. (2004) report that there are some isolated outliers, with as much as a 50 percent difference between observed and predicted figures. In their study of instant coffee they reported Maxim's very high annual purchase rate of 4.5 was found to "be due to two outliers (two households making over 30 purchases each, as against the average of about 3)". They comment "perhaps the households were running a bridge club!" (P. 1313). However, when the outliers were removed the correlations between the observed and the predicted returned to 0.9.

One of the few studies to look at the empirical distribution of deviations from the Dirichlet's predictions is Bhattacharya (1997). When reporting on the observed share of category requirements and the Dirichlet-predicted values Bhattacharya concluded the Dirichlet does a very good job - 70 percent of the deviations in the +/- 10% share of requirements range.

According to Light (1998), the Ehrenbergian tradition which he called the 'old view of marketing' (in particular the position that measures of loyalty are correlated to market share) is insufficient. While Light conceded that Ehrenberg has shown through repeated replications that there is a correlation between market share and loyalty, he maintains that individual brands deviate significantly from Ehrenberg's 'averages'. In support of his proposition Light reports the results for two categories from Baldinger and Rubinson's (1996) study as shown in Table 6.

Table 6: Market Share and Share of Requirements.

	Share	Share of requirements
Category One		
Brand A	**43**	**63**
Brand B	**19**	**46**
Brand C	**7**	**46**
Category Two		
Brand A	**47**	**63**
Brand B	**18**	**62**
Brand C	**16**	**48**
Brand D	**11**	**42**

(Light, 1998)

Light points out that brands B and C in Category One have differing shares but a similar share of requirements. In Category Two, brands A and B have differing shares but similar share of category requirement; whereas brands B and C have similar shares but differing share of requirements. However, the failure to observe a double jeopardy pattern, that is a correlation with market share, could simply be as a result of the categories coming from a partitioned market.

The reporting of average fits as shown in Table 4 shows the Dirichlet provides largely unbiased estimates except for the noted exception of 100% loyal buyers. Conceptually, any large deviations will cast doubt on both the scientific and managerial usefulness of the Dirichlet and its predictions. On the other hand, criticism of the Dirichlet needs to be balanced. Even where the correlations between the observed and predicted values are not particularly high, and discrepancies between the observed and the predicted do occur, the real choice is between competitive models that are not any better – and may be much worse. According to Ehrenberg (1993a) there are no other reported models that offer a similar magnitude of prediction.

3.7 KNOWN DIRICHLET DEVIATIONS OR DISCREPANCIES

Given the parsimonious input requirements of the model it should not be surprising that there are a number of what appear to be systematic deviations or discrepancies. Ehrenberg et al. (1990) comment that when examining any apparent deviation the first course of action is to see if the deviation consistently occurs. They note that it is important to diagnose and interpret each deviation.

Ehrenberg et al. (2004) note that:

> "Given the large consumer panels that are used nowadays (e.g., 10,000+ households), many of the reported discrepancies from the model will be "significant" (i.e., not just a sampling error). Moreover, a 5% difference from an average buying rate of 3.0 as shown in *'Table 4'* – e.g., 2.8 or 3.2 will of

course matter in terms of sales. But the modelling goal here is not to predict the sales volume of individual brands – these are already known – but to elucidate market structure. Namely, how very similar the brands' average purchasing rates are in *'Table 4'* compared with the eightfold variation (800%) in their penetrations" (p. 1312).

Nonetheless some systematic discrepancies or deviations, other than the previously mentioned buying rates for the 100% loyals, have been reported. Barnard et al. (1994 and Ehrenberg et al. (2004) set out systematic discrepancies or deviations such as:

- The over-predicting of quarter-by-quarter repeat buying. This occurs by not allowing for the steady erosion of repeat buying observed over longish periods of time (Barnard et al. 1994; East and Hammond, 1996)

- The under-predicting of purchase frequencies for some high share brands (Ehrenberg et al. 1990; Fader and Schmittlein 1993; Reibstein and Farris 1995)

- The over-predicting of the number of customers who buy a brand more than once a week, for those brands that have a significant number of weekly buyers (Ehrenberg 1959; Chatfield 1967)

- The under-predicting of 100% loyal buyers, by up to a purchase or two (Ehrenberg 1988). Ehrenberg et al. (2004) state that while this is so far unexplained, "…the discrepancy usually varies relatively little from brand to brand (except with market share) and has not been of diagnostic (i.e., "differentiating") marketing value so far" (p. 1312)

- There are often too many 'medium' buyers, in a category or subcategory compared to 'light' and 'heavy' buyers. The actual distribution of buyers is a little 'flatter' than predicted by the Dirichlet.

According to Ehrenberg and Uncles (1999), most deviations are due to 'other' factors which are excluded from the Dirichlet's specifications. However, such discrepancies do not restrict the Dirichlet's use and attempts to improve the model have not resulted in any major gains to its predictive abilities or its parsimony. If anything they improve the scientific status of the model by giving it clearly identified and qualified boundary conditions. Such boundary conditions which are a feature of natural science conduct are rarely identified in the marketing literature (Uncles and Wright 2004). In terms of this thesis the main boundary conditions will be the under-predicting of sole loyal buyers and their purchase rates being expressed as each radio stations' exclusive audience and their time spent listening.

3.8 SUMMARY

The Dirichlet is a stochastic approach to the modelling of consumer behaviour. By making probabilistic assumptions about purchase incidence and brand choice the Dirichlet specifies the probability of consumer *a* making *n* purchases in a time period and which brand is bought for each of the *n* purchases. By aggregating these probabilities over all consumers the Dirichlet is capable of describing and predicting a number of aspects of aggregate consumer behaviour that are of interest to marketers.

A considerable number of markets have been analysed over the past 40 years and these markets have been summarised by Ehrenberg et al. (2004) as showing patterns consistent with the Dirichlet model.

The predictive power of the Dirichlet means the model has a number of practical marketing uses. These include auditing the performance of established brands, and predicting and evaluating new brand performance. The Dirichlet can also be used for checking the structure of unfamiliar markets, of partitioned markets and of dynamic market situations. In reality, the Dirichlet has been shown to provide theoretical benchmarks for assessing marketing mix decisions such as price promotions or advertising by considering one factor at a time. This is in contrast to a 'one size fits

all' marketing mix decision-orientated model (see Ehrenberg et al. 2000 and Leeflang and Wittink, 2000) common in marketing.

4 RADIO AUDIENCE MEASUREMENT AND THE NEW ZEALAND RADIO INDUSTRY

4.1 INTRODUCTION

There are a number of problems and issues with radio audience research that make it a relatively more complex and more difficult medium than either television or newspapers to measure. These radio audience measurement problems derive both from the role radio plays in people's lives, and the ability of people to recall their exposure to a radio station or stations.

This chapter starts with a discussion on the reasons for measuring radio audiences and then looks at the special nature of radio audiences as well as the problems presented in terms of measuring those audiences. It then introduces Twyman's (1994) seminal work on the range of methods and techniques that have been used to measure the size and composition of radio audiences before specifically looking at the organisation of radio research in New Zealand. Some comments are also offered on both the special nature of radio research in general and the effectiveness of a number of radio audience measurement techniques.

This discussion is followed by a brief overview and description of New Zealand's commercial, non-commercial and semi-commercial radio networks. The chapter next looks at recent research into radio listening. This includes such topics as: why people listen to the radio; radio listening loyalty and switching behaviour; and double jeopardy and radio listening.

The chapter concludes with a statement of this research's objectives and the associated propositions related to the New Zealand radio market.

4.2 WHY MEASURE A RADIO STATION'S AUDIENCE?

The question of radio audience measurement is important. A radio station with no audience is like a shop with no customers. So to show how radio may be an effective communication tool requires some form of audience measurement. Even publicly-funded and community radio such as the National/Concert Programme and Access Radio will have a significantly reduced probability of surviving if they attract little interest from their targeted audiences. Radio stations are also commercial entities which mean that without some form of listenership they are unlikely to survive.

There are also various groups that have a vested interest in obtaining regular access to information about radio usage and the size a radio station's audience. All radio stations, regardless of type, need to know how their 'products' are being used, and radio audience data represents one way of measuring such performance. Radio station owners also require this information for a number of reasons including guiding future business strategies, reaching decisions about the competence of their staff, and selling their organisation's services to clients such as advertisers and sponsors. On the other hand, these clients need to know whether their money has been invested wisely by assessing whether the selected station(s) have delivered the number of expected listeners.

At a managerial level radio station managers need to know how their station is performing in terms of both retaining and attracting new listeners compared to their competitors. When a new radio station has been launched or an existing one is being evaluated, station managers particularly need to know how well it has performed. Advertising scheduling, for instance, needs detailed information on the behaviour of listeners, including how often they switch between stations, the points at which they do so, whether they return to a station and whether they listen at regular times across the week and so on.

Such information can be used to judge performance within two distinct radio markets. The first market consists of the listeners to particular station(s). The second market

consists of advertisers to whom these stations hope to sell opportunities to communicate with their audience as consumers of goods and services. Station managers need to be able to convince such advertisers that their station(s) will reach a predictable audience in terms of both size and composition.

In turn advertisers need audience information in order to decide which station or combination of stations to use, how much to spend, what messages to convey, and when, where and how often to convey those messages. This information can then be related to advertising costs to determine the most cost-effective means of communicating with particular customers. Similarly, advertising agencies, media buyers and other specialists are often operating on behalf of such advertisers. These specialists also depend on detailed audience information so they can advise clients on the relative effectiveness of different stations or different radio schedules. This need for detailed information on audience composition raises the question of how radio listening is measured.

4.3 PROBLEMS WITH MEASURING RADIO LISTENING

Radio presents a number of problems in the measurement of its audiences. As mentioned previously Twyman (1994) is a seminal work on radio audience measurement and he has listed a number of problems. They can be summarised as follows:

- recall of radio listening tends to be difficult because of the way in which memory works;
- radio is a medium ideally suited to being used as an accompaniment to other concurrent activities with which it shares the listener's attention, e.g. driving a car;
- radio listeners tend to be mobile in that much of their listening takes place outside of their home and on radios not owned or tuned by the listener;
- radio programming tends to flow in a continuous fashion rather than being a series of discrete activities or unique broadcasts which presents a challenge to the zero order assumption of the Dirichlet; and

- radio is a highly fragmented and expanding – for instance most New Zealand markets can receive around 20 radio stations.

Many of these radio listening and programming behaviours work together to influence individual listener's recall of their radio listening experiences. Often listeners can only remember *when* they were listening by recalling *where* they were listening. For instance, if they were listening at home in the morning it could be station A, whereas listening at work may be to station B. However, if they were mobile at the time of listening, or someone else was tuning the radio this may prove difficult. A large number of stations existing within a market can also render memory of a particular station listened to at a certain time difficult to recollect. In most New Zealand marketplaces over 20 radio stations can be received. This fragmentation means that not only is recall difficult, but that the audience size of most of the stations tends to be small. This in turn restricts the scale of research that can be conducted with regard to sample size and frequency.

Traditionally all radio audience measurement involves some form of recall from memory although with the increased use, in the USA and Canada, of personal people meters the impact of memory recall is minimised. Nevertheless, New Zealand's most common of method of radio audience measurement is the radio diary and these are context related in that they ask listeners to recall when or where the listening event took place, the uniqueness of the event, whether the listening behaviour was habitual, or some combination of these elements.

Listeners often find it difficult to recall when they were listening because they tend to be mobile, radio programming is often continuous, and because listening is often casual rather than habitual. Similarly, the actual identification of the radio station to which the respondent has listened may be problematic. In support of that contention Twyman (1994) points out the in research undertaken by the Bureau of Broadcast Measurement in Canada (BBM) (1974-75) it was found that only 60% of those who reported they were aware a radio was switched on knew exactly what station they were listening to.

Furthermore, a station's listeners will comprise a mixture of people with different levels of involvement: there will be those who are involved and give their full attention to the station, those who have it merely as background music, those who specifically chose a station and those who did not because someone else turned a radio on. Many listeners will be engaged in other activities, doing housework, studying, talking, driving, decorating, shopping, reading newspapers and so on, while the radio station is broadcasting. All the roles that radio has, as a part of people's everyday lives, also impacts on listeners being able to accurately recall their actual listening.

Furthermore, as far as the content of a radio station's broadcasts are concerned, programming is, by design, relatively 'seamless'. Major changes to programming tend to happen only when there is a change of announcer – usually every three to four hours. This means that radio listening is not easily recorded into discrete segments as can be achieved with television viewing which tends to involve specific 30 or 60 minute programmes. Programme material, and music in particular, may sound closely similar to other stations with the only difference being the announcer(s).

Twyman (1994) sums these issues up by claiming that any combination of some or all of those preceding radio listening characteristics is likely to be present in any radio audience measurement. This means that much radio listening will not be uniquely recorded as a discrete event, but rather by the timing of the listening, by habits, or by programme content. This generally weak performance of recording listening occasions has major implications for the degree of reliance that may be placed on memory-based measurement. Nonetheless, within the New Zealand radio industry diary based research has been the dominant form of radio audience measurement for over 30 years.

4.4 RADIO RESEARCH METHODS

Historically there has been far less methodological research into the validity of radio audience estimates than has been the case of television - possibly because of the

smaller sums of advertising expenditures at risk but also because television arrived on the scene at the same time as radio research started to be undertaken. Plus most of the research has come primarily from North America, and unfortunately is now at least thirty years old. Radio research in the United Kingdom, Europe, Australia and New Zealand over, the past thirty years, has tended to follow and reflect the North American research (see de Haas 1991, Franz 1991, Brown 1992, Phillip 1993, Twyman 1994, and Robinson 2000).

Twyman (1994) listed several radio audience measurement research techniques and noted they all vary according to a number of key dimensions. They are:

- The criterion of 'listening' they impose
- How far they reduce co-operation bias and sample the entire population
- Their degree of reliance on unaided and unprompted memory
- The mode of data capture.

The "criterion of 'listening' imposed" refers to the oft quoted respondent's question of "How seriously do I have to have been listening for it to count?" The common definition of listening, and the one used in most New Zealand research, is: "That respondents are able to hear the spoken announcements being broadcast and so identify the station broadcasting" (Research International 2007).

Reducing co-operation bias and sampling an entire population can also be difficult. There is a tendency in all media research for those most accessible to research to be more accessible to the media. People will have an inclination not to participate in research about something they do very seldom (Webster, Phalen and Lichty 2006). It therefore becomes important in radio research to ensure that those who are likely to be infrequent radio listeners are encouraged to take part so as to cover as much of the population as possible and not be accidentally selective with a bias towards heavy radio consumers. Radio research based on low response rates can very easily suffer from co-operation bias; therefore the most important elements in any technique are (i) presentation of the task, (ii) the mode of sampling and (iii) recruitment of a panel.

The degree of reliance on unaided and unprompted memory can similarly affect radio audience measurement. When asking people about their listening, very different results have been achieved when the respondents are given lists of stations in their area compared with simply being asked to recall unaided what stations to which they listened (Brown 1992). Prompted lists appear to produce much more reported listening, as will the thoroughness of attempts to help respondents to reconstruct their day.

Finally, the mode of data capture can have a direct impact on reported findings. Twyman (1994) identified the most commonly used modes of data capture in radio listening research as:

- Systematic recall
- General habit questions
- Coincidental interviewing
- Diaries
- Recording devices.

The following sections will examine these modes in greater depth.

4.4.1 Systematic Recall

This technique involves asking respondents to recreate a previous time period and report what listening occurred. In this method respondents are asked to go through the previous day and identify the occasions and content of radio listening that took place 'yesterday'. Thus it is usually called 'day-after-recall' (DAR) and a day's data is obtained from one interview (Webster et al. 2006).

While interviews can be conducted by telephone, systematic recall tends, in the main, to be applied in face-to-face interviews. Franz (1991) commented that variations in this technique revolve around where and how the sample is contacted - and therefore what kind of sample is interviewed. He also went further noting results will differ where there are variations in the degree of prompting used, the effort made to reconstruct the previous day's activities, and the degree of station identification and description included in the survey. As can be seen not all "recall" studies are equivalent. Higher levels of listening will be generated where levels of prompting are

higher, the reconstruction of the day's listening is thorough and the criterion of 'listening' is loose.

4.4.2 General Habits

Questions can also be asked of respondents about when they usually listen to the radio and to what stations they usually listen to at those times. The results can then be expressed in terms of estimated frequency of listening to differing stations at differing times.

However, one major problem with this approach is that much radio listening is not based on habit that television viewing with its specific programmes is likely to be. The task for respondents being questioned about their general habits is to recap a whole range of casual events without being provided with the context or cues needed to reconstruct even a single day (de Hass 1991). While, *all* media habit questions are comparatively difficult for respondents to answer, they seem especially difficult for radio listeners as radio lacks the structure of habit provided by other media.

The above brief analysis suggests that there is a risk of underestimating radio listening by reporting general habits as casual radio listening which is a relatively high proportion of total radio listening. For media that are heavily habit-based, the reverse is likely in that in practice people do not quite complete the totality of what they regard as their general habits (Webster et al. 2006).

4.4.3 Coincidental Interviewing

Coincidental interviewing involves asking people about their radio listening "here and now" – at the moment of the interview. As Brown (2000) states "…any coincidental method eliminates reliance on memory, largely if not wholly…" (p. 202). Thus this technique appears appropriate for the measurement of in-home listening levels, but considerable effort would be required to sample car drivers (!!) Nevertheless, car drivers have been sampled at traffic lights in some North American studies (McDowell and Dick 2003). While coincidental interviewing is very expensive to be used on an ongoing basis it has a role as a yardstick or standard in methodological

research because answers are unaffected by memory problems, and are potentially verifiable at the moment of the interview (Webster et al. 2006).

4.4.4 Diaries

With radio diaries respondents are asked to keep a diary of their radio listening for a period of time - most frequently for a week (note: a fuller discussion on diary methods can be found in Brown 1992; Bolger, Davis and Rafaeli 2003). There are a number of techniques available for so doing. Diaries may be personally placed and collected, or either or both of these operations may be conducted by post. Telephone can also be used for recruitment followed by postal placement and retrieval of any diaries.

Diaries can vary considerably in terms of layout. They may have time scales to be ticked, or they may require entries to be made of the times of starting and finishing listening sessions. Stations may be printed for the listener to tick, or he/she may have to write in the station(s) to which the respondent listened. As a result, diary studies, like recall studies, may not necessarily be equivalent.

However, diaries do have a major advantage over systematic recall in that their format usually minimises reliance upon memory and helps reduce confusion over station identification. Nonetheless, they potentially run the risk that people more interested in radio are relatively more likely to co-operate than those who are not. On the other hand, the alternative hypothesis that heavy listeners could be deterred by the sheer volume of their task might also apply. Therefore, as noted by Webster et al. (2006) it is important to ensure that the co-operation of all types of listeners is maximised

The memory problem can be alleviated by diaries in one of two ways. First it is clearly possible for respondents to record at or near the time of the listening event, although in practice some diary-keeping in arrears is inevitable – most respondents complete their diary at the end of each day or every other day (Webster et al. 2006). Second, the fact of keeping a diary has the crucial effect of prompting awareness that radio listening is to be remembered and can be a prerequisite for the formation of memories.

Radio diaries are currently the dominant method of measuring radio audiences throughout the western world although Arbitron in the USA and BBM in Canada are slowly moving towards the adoption of recording devices.

4.4.5 Recording Devices

Radio metering was, in fact, used long before its application to television. The first radio meter patent was filed in 1929 in the USA (Patchen and Webb 2002). The Nielsen Radio Index ran from 1936 to 1964 and combined metered measurement of the tuning of a sample of sets with diaries to measure listeners per set and the demographics of the audience. The demise of the Nielsen service was due in a large part to the steady growth in car radios, the explosion in the number of transistors or small portables, and the rise in multi-set ownership. While technology can overcome some of these problems, the increase in inadvertent casual out-of-home listening (which has become increasingly important) creates further problems in accurately recording listening behaviour.

However, over the last fifteen years Arbitron (Patchen and Webb 2002) has developed a portable people meter (PPM). The PPM is an electronic measurement device that tracks what consumers listen to on the radio and/(or) watch on broadcast, cable and satellite TV. It works by detecting identification codes embedded in the audio portion of any transmission. Because the device is portable, it can capture and report the media exposure wherever the consumer happens to be. Therefore the PPM provides a near-passive record of the consumer's exposure to encoded media (Patchen and Webb 2002; Pellegrini and Purdye 2004).

Currently the PPM has been tested by Arbitron in both Philadelphia and Houston in the USA and by BBM Canada in Montreal. Arbitron is now 'rolling out' the PPM across all US markets while BBM Canada is planning a similar programme there. In the United Kingdom the Radio Advertising Bureau has commissioned a report (Pearlman 2005) with a view to introducing the PPM.

4.5 COMPARISON OF RADIO DIARIES AND PERSONAL PEOPLE METERS

As radio listening measurement shifts from the diary method to the PPM, comparisons are already being made between those two methods. Pellegrini and Purdye (2005) report a comprehensive analysis of radio audience data captured by Arbitron's PPM. The study compared the diary and PPM results for a common area, time period, and list of stations. It found differences in the overall amount of radio use, the distribution of radio use by time periods, the reach of radio, but little difference in the *shares* of the stations. Audience shares for the different stations were quite similar for both the diary and PPM. The correlation coefficient reported was 0.98, showing significant agreement. The rank order of the stations was also preserved. Nevertheless, it was clear that 'talk' stations as a group tended to have slightly lower audience shares with the PPM system than with the diary system.

In terms of cumulative audience, reach levels by station are also much higher with PPM than with the diary. It appears that PPM discovers more listeners (to stations) than the diary, but they listen less to each station than indicated by the diary. The study analysed the twelve radio stations with significant audiences (that is, those stations with a cumulative audience over 10%) finding the average listener spends (according to the diary) an average of 4.9 hours with each station to which they listen compared with 3.6 hours according to the PPM. A corollary of this is that PPM listeners appear to listen to more stations per week (4.7 on average) than diary listeners (2.2 on average).

This comparison also evaluated the average time spent listening to the radio as reported by both systems. The average diary respondent reported listening to the radio for 2.6 hours per day. The equivalent figure for the PPM panel was 2.0 hours per day. On the surface the PPM shows about 20% less listening in total than the diary. Arbitron's Houston and Philadelphia trials recorded a 30% lower time spent listening to the radio than the diaries recorded (Patchen and Webb 2002). However, both Patchen and Webb and Pellegrini and Purdye state these differences may be due to an important difference in definition. The radio diary collects information for each

quarter hour during the week. Respondents are asked to count themselves as listening to radio for a specific quarter hour if they listen for at least five minutes within it. They are then counted as having listened for the full fifteen minutes. Radio listening, according to the diary, is essentially an agglomeration of quarter-hour cumulative audience estimates - many of which may not have filled the entire period - as compared to PPM readings which are able to record a period of less than a full fifteen minutes more accurately. However, this difference is not irreconcilable.

PPM rules require that exposure be recorded on a continuous basis, and then summarised by the minute. In the case of radio a minute is labelled as "listening" if at least 31 seconds of exposure occur. Each "minute" (whether a full sixty seconds or not) is then counted as a full minute of listening. Pellegrini and Purdye simulated the diary definition of listening with the PPM data by counting a quarter hour as 'listened' to if the respondent was exposed to at least five PPM "minutes" of radio within that fifteen minute period. When this was done, the PPM and diary data became much closer: the average PPM panel respondent listened to 2.5 hours of radio per day, almost the same level as the diary.

The study concluded that compared to the diary, PPM shows radio with a high daily reach and less listening per listener. These differences can be traced to differences inherent in the two methodologies. The differences as to the definition of what constitutes radio listening used by the diary and the PPM may indicate that they are, at times, measuring different things and this is why they paint two different pictures of radio listening. Pellegrini and Purdye are currently testing that proposition by running two experiments in which the respondents use a PPM and diary simultaneously.

4.6 THE ORGANISATION OF RADIO RESEARCH IN NEW ZEALAND

As with most media research, techniques for measuring radio audiences are employed within continuous or regular research systems. This is clearly illustrated through the

development of radio research in New Zealand. Initially radio research was solely within the responsibility of the New Zealand Broadcasting Corporation (NZBC) until the introduction of private radio in the mid 1960's. As private radio stations expanded throughout the country the responsibility for radio research shifted from the Broadcasting Corporation of New Zealand (BCNZ), a government appointed successor to the NZBC, to the Radio Broadcasters Association (RBA).

The RBA is an incorporated society established in 1971, and represents most commercial radio stations, (both AM and FM), plus certain semi-commercial and non-commercial stations such as Radio Rhema. The RBA is responsible for tendering the contract to undertake independent surveys of radio listening. Since 1991 Research International has been responsible for providing these 'official' radio surveys. They are expected to be an unbiased, independent view of the radio audience in the form of ratings for each market, as well as giving a standard of measurement for the comparison of stations.

The surveys are conducted as diary-based quantitative research. The diaries are pre-printed with all known radio stations listed, and the twenty four hours of each day, Monday to Sunday, are divided into quarter hour segments. Two versions of each radio diary are used with the only difference being the order in which the stations are listed. This reversal of the station order is done to average out any station order bias in the survey. The diaries are placed within randomly selected households. The respondents need to be over 10 years of age and have to complete a diary of their week's radio listening. During that week respondents have to indicate the radio station they listened to for each period of 8 minutes or more. The definition of listening is "that respondents are able to hear the spoken announcements being broadcast and so identify the station broadcasting" (Research International 2007). Each respondent is contacted at least once throughout the week to ensure the instructions were clearly understood and that there are no problems. Table 7 shows the frequency and sample size of the surveys in each geographic market.

Table 7: New Zealand Radio Research: Survey Frequency and Sample Size in each Market

Market	Frequency	Sample Size
Auckland	Bi-Annually	3000
Waikato	Bi-Annually	1500
Wellington	Bi-Annually	1500
Christchurch	Bi-Annually	1500
Dunedin	Bi-Annually	1000
Northland	Annually	1000
Tauranga	Annually	1000
Rotorua	Annually	800
Hawkes Bay	Annually	1000
Taranaki	Annually	1200
Manawatu	Annually	1000
Nelson	Annually	800
Southland	Annually	1200

(Research International 2005)

Age, gender, occupation, ethnic origins, personal and household income are collected from all members of the household within which a respondent resides. The survey data is then weighted by age, gender and geography based on Statistics NZ Census data to ensure the sample is representative of the New Zealand population. The information collected is then (with the respondent's listening habits and lifestyle) loaded into Research International's database for cross referencing and the analysing of radio audiences.

While there is an understandable (in light of the preceding discussion) debate within the New Zealand radio industry about the techniques used to collect this radio audience data, Research International claims that its methodology gives the closest approximation of actual listening behaviour available.

4.7 SUMMARY – RADIO AUDIENCE MEASUREMENT

The nature of radio as a medium and its greatest strength, being receivable in a wide variety of contexts, makes it difficult to research. The increasing number of stations,

together with further extensions to the variety of reception modes, causes problems for both systematic recall and diary research methods. In the context of radio audience measurement, the nature of the behaviour at the time of listening leads to poor memorisation of listening events, so that recall-based techniques may lead to under-estimation and to biases favouring relatively salient stations. 'Coincidental' measurement, contemporaneous with actual listening, largely eliminates recall difficulties but is likely to be too costly for other than methodological research.

As for any data collection instrument, the value and utility of self-completion diaries are not absolute and invariant. They are heavily dependent on context; the main considerations being the nature of the behaviour being studied; the complexity and size of the respondent's task; the practicality of adequately explaining the task and prompting its completion. With diaries contact can only occur when the diary is placed, so any ongoing motivation and the success rates of diary placement/completion - as well as the return of correctly completed diaries - must be areas of ongoing concern.

It is possible that new techniques will be needed to deal with these problems of radio audience measurement. One such possibility is a reasonably in-depth interview to establish which stations are listened to by each respondent followed by a specially created diary using stick-in station headings. Such a diary is currently being used experimentally in the USA, and only preliminary results have been published. The initial data appears to show different lengths of listening from that currently produced through the existing diary system However, the data is currently being validated so this technique cannot be considered ready for use by this study.

Another eventual possibility is the PPM system which is designed to detect and record radio frequencies to which the respondent has been exposed. This technology has been tested in the USA and in Canada, and is now fast becoming the dominant radio audience measurement system in those countries. Studies comparing the diary and PPM systems indicate that the PPM system shows radio with a high daily reach and less listening per listener. Unfortunately, since this system is not now available for use within New Zealand, it could not be considered for use within this study.

All of the preceding considerations greatly shaped the choice of methodology considered appropriate by this researcher. This shall be discussed further in later chapters. However, it is now appropriate to consider the New Zealand radio industry.

4.8 NEW ZEALAND RADIO INDUSTRY

The current New Zealand commercial radio environment stems from the passing of the Radio Communication Act 1989 and the Broadcasting Act 1989. Shanahan (2000) argued those acts have made the country arguably one of the most deregulated media environments in the world. In the 15 years from 1989 the New Zealand radio industry expanded dramatically with a significant increase in the number of stations throughout the country. In 1984 New Zealand had a total of 91 radio stations, of which the Broadcasting Corporation of New Zealand (BCNZ) controlled 65 both commercial and non-commercial, 22 stations were in private commercial ownership, and four were private non-commercial stations (Pauling 1994).

In the four years following July 1990 the Ministry of Commerce, released over 230 frequencies for tender bringing the total number of available radio frequencies for broadcast in 1994 to 325. Not all of these frequencies went into immediate use as many were bought for future utilisation and some for a quick return on investment. Moreover, the purchase of those new licences did not necessarily mean new stations, as many existing AM programmes were shifted to/or broadcast simultaneously on both AM and FM. nonetheless, by the mid 1990s the number of frequencies available had increased by 360% between 1989 and 1994.

The Ministry of Commerce continued to release licences so that by late 1998 New Zealand had more radio stations per capita than any other country in the world (Story and Brown 1999). In early 1999 there were 404 separate frequencies in use around the country (Day 2000). Just after the turn of the millennium the government released frequencies in the upper FM band between 101 and 108MHz. While many were reserved for non-commercial and minority interests, numerous frequencies were made available for auction. Shanahan and Duignan (2005) showed that a search of the

Ministry of Economic Development's Radio Frequency Register revealed close to 800 frequencies allocated nationwide for traditional radio broadcasting, with FM frequencies outnumbering AM frequencies by over three to one (See Table 8 below).

Of these 800 frequencies, around 50% were fully commercial and close to 20% had some form of commercial component. In addition the Ministry of Economic Development still holds around 50 further frequencies, but has no clear schedule for auctioning them at present. As Shanahan and Duignan (2005) argue, New Zealand has become one of the most competitive radio environments in the world. In the mid 1990s there was one radio station for every 12,000 New Zealanders, a ratio that rose to 1:5,250 by 2004. In 2006, the Manawatu market ratio was 1:4,650. This can be compared with markets such as Seattle that has a ratio of 1:50,000, Sydney 1:250,000, London 1:350,000.

Table 8: New Zealand Radio Licences in the AM and FM Sound Radio Spectrum by Owner and Number Owned in March 2004

Owner	AM	FM	Total
The Radio Network (TRN) (Commercial)	**57**	**100**	**157**
CanWest Global (Commercial)	**17**	**130**	**147**
Radio New Zealand (non-commercial)	**32**	**46**	**78**
Rhema Broadcasting (religious/part commercial)	**37**	**40**	**77**
New Zealand Racing Board (racing)	**1**	**36**	**37**
Port FM (commercial)	**1**	**17**	**18**
Radio Bay of Plenty (commercial)	**3**	**9**	**12**
Others (mostly no or restricted commercial content)	**30**	**237**	**267**
Total	**178**	**615**	**793**

Ministry of Economic Development (2004)

4.9 THE NEW ZEALAND COMMERCIAL RADIO MARKETPLACE

Today the New Zealand Radio marketplace is dominated by two major operators – The Radio Network (TRN) and CanWest MediaWorks (RadioWorks). TRN operates eight different network brands: Newstalk ZB (26 stations), Classic Hits (26 stations),

Radio Sport (20 stations), Radio Hauraki (13 stations), Easy Mix (4 stations), ZM (18 stations), the Coast (10 stations) and Flava (2 stations). RadioWorks also operates eight national networks: The Edge (20 stations), Radio Pacific (18 stations), The Rock (19 stations), Solid Gold (21 stations), More FM (21 stations), Radio Live (19 stations), Kiwi FM (3 stations) and The Breeze (6 stations). In addition, iwi-controlled Mai FM networks to several North Island markets, and the Pan Pacific broadcast network, Nui FM, covers close to 90% of the country with a network targeting Pacific peoples. All of these networks are Auckland based and with the exception of; More FM, The Breeze, and Classic Hits; broadcast near total programme content from offices and studios in Auckland. For More FM, The Breeze, and Classic Hits the programme elements are predominantly determined in Auckland but their local outlets still provide local presentation of material – usually a 6am to 9am breakfast show.

In 2007 TRN and RadioWorks acquired the vast majority of audience share and advertising revenue and tend, at times, to operate as a duopoly with the positioning of their eight brands in almost direct competition with each other as shown in Table 9.

Table 9: Competing New Zealand TRN and RadioWorks Brands

TRN	RadioWorks
Newstalk ZB	**Radio Live**
Classic Hits	**More FM**
Radio Sport	**Radio Pacific**
Radio Hauraki	**The Rock**
Easy Mix	**The Breeze**
ZM	**The Edge**
The Coast	**Solid Gold**
Flava	**Kiwi FM**

4.9.1 The TRN Brands

TRN is a major player in the New Zealand radio market. The Company owns a total of 120 radio stations operating in 26 markets across New Zealand. TRN is a wholly owned subsidiary of Australian Radio Network (ARN). The shareholders in ARN are Clear Channel Communications, USA and APN News & Media. TRN is also joint

venture partner in The Radio Bureau, which represents almost all of the radio industry to advertising agencies and their clients.

TRN's major brands are: Newstalk ZB, Classic Hits, Radio Sport, Radio Hauraki, easy Mix, ZM, The Coast and Flava.

Newstalk ZB

Newstalk ZB is promoted as New Zealand's premier source of news and information. Broadcasting in 26 markets throughout New Zealand, Newstalk ZB reaches over 420,000 listeners nationwide, mainly over the age of 35. The network's format can be described as primarily talk radio providing news and information.

Classic Hits

Classic Hits is promoted as New Zealand's premier adult music station. It broadcasts in 26 markets throughout the country reaching over 380,000 listeners every week. The network plays the music from the 70's 80's 90's, with a strong appeal to 25 to 55 year olds.

Radio Sport

Radio Sport is New Zealand's only totally dedicated sports network. Radio Sport is in 20 markets throughout the country and reaches over 193,000 listeners every week, but with a heavy male skew. Radio Sport basically operates a talk format but with a heavy sport emphasis.

Hauraki

Over 30 years ago, a group of 'radio pirates' ignored government warnings and started broadcasting illegally from the Hauraki Gulf. Since then, Radio Hauraki has become an institution broadcasting in 13 markets across the country. Radio Hauraki is New Zealand's original classic rock station – reaching over 219,000, typically 25 to 50 year olds and mostly male, listeners every week.

Easy Mix (formerly Viva)

Operating in just four markets, Easy Mix is a distinctly female focused station targeting woman in the 30 to 54 age group. Its format can be described as 'easy listening'.

ZM

ZM is a young adult music station playing 'Today's Hit Music'. Targeting the 18-39 age brackets and broadcasting in 18 markets throughout the country, ZM reaches an average 349,000 listeners every week. The ZM format can be described as 'adult contemporary'.

The Coast

The Coast broadcasts in 10 markets, targeting the 40-59 age group - the people typically called the "Baby Boomers". The station brands it music as "timeless music by timeless artists", or a golden oldie format.

Flava

Flava's format is Hip Hop, and Rhythm and Blues. The station broadcasts in just two markets targeting what it calls the 'Urban' consumer- a radio term that is used to describe the City - (Caucasian, Maori and Pacific Island) people, under 35, who identify with a metropolitan and cosmopolitan culture.

4.9.2 RadioWorks Brands

RadioWorks has a network of eight brands on 140 frequencies throughout New Zealand, with every network targeting a different audience. RadioWorks also encompasses the Radio Live News and Sports service. Of those eight brands, six are Network Brands - The Edge, Kiwi, The Rock, Solid Gold, Radio Live and Radio Pacific. They operate centrally from premises in Auckland with the network programmes being distributed to each geographic location. The other two brands (More FM and The Breeze) are what RadioWorks calls local radio product, meaning they have a degree of 'local' content.

The Edge

The Edge broadcasts into 20 markets, targeting the 10-29 age demographic and reaches an average 420,000 listeners. The networks' format is described as 'Top 40 contemporary'.

Kiwi FM

Kiwi FM was the first 100% New Zealand music station. It plays a unique blend of brand new local music combined with old classic kiwi favourites. Broadcasting in three markets it targets the 15 to 49 age bracket.

The Rock

The Rock targets all people 20-44 years old with a male bias, and broadcasting in 20 markets reaches an estimated 348,000 listeners. As the name suggests the station's format can be described as 'rock music'.

Solid Gold

Solid Gold operates in 21 markets playing predominantly 'hit' music from the '60s and '70s. It is aimed at the 40-54 age demographic and reaches around 201,000 listeners.

Radio Live

Radio Live targets a 35-54 year old audience providing local, national and international news. Broadcasting into 19 markets Radio Live's format is described as news, talk and information.

Radio Pacific

Radio Pacific is one of New Zealand's oldest radio brands. Radio Pacific is a dedicated and focused TAB racing and information station broadcasting throughout the country into 18 markets. During racing hours, Radio Pacific takes on the brand, Radio Trackside whilst during non-racing hours Radio Pacific provides a blend of music, information and entertainment.

More FM

More FM is live, local radio with an 'adult music' format targeting the 25-44 year old female. More FM broadcasts in 21 centres throughout New Zealand with local announcers and is positioned as the only truly local radio station in town.

The Breeze

The Breeze targets the 35-54 year old female with a blend of 'Easy Listening' music. The network reaches an estimated audience of 146,000 across 6 markets.

However, competing alongside the two major commercial networks for the radio listening audience are two non-commercial and semi-commercial networks - Radio New Zealand (non-commercial) and Rhema Broadcasting (religious/part commercial).

4.10 RADIO NEW ZEALAND – PUBLIC SERVICE RADIO

4.10.1 Overview

Public broadcasting had its beginnings in 1925 when, under a five year contract, the government granted the Radio Broadcasting Company substantial income from radio dealers' licences and 25 shillings from each receiving licence on the condition that the company expand the four existing stations in the main centres to establish a national non-commercial broadcasting system, the direct forerunner of today's Radio New Zealand National.

However, company income was insufficient to meet the demands for expansion and in 1931 legislation was passed establishing a government appointed New Zealand Broadcasting Board which was also dependent on licence fee income. In 1938 radio became a department of state and operated both non-commercial and commercial radio stations. It remained a government department until 1962 when, following the introduction of television, broadcasting (both radio and television) was made a Crown Corporation. Radio was part of the many guises of that corporation until it was set up as a state-owned enterprise on its own in 1998. During the period of reform prior to the sale of the commercial stations the non-commercial networks were distinguished from the commercial arm by being branded as New Zealand Public Radio. In 1995 legislation established Radio New Zealand (RNZ) as a Crown-owned company with legislative obligations, a charter and compliance obligations to the broadcasting funding body, New Zealand On Air, from which it receives most of its income. RNZ currently consists of two networks, Radio New Zealand National and Radio New Zealand Concert.

4.10.2 Radio New Zealand National

Radio New Zealand National broadcasts 24 hours a day and covers almost all of the country. Its programme mix includes news and current affairs, documentaries and features, drama and music; claiming at least 33% of the music it broadcasts is New Zealand in origin.

Talk-orientated programmes make up 60% of the air time with Radio New Zealand National being relatively well known for its high profile programmes; Morning Report, Nine to Noon, Midday Report and Checkpoint. Alongside the main programmes specialist features and documentaries focus on the interests of particular groups within the wider community.

In most marketplaces Radio New Zealand National simulcasts its programme on both AM and FM. This enables the company to meet its obligation to broadcast all sittings of Parliament, which it does on its AM frequencies.

4.10.3 Radio New Zealand Concert

Radio New Zealand Concert is the fine-music network broadcasting mainly classical music, plus specialist programmes covering jazz, contemporary and world music. Music comprises 85% of its air time.

Radio New Zealand Concert features music news and interviews, and actively promotes New Zealand music and composition providing an important showcase for the best of the country's performing artists. Its specialised production department commissions work from New Zealand musicians and composers, and initiates a wide range of music programmes. The station also delivers live broadcasts of concerts and recitals of both New Zealand and visiting international artists. Radio New Zealand Concert also features international programmes selected from commercial recordings and public radio broadcasts overseas.

4.11 RHEMA BROADCASTING GROUP

The Rhema Broadcasting Group is a Christian based radio network that has been broadcasting since 1978. As well as running a television network (Shine Television) the Rhema Broadcasting Group also operates three radio networks: Radio Rhema (34 stations), Life FM (24 stations) and Southern Star (16 stations). Each network broadcasts a similar type of religious programme targeting different age groups. Radio Rhema targets 25 to 55 year olds, Life FM the under 40s and Southern Star the over 50s.

One of the main reasons behind the plethora of competing networks and programme formats is the basic belief that people listen to the radio for a range of reasons. This is reflective of the heterogeneous nature of consumers in that they are all different in their purchase patterns, their likes and their dislikes, and their reasons for undertaking certain behaviours. This chapter now provides a brief overview of recent radio research and of the differing reasons why people listen to the radio.

4.12 RECENT RADIO RESEARCH

4.12.1 Why do People Listen to the Radio?

New Zealand radio listening figures for the past decade show that in excess of 90% of all people 10 years of age and older listen to a radio station at some stage during any given week (Research International, 2007). Many radio professionals attribute this to the fact that radio provides entertainment, music, information, personalities and contests (Shanahan and Brown, 2002). However, Alasuutari (1991), and Shanahan and Brown (2002) also argue that for some listeners their needs are more intrinsic.

Various reasons for listening to radio have been offered; the avoidance of feelings of isolation or loneliness (Fornatale and Mills 1980), to create a feeling of involvement and participation (Crisell 1986, 1994), or fulfilment of a need to stimulate one's imagination (Douglas 1999). In fact listeners themselves have implied their relationship with radio is deeper by using words to describe radio as: a friend, companion, secure and intimate (listeners' comments as cited in Radio: The Power of

Sound 1994). MacFarland (1997) adds further rigour to this argument suggesting that radio listening is more than just music, news and entertainment. He suggests it is about relaxation, excitement and fantasies, and these factors are among the underpinnings of human compulsion and goes on to argue that these pleasures are not the by-products of radio listening, but "They are the product" (p 43). MacFarland suggests that the real reason people tune into radio is the satisfaction of at least one of these basic human pleasures. Shanahan and Brown (2002) support MacFarland's contentions and go further arguing that radio listening is also a reflection of Maslow's Hierarchy of Basic Human Needs.

However, as Bass (1974) argues - even though behaviour is caused, the reasons for that behaviour are many and they may occur with an unpredictable frequency, so that, in practice, the process is effectively stochastic. Bass went on to say:

> "The most fundamental question that can be asked about consumer choice behaviour, … is whether that behaviour is at least partially stochastic or whether, in some fundamental sense, there may exist causes and explanations for all behaviour. …At some point, however, the distinction between an explanation based on objective and reproducible evidence and an explanation based on subjective conjecture becomes a distinction between an explanation and no explanation at all. To the extent that there is a stochastic component in behaviour, it is no more possible to provide an explanation for that component than it is to provide an explanation for the outcome of the toss of a coin" (1974, p. 1).

Therefore this thesis does not seek reasons why people listen to the radio but investigates the actual behaviours of those listeners to see if there are any patterns to those behaviours. In other words it asks whether the empirical generalisations, mentioned in Chapter Two that apply to both fast moving consumer goods and industrial products, also apply to radio listening. However, before considering those empirical generalisations it is appropriate to consider some studies into radio switching behaviour and double jeopardy in radio listening.

4.12.2 Radio Listening Loyalty and Switching Behaviour

In large markets where dozens of radio stations compete for the same target audience listeners often find that several stations broadcast very similar programmes and that one station could be easily substituted for another (Alexander 1997). This has meant that radio station managers, in an attempt to develop station loyalty, have introduced a myriad of marketing tactics such as contests, promotions, celebrity guests, and advertising in other media (Buchman 2002).

From a business perspective, Alexander (1997) maintained that the primary goal of radio programming is to maximise the size of an audience targeted by advertisers and the only way to accomplish this goal is to satisfy the needs and wants of the target audience. 'Uses and gratifications' has been a popular mantra to understanding audience motivations for tuning to a radio or television station. The underlying presumption is that audiences are not passive non-judgemental receivers of media but are instead active seekers of programme content that will satisfy specific needs. From practical considerations, such as wanting information about traffic congestion or the weather forecast, to more abstract psychological desires, such as relief from emotional stress, listening patterns may be determined by each person's expectations of how well different media or programmes will gratify their needs (Rubin and Perse 1994).

Therefore, in many respects radio listening can be compared to retail consumer behaviour. That is, audiences 'consume' certain brands of media content in a manner similar to the way people consume branded packaged goods. The concepts of audience gratification and consumer satisfaction are essentially synonymous. As mentioned previously, faced with unprecedented competition and fragmenting audiences, radio broadcasters in the 1990s began to embrace the concept of brand management (Belamy and Troudt 2000; Buchman 2002; McDowell and Batten 1999; Dickey 1994). In 1998 an editorial in the American magazine 'Broadcasting and Cable' proclaimed, "…branding is threatening to supplant 'synergy' or convergence' as the queen bee of … buzzwords" (Editorial 1998).

During this same time period we began to see media marketers and the trade press refer to the various networks as brands with references to branding, brand identity,

brand image, brand loyalty, brand extensions, and – the most muddled of brand management notions, brand equity. Keller (1998) talks about successful brands being brands that are 'positioned' in the consumers' mind and brands that are 'substitutable' in that they can be substituted for another without any discernable change in consumer satisfaction. McDowell and Dick (2003) took this audience-based brand theory perspective and explained radio switching through "three simultaneous processes:

1. Dissatisfaction with the expected content provided by a particular brand of station

2. Knowledge that there are alternative brands offering highly similar content that may be more satisfying

3. A predisposition that these alternative brands can be substituted readily with no substantial risk" (p.49).

However, the notion of 'substitutability' does create a problem for radio station managers in that most radio programmes are a single programme - whether that is a segment (breakfast, drive time) or a 'show' centred around a particular host. While this facilitates the welcoming of new listeners at any time, it also means listeners can leave at any time. Unlike most television programming, radio programming permits listeners to move about the programming landscape without the risk of losing a 'storyline'. This notion of substitutability has led researchers (McDowell and Dick 2003; Abernathy 1991) to look specifically at why listeners change stations and in particular why listeners change stations when driving cars. However, that research looks at switching between stations from the perspective of maintaining or enhancing listener loyalty rather than from the perspective of the duplication of purchase law – a focus of this research.

As mentioned previously, one question addressed by most radio researchers is 'Why do people change stations?' In most medium to large radio markets several stations compete for the same target audience. Listeners find that, in terms of format, one station can be substituted easily for another (Newton 2003). Typically, audiences tune back and forth among an array of acceptable stations. Television researchers

(Barwise, Ehrenberg and Goodhardt 1982; Barwise 1986) refer to this predetermined set of media choices as a person's 'channel repertoire', but the notion can also be applied to radio. The assumption here is that the listener is aware of acceptable alternatives and may abandon one media outlet for another (Ferguson and Perse 1993). However, switching between stations may not be undertaken as a personal preference. There may be an inability to change stations due to a specific situation (e.g. workplace) or due to someone else selecting a station (e.g. family member). This means some listening may be 'forced' rather than chosen. Looking exclusively at radio listener behaviour McDowell and Dick (2003) found that listeners reported switching stations (when driving a car) an average 3.5 times within a typical quarter-hour time span. Their findings substantiated an earlier study by Abernathy (1991) who discovered considerable switching among his respondents. The results of those studies indicate that people are aware of alternatives in the radio marketplace. However, one could also assume that the perception or awareness of alternatives is not uniform across radio stations and formats.

From both a theoretical and practical perspective, this switching behaviour illustrates a branding problem. Keller (1998) said some of the fundamental principles of consumer based brand equity apply to radio marketing, that is the ultimate goal of a radio station manager is to maximise brand equity among audiences by cultivating favourable, strong, and unique brand associations to persuade listeners that a particular station has no equivalent brand substitutes on the radio dial. Branding is designed to discourage the perception of alternatives. In an effort to cultivate brand loyalty radio managers have undertaken a number of promotional tactics designed to attract and hold listeners (Buckman 2002; Dickey 1994). Perhaps the issue that radio station managers need to consider is not the question of loyalty, but rather each listener's share of category requirement that the radio station meets.

4.12.3 Double Jeopardy Effect in Radio Station Behaviour

The relationship between a brand's market share and its loyal customers has been an area of interest for both academics and practitioners for many decades. As mentioned previously, amongst the many empirical generalisations that have been discovered, one of the most consistent is double jeopardy (McPhee 1963; Ehrenberg et al. 1990;

Fader and Schmittlein 1993; Ehrenberg et al. 2004). Originally noted by McPhee (1963) this phenomenon shows that smaller or less popular brands have fewer customers with fewer repeat purchases and fewer solely loyal buyers than bigger or more popular brands. This phenomenon has been observed across dozens of product categories in several countries, including United States, Great Britain, Japan, Australia and New Zealand (Ehrenberg et al. 2004).

The underlying psychology for this phenomenon is that double jeopardy will arise whenever competitive brands differ in popularity (e.g. market share or penetration). The power of simple brand familiarity, sometimes referred to as brand awareness, brand saliency, or mere exposure, has not been lost on researchers in marketing and advertising. Many studies (see Hoeffler and Keller 2003) have found that the most potent motivator for a brand purchase, particularly in situations of consumer uncertainty, is simple but overwhelming familiarity. Ehrenberg maintains that the key measures of brand performance, such as repeat buying and consumer loyalty, are direct functions of market share. As a result Ehrenberg said "there are no such things as 'strong' and 'weak' brands. There are only big brands and small brands" (Ehrenberg et al. 1997. p. 1). Other researchers maintain that this position is too rigid and that big brands don't become big brands by accident. Instead they enhance their market share by building brand equity. In particular, Chaudhuri (1995) provided an argument that double jeopardy theory and brand equity theory are far more alike than they are different, with each using consumer brand loyalty as its most obvious behavioural outcome.

Regardless of the attitudinal underpinnings, one common observation from the literature on double jeopardy is that the empirical evidence and resulting theory imply that - in terms of buyer behaviour - market share drives loyalty and not the reverse. When considering the two main marketing strategies for increasing market share – attracting more customers and increasing repeat buying by existing customers – the first option seems the most effective. Ehrenberg et al. (1990) concluded after studying numerous double jeopardy studies, "There is no convincing evidence of marketing strategies that have yielded large increases in average purchase frequency of a brand without concurrently increasing the number of individual customers" (p. 3). That is, strategies designed exclusively to encourage repeat buying from an existing customer

base seldom work. Instead, successful marketing strategies primarily aimed at attracting more customers – typically stealing them away from the competition in a zero sum market – are the most efficient means of increasing market share. Furthermore, as market share approaches a certain level (or threshold) repeat buying also begins to rise - thus contributing even more to the firm's bottom line.

This double jeopardy effect has also been revealed within the area of media consumption (Barwise and Ehrenberg 1988; McDowell and Dick 2005; Beal, Barwise and Collins 2004) and specifically in the United Kingdom where Ehrenberg et al. (1990) found that less popular newspapers were not only read by fewer people, but were also read less frequently by those who did read them. Correspondingly, those papers with a higher circulation (higher market share) were read by more people who also read them more often. Double jeopardy has also been found among television programmes; Barwise and Ehrenberg (1987) found that higher rated prime time series generated greater repeat viewing than lower rated programmes. Following the double jeopardy pattern less popular television programmes were viewed not only by fewer people but also less frequently. It is interesting to note that those studies defined audience loyalty as weekly or daily repeat viewing of individual programmes.

However, one possible exception to finding a double jeopardy effect within radio could be the highly fragmented nature of the radio market especially the number of formats and supposedly narrowly targeted audiences. Ehrenberg et al. (1990) suggested that the double jeopardy effect might not be as strong in a niche marketing environment, but to date there has been no empirical work investigating that proposition.

Unlike television, the radio industry has a long history of coping with numerous competitors in the market place. In New Zealand the television networks had throughout the 70s, 80s and 90s, enjoyed an effective two-network oligopoly, while the Ministry of Commerce has issued hundreds of licences to new radio stations. In the last two decades the number of radio stations has increased from fewer than 100 to almost 800. In order to survive in such a competitive environment radio operators cultivated what they called niche programming, where the aim is to cater to the tastes of a relatively narrow audience segment (Keith 2004; Tankel and Weymouth 1998).

Along similar lines, Dimmick (2003) offered an appropriate theory of the niche as a means of explaining modern media competition and coexistence. In its most succinct form, the theory maintains that, for a media business to survive and prosper, it must adapt and evolve through its marketing environment. Furthermore, a niche is fundamentally a relationship between an individual element and its surrounding "population". Although this population can be biological, sociocultural, or economic (such as a radio market), the common dynamic is the competition for scarce resources. The ultimate goal is to develop a niche that thrives without exhausting itself from fighting too many competitors for the same limited resources. The lesson to be learned is that media businesses exist and persist over time despite what often seems to be intense competition for resources (i.e. audiences and advertisers). A basic premise is that niche similarity leads to competition, whereas niche differentiation leads to coexistence.

Along the same lines as Dimmick (2003), radio stations have attempted to differentiate themselves to avoid pure head-to-head competition for the same target audience. This view is endorsed by the New Zealand radio industry's second largest player (116 stations), which supports that contention when it informs intending advertisers that:

> "Radio in New Zealand is actually very well niched and when matching your target market to the networks available the choice or combination of networks to choose from becomes quite straightforward." (The Radio Network 2006).

The most conspicuous means of ensuring or expressing this differentiation (i.e. niche) has been through programme formats. Depending on whom one talks to in the radio industry radio formats are broken down in dozens of different categories ranging from classical to classic hits, from heavy metal to easy listening, etc. The idea is that these different categories appeal to different demographic groups. However, Nelson-Field et al. (2005, 2007) found that in the New Zealand radio market, on average more than half of a radio station's listeners came from outside of their identified target market. Nonetheless it seems plausible that programme format might exercise a moderating influence on the double jeopardy effect.

In two studies of radio listening McDowell and Dick (2001, 2005) defined loyalty as audience retention over time, comparing ratings turnover (cumulative audience divided by average quarter hour) over multi-hour day parts. In their 2005 study McDowell and Dick found evidence of double jeopardy using their measures of loyalty. Their findings suggested that audiences consolidate their listening towards the more popular station. They cite a radio programme director of a classical music station who was reported to have said "At first we thought we attracted a small but loyal audience, but after looking at the research, we concluded that our audience was just small" (p. 281). It is also important to note that McDowell and Dick claimed that programme format was an important intervening variable in assessing the importance of double jeopardy. However, they did not look at switching between stations and whether there was, based on the duplication of purchase law, any format-based or genre-based partitions in the marketplace. This thesis also reports research into double jeopardy conducted before McDowell and Dick (2005) and previously discussed in Lees (2003). Lees (2006) further discussed double jeopardy in New Zealand radio listening.

Nonetheless while double jeopardy is evident in radio listening patterns, there have been no studies that have considered whether the Dirichlet's broader empirical regularities also apply to radio listening patterns. This research also addresses that question.

4.13 RESEARCH OBJECTIVES

Based on the previous discussions covering stochastic modelling and the assumptions and applications of the Dirichlet model of consumer behaviour this research has the following primary question:

- Do the market regularities or empirical generalisations that apply to both fast moving consumer goods and industrial products also apply to radio markets -

and can they be predicted by using the Dirichlet model of consumer behaviour?

In addressing that primary research question a number of propositions have been developed. These are:

1. That the different measures of brand performance; cumulative audience, sole loyals, and average listening time, will all vary with market share showing a double jeopardy (DJ) trend. The correlations will be in line with market share in that a small station will have fewer listeners, fewer loyal listeners and the listeners will listen for shorter periods than larger stations.

2. That the 'average purchase rates' or the average number of quarter hours that a listener listens to a particular station will be similar for all stations. However, a small DJ trend is also expected with those stations having a lower market share also having a smaller average time spent listening.

3. That each radio station's share of each listeners' listening requirement, will not only be low, but like average listening occasions, be much the same from station to station, other than with a small DJ effect. It is also expected that each station's listeners, on average, will listen to other stations more often. This is because listeners - like customers from FMCG - buy from or listen to a repertoire of brands or stations. To rephrase Ehrenberg's line 'Your listeners are really other people's listeners who occasionally listen to you".

4. That listeners are very heterogeneous in that typically only a few of a station's listeners listen to that station often; most will listen to it infrequently.

5. The percentage of listeners being loyal to just one radio station will reflect the Dirichlet's expectation of low sole loyals. (These sole loyals should also reflect, albeit slightly, a DJ pattern with the bigger stations having more sole loyals than the smaller stations.)

6. That audience duplication between radio stations will vary according to each station's market penetration, in accordance with the Duplication of Purchase Law.

Answering this research question and associated propositions will provide radio station managers with information describing their market places and how their station performs relative to other stations. This information will give a benchmark against which marketing activities can be measured, including promotions and advertising campaigns, as well as product development and market development strategies. Above all, given the competitive nature of the New Zealand radio market, addressing this research question will assist station managers to put in place strategies that will in the words of Ehrenberg and Uncles (1999) "hold one's own against one's competitors: Running hard to stand still".

5. METHODOLOGY

5.1 INTRODUCTION

The previous chapters have provided the context for this thesis by addressing the Dirichlet's assumptions and applications as well as issues involving the measurement of radio audiences. This chapter builds on those chapters but its aim is not as broad, only drawing on the academic literature when required to illustrate specific issues and to support methodological choices.

After this brief introduction it describes how the study (Pilot Study and main study) was conducted, (research instrument, procedure, and sample), the limitations of the research design and the reliability of the instruments used - all in preparation for the data analysis which follows.

5.2 RESEARCH INSTRUMENT

In order to test whether the empirical regularities underpinning the Dirichlet apply to radio listening and whether there are any deviations from those regularities, it was necessary to collect data on radio listening behaviours. The chosen method was through diary-based quantitative research.

As shown in the previous chapter, there are considerable variations as to how radio listening data can be collected, and both strengths and weaknesses can be found for most methodological choices (in general). There is also considerable debate about the validity or accuracy of data collected through diary-based quantitative research in particular. However, acknowledging those concerns, and given the fact that the

"official" radio research in New Zealand is undertaken using the diary method, it was considered to be appropriate to follow that methodology.

According to Starkey (2004) the diary method chosen has a major advantage in that it can minimise reliance upon memory and help reduce confusion over station identification. The respondents may have the stations listed in the diary which means they can take the opportunity to reflect on their daily radio listening free from the external pressures and potential biases that may be present. The memory problem can also be alleviated by diaries in two ways. Firstly, respondents can record their listening at or near the time of the event. Secondly, the fact of keeping a diary has the crucial effect of prompting awareness that radio listening is to be remembered.

Internationally there are two main techniques with diary-based research. In the USA a totally write-in diary is used. In this approach the respondent writes in the name of the station(s) listened to in a time grid - thus creating their own diary. However, in the USA stations tend to 'brand' themselves successfully, a situation that does not always happen in other countries (Robinson 2000). Robinson also notes that when write-in diaries were trialled in the United Kingdom a significantly lower listening figure was recorded. This could be in part to a double jeopardy effect in which listeners are more likely to recall listening to the bigger stations and less likely to recall listening to smaller or less popular ones.

In the United Kingdom and New Zealand pre-printed diaries listing all stations that subscribe to the research are used. However, in New Zealand that means only the major commercial networks who subscribe to the research will be included. Smaller commercial networks and the non-commercial networks are excluded and can only be listed as 'others'.

It was decided that this research should follow the United Kingdom and New Zealand practice of using pre-printed diaries. However, unlike the "official" New Zealand commercial radio research it was decided to include all commercial and non-commercial stations. In terms of the Manawatu market (the reasons for the choice of this market will be covered in Section 5.4) this meant 20 stations and an 'Other' category would be listed.

It should be noted that Twyman (1994) suggested that the more stations that were listed led to a lessening of the listening being recorded. He hypothesised that a large number of listed stations causes confusion, makes the diary task harder, and therefore deters some entering of listening. However, Twyman's figure of "more" stations was 30 - much greater than this research's number of 20 stations. So, it was felt that this issue was not problematic for this study.

Alongside the issue of the number of stations included within a diary is the issue of printing and legibility of the diaries themselves. An increasingly complex diary could lead to the possibility of data entry errors with respondents potentially mis-logging listening to stations due to the narrowness of the grids too big a matrix would require within the page space available.

When considering the design of this study's diary consideration was given to the issue of whether some design strategies would enhance the eventual response rate. Gendall (1996, 2000) tested the hypothesis that pictures or photographs on a questionnaire cover would increase mail survey response rates. While both studies found no evidence to support this possibility, it was decided that - while the use of photos may not increase the return rate - they would certainly ensure a professional presentation. However, Gendall did find in these studies that certain types of covering letter may influence the response rate and that an altruistic or 'help the researcher' appeal was more effective than others. Therefore the covering letter for this study emphasised an 'altruistic appeal'.

Consideration was also given to different incentives or forms of incentives to encourage both the accurate encoding and return of the completed radio diary. Brennan (1992) provided research showing that, while the most effective technique for achieving a response rate in excess of 60% was persistence, surveys addressed to a specific person with a monetary incentive were also successful. Therefore, following on from the Research International practice of offering the chance to win a major prize the opportunity to win one of three $500 cash prizes was included in the cover letter.

Based on common practice in New Zealand and the Gendall (1996, 2000) and Brennan (1992) studies the radio diary was designed:

- As a seven day self completion diary with a double-page A4 spread for each day
- With pre-printed station names across the top and pre-printed quarter-hour time slots down the side
- In full colour with photographs reflecting both the research and the local area on the front cover
- With a letter of thanks with an 'altruistic' appeal on the inside front cover, and
- A prize draw for one of three prizes of $500 cash.

The diary also contained instructions on how to fill it out that included an example of a completed radio diary. The initial diary was pre-tested, over a week by ten friends and colleagues of the author. As a result of the pre-testing some minor adjustments were made to the 'How to complete the radio diary' instructions and to the 'general questions' about the respondents' radio listening. A scaled version of the final diary is included as Appendix A.

5.3 PROCEDURE

5.3.1 Pilot Study

Introduction

Having designed the research instrument, a pilot study was undertaken to test the most cost effective manner in which a radio diary panel could be recruited. As shown by Webster et al. (2006), recruitment of a consumer research panel is a major undertaking. It can also be expensive due to the high churn rates and the costs and effort required to obtain both a representative sample and to maintain the required levels of respondent co-operation.

In the U.S.A., the Arbitron group first contacts potential dairy keepers by telephone and then sends out their survey by mail. In New Zealand the traditional way of

recruiting radio diary panels is usually via a random walk or door knock without prior phone contact. On the other hand, it must be said that some Australasian media research companies also follow the Arbitron pattern of telephone contact first.

Conceptually it is not expected by this researcher that the final results from a radio panel will differ greatly subject to the mode by which the panel is recruited as no prior research insists that this is so. Therefore, whether a respondent was contacted by telephone or as part of a random walk, was not expected to influence the final content of their completed diary. In light of these conclusions this pilot study simply considered which recruitment methods would be the most cost effective.

The following recruitment procedures were considered on a cost-per-response basis: the door knock/random walk, mall intercept, telephone and mail. A random walk or door knock can be particularly expensive because at any given time of the day a proportion of households will have no one at home - necessitating at least one return visit. This can be a major cost especially if selection procedures require call backs, but even if replacement is allowed the extra time and expense required to meet a quota is not insignificant.

Mall intercepts would clearly reduce the time required to complete any recruitment, given that potential participants would effectively come to the recruiter, rather than vice versa. With mail two options were considered. The first was to mail out the radio diary with a letter requesting assistance. However, it was also concluded that many of the diaries would be wasted due to non-response, so there could be a significant additional cost with this approach. A second mail option considered that could reduce this waste was to mail a request to participate along with a self-addressed postcard to be returned requesting a diary for willing respondents. On the other hand, the issue of self selection bias for this alternative was of concern as previous research (Winter 2000) showed that predominantly heavy listeners would be more likely to respond--thus distorting any result.

Finally, participants could be recruited via telephone and mailed a diary as with Arbitron in the US. Other methods of recruiting panel members, such as on-line

recruitment and via email, could also be used but they were not considered, mainly due to time constraints.

Method

Ultimately, a number of different techniques were used within the pilot study in order to assess their relative usefulness. Respondents were randomly selected from either shopping malls, the telephone directory (for telephone and mail), or a random walk (door knock). As far as possible, the instructions were equivalent across the five methods. The interviewer instruction sheets for each mode are attached as Appendix B. Six interviewers were used for the door knock, mall intercept and telephone interviews (5 in common). The door knock was conducted on Sunday September 4 2005, the mall intercept on Saturday September 3 2005, the telephone interviews on Monday August 29 2005 and Tuesday August 30 2005; and the two mail surveys were mailed on Thursday September 1 2005. In all modes, respondents were required to respond quickly to the request and then to record their radio listening behaviour for one week, beginning the Monday (September 5 2005) following their recruitment.

For all methods of recruitment respondents were offered the chance to be in one of three prize draws for $500 cash. A small chocolate bar was also included with the diary when it was either handed to or mailed out to all the respondents. Up to three call backs, at different times of the day, were used in the door-knock and telephone modes. No reminder was used with the mail survey. The sample sizes and responses for the five modes are reported in Table 10 below.

Table 10: Sample Sizes and Responses

	Door Knock	Mall Intercept	Telephone	Mail + Diary	Mail + Postcard
Initial Sample	**378**	**348**	**319**	**100**	**182**
GNA/Ineligible	**4**	**40**	**5**	**2**	**8**
Adjusted Sample	**374**	**308**	**314**	**98**	**174**
Non-contact	**154**	**n.a.**	**130**	**n.a.**	**n.a.**
Adjusted Sample	**220**	**308**	**184**	**98**	**174**
Sent surveys	**93**	**107**	**103**	**98**	**27**
Returned Surveys	**68**	**68**	**87**	**32**	**25**

Response Rates

The response rates for the five recruitment modes are reported in Table 11 below. Three different calculations for the response rates are considered, as the different modes are not always strictly comparable. For example, it is not possible to determine what proportion of the mail sample was never contacted - either because they had shifted address or didn't receive the mail sent to them. Thus, Response Rate 1 is based on attempted contact, and used the initial sample size less identified ineligible or non-contactable respondents including those with gone-no address, (gna). Response Rate 2 is based on actual contacts. That response rate was calculated from the initial sample less ineligibles, gna's, and non-contacts. The "Participation Rate" is the proportion of contacted respondents who agreed to participate, and the "Return Rate" is simply the proportion of delivered diaries that were returned completed.

Table 11: Response Rates

	Door Knock (%)	Mall Intercept (%)	Telephone (%)	Mail + Diary (%)	Mail + Postcard (%)
N	**378**	**348**	**319**	**100**	**182**
Participation Rate	**42**	**35**	**56**	**n.a.**	**16**
Return Rate	**73**	**66**	**85**	**33**	**93**
Response Rate 1	**18**	**20**	**27**	**33**	**14**
Response Rate 2	**31**	**22**	**47**	**33**	**14**

A notable feature of these various rates is the variation across the recruitment modes. The traditional door knock obtained agreement to participate from 42% of those contacted at home, compared with 35% contacted in the mall intercept and only 16% via mail/postcard. The highest participation rate of 56% was achieved via the telephone.

The highest return rate for completed diaries (93%) was for the mail/postcard - as might be expected since these were from respondents willing to complete and return a postcard in order to participate. However, the proportion of the mail/postcard sample

that actually participated by completing a diary was very low, and this is reflected in their response rate of only 14%.

It is worth noting that the return rate for the mail survey is actually the same as the response rate since it was calculated by those who returned a diary. It is probably so low at least partly because the sample size could not be adjusted for the unknown proportion of the sample who did not receive the diary (i.e. non-contacts). As such the mail method is not really comparable to the other methods with regard to this measure.

However, a number of other comparisons are valid. Clearly, the return rate from the door-knock (73%) is better than for the mall intercept (66%), but the best response is from the telephone sample (85%).

Consideration was also given to not just the participation and return rates, but the absolute return versus the initial sample, and this is reflected in the response rates. If non-contacts are included in the sample (Response Rate 1 in Table 11), then the mail method produced the best result (33%) followed by telephone (27%). The door knock response rate, 18%, is only slightly higher than the mail/postcard method (14%). Given that non-contacts cannot be determined until after the fieldwork, this response rate gives the best measure of efficiency, since it is based on the initial sample size.

However, one could also argue that it is unreasonable to include in a response rate calculation, households (or respondents) that could not be contacted. Thus, a second response rate (Response Rate 2 in Table 11) has been calculated, excluding non-contacts. As mentioned earlier, this measure is not accurate for the mail response rate, as non-contacts cannot be determined, and will produce a conservative estimate.

An examination of the response rates among respondents who had been contacted does show an interesting difference across methods. While the mail/postcard method achieves a very low response rate (14%), the mail method (33%) achieves a better response than both the mall intercept (22%) and the traditional door knock method (31%). However, the telephone method, with 47%, is by far the best.

Cost effectiveness

The response rates reported in Table 11 suggest that both mail and telephone are effective ways of recruiting diary panel members, with both methods producing considerably higher response rates than either the mall intercept or the traditional door-knock. However, the choice of a method also has to consider the costs involved. In order to compare the costs of the different methods, the data in Table 11 was weighted to determine the sample sizes required to produce a response of 100 diaries. The relative costs of producing 100 completed diaries are reported in Table 12 below.

Table 12: Relative Cost Effectiveness of the Recruitment Methods

Adjusted sample size/responses	Door Knock	Mall Intercept	Telephone	Mail + Diary	Mail + Postcard
Required sample size	**556**	**504**	**367**	**313**	**728**
Non-contacts	**226**	**0**	**149**	**n.a.**	**n.a.**
Diaries sent out	**137**	**155**	**118**	**306**	**696**
Surveys returned	**100**	**100**	**100**	**100**	**100**
Cost/return	**8.55**	**7.48**	**6.60**	**13.03**	**10.90**

In determining the cost-effectiveness of each mode required to generate a return of 100 diaries the following costs and charges were used in the calculations: Labour/travel time at $15 /hr; Diaries at $3.20 each; A4 postage $0.90 per envelope; and Letter postage at $0.45 per letter. In terms of the "interviewing", the following call rates were used; Door-knock or Random Walk 15 attempts/hr; Mall Intercept 30 attempts/hr; and Telephone 25 attempts/hr. The administration costs incurred were; the Mail processing 100 envelopes/hr; and Postcard processing 20/hr.

What is very clear from Table 12 is that the two mail methods are relatively expensive. The mail-plus-postcard (no diary) was costly because of the large sample size required to compensate for the low response rate. The mail method which sent out a diary to each respondent before being requested expanded costs due to the expense of printing and sending a diary to the whole sample.

Of the non-mail methods, the traditional door-knock method was more expensive than either mall intercept or telephone, with the telephone being the most cost effective method by some margin. The second best method was the mall intercept, followed by the traditional door-knock.

Summary

This pilot study looked at the relative cost effectiveness of five different methods of recruiting radio diary panel members: a mall intercept, telephone contact, a door-knock, a mailed letter with a reply-paid postcard acceptance, and an unsolicited diary mail-out. The main aim of this experiment was to see how cost-effective each of five different methods might be in achieving a radio diary panel of 100 respondents. It found that while the diary mail-out had the best overall response rate from the initial sample, it also had the highest cost/return rate per hundred diaries. On the other hand, the telephone contact had not only the best relative cost effectiveness per hundred diaries, but also had the second best response rate from the initial sample. It was therefore decided to use the telephone mode to contact potential diary respondents for the main study.

5.4 METHODOLOGY USED BY MAJOR STUDY

5.4.1 Introduction

The major study benefited from the pre-testing of the Pilot Study. And, as a consequence, no further amendments were made to the research instrument which remained the same as discussed in Section 5.2. This section therefore describes how the major study was undertaken (method and sample) - all in preparation for the data analysis to be conducted in the following chapter.

5.4.2 Method and Sampling

Method

In meeting this research project's objectives it was decided that the research should be undertaken within a set market place rather than the country as a whole. In addition to budget limitations this decision reflected the fact that, in terms of the New Zealand radio industry, the country is *de facto* a collection of about 24 individual marketplaces. The number of stations broadcasting in each market place varies from five in the smaller markets to in excess of 30 stations in the largest market place.

The selected marketplace was the author's home district of the Manawatu, a regional marketplace with 20 radio stations regularly broadcasting on a 24 hour-seven-day-a week basis. The Manawatu was also thought to provide an adequate representation of the New Zealand adult population as measured by, by age, gender, ethnicity, household income and an urban/rural balance.

An initial sample of 6,000 randomly selected Manawatu residential telephone numbers was supplied by the local telecommunications company. All residents of the survey area aged 15 years and over with a telephone were potential survey respondents. People without telephones or resident in institutions, including rest homes and student hostels were excluded. However, retirement villages where residents had separate dwellings with individual phones were included. The sample telephone numbers were randomly divided into four groups – one for each week of the research period.

A team of six people comprising friends and family members of the researcher as well as local students was assembled to phone the potential respondents. Training was provided and the instruction sheets utilised for this preparation are attached as Appendix C.

The major study was undertaken over a four week period from Monday 17th October to Sunday 13th November 2005.

Phoning of potential respondents was carried out each week on Monday evenings (only), and on Tuesdays and Wednesdays during both the day and the evening. Up to three call backs were made to each unanswered number. If the phone was answered the interviewer introduced themselves, explained the purpose of the call, and asked to speak to the person in the household who was 15 years of age or older who had the next birthday.

This was designed to ensure the sample was as representative of the population as possible within the constraints provided by the requirement of telephone availability. It the required person was not available a call back time was arranged. If they were available they were then asked if they would be prepared to complete a one-week-long diary of their radio listening.

If the respondent agreed they were posted a radio diary package on either a Thursday or Friday in order to enable them to start recording their listening from the following Monday. Only one respondent was chosen from each household.

The radio diary package contained the following items:

- A seven-day radio listening diary, with instruction and information sheets
- A thank you letter designed to encourage completion of the diary
- A small bar of chocolate as a thank you gift
- A reply paid envelope enabling the respondent to return the diary upon completion.

As previously mentioned in Section 5.2, the radio diary's format allowed each respondent to record the essential details of each radio listening occasion with the diary format breaking down each day into quarter hour time periods. Respondents were asked to indicate their radio listening in any given quarter hour where they had listened for eight minutes or more of that quarter hour. The definition of listening used was an important part of the survey design. 'Listening' was defined as 'respondents being able to hear the spoken announcements being broadcast and so identify the station broadcasting' – the same definition used by Research International, the "official" New Zealand radio research company.

In the front of the diary the respondents were asked to record:

- The number of radios in the household
- Where they mostly listened to the radio during certain times
- Radio stations of which they were aware, categorized by those they sometimes listened to and mostly listened to, and

In the diary itself:

- Whether they listened to the radio that day, as well as
- Their listening occasions – in 15 minute segments.

In the back of the diary the respondents were asked to provide their age, gender, ethnicity, number of people in the household, employment status, formal education and educational qualifications, as well as both their personal income and household income. At the back of the diary space was also provided for the respondents to write in comments about topics raised in the questionnaire and whether they would be prepared to take part in any follow up research. The return rates achieved over the next four weeks are shown as Table 13 which follows.

Table 13: Return Rates

	Week One %	Week Two %	Week Three %	Week Four %	Total %
End of the first week	**57**	**57**	**60**	**60**	**58**
End of the second week	**85**	**79**	**81**	**79**	**81**

As shown by this table, the majority of respondents returned their diaries during the week following the week in which they recorded their listening. Those respondents who had not returned their diary by the Thursday of the week following their recording were followed up. The follow up was by either telephone or by mail. Respondents were randomly selected for either of the treatments. There was no significant difference in the response rate between those who were phoned and those who received a letter. However, the follow ups did increase the response. Any

diaries that were returned later than 10 days after the finish of the recording period were not included in subsequent analysis.

Table 14 shows a more macro view. Over the four weeks of the main study an attempt was made to contact a total of 4,980 respondents. Of those 13 respondents were ineligible (usually house sitters and unable to complete a full week's radio recording) and a further 938 could not be contacted, in spite of up to three call backs being made. The final number of respondents contacted was 4,029, of which 1,399 agreed to complete a radio diary. Of the 1,399 respondents who agreed to complete the radio diary a total of 1,136 diaries were returned.

Table 14: Sample Sizes and Responses

	Week One	Week Two	Week Three	Week Four	Total
Initial Sample	**1315**	**1322**	**1345**	**998**	**4980**
GNA/Ineligible	**2**	**4**	**2**	**5**	**13**
Adjusted Sample	**1313**	**1318**	**1343**	**993**	**4967**
Non-contact	**233**	**295**	**264**	**146**	**938**
Adjusted Sample	**1080**	**1023**	**1079**	**847**	**4029**
Sent surveys	**360**	**371**	**382**	**286**	**1399**
Returned Surveys	**305**	**293**	**311**	**227**	**1136**

Upon return of the diaries they were scrutinised for what could be assumed as "impossible" listening patterns - that is listening for more than 20 hours per day or multiple listening to stations within one quarter hour period. Only seven diaries were regarded as having "impossible" listening patterns and were discarded. The final number of useable diaries was 1,129.

Response Rates

The response rates for each of the weeks and an overall total are reported in Table 15. As with the Pilot Study, three different calculations for the response rates are considered, although each week is comparable. Response Rate 1 is based on attempted contact, and used the initial sample size less identified ineligible or non-

contactable respondents gone-no address (gna). Response Rate 2 is based on actual contacts--that is, initial sample less ineligibles, gna's, and non-contacts. The Participation Rate is the proportion of contacted respondents who agreed to participate, and the Return Rate is simply the proportion of delivered diaries that were returned completed.

Table 15: Response Rates

	Week One (%)	Week Two (%)	Week Three (%)	Week Four (%)	Total (%)
N	**1315**	**1322**	**1345**	**998**	**4980**
Participation Rate	**33**	**36**	**35**	**34**	**35**
Return Rate	**85**	**79**	**81**	**79**	**81**
Response Rate 1	**23**	**22**	**23**	**23**	**23**
Response Rate 2	**28**	**29**	**29**	**27**	**28**

As can be seen from Table 15, each week is very similar with an overall participation rate of 35% and a response rate of 28%. However, as mentioned, of the diaries that were returned seven diaries were regarded as being unusable and were subtracted from the 1,136 received. This left a final sample of 1129 respondents giving an effective return rate of 80.7%.

A random sample of 1129 radio listeners has a maximum margin for error at the 95% confidence level of plus or minus 2.9%. That is a researcher can be confident that any result using the whole 1129 respondents (and not a sub sample) is within 2.9% of the true result excluding consideration of non-sampling error.

Sample

As already introduced, the only requirement for testing the applicability of the Dirichlet's potential as an empirical generalisation is data on the listening patterns of a "reasonable" population. Thus, the research targeted a sample size of between 1,000 and 1,200 respondents that was thought reasonable for the population considered.

As such this sample is not required to be representative of the population as a whole. However how representative this sample might be was tested against the population of the entire Manawatu as shown in Table 16 below.

Table 16: Sample and Population Comparisons

	Population 15 years and over	
	Sample Population (1129)	**Manawatu Population (77,500)**
	%	**%**
Gender		
Male	**39**	**47**
Female	**61**	**53**
Age		
15 to 29 years	**15**	**29**
30 to 49 years	**38**	**36**
50 to 74 years	**39**	**28**
75 years and over	**8**	**7**

The sample population differs from the Manawatu population only in that there are proportionally fewer males in the former and in the sample population the age group 50 to 74 years is over represented at the expense of the 15 to 29 year age group. These discrepancies were not thought avoidable as they reflect the known fact that women and older people are more likely to respond to surveys compared to younger people and males. However, as noted earlier, how representative a sample might be compared to a survey's population as a whole is not a major issue for Dirichlet research.

Non-response Bias

Some word should also be said about non-response bias. Most researchers are worried about the decline in survey response rates. Researchers such as Baim (1991), Meier (1991) and Brown (1994) have suggested that the declining rate is as a consequence of changing lifestyles. This includes increasing numbers of women in the work force, continued increases in urbanisation and even reduced leisure hours. Other reasons that have been mooted include unethical business practices such as

"sugging" and "frugging" (selling or fundraising under the guise of "research") and the huge increase in direct marketing, especially telemarketing. Whatever the reasons, survey response rates are declining with a "concomitant potential for non-response bias to increase… the views of a considerable number in the original sample who refused to take part… are not incorporated in the results" (Hosie 1995, p1). Non response bias in this case is both a refusal to participate in the research by declining the request to complete a radio diary as well as not returning a survey despite previously having agreed to complete one.

Methods of addressing non response bias have been covered in the discussion on the Pilot Study. As mentioned, many of those techniques are not applicable in terms of this research. For instance it was not possible to send out repeat copies of the radio diary to be completed within a given week. However, phoning respondents during the week they were to complete their diary asking if there were any problems could have helped the return rate and even the accuracy of their recorded listening. Unfortunately, a lack of resources made this impossible.

However, on average 60% of all diaries *were* returned during the first half of the week following the recording of the respondent's listening. Those respondents who had not returned their diary by mid way through the following week were contacted by either telephone or mail and asked, if the diary had been completed to send it back. If the diary had not been completed the respondent was asked to retain it and not send it back. This follow up resulted in an overall return rate of 81% - a rather pleasing result, which reduced the potential for non response bias.

Item Order Effects

The position of the radio station in the awareness questions, like all items in a list of attitudinal or behavioural statements, can be problematic in that it is acknowledged by researchers that respondents may pay more attention to items in various positions (for example near the top of the list). There is also the issue that respondents may become 'fatigued' by any long lists and make decisions on the items near the bottom of the list without the thought being given to the question that researchers assume has been given to earlier items. For details on research in this area see Payne (1951), Schuman

and Presser (1981), Belsen (1981), Sudman and Bradman (1982), Brennan (1995) and Wright and Lees (2003). To minimise item order effects the position of stations in the 'awareness' questions were reversed resulting in two versions of the radio diary. The 'correct' item order was re-established at the data entry stage by adjusting the data entry programme accordingly.

In terms of listing the stations on the diary pages the order across the top of the page, remained the same for all surveys. It was considered that any item order effect introduced by this minimal sequencing would be minimal at best.

Other Sources of Error

Potential sources of error are acknowledged, and those that pertain to non response have been discussed above. Clearly any research that achieves less than 100% response will produce estimates potentially affected by non response error. Its impact on this research's results is mostly unknown but the effect of non response cannot be dismissed entirely.

Similarly, respondent error is unavoidable; researchers rely on respondents for truthful and accurate information. Research topics like radio listening may or may not be susceptible to respondent error. The possibility of social desirability bias (where respondents record a station as being listened to as they feel it is more appropriate than other stations) is also acknowledged, but its effects on the results can not be ascertained.

6. MARKET REGULARITIES, THE DIRICHLET MODEL AND RADIO LISTENING

6.1 INTRODUCTION

The Dirichlet model may be the best-known example of an empirical generalisation in marketing (Uncles et al 1995). The model is certainly an advanced empirical generalisation in which many marketing empirical regularities seem entwined. Those regularities can easily be adapted to a number of brand performance measures in radio: the number or percent of listeners listening to a station over a given time period; the average time spent listening (ATSL) per listener; the percent who are a station's exclusive audience and their ATSL; each station's share of category requirement and switching between stations. A number of these brand performance measures are illustrated in Table 17 for More FM, together with the associated Dirichlet predictions.

Table 17: Brand Performance Measures for More FM (O – Observed and T – Theoretical)

	Market Share (%)	Cumulative Audience (%)	Average Time Spent Listening (Hours)	Share of Category (%)	Exclusive Audience (%)	Exclusive Audience (ATSL) (Hours)	% who listened to Solid Gold	% who listened to The Breeze	% who listened to Radio Live
Observed	**10.1**	**30**	**7.0**	**32**	**7**	**15.8**	**21**	**14**	**11**
Theoretical		**29**	**7.2**	**39**	**3**	**6.6**	**19**	**15**	**12**

However, before considering the Dirichlet and its predictions, this chapter first defines the terms used in radio research, next presents the data gathered through the

radio diaries, and then relates it to the research question and the propositions associated with the hypothesized market regularities. The research question and associated propositions can be summarised as follows:

1. Radio stations' cumulative audiences will vary greatly, but in line with each station's market share

2. Each station's average time spent listening will be similar, but with a small double jeopardy trend

3. Each station will have a low share of category requirements in that each station's listeners will listen to other stations more often than they listen to it

4. Each station's exclusive audience will be small, and they will be light radio consumers

5. The number of listeners to one radio station who listen to another radio station will mostly be in line with the other station's cumulative audience

6. The Dirichlet model of consumer behaviour can be used to describe radio listening patterns

6.2 RADIO INDUSTRY TERMS

The radio industry uses a number of terms that have specific meanings. So, in order to ensure that the following analysis and results are easily understood, the terms used within it are defined as follows:

Station Share:	A station's percentage share (%) of the total listening done by a particular audience across a specified time period. This is the percentage of the total number of quarter hours spent listening

to a particular station. Station share is also called a station's 'Market Share'.

Cumulative Audience: The number of different listeners reached by a station over a specified time period. This is also called a station's 'Penetration' or 'Reach'.

Exclusive Audience: The number or percentage of people who listen to just one station over a specified time period. A station's exclusive audience can also be called their 'Sole Loyals' or '100% Loyals'. In terms of this research it is the number of respondents who report listening to a given station exclusively.

Average Time Spent Listening: The average amount of time (in hours) a person in a specified target group spends listening to a station over a specified time period.

6.3 SUMMARY STATISTICS FROM THE RADIO DATA

The summary statistics from the radio diary data are shown in Table 18 under the headings of market share, cumulative audience, average time spent listening to a station, average time spent listening to the radio, share of category requirements, exclusive audience, and the exclusive audience's average time spent listening. A radio station's market share is their share of the number of listening occasions whilst a station's cumulative audience is the number of people who listened to that station at least once during the period of analysis. The average time spent listening is the average number of hours listeners spent listening to a particular station. The average time spent listening to the radio is the average number of hours listeners to a station spent listening to the radio (it includes time spent listening to other stations). The share of category requirement is the ratio between the time a listener spent listening to

a specific station and their time spent listening to the radio. A station's exclusive audience is the proportion of that station's listeners who listened to just that station.

As the listening data was received in raw form, it had to be summarised in order to ascertain each station's market share and their associated brand performance measures. Since SPSS is a sophisticated piece of software widely used by social scientists for statistical analysis, it was selected as the primary tool to undertake the required analysis. The period of analysis, as mentioned in Chapter 5, is Monday to Sunday 6am to 12 midnight.

Given there are over 20 radio stations included in the data, it is not surprising that many of the stations have a very small market share and/or cumulative audience. As expected, these small market shares or cumulative audiences also reflect some very small sample sizes, especially those stations with a market share below 5% or a cumulative audience below 10%. Therefore it was considered that those stations whose cumulative audience was less than 10% would have sample sizes that would be too small to be completely reliable (see Pellegrini and Purdye 2005).

Table 18: Summary Statistics – 'All Stations'*

Radio Station	Market Share (%)	Cumulative Audience (%)	Average Time Spent Listening (hours)	Average Time Spent Listening to Radio (hours)	Share of Category Requirement (%)	Exclusive Audience (%)	Excl Aud A.T.S.L. (hours)
National Radio	**14.4**	**27.7**	**8.9**	**23.4**	**38.0**	**10.5**	**15.9**
Newstalk ZB	**10.4**	**21.3**	**8.9**	**23.9**	**37.2**	**9.2**	**15.4**
More FM	**10.1**	**30.3**	**7.0**	**21.9**	**32.0**	**7.0**	**15.8**
The Rock	**9.5**	**21.3**	**7.6**	**22.1**	**34.4**	**7.0**	**11.9**
Classic Hits	**8.3**	**25.5**	**6.1**	**22.9**	**26.6**	**6.3**	**12.1**
Solid Gold	**6.5**	**18.7**	**6.0**	**23.0**	**26.1**	**7.3**	**14.9**
The Breeze	**6.5**	**18.1**	**6.3**	**22.9**	**27.5**	**8.3**	**10.1**
The Edge	**5.3**	**18.8**	**6.2**	**22.4**	**27.7**	**2.8**	**22.2**
ZM	**5.2**	**17.1**	**6.1**	**23.3**	**26.2**	**6.7**	**11.6**
Coast	**4.4**	**9.1**	**8.2**	**24.6**	**33.3**	**9.7**	**15.1**
Radio Live	**4.0**	**12.2**	**6.5**	**23.4**	**27.8**	**6.5**	**13.3**
Radio Sport	**3.0**	**13.6**	**5.6**	**25.8**	**21.7**	**2.6**	**15.3**
Concert FM	**3.0**	**9.4**	**6.3**	**23.9**	**26.4**	**6.6**	**18.0**
Radio Rhema	**2.5**	**6.4**	**7.1**	**20.7**	**34.3**	**22.2**	**12.6**
Radio Pacific	**2.3**	**10.5**	**4.3**	**23.9**	**18.0**	**1.7**	**5.5**
Access	**0.7**	**3.5**	**5.6**	**28.5**	**19.6**	**0**	**0**
Radio Control	**0.7**	**2.2**	**5.8**	**26.4**	**22.0**	**4.0**	**12.0**
Life FM	**0.6**	**3.3**	**4.5**	**20.9**	**21.5**	**8.1**	**8.7**
Kia Ora FM	**0.5**	**3.4**	**5.0**	**25.9**	**19.3**	**0**	**0**
Others	**2.0**	**7.8**	**4.9**	**23.5**	**20.9**	**3.4**	**6.3**
Average	**5.0**	**14.0**	**6.4**	**23.7**	**27.1**	**6.3**	**11.8**

* Totals may not add correctly due to rounding

Thus, The Coast, Concert FM, Radio Rhema, Access Radio, Kia Ora FM, Life FM and Radio Control were merged together into an 'Other' category. The results of the merging are shown in Table 19 under the heading of 'Top Twelve Stations'. However, some of the stations that have been merged into the 'Other' category (e.g. Radio Rhema) are specialist stations, theoretically appealing to a specific audience. Where appropriate their performance is also noted in the relevant section.

Table 19: Summary Statistics – 'Top Twelve Stations'*

Radio Station	Market Share (%)	Cumulative Audience (%)	Average Time Spent Listening (hours)	Average Time Spent Listening to Radio (hours)	Share of Category Requirement (%)	Exclusive Audience (%)	Excl Aud A.T.S.L. (hours)
National Radio	**14.4**	**27.7**	**8.9**	**23.4**	**38.0**	**10.5**	**15.9**
Newstalk ZB	**10.4**	**21.3**	**8.9**	**23.9**	**37.2**	**9.2**	**15.4**
More FM	**10.1**	**30.3**	**7.0**	**21.9**	**32.0**	**7.0**	**15.8**
The Rock	**9.5**	**21.3**	**7.6**	**22.1**	**34.4**	**7.0**	**11.9**
Classic Hits	**8.3**	**25.5**	**6.1**	**22.9**	**26.6**	**6.3**	**12.1**
Solid Gold	**6.5**	**18.7**	**6.0**	**23.0**	**26.1**	**7.3**	**14.9**
The Breeze	**6.5**	**18.1**	**6.3**	**22.9**	**27.5**	**8.3**	**10.1**
The Edge	**5.3**	**18.8**	**6.2**	**22.4**	**27.7**	**2.8**	**22.2**
ZM	**5.2**	**17.1**	**6.1**	**23.3**	**26.2**	**6.7**	**11.6**
Radio Live	**4.0**	**12.2**	**6.5**	**23.4**	**27.8**	**9.7**	**13.3**
Radio Sport	**3.0**	**13.6**	**5.6**	**25.8**	**21.7**	**6.5**	**15.3**
Radio Pacific	**2.3**	**10.5**	**4.3**	**23.9**	**18.0**	**1.7**	**5.5**
Others	**14.5**	**37.6**	**5.9**	**24.3**	**23.9**	**7.1**	**9.1**
Average	**7.7**	**21.0**	**6.6**	**23.3**	**28.4**	**6.3**	**11.8**

* Totals may not add precisely due to rounding

It is expected in a highly competitive market (e.g. radio listening as shown in Table 18) there will be a degree of switching between stations. This switching is reflected in the listeners' repertoires (mix of stations to which each respondent reported listening). Table 20 shows the number and percentage of listeners for each repertoire size.

Table 20: Repertoire Sizes

Repertoire Size	Number	%
1	212	19.1
2	320	28.9
3	249	22.5
4	148	13.3
5	95	8.6
6	44	4.0
7+	41	3.7
Total	1109	100

Meanwhile, Table 21 shows the average repertoire size reported by each station's associated respondents. In general terms it can be see that the repertoires are similar for all stations, but with a slight double jeopardy (DJ) effect in that listeners to the

bigger stations have a slightly lower repertoire size than listeners to the smaller stations. This is reflective of the bigger stations providing their listeners with a slightly higher share of category requirement than the smaller stations.

Table 21: Repertoire Size by Station

Radio Station	Repertoire Size
National Radio	3.1
Newstalk ZB	3.5
More FM	3.7
The Rock	3.9
Classic Hits	3.8
Solid Gold	4.1
The Breeze	3.8
The Edge	4.2
ZM	4.1
Coast	3.6
Radio Live	3.9
Radio Sport	4.1
Concert FM	3.8
Radio Rhema	3.8
Radio Pacific	4.4
Access	4.5
Radio Control	5.2
Life FM	4.0
Kia Ora FM	4.9
Other	4.0

In analysing the above data, the propositions associated with expected market regularities have been grouped together under the headings of Brand Size, Brand Loyalty-Related Measures and Market Partitioning inn Section 6.4.

6.4 MARKET REGULARITIES AND THE RADIO DATA

6.4.1 Brand Size

In considering the market regularities and the radio data this thesis, at this stage is looking at the broad patterns rather than the applicability of the model. Thus, a correlation gives a measure of association, and a qualitative inspection reveals outliers

or other patterns in the data. The two key measures of brand size are market share and cumulative audience or penetration. Proposition 1 states that while each radio station's cumulative audience will vary greatly; that variation will be in line with each station's market share and that there will be a strong correlation between the two variables.

As can be seen from Table 18 there is considerable variation in the cumulative audience with an 814% variation from bottom to the top ranked stations, and an average cumulative audience of 14%. As noted above the sample sizes for those stations with cumulative audiences below 10% were thought relatively small, so they have been combined into the 'Others' category and a 'Top Twelve' table produced. Even amongst the 'Top Twelve' Stations (as shown in Table 19) there is a 264% variation from the bottom to the top ranked stations with an average cumulative audience of 21%.

A correlation was undertaken to test whether the variation in cumulative audience varied in line with individual market shares. The test for 'All Stations' showed a correlation of 0.93, $r^2 = 0.87$, and the correlation for the 'Top Twelve' was 0.91, $r^2 = 0.82$. These findings support Proposition 1, that not only will the different stations' cumulative audience vary greatly, the variation will be in line with each station's market share.

6.4.2 Brand Loyalty-Related Measures

The conceptual definition of brand loyalty used in this study is the one proposed by Brown (1952) which defines brand loyalty as a deliberate prior tendency to purchase a brand, often stemming from positive past experiences with its use. Kahn and Meyer (1989) support this definition claiming it closely mirrors modern views on the subject.

For all loyalty related measures (average time spent listening, share of category requirements and exclusive audience) the associated propositions state that they will be virtually the same for all stations with a small downward DJ trend and that the measure will correlate with market shares. This means that all stations with a similar market share will have similar loyalty measures. The DJ effect predicts that a small

station, when compared with a large station, will suffer twice in that less people will listen to it and those that do listen will do so for shorter time periods (e.g. McPhee 1963, Ehrenberg et al. 1990).

Average Time Spent Listening

With both fast moving consumer goods and industrial products average purchase frequencies are very similar from brand to brand. Thus Proposition 2 asserts that if radio listening behaviours followed similar patterns, then the average time spent listening to each station will be very similar from station to station, but that there would be a small downward DJ trend in line with market share. Also, the average time spent listening would strongly correlate with market share if proposition two is to be supported.

However, Ehrenberg (1975) notes that average purchase frequency is not exactly constant across brands, but the variation in it is relatively small across brands (e.g., within +/- 10%). Looking at the data related to this phenomenon, it can be seen, from Tables 18 and 19 that the average time reportedly spent listening for all the stations is similar from brand to brand, although some stations are outside Ehrenberg's +/- 10% band. And, there does seem to be a clear DJ effect in line with market share. The correlation between market share and average time spent listening for 'All Stations' was 0.75, $r^2 = 0.58$ and for the 'Top Twelve' Stations the correlation was 0.86, $r^2 = 0.75$ indicating a rather good fit.

Although diaries showing supposedly 'impossible' listening scenarios (e.g. listening over 20 hours per day) were discarded, there were four stations: The Rock, National Programme, Newstalk ZB, and The Coast, who between them had a total of 22 listeners who reported listening for periods in excess of 12 hours per day. When those 22 listeners were omitted from the analysis, the average time spent listening for those stations became: The Rock 7.4, National Programme 8.4, Newstalk ZB 8.3, and The Coast 6.1. When this adjustment was made the correlations for 'All Stations' increased to 0.81 and for the 'Top Twelve Stations' to 0.87.

Nonetheless, even with the inclusion of those outlying heavy listeners it is clear that Proposition 2 can be judged as supported. That is, the average time spent listening to each station is very similar from station to station with a small downward DJ trend, and the average time spent listening strongly correlates with market share.

Share of Category Requirements

Share of category requirements (SCR) is the most common measure of brand loyalty used by market researchers (Bhattacharya, Fader, Lodish and Desarbo 1996) and is also used extensively in Dirichlet analysis (e.g. Uncles et al. 1994, 1995; Ehrenberg et al. 2004). As used in this study SCR simply measured each station's market share among the listeners who listened to that station during the time period in question. Moreover, as market share is calculated among 'triers', SCR captures the notion that a listener can be loyal only to a station after she/he has listened to it; which is one of the key underpinnings of Brown's (1952) loyalty definition.

On the other hand, in a marketing intensive environment (e.g. radio station survey periods), listening-based measures such as SCR fail to reflect whether a particular listening period is attributable to a deliberate prior tendency stemming from positive past experiences with the station, or instead to promotional or situational conditions that prevailed at the time the listening occurred. In other words, did the listener switch stations due to the influence of a promotional message, or because they changed location; or perhaps did a third party change the station - thus causing the listener to effectively change stations?

As can be seen from Tables 18 and 19 the average time spent listening to the radio is typically far higher than the average time spent listening to a particular station (on average 3 to 4 times higher). This ratio naturally gives a low SCR (e.g. for 'All Stations' 6.4/23.7= 27%). In looking at the observed SCR's we see that every station has a low SCR (below 40%), and that all are close to the average, with a slight double jeopardy effect. Whilst these low SCR's are reflective of the fact that the exclusive audience are light listeners, they also highlight that most listeners are multi-station listeners (refer to Table 20).

As well as proposing that each station's SCR would be low, Proposition 3 states that, as with cumulative audience and average time spent listening, share of category requirements would vary with market share. The correlation between market share and share of category requirement for 'All Stations' was 0.79, $r^2 = 0.62$ and for the 'Top Twelve Stations' the correlation was 0.89, $r^2 = 0.79$. When the 22 outliers are removed from the analysis, the correlation for 'All Stations' was r = 0.88 and for the 'Top Twelve' Stations 0.90. These correlations strongly support Proposition 3.

Exclusive Audience

The final loyalty-related measure is that of exclusive audience - or those respondents who, during the selected time period, report listening to just one station. From a radio industry perspective station managers see specific formats as one way of differentiating their station from their competitors (Eastman, Fergusson and Klein 2002). In so doing they hope that somehow this will increase their exclusive audience. Thus, it is assumed that, for instance, Classic Hits listeners would behave differently from More FM listeners, and listeners to each station would rarely listen to another.

This section examines Proposition 4 which states that; each station's exclusive audience will be small; that the exclusive audiences will be light radio consumers; and that in aggregate the exclusive audience will strongly correlate with market share. The exclusive audience and their average time spent listening (see Tables 18 and 19) are almost constant across all stations--although a slight double jeopardy effect does seem present. For instance, More FM's exclusive audience is 7%. The proportion of listeners listening just to the lower share Classic Hits is slightly less, whereas at the higher share Newstalk ZB it is slightly more. Also, for all stations, the exclusive audience listens less frequently than the average listener; just an average of 11.8 hours per week, compared with an average listener's 23.3 hours. The few oddities that exist (The Edge) seem to be the exception rather than the rule, and could be due to factors such as sampling variation or outliers. In the case of The Edge there was one exclusive listener who claimed to spend over 8 hours per day listening to that station. The raw data shows the average number of exclusive listeners per station to be 10 and even the top ranked station had only 33 solely loyal listeners.

As with cumulative audience, average time spent listening and SCR, the exclusive audience was expected to vary with market share. The correlation between market share and exclusive audience for 'All Stations' was 0.31, $r^2 = 0.10$ indicating a poor fit. On the other hand, the correlation for the 'Top Twelve' Stations the correlation is 0.83, $r^2 = 0.68$ – indicating a reasonable fit. The prime reason for the poor fit between the market share and exclusive Audience for 'All Stations' primarily rests with Radio Rhema (22.2%) which may be due to the additional sampling variation associated with a small station, or the unusual listening patterns associated with its religious format.

The key observations from the exclusive audience are clear: there are very few exclusive listeners, they are very light listeners – that is on average an exclusive listener spends just 11.8 hours listening to the radio compared to a polygamous listener who spends almost twice that time (23.3 hours). Also from a station's marketing perspective--not very important in terms of the station's overall audience. This supports Proposition 4.

6.4.3 Market Partitioning

Previous research (Ehrenberg et al. 2004) has shown that most markets for directly substitutable brands are not usually partitioned in that they indicate no special grouping or clustering of the brands. However, in some markets evidence of subcategories does exist, for example: petrol - leaded and unleaded; and coffee – decaffeinated and regular. It could be expected that these subcategories, usually based on a functional attribute, may attract a special or 'segmented' following with purchasers showing a marked grouping towards selected attributes - thus indicating a partition in the marketplace.

In terms of the New Zealand radio industry the largest radio station owner informs intending radio advertisers that "Radio in New Zealand is actually very well niched and when matching your target market to the networks available, the choice…becomes quite straightforward" (The Radio Network 2006). The network claims that their different genres or station formats attract a special 'segmented' listener base. This claim is in contrast with Proposition 5 which claims that switching

between stations will follow the Duplication of Purchase Law. The proposition and contrasting Radio Network claim can be tested by considering the observed duplications between pairs of stations to those stations' penetrations, with expected penetrations based on the Duplication of Purchase Law.

The Duplication of Purchase Law states that the competitive stations to which listeners indicate affiliation will be similar in the aggregate from station to station, and that the listening duplications for one station with another will vary in line with the cumulative audience of the other station. In terms of radio listening the expected duplication for different stations *x* and *y* can be expressed as $b_{xy} = D.b_x$. D being the switching coefficient which is constant for all stations. If there are partitions in the radio market place, then it is expected that the Duplication of Purchase Law will apply both within each separate partition and also between the partitions but with differing 'duplication coefficients'.

Table 22, below, illustrates the Duplication of Listening between all the 'Top Twelve' stations with the average duplications, cumulative audiences, expected duplications and the difference between the expected duplication and the average duplication being shown in the bottom four rows. The Duplication of Listening between 'All Stations' is shown as Appendix D.

Table 22: Duplication of Listening Between 'Top Twelve' Stations (%)

	Cumulative Audience	More FM	National Radio	Classic Hits	Newstalk ZB	The Rock	The Edge	Solid Gold	ZM	The Breeze	Radio Sport	Radio Live	Radio Pacific	Others
More FM	30		13	40	13	34	29	21	23	14	11	11	12	38
National Radio	28	14		16	23	10	7	11	7	8	16	16	9	65
Classic Hits	26	48	17		18	30	20	28	18	22	19	9	13	36
Newstalk ZB	21	19	29	21		9	21	17	12	24	20	13	19	46
The Rock	21	49	12	36	9		31	29	28	13	14	10	9	45
The Edge	19	47	11	28	24	35		24	33	16	13	12	17	37
Solid Gold	19	35	16	39	19	34	24		17	20	17	13	9	44
ZM	17	40	11	27	15	35	36	18		11	15	13	9	48
The Breeze	15	27	15	37	33	19	19	25	13		16	9	14	52
Radio Sport	14	25	32	35	32	22	18	23	18	18		18	26	43
Radio Live	12	26	36	19	23	18	19	20	19	12	20		20	65
Radio Pacific	11	34	24	31	38	18	29	17	15	20	34	24		55
Others	38	44	68	35	38	37	26	31	32	30	22	31	22	
Average	21	34	24	30	24	25	23	22	19	17	18	15	15	48
Expected Duplication		35	32	30	25	25	22	22	20	18	16	14	12	44
Average - Expected		-1	-8	1	-1	0	1	0	0	0	2	1	3	4

The D coefficient for each combination of stations has been calculated by taking the raw number of listeners for each station that listen to some competitor and presenting it as a percentage of the total number of listeners to the station. In calculating the expected duplication (Cumulative Audience x D Value) the D value has been worked out by calculating a D value for each pair of stations recorded by the respondents. The average of these computations was then calculated having weighted each initial calculation by the number of listening occasions for each combination. The D value coefficient used to calculate the expected duplications in Table 22 was 1.125 (1.1). The D value can also be quickly calculated by dividing the average duplication by the average penetration.

The correlation between the average duplication and the expected duplication in Table 22, was 0.95, $r^2 = 0.90$ indicating a very good fit. The major deviation between the average and expected duplications is for National Radio. This deviation appears partly

due to its greater than expected sharing with the 'Others' which includes the Concert Programme and Access Radio's BBC News. One possible reason for this particular deviation is that all programmes are essentially commercial free. In considering the actual differences between the average duplication and the expected duplication have a Mean Absolute Deviation (MAD) of 1.8% was observed. The Mean Absolute Deviation has been chosen as a measure of dispersion because it is thought to be more efficient in life-like situations where small errors will occur in observation and measurement. "In practice we should prefer mean deviation to square deviation" (Huber 1981, p. 3).

However, there are a number of combinations of stations where the listening duplication between stations is either higher or lower than predicted. For instance, The Edge, The Rock and Classic Hits have a greater than expected duplication with More FM, whereas Newstalk ZB and National Programme have a much lower duplication than was anticipated. These duplications or deviations from the Duplication of Purchase Law suggest a need for further analysis. They could represent a number of potentially confounding factors including partition in the market, functional differences such as station frequencies (AM/FM), formats (music/talk), or segmentation among the listeners.

Whilst different frequencies (AM/FM) could contribute to a functional partition in the marketplace – that is respondents have a radio receiver able to receive only one type of frequency—such a situation was considered unlikely as most radio receivers these days have the ability to pick up both frequencies, even if it does involve pushing a few more buttons.

On the other hand, considering possible partitions, it is intuitive to expect that formats are more likely to result in a partition as listeners choose stations with a similar format, be that either 'music' or 'talk'. Therefore the stations were grouped together in terms of their formats (music/talk) as identified in Chapter 4 and a unique duplication coefficient calculated for each grouping. These groupings were confirmed as standard radio industry groupings by Gerard Duignan (Former Deputy Head of Programming, Radio New Zealand, personal correspondence August 2007). Tables 23, 24, 25 and 26 show the listening duplications between the 'Music' stations and

'Talk' stations while Table 27 shows the corresponding average duplications, duplication coefficients and correlations.

Table 23: Duplication of Listening Between the 'Music' and 'Music Stations' (%)

	Cumulative Audience	More FM	Classic Hits	The Rock	The Edge	Solid Gold	ZM	The Breeze
More FM	30		40	34	29	21	23	14
Classic Hits	26	48		30	20	28	18	22
The Rock	21	49	36		31	29	28	13
The Edge	19	47	28	35		24	33	16
Solid Gold	19	35	39	34	24		17	20
ZM	17	40	27	35	36	18		11
The Breeze	15	27	37	19	19	25	13	
Average	21	41	34	31	27	24	22	16
Expected Duplication		40	34	28	25	24	22	20
Average -Expected		-1	0	3	2	0	0	4

Table 24: Duplication of Listening Between 'Music' and 'Talk' Stations (%)

	Cumulative Audience	National Radio	Newstalk ZB	Radio Sport	Radio Live	Radio Pacific
More FM	30	13	13	11	11	12
Classic Hits	26	17	18	19	9	13
The Rock	21	12	9	14	10	9
The Edge	19	11	24	13	12	17
Solid Gold	19	16	19	17	13	9
ZM	17	11	15	15	13	9
The Breeze	15	15	33	16	9	14
Average	21	14	19	15	11	12
Expected Duplication		19	14	9	8	7
Average -Expected		-5	4	6	3	5

Table 25: Duplication of Listening Between 'Talk' and 'Music' Stations (%)

	Cumulative Audience	More FM	Classic Hits	The Rock	The Edge	Solid Gold	ZM	The Breeze
National Radio	28	14	16	10	7	11	7	8
Newstalk ZB	21	19	21	9	21	17	12	24
Radio Sport	14	25	35	22	18	23	18	18
Radio Live	12	26	19	18	19	20	19	12
Radio Pacific	11	34	31	18	29	17	15	20
Average	17	24	24	15	19	18	14	16
Expected Duplication		33	28	23	21	20	19	17
Average -Expected		-9	-4	-8	-2	-3	-4	0

Table 26: Duplication of Listening Between 'Talk' and 'Talk' Stations (%)

	Cumulative Audience	National Radio	Newstalk ZB	Radio Sport	Radio Live	Radio Pacific
National Radio	28		23	16	16	9
Newstalk ZB	21	29		20	13	19
Radio Sport	14	32	32		18	26
Radio Live	12	36	23	20		20
Radio Pacific	11	24	38	34	24	
Average	17	31	29	23	18	19
Expected Duplication		38	30	19	17	15
Average -Expected		-8	-1	4	1	4

Table 27: Correlations and D Values for Tables 23 to 26

	Average Duplication	Duplication Coefficient	Correlation Average/ Expected Duplication
Music/Music	28	1.33	0.97
Music/Talk	14	0.67	0.48
Talk/Music	19	1.09	0.83
Talk/Talk	24	1.38	0.95

In considering Tables 23 to 27 and their associated listening duplications by format, the structure of the Manawatu radio market becomes clearer. This is most obvious when the duplication of listening for the music station listeners who also listen to either music or talk stations is considered. The average duplication for music to music station listeners is 28%, double the proportion of music station listeners who listen to talk stations (14%). A similar pattern is seen with talk station listeners who also proportionately listen to other talk stations (24%) more, on average, than they do to music stations (19%). These differences are reinforced when the correlation between the average and expected duplications between the two formats is calculated. Although there are good correlations between the music/music ($r = 0.97$), talk/music ($r = 0.83$) and talk/talk ($r = 0.95$) formats, there is not a good fit with music/talk ($r = 0.48$). Along with the much lower average duplication, the correlation figures support the contention that the radio listening market has a sub market or partition based on format. Once market partitioning has been taken into account the duplication patterns within each partition show clear support for Proposition 5.

6.4.4 Summary

This section has studied market regularities and their associated propositions in order to identify whether they seem to apply to radio listening. In the aggregate the evidence supported each proposition, although there were some deviations. These deviations are thought to be explained as either statistical anomalies due to small sample sizes or due to a specific format targeting listeners of a religious persuasion.

The first proposition claimed that each radio station's cumulative audience will vary greatly but that the variation would be in line with each station's market share. This was found to be the case with a very strong correlation for not only 'All Stations' ($r = 0.93$) but also for the 'Top Twelve' stations ($r = 0.91$).

Second, as with cumulative audience, it was also hypothesized that the average time spent listening would vary with market share. The correlation between market share and average time spent listening for 'All Stations' was 0.75, and for the 'Top Twelve' Stations the correlation was 0.86, indicating a relatively good fit. Also, through looking at the actual observation, it can be seen that the average time spent listening

for all the stations is similar from brand to brand and that there is an apparent DJ effect in line with market share.

As well as proposing that each station's SCR would be low the third proposition states that share of category requirements would vary with market share. The correlation between market share and share of category requirement for 'All Stations' was 0.79, and for the 'Top Twelve Stations' the correlation was 0.89. These correlations indicate support for the proposition. It was also shown that the average time spent listening to the radio is typically far higher than the average time spent listening to a particular station thus giving each station a low SCR. In looking at the observed SCR's, it can be seen that not only did all stations have a low SCR they were also close to the average, with an observed slight double jeopardy effect. Whilst these low SCR's are reflective of the fact that the exclusive audience are light listeners, they also highlight that most listeners are multi-station listeners.

Proposition 4 proposed that each radio station would have a low exclusive audience, and that those listeners would be light radio consumers. This proposition was supported with 'All Stations' having an average exclusive audience of 6.3% and an exclusive audience average time spent listening of 11.8 hours – less than half the average time spent listening reported for all listeners of 23.7 hours. However, it was noted that the sample sizes for the exclusive audiences were low with an average of just 10 listeners per station. It was thought that these low sample sizes will have impacted on the correlations. Nonetheless, as with cumulative audience, average time spent listening and SCR it was expected that exclusive audiences for individual stations would vary according to their market share. The correlation between market share and exclusive audience for 'All Stations' was 0.31, indicating a poor fit. However, the correlation for the "Top Twelve' Stations the correlation is 0.83, – indicating a reasonable fit. Outside of the small sample sizes, the other reason for the poor fit between the market share and exclusive audience for 'All Stations' primarily seemed to rest with Radio Rhema (22.2%) which, as explained previously, has a strongly 'Christian' format as well as being a small station and this subject to greater sampling variation.

The Duplication of Purchase Law states that brands share their customers in line with the other brands' penetrations. It was expected that a switching between stations would follow a similar pattern. The correlation between the average duplication and the expected duplication in Table 22 was found to be 0.95, a very good fit. This was in spite of the fact that the correlations supported the proposition there did seem to be evidence of a market partition based on format. In considering the stations grouped according to their primary formats of either music or talk, it was shown that music station listeners were more likely to switch to another music station than to a talk station suggesting a partition in the market place.

Overall, each of the propositions was judged to be supported with acceptable correlations between each station's market share and their cumulative audience, average time spent listening and share of category requirement. However, this thesis also had as a key research question, 'Can the Dirichlet model of consumer behaviour be used to describe radio listening behaviour?' Having found that the market regularities that support the Dirichlet model do apparently apply to radio listening, this chapter now looks specifically at the Dirichlet model and the predictions it makes.

6.5 THE DIRICHLET MODEL AND THE RADIO DATA

If the Dirichlet model is to represent a serious contribution to marketing science and be a useful tool for radio station managers it needs to accurately describe the markets to which it is applied. On this point Uncles et al. (1994) report an anonymous commentator as remarking that "the Dirichlet model is clearly not tenable in most markets", (p 376). And if this contention is true, it would severely limit the applicability of the model. As discussed in Chapter 3 the model has shown (see Ehrenberg et al. 2004) over the last 50 years to be applicable in most markets and to have made a serious contribution to marketing science.

Therefore, this research next addresses the question as to the suitability of the model as a predictor and describer of radio markets—particularly in terms of its usefulness

to radio station managers. In other words does the model provide an acceptably good fit for managerial decision making? As previously discussed in Chapter 3, Morrison and Schmittlein (1988) note that some consideration has to be given to what one measures the fit of the model across. 'Fit' may be used to refer to the predictions obtained from the model, or to the assumptions incorporated in the model. The justifications of the assumptions in the model are considered in Chapter 3 so in the current context 'fit' refers to the fit of the predictions obtained from the model.

However, as noted by Ehrenberg and Uncles (1999) a common criticism is the difficulty in how an 'eyeball' judgement of the fit of the model is made, or in other words "how close is close enough". This question was addressed in Section 3.6.2 where the evidence showed that correlations in the 0.7 to 0.9 range, depending on the variable, were expected. In comparison to this standard the observed and Dirichlet-predicted values for cumulative audience, average time spent listening, SCR and exclusive audience, are shown in Table 28 for 'All Stations' and Table 29 for 'Top Twelve' stations. The observed (O) values are tabulated from the radio dairies and the numerical Dirichlet estimates (T) are derived through the application of the Dirichlet model (Goodhardt et al. 1984) using specialised software called 'Dirichlet' (Kearns 2002).

Table 28: Observed and Theoretical Performance Measures 'All Stations'*

	Market Share (%)	Cumulative Audience (%)		Average Time Spent Listening (hours)		Average Time Spent Listening to Radio (hours)		SCR (%)		Exclusive Audience (%)		Excl Aud. A.T.S.L. (hours)	
		O	T	O	T	O	T	O	T	O	T	O	T
National Radio	14.4	28	34	8.9	7.4	23.4	18.5	38	40	11	3	15.9	6.5
Newstalk ZB	10.4	21	27	8.9	7.0	23.9	18.5	37	38	9	3	15.4	6.6
More FM	10.1	30	29	7.0	7.2	21.9	18.5	32	39	7	3	15.8	6.6
The Rock	9.5	21	24	7.6	6.9	22.1	18.5	34	37	7	3	11.9	6.4
Classic Hits	8.3	26	23	6.1	6.9	22.9	18.6	27	37	6	3	12.1	6.4
Solid Gold	6.5	19	17	6.0	6.6	23.0	18.6	26	36	7	2	14.9	6.2
The Breeze	6.5	18	17	6.3	6.6	22.9	18.6	28	36	8	2	10.1	6.1
The Edge	5.3	19	18	6.2	6.7	22.4	18.6	28	36	3	2	22.2	6.2
ZM	5.2	17	16	6.1	6.6	23.3	18.6	26	35	7	2	11.6	6.2
Coast	4.4	9	12	8.2	6.4	24.6	18.7	33	34	10	2	15.1	6.0
Radio Live	4.0	12	12	6.5	6.5	23.4	18.6	28	35	7	2	13.3	6.0
Radio Sport	3.0	14	12	5.6	6.4	25.8	18.7	22	34	3	2	15.3	6.0
Concert FM	3.0	9	9	6.3	6.3	23.9	18.7	26	34	7	2	18.0	5.9
Radio Rhema	2.5	6	7	7.1	6.3	20.7	18.7	34	34	22	2	12.6	5.9
Radio Pacific	2.3	11	7	4.3	6.3	23.9	18.7	18	34	2	2	5.5	5.9
Access	0.7	4	3	5.6	6.1	28.5	18.7	20	33	0	2	0.0	5.8
Radio Control	0.7	2	2	5.8	6.1	26.4	18.7	22	33	4	2	12.0	5.7
Life FM	0.6	3	3	4.5	6.1	20.9	18.7	22	33	8	2	8.7	5.8
Kia Ora FM	0.5	3	6	5.0	6.1	25.9	18.7	19	33	0	2	0.0	5.7
Others	2.0	8	14	4.9	6.2	23.5	18.7	21	33	3	2	6.3	5.9
Average	5.0	14	14	6.4	6.5	23.7	18.6	27	35	6	2	11.8	6.1
MAD			2.2		0.9		5.0		8.2		4.7		6.9

* Totals may not add precisely due to rounding

Table 29: Observed and Theoretical Performance Measures 'Top Twelve'*

	Market Share (%)	Cumulative Audience (%)		Average Time Spent Listening (hours)		Average Time Spent Listening to Radio (hours)		SCR (%)		Exclusive Audience (%)		Excl Aud. A.T.S.L. (hours)	
		O	T	O	T	O	T	O	T	O	T	O	T
National Radio	14.4	28	34	8.9	7.4	23.4	18.5	38	40	11	3	15.9	6.5
Newstalk ZB	10.4	21	27	8.9	7.0	23.9	18.5	37	38	9	3	15.4	6.6
More FM	10.1	30	29	7.0	7.2	21.9	18.5	32	39	7	3	15.8	6.6
The Rock	9.5	21	24	7.6	6.9	22.1	18.5	34	37	7	3	11.9	6.4
Classic Hits	8.3	26	23	6.1	6.9	22.9	18.6	27	37	6	3	12.1	6.4
Solid Gold	6.5	19	17	6.0	6.6	23.0	18.6	26	35	7	2	14.9	6.2
The Breeze	6.5	18	17	6.3	6.6	22.9	18.6	28	35	8	2	10.1	6.1
The Edge	5.3	19	18	6.2	6.7	22.4	18.6	28	36	3	2	22.2	6.2
ZM	5.2	17	16	6.1	6.6	23.3	18.6	26	35	7	2	11.6	6.2
Radio Live	4.0	12	12	6.5	6.5	23.4	18.6	28	35	7	2	13.3	6.1
Radio Sport	3.0	14	12	5.6	6.4	25.8	18.7	22	34	3	2	15.3	6.0
Radio Pacific	2.3	11	7	4.3	6.3	23.9	18.7	18	34	2	2	5.5	5.9
Average	7.7	20	20	6.6	6.7	23.2	18.6	29	36	6	3	13.7	6.3
MAD			1.6		0.5		0.7		3.1		1.8		2.8

* Totals may not add precisely due to rounding

In considering the above tables, and the main research question: 'Can the Dirichlet model of consumer behaviour can be used to describe radio listening patterns?' the following discussion, as with the previous discussion on the propositions, has been grouped together under the headings of Brand Size, Brand Loyalty-Related Measures, and Market Partitioning.

When considering a goodness fit to establish whether or not an observed distribution differs from a theoretical distribution a Pearson chi-squared test would normally be undertaken. However, with Tables 28 and 29 that cannot be used as a measure of fit as the 'counts' are somewhat arbitrary. The 'count' could be in minutes, 15 minute, or hourly blocks, each of which would give a different chi-square value and thus a different significance. Therefore following the pattern used by Ehrenberg and others, when considering the fit of the Dirichlet this thesis considers the correlations.

However, before looking at each of the propositions it is worth noting the averages and Mean Absolute Deviations. In terms of the cumulative audience and average time spent listening to the station the averages are almost identical indicating that overall

the Dirichlet provides unbiased estimates. The MADs for the cumulative audience were 2.2 for 'All Stations' and 1.6 for 'Top Twelve'; and for the average time spent listening to the station 0.9 and 0.5 respectively. When eyeballing the averages for average time spent listening to the radio, share of category requirement, exclusive audience and the exclusive audience's average time spent listening there does not appear, at first glance, to be such a good fit. Nonetheless the MADs for each of those measures were low; for average time spent listening to the radio ('All Stations' 5.1; 'Top Twelve' 0.7), SCR (8.2, 3.1), exclusive audience (4.7, 1.8), and the exclusive audience's average time spent listening (6.9, 2.8). This does indicate an overall good fit. These findings are discussed in greater detail in the following sections.

6.5.1 Brand Size

The two key measures of brand size are market share and cumulative audience or penetration. A correlation was undertaken to test the strength of the linear association between the observed cumulative audience and the Dirichlet's theoretical cumulative audience. The test for 'All Stations' showed a correlation of 0.97, $r^2 = 0.94$, and for the 'Top Twelve' stations it was 0.94, $r^{2 =} 0.87$. Given the Dirichlet's predictions are made on the basis of a station's market share, and having already noted in Section 6.3.1 a strong correlation between market share and cumulative audience, this result supports the contention that the Dirichlet can be used to predict a station's cumulative audience. Furthermore, the observed average and theoretical average for cumulative audience are identical, demonstrating that the Dirichlet theoretical estimates appear to be unbiased.

6.5.2 Brand Loyalty-Related Measures

Section 6.4.2 has already shown there is a strong linear relationship between a station's market share and two of the three brand loyalty-related measures (average time spent listening and share of category requirement). Although the correlation between market share and exclusive audience was very weak for 'All Stations' a reasonable fit was seen for the 'Top Twelve' stations. This section now looks at the relationship between the observed and Dirichlet's theoretical results for the three brand loyalty-related measures.

Average Time Spent Listening To A Specific Station

In the aggregate there is a good fit between the observed and theoretical variables with the averages being almost the same at observed 6.4 hours and theoretical 6.5 hours. The correlation between the observed and theoretical average time spent listening for 'All Stations' was r = 0.72 and for the 'Top Twelve' r = 0.85. However it appears that the Dirichlet does slightly under-predict the average time spent listening for the larger stations, whilst slightly over-predicting the average time spent listening for the smaller stations. This under prediction for the larger stations supports the findings by Fader and Schmittlein (1993), providing a further useful extension of prior work. However, these apparent discrepancies are not thought a major concern. They could be either as a result of the data collection methodology or the effect of the 22 outliers mentioned in Section 6.4.2. In aggregate, the observed averages and theoretical averages are virtually identical.

Average Time Spent Listening To The Radio

The fit between the observed and theoretical values for the average time spent listening to the radio for 'All Stations' is r = 0.40 and for 'Top Twelve' stations is r = 0.51. As noted in Chapter 4 data released from Arbitron's Houston, and BBM Canada's Quebec portable – people – meter (PPM) trials indicated that, not only were listeners recorded as hearing more stations (up to twice as many stations), they also spent between 20% to 30% less time listening to the radio than found with the traditional diary method. In the BBM Canada study this was shown to be a methodological issue as the meters recorded listening to the nearest minute whereas diaries rounded time to the nearest 15 minutes. These differences have implications for fit of the Dirichlet. In considering Table 29, if the overall average of theoretical estimates for the average time spent listening is 20% lower than the overall average observed value; this is consistent with the results of the BBM Canada study. Whilst the issues surrounding reporting of radio listening are important and are covered in Chapter 4, they are beyond the scope of this thesis and are an area for further research. Nonetheless, further reference to this phenomenon will be made in Chapter 7.

Share of Category Requirements

As mentioned, share of category requirements (SCR) is one the most common measures of brand loyalty and is also used extensively in Dirichlet analysis. Also, the correlations between market share and SCR demonstrated a good fit. Likewise, with the Dirichlet's theoretical and the observed SCRs a good fit was evident ('All Stations' r = 0.76 and 'Top Twelve' Stations r = 0.89). But, there is a suspected bias with the theoretical average higher than the observed values. Compared to the Dirichlet estimates, this radio market shows more time spent listening to the radio and consequently a lower SCR for each station.

Exclusive Audience

This study has initially found that there was not a good correlation between market share and exclusive audience. Likewise with the fit of the Dirichlet – with 'All Stations' the correlation between the observed exclusive audience and the Dirichlet's theoretical exclusive audience was r = 0.22, however, the correlation did improve with the 'Top Twelve' stations among which it was r = 0.63. As mentioned previously, the main deviation was with Radio Rhema where its observed exclusive audience was 22% compared with the Dirichlet's predicted 2% which may be due to the sampling variation associated with a small station, or the unusual listening patterns associated with its Christian format.

Ehrenberg et al. (2004) report the "annual purchase rates of 100% loyal buyers are consistently under predicted. This is so far unexplained. But the discrepancy usually varies relatively little from brand to brand (except with market share) and has not been of diagnostic (i.e. differentiating) marketing value so far" (p. 1312). This comment by Ehrenberg is supported with this study's recorded exclusive audience's average time spent listening where the correlation confirms that the same boundary conditions (namely the under prediction of loyal buyers purchase rates) that are seen in other markets seemingly also apply to radio. The correlation between the observed and theoretical values for 'All Stations' and the 'Top twelve' stations were r = 0.57 and r = 0.44 respectively

However, there are two issues that need to be considered. First, as mentioned previously, the sample sizes for the exclusive audiences were small and second, as mentioned with SCR, there could be methodological issues with the radio diaries that resulted in an over reporting of sole loyal listeners and an over reporting of the average time spent listening.

Nonetheless, the point made earlier about the observations from the exclusive audience is important: there are very few exclusive listeners and they are very light listeners – and from a station's marketing perspective they should be viewed as not very important in terms of the station's overall audience.

Market Partitioning, Brand Size and Brand Loyalty

As shown in Section 6.4.3 there are a number of combinations of stations between which the listening duplication between stations is either higher or lower than predicted. For instance it was seen that, the music stations have, on average, a greater than predicted sharing with other music stations than do talk stations. As discussed previously, this indicates a partition in the market place based on format or genre. This is, however, a 2-submarket solution rather than a proliferation of niches popularly believed to exist by station managers.

Therefore, before specifically examining the observed and Dirichlet's theoretical listening duplications it is worth examining the observed and Dirichlet's theoretical values for brand performance measures. Table 30 shows the observed and theoretical performance measures for the music stations while Table 31 shows the same data for the Talk stations. Table 32 shows the correlations for each of the brand performance measures for both the 'Music' and 'Talk' stations.

Table 30: Observed and Theoretical Performance Measures 'Music Stations'

	Market Share (%)	Cumulative Audience (%)		Average Time Spent Listening (hours)		Average Time Spent Listening to Radio (hours)		Share of Category Requirement (%)		Exclusive Audience (%)		Excl Aud. A.T.S.L. (hours)	
		O	T	O	T	O	T	O	T	O	T	O	T
More FM	10.1	30	29	7.0	7.2	21.9	18.5	32	39	7	3	15.8	6.6
The Rock	9.5	21	24	7.6	6.9	22.1	18.5	34	37	7	3	11.9	6.4
Classic Hits	8.3	26	23	6.1	6.9	22.9	18.6	27	37	6	3	12.1	6.4
Solid Gold	6.5	19	17	6.0	6.6	23.0	18.6	26	35	7	2	14.9	6.2
The Breeze	6.5	18	17	6.3	6.6	22.9	18.6	28	35	8	2	10.1	6.1
The Edge	5.3	19	18	6.2	6.7	22.4	18.6	28	36	3	2	22.2	6.2
ZM	5.2	17	16	6.1	6.6	23.3	18.6	26	35	7	2	11.6	6.2
Average	7.3	21	21	6.5	6.8	22.6	18.6	29	36	6	2	14.1	6.3
MAD			1.7		0.5		4.1		7.6		2.4		7.8

Table 31: Observed and Theoretical Performance Measures 'Talk Stations'

	Market Share (%)	Cumulative Audience (%)		Average Time Spent Listening (hours)		Average Time Spent Listening to Radio (hours)		Share of Category Requirement (%)		Exclusive Audience (%)		Excl Aud. A.T.S.L. (hours)	
		O	T	O	T	O	T	O	T	O	T	O	T
National Radio	14.4	28	34	8.9	7.4	23.4	18.5	38	40	11	3	15.9	6.5
Newstalk ZB	10.4	21	27	8.9	7.0	23.9	18.5	37	38	9	3	15.4	6.6
Radio Live	4.0	12	12	6.5	6.5	23.4	18.6	28	35	7	2	13.3	6.1
Radio Sport	3.0	14	12	5.6	6.4	25.8	18.7	22	34	3	2	15.3	6.0
Radio Pacific	2.3	11	7	4.3	6.3	23.9	18.7	18	34	2	2	5.5	5.9
Average	6.8	17	18	6.8	6.7	24.1	18.6	29	36	6	2	13.1	6.2
MAD			3.6		1.2		5.5		7.6		2.4		7.0

Table 32: Correlations Between Observed and Theoretical Performance Measures for 'Music', 'Talk' and 'Top Twelve' Stations.

Performance Measure	Music Stations	Talk Stations	Top Twelve Stations
Cumulative Audience	0.93	0.98	0.94
Average Time Spent Listening	0.63	0.93	0.85
Share of Category Requirements	0.71	0.94	0.89
Exclusive Audience	0.14	0.85	0.63

When comparing the correlations for the brand performance measures there is a very good fit, overall, for the 'Talk' Stations along with a reasonable fit, for the 'Music Stations. The poor fit for the 'Music' stations' Exclusive Audience might be accounted for (as mentioned previously) as sampling variation. Nonetheless, the 'fits' for each of the two groups of stations indicates there does seem to be a partition in the market place.

6.5.3 Market Partitioning

Listening duplication plays a very important role within the radio industry. Not only is it important for station managers to know where their audience comes from and goes to, but media buyers also need to understand listening duplications when planning a media schedule. Any audience duplication will impact on the reach and frequency calculations involved in buying differing radio stations.

The Dirichlet's ability to provide a duplication coefficient (average duplication coefficient of .993) means a comparison can be made between the observed and theoretical duplications. Table 33 shows the observed and theoretical duplications for the 'Top Twelve' stations. The corresponding table for 'All Stations' is included as Appendix E. This is a more sophisticated version of the Duplication of Purchase Law applied earlier in the chapter.

The correlation between the averages of the observed and theoretical duplications for each station was $r = 0.92$, $r^2 = 0.86$ and, in considering the actual differences between the average observed duplication and the theoretical duplication, a Mean Absolute Deviation (MAD) of 3.5% is present, all indicating a very good fit.

Table 33: Dirichlet Predictions of Duplication of Listening Between 'Top Twelve' Stations (%)

	Cumulative Audience	More FM		National Radio		Classic Hits		Newstalk ZB		The Rock		The Edge		Solid Gold		ZM		The Breeze		Radio Sport		Radio Live		Radio Pacific	
		O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T
More FM	30			13	28	40	25	13	21	34	21	29	19	21	19	23	17	14	15	11	14	11	12	12	11
National	28	14	30			16	25	23	21	10	21	7	19	11	19	7	17	8	15	16	14	16	12	9	11
Classic Hits	26	48	30	17	28			18	21	30	21	20	19	28	19	18	17	22	15	19	14	9	12	13	11
Newstalk ZB	21	19	30	29	28	21	25			9	21	21	19	17	19	12	17	24	15	20	14	13	12	19	11
The Rock	21	49	30	12	28	36	25	9	21			31	19	29	19	28	17	13	15	14	14	10	12	9	11
The Edge	19	47	30	11	28	28	25	24	21	35	21			24	19	33	17	16	15	13	14	12	12	17	11
Solid Gold	19	35	30	16	28	39	25	19	21	34	21	24	19			17	17	20	15	17	14	13	12	9	11
ZM	17	40	30	11	28	27	25	15	21	35	21	36	19	18	19			11	15	15	14	13	12	9	11
The Breeze	15	27	30	15	28	37	25	33	21	19	21	19	19	25	19	13	17			16	14	9	12	14	11
Radio Sport	14	25	30	32	28	35	25	32	21	22	21	18	19	23	19	18	17	18	15			18	12	26	11
Radio Live	12	26	30	36	28	19	25	23	21	18	21	19	19	20	19	19	17	12	15	20	14			20	11
Radio Pacific	11	34	30	24	28	31	25	38	21	18	21	29	19	17	19	15	17	20	15	34	14	24	12		
Average	21	34	30	24	28	30	25	24	21	25	21	23	19	22	19	19	17	17	15	18	14	15	12	15	11
Expected Duplication		33	30	31	28	28	26	23	21	23	21	21	19	21	19	19	17	16	15	15	14	13	12	11	11

However, as shown in the previous consideration of the listening duplications there are a number of combinations of stations where the listening duplication between stations is either higher or lower than predicted. For instance it can be seen that, the music stations have, on average, a greater than predicted sharing with other music stations than with the talk stations. Again as discussed previously, this indicates a partition in the market place based on format or genre.

The observed and theoretical duplications for the 'Music' and 'Talk' stations are shown in Tables 34, 35, 36, 37 and the correlations and MADs are shown in Table 38.

Table 34: Dirichlet Predictions of Duplication of Listening Between 'Music' Stations (%)

	Cumulative Audience	More FM		Classic Hits		The Rock		The Edge		Solid Gold		ZM		The Breeze	
		O	T	O	T	O	T	O	T	O	T	O	T	O	T
More FM	30			40	25	34	21	29	19	21	19	23	17	14	15
Classic Hits	26	48	30			30	21	20	19	28	19	18	17	22	15
The Rock	21	49	30	36	25			31	19	29	19	28	17	13	15
The Edge	19	47	30	28	25	35	21			24	19	33	17	16	15
Solid Gold	19	35	30	39	25	34	21	24	19			17	17	20	15
ZM	17	40	30	27	25	35	21	36	19	18	19			11	15
The Breeze	15	27	30	37	25	19	21	19	19	25	19	13	17		
Average	21	41	30	34	25	31	21	27	19	24	19	22	17	16	15

Table 35: Dirichlet Predictions of Duplication of Listening Between 'Music' and 'Talk' Stations (%)

	Cumulative Audience	National Radio		Newstalk ZB		Radio Sport		Radio Live		Radio Pacific	
		O	T	O	T	O	T	O	T	O	T
More FM	30	13	28	13	21	11	14	11	12	12	11
Classic Hits	26	17	28	18	21	19	14	9	12	13	11
The Rock	21	12	28	9	21	14	14	10	12	9	11
The Edge	19	11	28	24	21	13	14	12	12	17	11
Solid Gold	19	16	28	19	21	17	14	13	12	9	11
ZM	17	11	28	15	21	15	14	13	12	9	11
The Breeze	15	15	28	33	21	16	14	9	12	14	11
Average	21	14	28	19	21	15	14	11	12	12	11

Table 36: Dirichlet Predictions of Duplication of Listening Between 'Talk' and 'Music' Stations (%)

	Cumulative Audience	More FM		Classic Hits		The Rock		The Edge		Solid Gold		ZM		The Breeze	
		O	T	O	T	O	T	O	T	O	T	O	T	O	T
National	28	14	30	16	25	10	21	7	19	11	19	7	17	8	15
Newstalk ZB	21	19	30	21	25	9	21	21	19	17	19	12	17	24	15
Radio Sport	14	25	30	35	25	22	21	18	19	23	19	18	17	18	15
Radio Live	12	26	30	19	25	18	21	19	19	20	19	19	17	12	15
Radio Pacific	11	34	30	31	25	18	21	29	19	17	19	15	17	20	15
Average	21	34	30	30	25	25	21	23	19	22	19	19	17	17	15

Table 37: Dirichlet Predictions of Duplication of Listening Between 'Talk' and 'Talk' Stations (%)

	Cumulative Audience	National Radio		Newstalk ZB		Radio Sport		Radio Live		Radio Pacific	
		O	T	O	T	O	T	O	T	O	T
National	28			23	21	16	14	16	12	9	11
Newstalk ZB	21	29	28			20	14	13	12	19	11
Radio Sport	14	32	28	32	21			18	12	26	11
Radio Live	12	36	28	23	21	20	14			20	11
Radio Pacific	11	24	28	38	21	34	14	24	12		
Average	21	24	28	24	21	18	14	15	12	15	11

Table 38: Correlations and MAD for Tables 33 to 37

	Correlation Observed/ Theoretical Duplication	Mean Absolute Deviation
Music/Music	**0.97**	**6.0**
Music/Talk	**0.48**	**4.2**
Talk/Music	**0.83**	**3.5**
Talk/Talk	**0.93**	**3.6**

In considering Tables 28 to 31 and the listening duplications by format, the structure of the Manawatu radio market becomes clearer. There was a demonstrated partition in the market in that music station listeners had a greater probability of listening to another music station rather than a talk station. This partition is reflected (as shown in Tables 33 to 38) in the Dirichlet's predictions which show a very good fit between the Music/Music (r = 0.79), Talk/Music (r = 0.83) and Talk/Talk (r = 0.93) groups and a poor fit in the Music/Talk (r = 0.48) grouping. However, one station (National Radio) counted for the majority of the deviation in the Music/Talk group. This is because the National Programme shared, in the main, its audience with the Concert Programme, as discussed previously.

6.6 SUMMARY

This chapter has examined the research question and the associated propositions. It has found that that in the aggregate the evidence supported each proposition although there were some deviations. These deviations were thought to be statistical anomalies due to small sample sizes or due to a specific format targeting listeners of a religious persuasion. Nonetheless this study has confirmed the broad patterns of the generalisations, and identified submarkets using duplication analysis. However, when it comes to the fit of the Dirichlet model, methodological issues with diary data collection seem to be introducing a bias that leads to a poor fit. This section will next briefly summarise each proposition and its apparent support.

Proposition 1 claimed that each radio station's cumulative audience will vary greatly but that the variation would be in line with each station's market share. This was found to be the case with a very strong correlation for not only 'All Stations' but also for the 'Top Twelve' stations.

Proposition 2 claimed the average time spent listening would not only vary with market share but would be similar from brand to brand and that there would be a clear DJ effect in line with market share The correlation between market share and average time spent listening for 'All Stations' was 0.75, and for the 'Top Twelve' Stations the correlation was 0.86, indicating a very good fit confirming the second proposition.

As well as proposing that each station's SCR would be low, Proposition 3 stated that share of category requirement would vary with market share. The correlation between market share and share of category requirement for 'All Stations' was 0.79, and for the 'Top Twelve Stations' the correlation was 0.89. These correlations support the proposition. It was also shown that the average time spent listening to the radio is typically far higher than the average time spent listening to a particular station thus giving each station a low SCR. Not only did all stations have a low SCR they were also close to the average, with a slight double jeopardy effect. Whilst these low SCR's are reflective of the fact that the exclusive audience are light listeners, they also highlight that most listeners are multi-station listeners.

Proposition 4 claimed that each radio station would have a low exclusive audience and that those listeners would be light radio consumers. This proposition was supported with 'All Stations' having an average exclusive audience of 6.3% and an exclusive audience average time spent listening of 11.8 hours – less than half the average time spent listening for all listeners of 23.7 hours. However, it was noted that the sample sizes for the exclusive audiences were low with an average of just 10 listeners per station. These low sample sizes impacted on the correlations and the deviations were thought accounted for as a sampling variation. Nonetheless, while the correlation between market share and exclusive audience for 'All Stations' was 0.31, indicating a poor fit, the correlation for the 'Top Twelve' Stations the correlation was 0.83, – indicating a good fit.

Proposition 5 stated that, as with the Duplication of Purchase Law, stations would share their listeners in line with the other station's penetrations. It was expected that a switching between stations would follow a similar pattern. The correlation between the average duplication and the expected duplication was 0.95, a very good fit. Although the correlations supported the proposition, there was evidence of a possible market partition based on format. In considering the stations, grouped as either music or a talk station, it was shown that music station listeners were more likely to switch to a music station than a talk station demonstrating a partition in the market place.

Overall, each of the first five propositions was shown to be supported with strong correlations between each station's market share and their cumulative audience, average time spent listening and share of category requirement. However, this thesis also proposed that the Dirichlet model of consumer behaviour could be used to describe radio listening behaviour.' Having found that the market regularities that support the Dirichlet model do apply to radio listening within reasonable parameters, this thesis examined the Dirichlet model's predictions.

Section 6.5 specifically looked at the Dirichlet's predictions and whether they were a good fit when compared with the actual observations. Overall there was a strong correlation between the observed and theoretical values for the cumulative audience ($r = 0.94$), average time spent listening to a station ($r = 0.85$), share of category requirement ($r = 0.89$) and duplication of listening ($r = 0.86$) variables. However,

there was not a good fit with the average time spent listening to the radio (r = 0.51), exclusive audience (r = 0.63) and the exclusive audience's average time spent listening (r = 0.44). Also, there was a systematic bias in that the theoretical average was lower than the observed values confirming the boundary condition that the Dirichlet under-predicts the purchase rates of solely loyal buyers.

Whilst it cannot be proven conclusively within the context of this study, it appears from the Arbitron and BBM Canada studies that methodological issues may account for the differences. As highlighted in Chapter 5 the BBM Canada study showed that average time spent listening to the radio was over-reported in diary methodology by up to 30% and listener repertoire sizes were under-reported by almost 50%. These findings indicate that both the actual exclusive audience levels and the average time spent listening to the radio might well be closer to the Dirichlet's predictions than the actual diary observations. This implies that within the New Zealand radio environment where diary methodology is used the Dirichlet's predictions may be a better benchmark than the observed values as they are not subject to the method bias of the empirical results. This is an area for further research.

Nonetheless, while, in the aggregate, the Dirichlet has provided a reasonable overall fit the question needs to be asked whether the model has any practical application within the New Zealand radio industry. The following chapter looks at how the Dirichlet generalisations can be applied and what the implications appear to be for radio station managers.

7 DISCUSSION, CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

7.1 INTRODUCTION

This chapter brings together the key findings from earlier chapters and discusses their implications for managing a radio station's audience. It first reviews the assumptions behind the research and the academic implications arising from its findings. Second it looks at the structure of the Manawatu radio market and whether findings applicable to that market can be generalised to other New Zealand radio markets. The chapter then considers the implications for radio station managers and how this research might present them with opportunities to enhance their station's performance. Finally, it concludes with remarks on possible future academic research as well as suggesting areas for further developing radio-related research in New Zealand.

7.2 STOCHASTIC ASSUMPTIONS, IMPLICATIONS AND VERSIONS OF THE MODEL

This thesis was designed to meet both academic and applied objectives. From the academic perspective it was intended primarily to extend earlier studies on empirical regularities and generalisations applying to fast moving consumer goods/industrial product markets to a new area–radio listening. It considered whether some of the assumptions behind the Dirichlet, in particular the Poisson assumption, would be placed under pressure due to what could be considered short inter-purchase time periods associated with radio listening. Closely allied to that question was the issue of how to measure purchase frequency or purchase occasions within radio markets.

7.2.1 Poisson Process and Inter-Purchase Time Periods

As mentioned in Sections 2.3.1 and 3.3.1 the Dirichlet assumes that each consumer buys in a way that can be modelled as a Poisson process (see Ehrenberg 1988, 1972, 1959; Ehrenberg et al. 2004). For this work on radio markets that was defined as meaning random listening in counts of fifteen minute periods. These counts were then divided by four to correspond with standard industry reporting.

As used in this context what the Poisson process means is that such purchase behaviour can be modelled as a random process where knowledge of the last purchase does not help to predict the next incidence. However, as already mentioned, it was thought that this assumption of randomness was open to question in that there might be radio stations that are listened to regularly or in a more regular pattern than that implied by a Poisson process. Further complicating the issue, radio listening is consumed at the time of its purchase thus there is the potential for the listener to make several purchases over a relatively short period of time. With radio listening these inter-purchase time periods may be as short as '15 minutes' or even zero (for consecutive fifteen minute intervals). Therefore, in terms of the current research, the Poisson assumption seemed likely to be placed under more pressure than in the case of fast moving consumer goods – which tend to be purchased weekly.

Nonetheless, given the 'fit' of the Dirichlet in the aggregate across the various brand performance measures, especially cumulative audience, average time spent listening and share of category requirements, the 'relatively' short inter-purchase time periods were not seen to have placed the Poisson assumption under undue pressure. However, this study considered radio listening behaviour over a week and it could be that the results might be different if the period under study was one day or a specific time period (e.g. Monday to Friday 6am to 9am). This could be an area for further study as radio advertising is sold either in specific time blocks (6am to 9am) or daily 'Run of Station'.

7.2.2 Purchase Occasions

The issue of purchase occasions/purchase frequency also needs to be clarified. As already mentioned, one of the key principles of this research was to make sure it was applicable to practitioners and academics alike. Therefore, it was important to ensure that the data was presented and analysed in the same manner as that normally available to radio station managers. Given that the 'official' New Zealand radio audience measurement surveys use the diary method and that listening is recorded in 15 minute or quarter hour segments it was decided to follow the same pattern. This meant that listening occasions were defined from the count of quarter hours during which a respondent reported listening to a station across a specified time period. Each quarter hour spent listening to a station was regarded as one listening occasion reflecting the respondent's recording their listening in fifteen minute segments.

However each listening occasion could also be defined as the actual time period that a listener spent listening to the radio. That is if the listening was from, for example, 9am to 10-15am then this time period would be one listening occasion rather than five occasions. This is an area for further research and a comparison of the findings using both definitions would be of academic value. Nonetheless, while the Dirichlet was originally developed for data that records repeat purchases by consumers, it is increasingly being applied to other multivariate count data with different structures (Rungie and Goodhardt 2004). While this might violate basic assumptions of the model it has still been found to fit reasonably well. It appears, as in this case, that the model does account for variations in multivariate count data in a manner that is parsimonious.

7.2.3 Dirichlet Discrepancies

Since the Dirichlet is parsimonious or even simplistic in its assumptions and input requirements, it should not be surprising that discrepancy problems do occur. For instance, over many studies the model has systematically under-predicted the average purchase rates of 100% loyal buyers. This study has confirmed that boundary condition by showing that the model has again under-predicted the average time spent listening by the various stations' exclusive audiences.

One important feature of the model is that discrepancies do stand out. As shown in this thesis they seem small and explicable in terms of case-specific factors. However, where they are systematic, as in the case of 100% loyal buyers/listeners a basis exists for further generalisation. The model is about habitual near steady-state behaviour. It supposedly is not dynamic. However, even in dynamic situations it has still been found to provide useful benchmarks for performance appraisal. As noted in Chapter 3, conditional trend analysis using the Dirichlet norms for period-to-period repeat-buying has enabled studies of the effects of price promotions, seasonality, and new product launches – studies (Uncles and Ehrenberg 1990; Ehrenberg, Hammond and Goodhardt 1994; Hammond, Ehrenberg and Goodhardt 1996; Wellan and Ehrenberg 1988) that have yielded useful results without having to fine-tune the model. Whilst the Dirichlet is not perfect, competing models do not apparently provide a better approach—if as good.

7.2.4 Versions of the Dirichlet

From a practical perspective this thesis endeavoured to ensure that radio station managers would be able to easily use the Dirichlet to benchmark promotional and marketing activities. This meant using a version of the model that was accessible and relatively easy to use with available data. Whilst most stations undertake some form of localised research, the majority of radio research is in the form of the 'official' radio audience measurement surveys. Since that data is available in Excel it was decided that using the Dirichlet software (Kearns 2000) which is Excel-based was most appropriate. However, this choice does leave open the question as to whether using the BUYER software (Uncles 1989), or using maximum likelihood (Rungie, 2003) would provide different results. This is an area for further research and a comparison of the three versions including the suitability for different markets would provide practitioners with a greater degree of certainty.

7.3 PATTERNS OF THE DIRICHLET AND ITS EMPIRICAL UNDERPINNINGS

This thesis has shown through the examination for support of the research question and associated propositions that there do appear to be patterns to the radio listening within the Manawatu radio market. These patterns are rather clear and can be described quite easily:

- Tables 18, 19, and 22 show regular patterns in that the brand performance measures all correlate with market share and that they are much the same for the different radio stations, except for a double jeopardy effect.

Specifically the patterns are:

- Each radio stations' cumulative audience differs greatly, but they all differ in line with each station's market share. Also, each station's average time spent listening is similar. However, there is a small double jeopardy trend.

- Each station has few 100% loyal listeners, and they are light listeners. On average a radio station meets less than 30% of their affiliated listeners' needs for radio broadcasting.

- Stations that are supposed to directly compete with each other, as shown in Table 9 also shared their audience with stations who had a distinctly different format (Table 22). In fact, the numbers of listeners who also listen to another station are in line with the competitor station's cumulative audience. There are no clusters of two or more stations that are especially competitive with each other, so implying very little distinct segmentation.

- More generally, the radio patterns demonstrated are not unique in that they closely resemble ones found in a very wide range of fast moving consumer goods and industrial markets, as described by the Dirichlet model.

However, what are the implications arising from radio markets being 'Dirichlet'? What do these patterns mean? What are the managerial implications – especially to

what extent a manager should take the patterns as 'normal' or seek to 'buck the trend'?

7.4 IMPLICATIONS OF THE DIRICHLET PATTERNS.

By extension Ehrenberg and Uncles (1999) note that the Dirichlet model and its empirical underpinnings have implications for how a radio station manager should perceive: their listeners, their stations and station loyalty, and their marketing activities. This section discusses the Dirichlet's implications for radio and radio station managers within those three areas. The bias evident in some loyalty related measures limits the application of the Dirichlet for calculating brand performance benchmarks. However, the confirmation of the broader Dirichlet generalisations in Propositions 1 – 5 provide many implications for management.

7.4.1 Dirichlet Implications for Radio Audiences.

The Dirichlet has several implications about how a listener will choose the station(s) to which they listen. The model, as shown in Chapter 3, assumes that each listener will choose a station from within their personal consideration set or station repertoire (see Tables 20 and 21), with their own habitual steady probabilities, but differing from person to person.

The Dirichlet also implies that for a listener to be 'loyal' to a station does not mean that they have to be an exclusive listener – they merely have to listen to that station at some stage. Even light listeners to a station may be 'loyal', i.e. they listen to the station but do so less frequently and only for short periods of time. Most Dirichlet-type listeners show split loyalty for several stations – listening to several stations per listener per week. The model's successful theoretical predictions show that listeners' multi-station loyalty is not apparently due to the varying marketing inputs, because none are assumed in the model, yet it still 'fits'. Instead, both the observed and theoretical values show that few listeners to a station are monogamous (the observed

average exclusive audience is just 6.3%) – they display polygamous loyalty listening to several stations.

As noted earlier the average listener has a repertoire of several stations listened to, for instance 55%, 35% and 10% of the time. They therefore listen to the 10% station about 1 time in 10 times. But precisely when they listen, (e.g. Monday 9am or Saturday 2pm) is assumed to be as-if-by-random (with a probability of 0.1).

However, station choice is not really random as listeners do not say 'What station shall I listen to now?' They have their reasons, motives or feelings for their specific choices (such as; company, need to relax, news and information, they like the announcer, competitions and so on). Such reasons are, or appear to be, irregular; hence listener choice can be modelled as if it were by random. The general 'fit' of the model's performance as seen in Tables 28 and 29 show that the hypothesis seems to work.

The Dirichlet makes the zero-order assumption that purchase probabilities are not affected by directly preceding purchases. This makes sense because listeners are already highly experienced; any 'learning' from habitual listening to a station would already have worked its way into the station-choice probabilities. Nonetheless, some listening feedback will occur at times (e.g., that was a good song; or It's the last time I listen to that idiot!). However, as Ehrenberg and Uncles (1999) state "… (this) may even then have been due to other causes, such as some overlooked non-stationarity" (p. 121).

With the Dirichlet it is assumed every listener is different; they are infinitely segmented, and there will therefore be no systematic station segmentation for any of the closely substitutable stations (see Table 9). This is shown by the finding that listeners do not fall into a few distinct and relatively homogenous subgroups listening to specific stations. They, in fact, follow the Duplication of Purchase Law and listen to other stations in proportion to the other station's cumulative audience (see Table 22).

However, while these findings showed no clear segmentation, Ehrenberg and Uncles (1999) do point out that "Customers of different product categories or subcategories can however be distinct with clear segmentation" (p. 121) (e.g., pet food buyers have pets, users of leaded petrol have older cars, etc.). In this study subcategories of music and talk stations were present but then, as shown in Tables 30 and 31, the patterns and 'fit' of the Dirichlet held equally for all the stations competing within the 'music' and 'talk' subcategories.

As shown with the 'fit' of the Dirichlet, the stations tended to differ only in market shares implying that listeners' attitudes and beliefs about directly substituted stations should theoretically be similar. However, this study did not look at listener attributes or beliefs about stations, although studies (Barnard and Ehrenberg 1999) have shown they are much the same from brand to brand. There have been numerous studies looking at attitudinal response levels (e.g. Franzen 1994; Dall'Olmo Riley et al. 1997), and this is an area for further research within the radio market

Although the Dirichlet is mainly about established brands, it is also important to consider how a listener first comes to listen to a new station or a station that is new to them. As identified in Chapter 4, the New Zealand radio industry has not only expanded over the last 15 years, but is continuing to expand as the various networks are moving into new markets. Therefore, knowledge of how a station might be trialled and eventually included in a listener's station repertoire could be important. By extension, Ehrenberg (1997) talks about the process as follows: after a listener first becomes aware of a radio station (e.g. sees an advertisement, friend mentions it) they may decide to listen to it for a short period of time. At the next or subsequent time the radio is turned on the listener may decide to listen to that 'new' station again. Mostly, however, the station is likely to be dropped. But, if the experience was 'good' enough, then perhaps the station may be included in their station repertoire. Nonetheless, the new station would be listened to infrequently, simply because most listeners to a radio station are light listeners as shown by Tables 18 and 19.

For a listener's new station to survive against the competition their ongoing choice needs to be reinforced by that station's marketing mix. Even though a steady listening habit can change, that process is usually slow - occurring over a lengthy period of

time. This is a process that is reflective of the problems seen with 'Easy Mix' and Kiwi FM' as mentioned in Chapter 1. It appears that the process comes about by what Ehrenberg calls 'nudging' rather than a sudden conversion. The process has been expanded upon by Ehrenberg, Barnard and Scriven (1999) as the Awareness → Trial → Reinforcement and Nudging - and applies to both existing products and new products entering a market place.

As mentioned previously, New Zealand is seeing the radio market's various networks expanding into new market places so it is also important to briefly consider the aggregate effect of those new radio stations on their marketplaces. When launching a new radio station the main aim of the broadcaster is to shift audience listening (in terms of both numbers of listeners and the time spent listening) from their major competition to the new station. For instance, if one of the major networks is launching their rock music or talk station into a new market, their main aim appears to be to draw listeners from the other network's existing rock music or talk station. However, this is not the case as all radio stations lose share to a new entrant in direct proportion to their market share and cumulative audience before the new station's launch (Lees and Buchanan 2005). This is consistent with the share-order-effect (SOE) model that predicts all brands will lose market share to a new entrant in direct proportion to their size before the new entrant's launch model (Ehrenberg 1988; Lomax, Hammond, East and Clemente 1996; Lomax, Hammond, Clemente and East 1996). Further studies Ehrenberg and Goodhardt (2000), Wright and Sharp (2001) have also shown that a new brand behaves just like an existing brand very shortly after launch. Therefore coupled with the share order effect model, the Dirichlet can be used to predict what the marketplace would look like shortly after a new station is launched. This shall be discussed in the following section.

7.4.2 Dirichlet Implications for Station and Station Loyalty

An important feature of competitive radio markets is that (broadly) most stations keep their market shares, be they large or small, for several years at a time (Research International Radio Audience Measurement 2001, 2002, 2003, 2004, 2005, 2006, and 2007). The largest shift in national market share for all radio stations between the 2006 and 2007 audience measurement surveys was just 1.6%, with the average being

0.3%. If listeners were, because of advertising or promotion, consistently changing stations this 'steady state' would be unlikely. However, the Dirichlet explanation is simple – individual listeners are polygamous or multi-station listeners and tend to remain loyal to their station repertoires. While listeners could switch to other stations because they are similar, there appears to be no great motivation for a 'search' or for a switch. Habitual, even divided loyalty is less effort to the listener.

The marketing literature shows brand loyalty is measured in different ways (e.g. Jacoby and Chestnut 1978) but each measure still reflects the same thing. In fact, as shown in Tables 18 and 19 where - in the aggregate - loyalty measures do vary from station to station in the Dirichlet perspective, they still correlate with market share, although with a DJ effect. However, overall the loyalty measures (average time spent listening, share of category requirements and exclusive audience) tended to have the same value for all competing stations. Such uniformity implies that loyalty-related measures cannot be readily changed by what marketers may do. A typical radio station fulfils less than 30% of its listeners' share of category requirements. This means that listeners to More FM could easily listen to that station more often without having to listen to the radio for an increased period of time: they would merely have to listen to other stations in their repertoires less often. But that scenario hardly ever occurs, whether in practice or in Dirichlet theory.

What matters to radio station managers is the number of listeners to whom their station is 'salient', i.e. 'stands out' (Ehrenberg, Barnard and Scriven 1997, 1999). If Newstalk ZB has five times the number of listeners as Radio Pacific it is because Newstalk ZB is salient to five times more listeners, not because Newstalk ZB is five time more salient to its listeners. This is in line with the Dirichlet-type patterns, both empirical and theoretical. This raises the question for radio station managers – "how do I make my station more salient to more listeners?"

7.4.3 Dirichlet Implications for Radio Marketing Inputs.

Radio, like television and newspapers, is in a unique position in that it needs to advertise and promote itself to attract listeners, viewers or readers so that it can then 'on sell' these listeners, viewers and readers to its advertisers. Therefore, the Dirichlet

has implications for radio both as an advertising medium and as an advertiser of its own product. This section specifically looks at the marketing mix factors applying to radio stations as a product being promoted to potential listeners – advertising, product differentiation and marketing management.

It is rather ironic that the dominant view of advertising held by The Radio Bureau (2006) is one in which advertising, in general, and radio advertising specifically has a role to play as 'brand builders'. Advertising, according to the Bureau, is designed to persuade potential customers to buy the product or service being promoted. However, the market structure and listening patterns, as already shown by this thesis, infer this 'growth' strategy will fail and that a view of brand advertising which is consistent with the Dirichlet and its empirical generalizations is probably more appropriate. Ehrenberg et al. (1999) talk about a 'weak view' of advertising in that its main role is to act as publicity affecting the number of people for whom the brand is salient.

This means that a radio station's advertising and promotion has to be largely defensive. Even the biggest radio station, the National Programme with a 28% cumulative audience has some 72% of the competition against it. Radio is in the perfect position whereby it can promote itself to its listeners reinforcing their existing behaviour. However, radio stations need to think strategically noting that advertising mainly works over the longer term, leaving memory-traces and associations of the station name in the mind. Some time may pass between a potential listener seeing an advertisement and tuning in to the associated station.

Radio stations also try to differentiate themselves making claims such as 'they are the number one station for females 18 to 25 years' (see Nelson-Field et al. 2005, 2007). This differentiation is mainly aimed at potential advertisers, as outside of the radio announcers performing on a station there appears to be little differentiation between competing brands. Stations that support a particular format or genre play similar music and have similar length news bulletins and commercial breaks. Any innovation that one network develops (e.g. "six hits in a row commercial free"!!) is soon copied by their competing network, and any gains in audience numbers cannot be guaranteed.

This reality is reinforced by the already mentioned fact that the only major difference between competing networks is their affiliated announcers - yet these tend to be only noticed by listeners ***after*** they have been listening to the station (Gerard Duignan, Former Deputy Head of Programming, Radio New Zealand, personal correspondence August 2007). It is these differences that can lead to station preferences and with listeners identifying with a station. (e.g., "I like Paul Holmes so I listen to Newstalk ZB"). Such a position is not inconsistent with the Dirichlet concept of 'stations are stations'.

As discussed in Chapter 3, a common misconception is how a marketer can be interested in a steady state market when they are always trying to change that state (e.g. Little and Anderson 1994). Reason and experience shows that most established radio stations do not grow most of the time, and that their market shares remain relatively stable. This implies that the task for radio station managers is not to try and greatly increase one's audience each year, but to hold one's own audience against the competition. As Ehrenberg and Uncles (1999) say, it is "…Running hard to stand still".

Therefore, to make good marketing decisions, reasonably accurate and usable information is needed. Yet, all too often only partial information is to hand, and this may lead to the formulation of inappropriate marketing strategies. For instance, radio station managers assume that listeners selectively listen to the various radio stations – but this is not supported by the evidence. In fact this research casts doubt on the strategic marketing of the various networks; despite campaigns focused on building/sustaining station loyalty, and being differentiated in such a way that listeners should actually change their behaviour, those networks mostly compete with apparently directly substitutable competitors.

This research has shown that listeners appear to treat the differing radio stations alike: there happen to be some loyal buyers, but most listeners have a station repertoire. This implies that stations can be judged against norms and that brand performance measures can be benchmarked. For instance is a share of category requirement of 27% 'good' or 'bad', or is it 'just about right'? The absolute figure has little meaning

without comparable information, such as theoretical norms. If the share of category requirement is lower than expected then remedial action can be taken.

Also, given the near ubiquitous Dirichlet empirical regularities, it is doubtful whether a station manager should view any deviations as marketing opportunities – certainly not until the deviation (e.g. Radio Rhema and a religious format) has been clearly explained. The Dirichlet model implies that 'good marketing' means going with the market and not trying to 'buck the trend'. It imposes constraints on what can be expected. However, stations can and do gain or lose listeners, but those changes are mainly as a result of changes in cumulative audience, not in loyalty-related measures. While there are no set answers as to how a station manager should promote their station it appears that increases in awareness result in increases in cumulative audience and increases in market share.

7.5 SUMMARY

Why are some radio stations bigger than others? The answer seems to be that a big station has far more listeners than a small station. However, the bigger station's listeners listen to it only slightly more frequently than listeners to the smaller stations, and even this double jeopardy effect is predictable. There are patterns to a radio station's listeners' listening.

This thesis has shown that the empirical regularities and generalisations that apply to fast moving consumer goods and industrial products apparently also apply to radio listening. These patterns are called 'Dirichlet-type' because the observed patterns are closely predictable from a single and parsimonious model, the Dirichlet. This is defined for any market which is stationary or steady-state, unsegmented and non-partitioned. Research International's audience research has shown that radio markets have been approximately like that over a number of years.

The Dirichlet, however, in no way implies - let alone predicts - that a radio market will be stationary, unsegmented and non-partitioned. The model merely predicts,

successfully, what a New Zealand radio market will look like when they are approximately stationary, unsegmented and non-partitioned. Yet, when, over time, market shares will change, research (Ehrenberg et al. 2004) shows the Dirichlet patterns continue and provide validated steady-state benchmarks.

This thesis has reviewed the known patterns of buyer behaviour in near-steady-state and non-partitioned markets, and how they can be described and predicted by the Dirichlet theory. It has also outlined the many applications that have been carried out over the past 50 years and replicated and extended them to a new area, that of radio listening where it has shown those patterns of behaviour mostly hold true and can be described by the Dirichlet model.

However, this thesis has also shown that the model has some limitations. For instance this study found there was a poor correlation between market share and exclusive audience - a finding that was confirmed with the poor 'fit' between the Dirichlet's exclusive audience observed vs. theoretical values. However, this finding has also confirmed an existing boundary condition. The thesis has also considered the implications of those findings noting the bias evident in some brand loyalty measures has limited the application of the Dirichlet for calculating brand performance benchmarks.

At the individual level listening behaviour appears predominantly habitual. Most radio listeners report small station repertoires and /or consideration sets of stations. Over time they will choose stations consistently from their repertoires, i.e. showing polygamous loyalty. Individuals do differ greatly from each other in their listening frequencies and station choices. Their heterogeneous listening behaviours do, nevertheless, combine into regular patterns - and these listening patterns are much the same for different stations.

Recognising/acknowledging these empirical regularities, while having an understanding of the underlying theory said to be behind them, means that marketers can see how their strategies will impact on their station's performance. The Dirichlet findings do not explain everything, but they do provide a benchmark and background

against which it is possible to gain a better understanding of listener attitudes/motivations, and of the apparent effects of much marketing activity.

It is important for station managers to know that their listeners are seldom loyal to a single station, no matter the number of listening occasions, but that they do tend to stick loyally with two to three stations. This enables listeners to have some choice without having to re-evaluate all the available criteria at each purchase. In this way their listening decisions are rational, whilst not necessarily 'optimized' in the narrow economic sense.

Marketing activities such as advertising and promotions are usually found difficult to assess as they do not seem to add extra listeners. That is because these activities rarely persuade or cause listeners to change stations; more often they simple serve to re-affirm or marginally nudge an 'existing' habit. If this were not so there probably would be greater advertising and promotional activity than currently seen. Conversely, without any marketing activity in a competitive radio market, a station's cumulative audience would likely decline slowly over the medium to long term. The high degree of stability of many radio markets in the medium term is because each station's marketing activities are not as influential as expected and tend to balance one another out. Each station is in effect "Running hard to stand still".

Radio station managers faced with the realities of listening behaviour and listening loyalty patterns described in this thesis may think that if these patterns are so regular and one cannot change them, 'why bother'. Ehrenberg and Uncles (1999) reply:

> "That whilst the earth may look flat, and one cannot do anything about that, it seems better to know that is in fact round, and to have some maps showing how far X is from Y and how to get there. Brands do differ in market shares and penetrations, and one needs to understand how and why they got there, and at times one can do something to nudge one's sales. But so can one's more numerous competitors. Competitive marketing is therefore mostly defensive. Defending one's patch may at first seem unexciting, yet as Noel Coward said when asked how he liked being old, it is preferable to the alternative" (p. 128).

7.6 FUTURE RESEARCH

As has been discussed previously, few studies into radio listening exist that consider the impact of empirical regularities and Dirichlet type patterns on radio listening behaviour. Those studies that do are mainly from the USA, and primarily look at the double jeopardy effect. This thesis reports one of the first studies of its kind to be undertaken in New Zealand. Given the geographical constraints and the complexities of radio data collection, the time-honoured call for further research is again stated here. Uncles et al. (1995) echo such a call in regard to the Dirichlet and the empirical regularities that underpin it when they say they expect to see further extensions to differentiated product categories, applications in newly developed countries and investigations of other measures like favourite brands.

This thesis has answered that call when it posed questions such as:

- Does a radio station's cumulative audience vary greatly but in line with each station's market share?
- Is each station's average time spent listening similar but with a small double jeopardy trend?
- Do each station's listeners listen to other stations more often than they listen to it?
- Will each station's exclusive audience be small and will they be light radio consumers?
- Will the number of listeners to one radio station who listen to another radio station be mostly in line with the other station's cumulative audience?
- Can the Dirichlet model of consumer behaviour be used to describe radio listening patterns?

Arguably, this thesis has suggested answers to most of those questions albeit at a micro-level using one marketplace - the Manawatu in New Zealand. Further research

is required to help generalise the results and to examine variations from them within different radio marketplaces, both within New Zealand and further a field (see Lees 2003, 2006). As found in this thesis, measuring radio audiences is not easy and improved measurement methods would be welcome.

Therefore, future research could address the following issues:

- Replicating this study in other New Zealand marketplaces especially the Auckland marketplace where there is a number of specialist radio stations claiming to target specific audience segments. Such research should also specifically consider the behaviour of smaller stations and the switching between directly competitive stations. This research would be of special interest to radio station managers and academics considering the existence of niche markets. Whether the assumptions behind the Dirichlet model, and in particular the Poisson and 'zero-purchase order assumptions, hold true over shorter time periods such as a day or a specific time zone (e.g. Monday to Friday 6am to 9am and Monday to Friday 6am to 7pm). This research should also consider whether specific time zones could themselves be partitions in the marketplace.
- The question of radio audience measurement and the differences between the various methodologies being used. The New Zealand Radio Broadcasters Association could follow their U.K. counterparts and commission a report into the effect of introducing portable people meters as a form of audience measurement
- The apparent difference between electronic audience measurement techniques such as portable people meters and diary-based audience measurement. New Zealand could then follow the BBM Canada example by comparing and contrasting the current diary-based methodology with the PPMs.
- The question of what is a listening occasion and whether the different forms of measurement produce significantly different results.
- Whether the Dirichlet's implication that listeners' attitudes and beliefs about directly substituted stations are actually similar.

7.7 FINAL COMMENTS

The results presented in this thesis show that the Dirichlet's empirical generalisations describe radio markets and the application of the Dirichlet model of consumer behaviour to a radio market place in New Zealand has merit. Radio station performance measures such as cumulative audience, average time spent listening, share of category requirements, listening duplication and exclusive audience are all closely related to market share. In turn the Dirichlet model has been shown to predict in the aggregate what each stations' brand performance measures and listening duplication will be simply based on the station's market share--although there is some bias with brand loyalty-related measures.

The most compelling result of this thesis is the ability of the Dirichlet to describe the structure of a radio market place relatively accurately. The conclusion was drawn that radio station managers need to carefully manage their station--working with the market rather than trying to 'buck the trend'. This is likely to involve station managers actively promoting their stations to ensure that their station remains salient to its current listeners while also trying to increase its awareness amongst non listeners.

This thesis has also made several contributions to marketing knowledge concerning the Dirichlet. First, it has extended knowledge about that model to a new area – that of radio listening. Second, it has shown that while some radio listening may violate some of the assumptions behind the model, it is still robust enough to largely account for variations in multivariate count data in a manner that is parsimonious. Third, it has confirmed the boundary condition that the Dirichlet does under-predict sole loyal purchase frequency. Overall, the results look promising in spite of the usual provisos attached to such measurement and assertions.

Potential errors and sources of bias in the results have been acknowledged and discussed. None appear to be of a major concern in their effect upon the thesis's

results, although they may affect the use of the Dirichlet for brand performance benchmarks. Further research at both the macro and micro levels has been discussed. This includes the replication of parts of this study in different environments, and heed was taken of Uncles et al. (1995) call when they expected to see further extensions of the Dirichlet to differentiated product categories, applications in newly developed countries and investigations of other measures like favourite brands.

This researcher further echoes this call and looks forward to subsequent applications of the Dirichlet to new areas of analysis.

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9. APPENDICES

Appendix A: Radio Diary

Massey University

RADIO RESEARCH

MANAWATU RADIO DIARY
DEPARTMENT OF MARKETING
2005

Te Kunenga ki Pūrehuroa

Massey University
COLLEGE OF BUSINESS
Kaupapa Whai Pakihi

September 2005

Dear Respondent

Thank you for agreeing to take part in this research. Your assistance is vital to its success, and much appreciated.

This study is part of my PhD research, looking at people's radio listening behaviour. It is not aligned to any commercial research. It is also an important part of the Massey University Department of Marketing's ongoing research programme into marketing practice and consumer behaviour. The fact that you and other members of your household aged fifteen and over have agreed to participate in this project will ensure that the survey accurately reflects the radio listening carried out by people in Manawatu.

No matter how long or how infrequently you listen to the radio, your listening is important to me. What I am interested in is your normal listening patterns, so it is most important that you don't change your listening pattern just because you are completing this diary.

All that is required is five minutes per day, for one week, to complete the radio diary. All responses will be treated with the utmost confidentiality, and no individual or family will be identified in the study.

Again, on behalf of myself and Massey University, thank you for your assistance.

If you have any questions please feel free to contact me: Gavin Lees, Massey University, Phone 356-9099 ext 7945 or email G.J.Lees@massey.ac.nz.

Regards

Gavin Lees
Department of Marketing

Te Kunenga ki Pūrehuroa

WIN $500 CASH!

Simply complete your Radio Listening Diary in full and go into the draw to win one of three prizes of $500 cash!

CONDITIONS OF ENTRY

- The Radio Listening Diary must be completed truthfully and in full, including the 'About You' section of the diary to be considered a 'valid' diary.
- The first three valid diaries drawn will each win $500 cash. The total prize pool is $1,500.
- Employees of Massey University and their immediate families are not eligible to enter.
- If the winner is under 18 years of age the prize will be awarded to the winner's parent or guardian.
- Massey University's Community Constable will make the prize draw. The prize draw will take place on November 8th. Winners will be notified by telephone on the draw day.

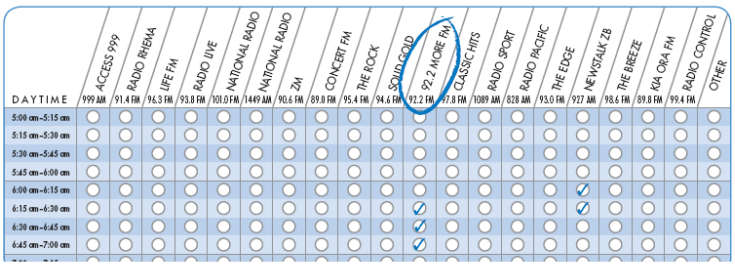
HOW TO COMPLETE THE RADIO DIARY

- For each day of the week, **starting next Monday**, please complete the following radio diary.
- Remember to include all occasions when you listened to the radio. ***Include listening at home, work, school, in the car, walking, exercising, watching sport or sitting in a café.***
- Please place a tick (✓) in each of the 15 minute time blocks in the column that indicates the radio station or stations that you listened to. For instance if you were listening to Radio Control for at least 15 minutes between 6 am–6.15 am you would tick the 6 am–6.15 am circle in the Radio Control column. If you listened to more than one station please **circle** the station you listened to the most.
- Please record your listening when you listen or as soon as possible afterwards. It is important to do this so that details of your listening are still fresh in your mind.
- If you did not listen at all during the day or the evening please tick the box in the top right hand corner "I did not listen at all today/tonight".
- If you listen to a station that is not listed in the diary, please tick the appropriate 15 minute time circle in the "Other" column.

EXAMPLE OF A RADIO DIARY

If you listened between 6 am and 6.30 am to NewstalkZB and from 6.45 am to 7 am to More FM you would complete your diary as shown below.

Did you listen to the radio today? YES ✓ NO ○



ABOUT YOURSELF

At the back of the diary there are a number of questions about you; they can be answered at any time during the week. We would appreciate it if you could answer these questions as they are designed to ensure that we have a good cross-section of people in our survey. Remember that all responses remain STRICTLY CONFIDENTIAL.

Before you start completing the radio diary we would like to ask you some general questions about your radio listening ...

Q1 How many radios in total are owned by members of your household?

1–3 ○ 4–6 ○ 7–9 ○ Over 10 ○

Q2 Where do you mostly listen to the radio during the following times?
Please tick one circle for each time period.

	HOME	CAR	WORK	OTHER	DON'T LISTEN
WEEKDAYS					
12 midnight to 6 am	○	○	○	○	○
6 am to 7 am	○	○	○	○	○
7 am to 8 am	○	○	○	○	○
8 am to 9 am	○	○	○	○	○
9 am to 12 midday	○	○	○	○	○
12 midday to 4 pm	○	○	○	○	○
4 pm to 5 pm	○	○	○	○	○
5 pm to 6 pm	○	○	○	○	○
6 pm to 7 pm	○	○	○	○	○
7 pm to 12 midnight	○	○	○	○	○
WEEKENDS					
Saturday					
12 midnight to 6 am	○	○	○	○	○
6 am to 12 midday	○	○	○	○	○
12 midday to 6 pm	○	○	○	○	○
6 pm to 12 midnight	○	○	○	○	○
Sunday					
12 midnight to 6 am	○	○	○	○	○
6 am to 12 midday	○	○	○	○	○
12 midday to 6 pm	○	○	○	○	○
6 pm to 12 midnight	○	○	○	○	○

Q3 Please tick the circles in each column, starting with Column A, then Column B and lastly Column C, to indicate those radio stations that you are: Aware of, Sometimes listen to or Mostly listen to.

		A I am AWARE of this radio station	B I SOMETIMES listen to this radio station	C I MOSTLY listen to this radio station
Coast	1548 AM	○	○	○
Radio Control	99.4 FM	○	○	○
Kia Ora FM	89.8 FM	○	○	○
The Breeze	98.6 FM	○	○	○
Newstalk ZB	927 AM	○	○	○
The Edge	93.0 FM	○	○	○
Radio Pacific	828 AM	○	○	○
Radio Sport	1089 AM	○	○	○
Classic Hits	97.8 FM	○	○	○
92.2 More FM	92.2 FM	○	○	○
Solid Gold	94.6 FM	○	○	○
The Rock	95.4 FM	○	○	○
Concert FM	89.0 FM	○	○	○
ZM	90.6 FM	○	○	○
National Radio	101.0 FM	○	○	○
National Radio	1449 AM	○	○	○
Radio Live	93.8 FM	○	○	○
Life FM	96.3 FM	○	○	○
Radio Rheema	91.4 FM	○	○	○
Access 999	999 AM	○	○	○
Others		○	○	○
I do not listen to the radio		○	○	○

Thank you, now please complete the following radio diary, starting on Monday.

MONDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

MONDAY

Did you listen to the radio today? YES ◯ NO ◯

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 pm–5:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 pm–5:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 pm–6:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 pm–6:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 pm–6:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 pm–6:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 pm–7:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 pm–7:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 pm–7:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 pm–7:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 pm–8:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 pm–8:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 pm–8:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 pm–8:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 pm–9:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 pm–9:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 pm–9:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 pm–9:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 pm–10:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 pm–10:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 pm–10:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 pm–11:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 pm–11:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 pm–11:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 pm–11:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 midnigh	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 am–12:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 am–12:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 am–12:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 am–1:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 am–1:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 am–1:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 am–1:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 am–2:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 am–2:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 am–2:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 am–2:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 am–3:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 am–3:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 am–3:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 am–3:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 am–4:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 am–4:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 am–4:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 am–4:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 am–5:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

TUESDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

TUESDAY

Did you listen to the radio today? YES ◯ NO ◯

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 pm–5:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 pm–5:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 pm–6:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 pm–6:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 pm–6:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 pm–6:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 pm–7:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 pm–7:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 pm–7:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 pm–7:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 pm–8:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 pm–8:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 pm–8:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 pm–8:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 pm–9:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 pm–9:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 pm–9:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 pm–9:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 pm–10:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 pm–10:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 pm–10:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 pm–11:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 pm–11:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 pm–11:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 pm–11:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 midnight	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 am–12:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 am–12:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 am–12:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 am–1:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 am–1:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 am–1:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 am–1:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 am–2:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 am–2:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 am–2:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 am–2:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 am–3:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 am–3:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 am–3:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 am–3:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 am–4:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 am–4:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 am–4:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 am–4:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 am–5:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

WEDNESDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

WEDNESDAY

Did you listen to the radio today? YES ◯ NO ◯

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 pm–5:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 pm–5:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 pm–6:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 pm–6:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 pm–6:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 pm–6:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 pm–7:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 pm–7:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 pm–7:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 pm–7:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 pm–8:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 pm–8:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 pm–8:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 pm–8:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 pm–9:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 pm–9:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 pm–9:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 pm–9:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 pm–10:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 pm–10:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 pm–10:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 pm–11:00	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 pm–11:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 pm–11:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 pm–11:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 midnight	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 am–12:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 am–12:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 am–12:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 am–1:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 am–1:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 am–1:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 am–1:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 am–2:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 am–2:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 am–2:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 am–2:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 am–3:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 am–3:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 am–3:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 am–3:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 am–4:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 am–4:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 am–4:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 am–4:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 am–5:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

THURSDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

THURSDAY

Did you listen to the radio today? YES ○ NO ○

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5:15 pm–5:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5:30 pm–5:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5:45 pm–6:00 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
6:00 pm–6:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
6:15 pm–6:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
6:30 pm–6:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
6:45 pm–7:00 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
7:00 pm–7:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
7:15 pm–7:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
7:30 pm–7:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
7:45 pm–8:00 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
8:00 pm–8:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
8:15 pm–8:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
8:30 pm–8:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
8:45 pm–9:00 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
9:00 pm–9:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
9:15 pm–9:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
9:30 pm–9:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
9:45 pm–10:00 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
10:00 pm–10:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
10:15 am–10:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
10:30 pm–10:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
10:45 pm–11:00 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
11:00 pm–11:15 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
11:15 pm–11:30 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
11:30 pm–11:45 pm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
11:45–12:00 midnight	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
12:00 am–12:15 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
12:15 am–12:30 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
12:30 am–12:45 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
12:45 am–1:00 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1:00 am–1:15 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1:15 am–1:30 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1:30 am–1:45 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1:45 am–2:00 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2:00 am–2:15 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2:15 am–2:30 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2:30 am–2:45 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2:45 am–3:00 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3:00 am–3:15 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3:15 am–3:30 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3:30 am–3:45 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3:45 am–4:00 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4:00 am–4:15 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4:15 am–4:30 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4:30 am–4:45 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4:45 am–5:00 am	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Please record all your listening – at home, away from home and in the car.

FRIDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

FRIDAY

Did you listen to the radio today? YES ◯ NO ◯

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 pm–5:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 pm–5:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 pm–6:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 pm–6:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 pm–6:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 pm–6:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 pm–7:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 pm–7:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 pm–7:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 pm–7:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 pm–8:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 pm–8:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 pm–8:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 pm–8:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 pm–9:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 pm–9:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 pm–9:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 pm–9:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 pm–10:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 pm–10:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 pm–10:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 pm–11:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 pm–11:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 pm–11:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 pm–11:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 midnight	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 am–12:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 am–12:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 am–12:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 am–1:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 am–1:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 am–1:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 am–1:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 am–2:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 am–2:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 am–2:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 am–2:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 am–3:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 am–3:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 am–3:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 am–3:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 am–4:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 am–4:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 am–4:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 am–4:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 am–5:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

SATURDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

SATURDAY

Did you listen to the radio today? YES ◯ NO ◯

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 pm–5:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 pm–5:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 pm–6:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 pm–6:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 pm–6:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 pm–6:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 pm–7:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 pm–7:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 pm–7:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 pm–7:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 pm–8:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 pm–8:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 pm–8:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 pm–8:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 pm–9:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 pm–9:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 pm–9:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 pm–9:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 pm–10:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 pm–10:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 pm–10:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 pm–11:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 pm–11:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 pm–11:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 pm–11:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 midnight	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 am–12:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 am–12:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 am–12:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 am–1:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 am–1:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 am–1:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 am–1:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 am–2:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 am–2:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 am–2:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 am–2:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 am–3:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 am–3:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 am–3:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 am–3:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 am–4:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 am–4:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 am–4:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 am–4:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 am–5:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

SUNDAY

Did you listen to the radio today? YES ◯ NO ◯

DAY	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 am–5:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 am–5:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 am–5:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 am–6:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 am–6:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 am–6:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 am–6:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 am–7:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 am–7:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 am–7:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 am–7:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 am–8:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 am–8:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 am–8:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 am–8:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 am–9:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 am–9:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 am–9:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 am–9:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 am–10:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 am–10:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 am–10:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 am–11:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 am–11:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 am–11:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 am–11:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 noon	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 pm–12:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 pm–12:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 pm–12:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 pm–1:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 pm–1:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 pm–1:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 pm–1:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 pm–2:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 pm–2:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 pm–2:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 pm–2:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 pm–3:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 pm–3:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 pm–3:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 pm–3:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 pm–4:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 pm–4:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 pm–4:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 pm–4:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 pm–5:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

SUNDAY

Did you listen to the radio today? YES ◯ NO ◯

NIGHT	ACCESS 999 999 AM	RADIO RHEMA 91.4 FM	LIFE FM 96.3 FM	RADIO LIVE 93.8 FM	NATIONAL RADIO 101.0 FM	NATIONAL RADIO 1449 AM	ZM 90.6 FM	CONCERT FM 89.0 FM	THE ROCK 95.4 FM	SOLID GOLD 94.6 FM	92.2 MORE FM 92.2 FM	CLASSIC HITS 97.8 FM	RADIO SPORT 1089 AM	RADIO PACIFIC 828 AM	THE EDGE 93.0 FM	NEWSTALK ZB 927 AM	THE BREEZE 98.6 FM	KIA ORA FM 89.8 FM	RADIO CONTROL 99.4 FM	COAST 1548 AM	OTHER
5:00 pm–5:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:15 pm–5:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:30 pm–5:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
5:45 pm–6:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:00 pm–6:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:15 pm–6:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:30 pm–6:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
6:45 pm–7:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:00 pm–7:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:15 pm–7:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:30 pm–7:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
7:45 pm–8:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:00 pm–8:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:15 pm–8:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:30 pm–8:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
8:45 pm–9:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:00 pm–9:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:15 pm–9:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:30 pm–9:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
9:45 pm–10:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:00 pm–10:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:15 am–10:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:30 pm–10:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
10:45 pm–11:00 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:00 pm–11:15 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:15 pm–11:30 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:30 pm–11:45 pm	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
11:45–12:00 midnigh	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:00 am–12:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:15 am–12:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:30 am–12:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
12:45 am–1:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:00 am–1:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:15 am–1:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:30 am–1:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
1:45 am–2:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:00 am–2:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:15 am–2:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:30 am–2:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
2:45 am–3:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:00 am–3:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:15 am–3:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:30 am–3:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
3:45 am–4:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:00 am–4:15 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:15 am–4:30 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:30 am–4:45 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
4:45 am–5:00 am	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please record all your listening – at home, away from home and in the car.

ABOUT YOURSELF

So that we can be sure to have a good cross-section of people in our survey would you please answer the following questions about yourself. Remember that all responses remain STRICTLY CONFIDENTIAL.

Q1 **Please indicate the year in which you were born.**

19 ☐

Q2 **What is your sex?**

Male ◯ Female ◯

Q3 **Which of the following categories describes your ethnic origin?**
Please tick as many as you need to show which ethnic group(s) you belong to.

NZ Maori	◯ Which iwi do you identify with?	☐
NZ European or Pakeha	◯	☐
Other European	◯	☐
Samoan	◯	☐
Tongan	◯	☐
Chinese	◯	☐
Indian	◯	☐
Other	◯	☐

Q4 **Including yourself, how many people are there in your household?**

Number in household ☐

Q5 **Which of these following categories best describes your own current employment status?**
Please tick as many as apply.

Employed full-time (35+ hours weekly)	◯
Employed part-time (15–35 hours weekly)	◯
Employed less than 15 hours/temporarily out of work	◯
Helping family member	◯
Unemployed or beneficiary	◯
Student	◯
Retired	◯
Housewife/husband (home duties)	◯
Permanently disabled	◯

Q6 **Which of these following categories best describes the amount of formal education you have?**
Please tick one box only

- ○ No formal schooling
- ○ A few years of primary school
- ○ Primary/Intermediate up to Standard 6 or Form 2
- ○ Secondary schooling for up to 3 years
- ○ Secondary schooling for more than 3 years
- ○ University/polytechnic for up to 3 years
- ○ University/polytechnic for more than 3 years

Q7 **Which of these following categories best describes your highest formal qualification?**
Please tick one box only.

- ○ No formal qualification
- ○ School qualifications only (NCEA, School C, UE, Bursary, etc.)
- ○ Trade or Professional certificate
- ○ Diploma below Bachelor level
- ○ Bachelor's degree
- ○ Post-graduate or higher qualification

Q8 **Which of the following categories best describes your own yearly income from all sources before tax?** *Please tick one box only.*

- ○ $10,000 or less
- ○ $10,001–$15,000
- ○ $15,001–$20,000
- ○ $20,001–$25,000
- ○ $25,001–$30,000
- ○ $30,001–$40,000
- ○ $40,001–$50,000
- ○ $50,001–$70,000
- ○ $70,001–$100,000
- ○ $100,001 or more

Q9 **Which of the following categories best describes the total yearly income of everyone in your household from all sources before tax?** *Please tick one box only.*

$10,000 or less	○
$10,001–$15,000	○
$15,001–$20,000	○
$20,001–$25,000	○
$25,001–$30,000	○
$30,001–$40,000	○
$40,001–$50,000	○
$50,001–$70,000	○
$70,001–$100,000	○
$100,001 or more	○

THE INTERNET

The following questions have nothing to do with radio listening but are being asked in a large number of countries to see what is happening around the world.

If you are not tired of answering questions, we would be grateful if you would answer these questions about the Internet.

Q10 **Do you personally ever use a computer at home, at work or somewhere else?**

Yes ○ No ○

Q11 **About how long each week do you spend sending and answering electronic mail or email?** *Please tick one box only.*

Don't use a computer for this	○	6 to 10 hours a week	○
Less than one hour a week	○	11 to 20 hours a week	○
1 to 5 hours a week	○	More than 20 hours a week	○

Q12 **Not counting email, about how long each week do you spend using the Internet or the World Wide Web? (Include time you spend visiting regular websites and time spent using interactive Internet services like chat rooms, usenet groups, discussion forums, bulletin boards, etc.)** *Please tick one box only.*

Don't use a computer for this	○	6 to 10 hours a week	○
Less than one hour a week	○	11 to 20 hours a week	○
1 to 5 hours a week	○	More than 20 hours a week	○

I now have just a couple of questions about a new product, the **MP3 player**. MP3 players are the latest portable digital audio players, rapidly replacing audio cassette and CD players. A model soon to come on the market has a 40 gigabyte hard disc drive, which can deliver music for up to 1400 hours. It will support the latest music file formats and has a built in FM radio.

Q13 **Do you currently own an MP3 player?**

Yes ◯ No ◯

In the next question I want to know the likelihood of you buying this MP3 player at various prices. To answer this question, I would like you to use the 'Likelihood of Purchase' scale below, and choose answers between 0 and 10.

Likelihood of Purchase Scale	
10	Certain, practically certain (99 in 100)
9	Almost sure (9 in 10)
8	Very probably (8 in 10)
7	Probable (7 in 10)
6	Good possibility (6 in 10)
5	Fairly good possibility (5 in 10)
4	Fair possibility (4 in 10)
3	Some possibility (3 in 10)
2	Slight possibility (2 in 10)
1	Very slight possibility (1 in 10)
0	No chance, almost no chance (1 in 100)

Q14 **Taking everything into account, what would you say the chances were of you personally buying this new 40 gigabyte MP3 player …**

Record an answer between 0 –10 in each box below using the Likelihood of Purchase scale above.

… if it was available from your local retail stores today for **$1099?**	☐
What if the price of the MP3 player was **$949?**	☐
What about if the price was **$799?**	☐
What if the price was **$649?**	☐

Q15 **What would you think would be a "fair" price for this product?**

Fair price = $ _____

Q16 We would like to ask you a few more brief questions in six months time. This would take less than five minutes. Do you consent to completing a very brief follow-up survey in about six months time?

Yes ○ No ○

If yes, please provide your first name and telephone number:

First name _____ Telephone number _____

If you have any other comments you wish to add, on any of the topics raised in this questionnaire, we would welcome them. Please write them in the space below.

Thank you for taking the time to complete my survey. It is appreciated. Please place it in the Reply-Paid envelope provided and send it back to me today – no stamp is required.

Appendix B: Interviewer Instruction Sheets

Radio Diary Door Knock Instructions

Please start you door knocking at the address provided. Please knock on every third house. If there is no reply note the number down on the door knock information sheet. These houses will be called on later in the day.

If the door is answered please reply as follows:

Good Morning/Afternoon my name is …… and I am calling on behalf of Massey University's Department of Marketing. Can I please speak to the person in the household who is over fifteen (15) years of age and will have the next birthday?

If the person is unavailable please ask for their name and a time when it would be convenient to call back. Please note this information in the Call Back section of the door knock information sheet.

When the person who qualifies comes to the door reply as follows:

Good Morning/Afternoon my name is …… and I am calling on behalf of Massey University's Department of Marketing. We are conducting research into radio listening habits and would like you to assist by completing a radio diary of your radio listening during next week. The radio diary should take about five (5) minutes each day to fill in. You will also go into a draw to one of three prizes of $500. Once you have finished the diary you can send it back to Massey University in a reply paid envelope. (If necessary you can show them the diary) Would you be able to complete a diary for us?

If the respondent says yes say:

T**hank you very much for assisting us with this research, here's your radio diary. You can start filling it in from next Monday. Can I please have your name, and telephone number so I can enter you into our draw?**

Then please ensure you have written their name, address and phone number on the radio diary respondents list.

Then say:

Thank you very much. Have a pleasant day.

If the respondent refuses or declines to participate to say:

Thank you very much and have a pleasant evening.

Radio Diary Telephone Instructions

Please phone the telephone numbers in the order provided. If a number is engaged or there is no reply note the number down on the telephone information sheet. These numbers will be phoned later in the week.

If the phone is answered please reply as follows:

Good Evening my name is …… and I am calling on behalf of Massey University's Department of Marketing. Can I please speak to the person in the household who is over fifteen (15) years of age and will have the next birthday?

If the person is unavailable please ask for their name and a time when it would be convenient to call back. Please not this information in the Call Back section of the telephone information sheet.

When the person who qualifies comes to the phone reply as follows:

Good Evening my name is …… and I am calling on behalf of Massey University's Department of Marketing. We are conducting research into radio listening habits and would like you to assist by completing a radio diary of your radio listening during next week. The radio diary should take about five (5) minutes each day to fill in. Once you have finished the diary you can send it back to Massey University in a reply paid envelope. Can I please have your name and address so we can post you a diary.

If the respondent provides you with their name and address say:

T**hank you very much for assisting us with this research, the radio diary will be posted out to you later this week. You can start filling it in from next Monday. Have a pleasant evening.**

Then please ensure you have written their name, address and phone number on the radio diary respondents list.

If the respondent refuses or declines to participate to say:

Thank you very much and have a pleasant evening.

Radio Diary Intercept Instructions

Please be at you intercept point in either the Plaza or Downtown by 10am.

Please approach every third person who walks past your intercept point saying

Good Morning/Afternoon my name is …… and I am working on behalf of Massey University's Department of Marketing. We are conducting research into radio listening habits and would like you to assist by completing a radio diary of your radio listening during next week. The radio diary should take about five (5) minutes each day to fill in. You will also go into a draw to one of three prizes of $500. Once you have finished the diary you can send it back to Massey University in a reply paid envelope. (If necessary you can show them the diary) Would you be able to complete a diary for us?

If the respondent says yes say:

T**hank you very much for assisting us with this research, here's your radio diary. You can start filling it in from next Monday. Can I please have your name, address and telephone number so I can enter you into our draw?**

Then please ensure you have written their name, address and phone number on the radio diary respondents list.

Then say:

Thank you very much. Have a pleasant day.

If the respondent refuses or declines to participate to say:

Thank you very much and have a pleasant day.

Appendix C: Interviewer Training Information

Interviewer Briefing Sheet

Introduction

The Department of Marketing is undertaking an important project into people's radio listening habits. The project involves selected respondents completing a radio diary covering a weeks radio listening.

As part of the project we are required to obtain a sample of Manawatu people who are willing to complete the radio diary. The sampling locations, including times, places and days are attached to this briefing sheet.

Preparation

Make certain that we have a clipboard, several pens, contact sheets, sampling plan and ID card. Make sure you know and understand the instructions on this sheet.

- **Sampling** Each intercept should take 5 minutes and we require a minimum of 50 participants.

To ensure a random selection of people our selection procedure must give every individual the same chance of being approached. To avoid any unintended bias we will contact every third person, until a qualifying respondent is found.

Recording

For every person contacted, complete the attached Contact Record Sheet, indicating whether the respondent refused and whether the diary was taken.

Making Contact

Make eye contact with the respondent, smile, look relaxed and friendly. Clothing should be appropriate for the weather conditions and place of contact. Probably 'smart casual' would be best, looking neat and tidy. Speak in an interested way.

Enquiries If you are approached and asked questions about what you are doing, explain that you are undertaking some market research for Massey University's marketing Department. The results will not be published. If someone requires further information refer them to:

Gavin Lees, Department of Marketing
Massey University, Ph 06-356-9099

Ethics All research undertaken under the auspices of Massey University is governed by the Code of Ethical Conduct. Since our research requires the co-operation of individuals it requires their informed consent. We must at all times follow ethical principles of maintaining confidentiality of the data, minimising the possibility of harm, avoiding unnecessary deception and being socially sensitive. Practically, it is important to be unobtrusive and to avoid impinging on anyone's privacy, to keep ourselves safe and not to provide copies of the data to anyone.

Accept all refusals cheerfully and above all remember to leave a positive impression of Massey University, whether or not the person agrees to participate in the research.

DEPARTMENT OF MARKETING

TELEPHONE INTERVIEWER NOTES

AUGUST 2005

INTRODUCTION

Massey University's Department of Marketing is conducting research into radio listening habits. As part of this research on radio listening we are seeking people to complete a diary of their radio listening for one week.

As part of this project your task is to obtain a sample of Manawatu people who are willing to complete the radio diary.

PLEASE READ THESE NOTES BEFORE YOU START TELEPHONING

1. You have been provided with two lists of telephone numbers (attached to the back of this information sheet). Starting with the first number on the first list make the call.

2. You must have an introduction to the respondents that you are happy with and feel comfortable with. This usually means something in your own words. However, you may use the following approach if you would feel more confident with it.

"Good Evening I'm …….. from Massey University. I'm working on a study for the Department of Marketing looking at people's

radio listening. I need to speak to the person in your household over fifteen years of age whose birthday is due next. Is that person available please?"

3. IF RESPONDENT IS NOT AVAILABLE OR TIME NOT CONVENIENT FOR RESPONDENT **ask**

"When would it be convenient to call back and speak to him/her?

RECORD DAY AND TIME ON CALL SHEET

"And who do I ask for?"

RECORD NAME ON CALL SHEET.

4. If there is no reply please note the telephone number on the Call back Sheet. These numbers will be followed up the following night.

5. **If the person who qualifies comes to the phone, reply as follows:**

"Good Evening I'm …….. from Massey University. I'm working on a study for the Department of Marketing looking at people's radio listening and would like you to assist. We need people to complete a radio diary of their radio listening for one week - from Monday September 5th. The radio diary should take about (5) five minutes each day to fill in. If you complete the diary for us we will put you into a draw for one of three prizes of $500.00.

Once you have finished the diary you can send it back to Massey University in a reply paid envelope. Would you be willing to complete a diary for us?

If the respondent says yes then reply as follows:

"Thank you very much for agreeing to assist us with this research. Can I please have your name and address so I can post you out a diary?"

PLEASE ENSURE YOU HAVE WRITTEN THEIR NAME AND ADDRESS ON THE DIARY RESPONDENT'S LIST.

Then say:

" The radio diary will be posted out to you later this week. You can start completing it from next Monday September 5th. Have a pleasant evening"

6. If the respondent says no then reply as follows:

"Thank you very much, have a pleasant evening".

7. Once you have called all the numbers on the first list and completed the three call back attempts then you may start calling the numbers on the second list.

DEPARTMENT OF MARKETING

MALL INTERCEPT INTERVIEWER NOTES

SEPTEMBER 2005

INTRODUCTION

Massey University's Department of Marketing is conducting research into radio listening habits. As part of this research on radio listening we are seeking people to complete a diary of their radio listening for one week.

As part of this project your task is to obtain a sample of Manawatu people who are willing to complete the radio diary.

PLEASE READ THESE NOTES BEFORE YOU START YOUR MALL INTERCEPT

1. Please be at your intercept point by 10am on Saturday September 3rd. Your intercept point is ……

2. Please approach every third person who walks past your intercept point.

3. You must have an introduction to the respondents that you are happy with and feel comfortable with. This usually means something in your own words. However, you may use the following approach if you would feel more confident with it.

"Good Morning/Afternoon I'm …….. from Massey University. We're working on a study for the Department of Marketing looking at people's radio listening and would like you to assist. We need people to complete a radio diary of their radio listening for one week - from Monday September 5th. The radio diary should take about (5) five minutes each day to fill in. If you complete the diary for us we will put you into a draw for one of three prizes of $500.00. Once you have finished the diary you can send it back to Massey University in a reply paid envelope. (If necessary you can show them a copy of the diary). Would you be willing to complete a diary for us?

4. If the respondent says yes then reply as follows:

"Thank you very much for agreeing to assist us with this research. Here is your diary. Please start filling it out from next Monday – September 5th. Can I please have your name address and telephone number so I can enter you into the draw when we get your completed diary back?"

PLEASE ENSURE YOU HAVE WRITTEN THEIR NAME, ADDRESS AND TELEPHONE NUMBER ON THE DIARY RESPONDENT'S LIST.

Then say:

" Thank you very much. Have a pleasant day"

5. If the respondent says no then reply as follows:

"Thank you very much, have a pleasant day".

DEPARTMENT OF MARKETING

DOOR KNOCK INTERVIEWER NOTES AND INSTRUCTIONS

SEPTEMBER 2005

INTRODUCTION

Massey University's Department of Marketing is conducting research into radio listening habits. As part of this research on radio listening we are seeking people to complete a diary of their radio listening for one week.

As part of this project your task is to obtain a sample of Manawatu people who are willing to complete the radio diary.

PLEASE READ THESE NOTES BEFORE YOU START YOUR DOOR KNOCKING

WHEN TO INTERVIEW

1. The interviews will take place Sunday September 4th.

2. Interview between 10am and 4pm. DO NOT INTERVIEW AFTER DARK

3. Make all call backs after 4:00pm unless you have an appointment at another time.

WHERE TO INTERVIEW

1. You have been assigned four starting points. Go to the starting address at the first starting point.. Do not attempt an interview at this address at this time.

2. Leaving the starting address (on your left hand side), walk straight ahead, and start your interviews. Begin with the **first** occupied dwelling next to the starting address.

3. Proceed around the block, making left turns, and attempt additional interviews at every **third** dwelling until you have allocated **eight** diaries. You should follow a route of all left-hand turns. The "left turn" rule should be followed regardless of where you are interviewing.

4. An interview must be attempted at each occupied dwelling indicated by the selection system. However, if the dwelling selected is unoccupied, is a commercial property or an institution (e.g. school or hospital), you should continue around the block until you reach the next occupied dwelling and attempt an interview there.

5. Where two or more dwellings occupy the same section (e.g. townhouses, or flats), you should treat each flat or unit as a separate dwelling. (In other words, if the street numbers you are following are getting bigger, flat 2 would follow flat 1; whereas if the numbers you are following are getting smaller, flat 2 would come before flat 1.)

6. If you work an entire block and find it does not contain enough dwellings for you to attempt eight interviews, proceed to the dwelling on the opposite side of the street, which is nearest the dwelling where you attempted your first interview. Treat the address across the street as the next occupied dwelling, and continue around that block using the "left turn" rule.

7. If there are no dwellings on the street or road opposite the dwelling where you attempted your first interview, walk directly across the street from where you attempted your first interview and circle that block in an anti-clockwise direction (following the "left turn" rule) until you come to an occupied

dwelling. Attempt your next interview there and proceed in a similar manner until you have achieved your eight interviews.

8. Once you have completed you eight interviews at each the respective starting point please go to your next starting point and complete the process until you have completed eight interviews at each starting point.

9. If you are refused an interview, or an interview cannot be made, you should abandon that address and select another one.

RECORDING ADDRESSES AND CALLS

1. Details of each interview you attempt should be recorded on your call sheet.

2. At the first occupied dwelling (next to the starting address), before you knock or ring the door bell, record the address, including number, street, and flat or apartment number if any.

3. For each address where you are to attempt an interview, write the day's date and time code under "1st Call".

4. For each attempted interview you should also record the outcome of each attempt by writing one of the following codes:

    a. Successful diary allocation made.

    b. No-one home when you called.

    c. No residing adults (15+) home. At some dwellings you may find only children under 15 years of age at home when you call. Or you might find children with a baby sitter. Or you might find adults such as friends or relatives who do not live there. Since you can only interview adults who are members of the household, you would write three in

these situations. Ask when you can find the household's adults at home and return to the dwelling to get an interview when they will be home.

d. Refused at door. This means you talked to somebody at that address but were unable to get cooperation before you selected the respondent.

e. Respondent refused (temp). This temporary refusal code is used if the selected respondent cannot be interviewed on your call at that dwelling. Set up an appointment to interview the selected respondent at a later time in the day.

f. Respondent refused (perm). Write this code if you get a permanent refusal from the selected respondent at that address.

g. Other. Write 8 and explain in the space provided. These outcomes could include:
   - respondent doesn't speak English.
   - other physical barrier blocking access to dwelling, such as a locked gate.
   - persons at home but refused to answer the door.

SELECTING RESPONDENTS

1. At each dwelling where someone answers the door, explain that you would like to interview someone currently living in the household who is 15 years of age or older. Explain to the person you are talking to that this includes himself/herself and any boarders or lodgers, but does not include those away on long trips, away at school or university, or otherwise not living at home.

2. Ask to speak to the person 15 years of age or older whose birthday is due next. This is the person you should interview in this household.

3. If the selected person is not available, establish a time later in the day when it would be convenient to call back and interview him/her. Record this on your call-sheet. Also ask for the selected person's name, and record this so you will remember who to ask for when you call back.

4. If the informant does not know whose birthday is due next, such as might occur in a flat, interview the informant (the person who answers the door). But do not resort to this until you have first made a genuine effort to establish the selected respondent.

5. If more than one person in a dwelling qualifies to be interviewed as a result of the "next birthday" test (e.g. two people have their birthday on the same day) choose one by tossing a coin.

6. Only **one** person should be interviewed in a household and only the selected person; no substitutions should be made.

YOUR APPROACH TO THE INTERVIEW

1. Introducing yourself and persuading the respondent to give the interview is probably one of the most critical and difficult parts of interviewing. Your job is more than just making calls and making interviews with people who want to talk to you; it is selling people on the idea of being interviewed when there might be some resistance.

2. Most resistance is due to two causes: misunderstanding - that this is not really a survey, that it is a sales pitch; and 'don't want to be bothered' - 'too busy', 'an invasion of privacy'. You need to be able to overcome these objections by convincing respondents that:

   - you are calling for a legitimate reason and represent a reputable organisation;
   - you are engaged in important and worthwhile research; and,

- the respondent's participation is vital to the success of that research.

3. Your voice, words and appearance must convey your credibility. So be courteous, cheerful and self-confident - without overdoing it. If your approach is uncertain, this feeling will be communicated to the respondent, who will react accordingly.

4. Approach people as if they are friendly and interested. Assume that they are willing to give you an interview.

5. If a respondent is busy, immediately explain that you would like to come back at a time convenient to them.

6. Brief introductions are more effective than long explanations. Many respondents will grant an interview with only a brief explanation of purpose; others will need more detail. Begin with a brief introduction and save your more detailed explanation to use as needed.

7. If you are asked, explain the purpose of the survey: “to ask people to record their radio listening behaviour.” But note that this summary should be as non-specific as possible. Avoid making statements that might introduce bias into the actual interview or would give the respondent the idea that the topic was something he/she didn't want to talk about.

8. Above all talk to people, not at them. If they believe you are really interested in them, they are more likely to participate.

9. To help establish your credibility as a bona fide interviewer, you are provided with an identification badge and a letter of introduction, so use them!

10. If you find that you are getting repeated refusals, something is wrong with your interviewing approach, and you should contact one of the survey organisers immediately and discuss the problem.

YOUR ROLE AS AN INTERVIEWER

1. As an interviewer, it is important that you be aware of the vital role you are playing in this survey. You are the link between the researchers and the respondents. The quality of the final results depends on your ability to get respondents to accept a diary.

PERSONAL SAFETY

You should put your personal safety first when deciding when and whether to attempt an interview. Although we have never had an interviewer abused, this is no guarantee of safety. If you feel nervous, team up with a friend and conduct the interviews while the friend waits for you.

You should also ensure that you conduct yourself in a way that may not be misconstrued by the person you are attempting to interview. There are a lot of frightened people in the community.

The times of day you conduct your interviews, as well as your manner, appearance and behaviour are all important. Make sure you use your name tag, and present the letter of introduction from Professor Gendall.

CODES OF PRACTICE

All research conducted in the Department of Marketing must conform with the Code of Practice of the Market Research Society of New Zealand and the Massey University Code of Ethical conduct for Research and Teaching involving Human Subjects.

A copy of these codes is provided in Chapter 7 of the Department of Marketing *Research Manual*.

In conclusion, remember that survey research can be an enjoyable experience for both the interviewer and the respondent. The key to being a successful interviewer is to be thoroughly familiar with the survey questionnaire, its questions and requirements, and to be well rehearsed **before** beginning the interviews. First-time interviewers typically feel nervous and anxious before they begin. However, in our experience, most interviewers enjoy the task once they get started, and are left with a great sense of accomplishment when they have finished. So - rehearse, rehearse, rehearse! Then, get on with it as soon as possible.

Happy interviewing!

DEPARTMENT OF MARKETING

DOOR KNOCK INTERVIEWER NOTES

SEPTEMBER 2005

INTRODUCTION

Massey University's Department of Marketing is conducting research into radio listening habits. As part of this research on radio listening we are seeking people to complete a diary of their radio listening for one week.

As part of this project your task is to obtain a sample of Manawatu people who are willing to complete the radio diary.

PLEASE READ THESE NOTES AND THE DOOR KNOCK INSTRUCTIONS BEFORE YOU START DOOR KNOCK.

1. You have been supplied with four starting addresses. Please be at your first starting address by 10am on Sunday September 4th. Your starting points are attached to these instructions.

2. You must have an introduction to the respondents that you are happy with and feel comfortable with. This usually means something in your own words. However, you may use the following approach if you would feel more confident with it.

"Good Morning/Afternoon I'm …….. from Massey University. I'm working on a study for the Department of Marketing looking at people's

radio listening. I need to speak to the person in your household over fifteen years of age whose birthday is due next. Is that person available please?"

3. IF RESPONDENT IS NOT AVAILABLE OR TIME NOT CONVENIENT FOR RESPONDENT **ask**

"When would it be convenient to call back and speak to him/her?

RECORD DAY AND TIME ON CALL SHEET

"And who do I ask for?"

RECORD NAME ON CALL SHEET.

4. If there is no reply please note the address on the Call back Sheet. These will need to be called back on later in the day.

5. **If the person who qualifies comes to the door, reply as follows:**

"Good Evening I'm …….. from Massey University. I'm working on a study for the Department of Marketing looking at people's radio listening and would like you to assist. We need people to complete a radio diary of their radio listening for one week - from Monday September 5th. The radio diary should take about (5) five minutes each day to fill in. If you complete the diary for us we will put you into a draw for one of three prizes of $500.00.

Once you have finished the diary you can send it back to Massey University in a reply paid envelope. Would you be willing to complete a diary for us?

4. If the respondent says yes then reply as follows:

"Thank you very much for agreeing to assist us with this research. Here is your diary. Please start filling it out from next Monday – September 5th. Can I please have your name address and telephone number so I can enter you into the draw when we get your completed diary back?"

PLEASE ENSURE YOU HAVE WRITTEN THEIR NAME, ADDRESS AND TELEPHONE NUMBER ON THE DIARY RESPONDENT'S LIST.

Then say:

" Thank you very much. Have a pleasant day"

7. If the respondent says no then reply as follows:

"Thank you very much, have a pleasant day".

This package of materials contains:

* 1 call sheet (if you need more then ask)
* 6 numbered questionnaires
* 6 coding sheets
* 1 set of 12 showcards (A to L)
* 1 set of interviewer briefing notes

* 1 set of coding notes

* 1 identification badge (*print your own name on it)*

* 1 identification letter

* 1 city map

RETURN OF QUESTIONNAIRES, CODING SHEETS AND CALL SHEETS:

Return your completed respondent call sheet to The Department of Marketing. Do this as soon as you can, but no later than **Tuesday September 6th.**

STARTING ADDRESS:

Your starting addresses are: _____

_____

_____

_____

TELEPHONE CONTACT RECORD SHEET

INTERVIEWER…… **LOCATION……**

DAY AND DATE……..

TIME	REFUSALS	ENGAGED/NO REPLY	SURVEY AGRRED TO
6-7	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
7-8	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
8-9	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TOTALS

CALLS MADE ……. ENGAGED/NO REPLY ……

REFUSALS ……. SURVEYS TAKEN…….

TOTAL CONTACTS ……..

Engaged/No Reply Telephone Numbers.

……. …….

…….

……. …….

…….

……. …….

…….

……. …….

…….

Call Backs:

Name: …… Telephone Number: ……

Name: …… Telephone Number: ……

Name: …… Telephone Number: ……

Name: …… Telephone Number: ……

Name: …… Telephone Number: ……

Name: …… Telephone Number: ……

INTERCEPT/DOOR KNOCK CONTACT RECORD SHEET

INTERVIEWER…… **LOCATION……**

DAY AND DATE……..

TIME	REFUSALS	CALL BACKS	NO REPLY	SURVEY TAKEN
10-11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11
11-12	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11
12-1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11
1-2	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11
2-3	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11
3-4	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 2 3 4 5 6 7 8 9 10 11

TOTALS

REFUSALS ……. SURVEYS TAKEN…….

CALL BACKS ……..

TOTAL CONTACTS ……..

2 September 2005

INFORMATION SHEET

The Massey University Department of Marketing is conducting research into radio listening habits.

As part of the research on radio listening we are seeking people to complete a diary of a weeks radio listening.

The diary will take about 5 minutes each day to complete. It asks you to identify what radio stations you listen to and when you listened to them as well as other related issues.

Your participation is completely voluntary and your responses will be treated with the utmost confidentiality.

The results of this research will not be made publicly available and are not part of a commercial operation.

If you require further information on this research please contact, Gavin Lees, Massey University, phone 356-9099.

Gavin Lees
Department of Marketing

HEAD OF DEPARTMENT INTRODUCTION LETTER.

1 September 2005

The bearer of this letter is working with the Department of Marketing at this University, and is engaged in one of the Department's research projects.

I would be grateful for your co-operation in the study, which is being carried out as part of a PhD research programme. Like all research carried out in this Department, this project is subject to the Code of Practice of the Market Research Society of New Zealand, which requires that any answers you give be treated in absolute confidence.

If you have any questions about the research, please do not hesitate to write or telephone Dr Mike Brennan, 350 5576 or Gavin Lees 356 9099, extension 7945.

Professor Phil Gendall
Head of Department
Department of Marketing

Appendix D: Duplication of Listening for All Stations

Duplication of Listening Between All Stations (%)

	Cumulative Audience	More FM	National	Classic Hits	Newstalk ZB	The Rock	The Edge	Solid Gold	ZM	The Breeze	Radio Sport	Radio Live	Radio Pacific	Concert FM	Coast	Radio Rhema	Access	Kia Ora FM	Life FM	Control	Others
More FM	30		13	40	13	34	29	33	23	14	11	11	12	8	5	5	2	4	4	2	8
National Radio	28	14		16	23	10	7	11	7	8	16	16	9	18	12	9	8	1	4	3	10
Classic Hits	26	48	17		18	30	20	28	18	22	19	9	13	8	6	6	2	3	1	2	7
Newstalk ZB	21	19	29	21		9	21	17	12	24	20	13	19	3	16	5	5	5	2	3	7
The Rock	21	49	12	36	9		31	29	28	13	14	10	9	16	3	5	1	5	4	4	8
The Edge	19	47	11	28	24	35		24	33	16	13	12	17	6	2	5	3	8	4	4	5
Solid Gold	19	53	16	39	19	34	24		17	20	17	13	9	8	9	4	3	5	3	4	8
ZM	17	40	11	27	15	35	36	18		11	15	13	9	10	6	6	4	8	3	4	7
The Breeze	15	27	15	37	33	19	19	25	13		16	9	14	5	13	4	4	11	1	5	11
Radio Sport	14	25	32	35	32	22	18	23	18	18		18	26	7	10	5	6	2	1	3	8
Radio Live	12	26	36	19	23	18	19	20	19	12	20		20	7	6	12	5	4	12	2	6
Radio Pacific	11	34	24	31	38	18	29	17	15	20	34	24		8	12	8	5	6	5	4	6
Concert FM	9	26	52	21	7	36	12	16	18	8	10	9	9		8	8	5	7	2	2	14
Coast	9	16	38	17	37	7	4	18	12	21	15	8	14	9		5	9	5	1	6	20
Radio Rhema	6	24	38	24	17	15	15	13	17	10	11	22	14	11	7		7	6	21	3	11
Access	3	21	64	18	33	8	15	15	21	15	26	18	15	13	23	13		0	3	8	18
Kia Ora FM	3	32	11	24	34	32	47	26	42	50	8	13	18	18	13	11	0		0	8	5
Life	3	38	30	11	16	24	22	19	16	3	5	46	16	5	3	41	3	0		3	3
Radio Control	2	32	40	24	28	36	32	32	28	32	16	12	20	8	24	8	12	12	4		24
Others	8	31	35	24	18	23	11	18	15	20	15	9	8	17	24	9	8	2	1	7	
Average Duplication	**14**	**32**	**28**	**26**	**23**	**23**	**22**	**21**	**19**	**18**	**16**	**15**	**14**	**10**	**11**	**9**	**5**	**5**	**4**	**4**	**10**
Expected Duplication		**34**	**31**	**29**	**24**	**24**	**21**	**21**	**19**	**17**	**15**	**14**	**12**	**11**	**10**	**7**	**4**	**4**	**4**	**3**	**9**
Average - Expected		**2**	**3**	**3**	**-1**	**1**	**-1**	**0**	**0**	**-1**	**-1**	**1**	**-2**	**1**	**-1**	**-2**	**-1**	**-1**	**0**	**-1**	**-1**

Appendix E: Dirichlet Predictions of Duplication of Listening Between 'All Stations'.

Dirichlet Predictions of Duplication of Listening Between 'All Stations' (%)

	Cumulative Audience	More FM		National Radio		Classic Hits		Newstalk ZB		The Rock		The Edge		Solid Gold		ZM		The Breeze		Radio Sport		Radio Live		Radio Pacific	
		O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T
More FM	30			13	28	40	25	13	21	34	21	29	19	21	19	23	17	14	15	11	14	11	12	12	11
National	28	14	30			16	25	23	21	10	21	7	19	11	19	7	17	8	15	16	14	16	12	9	11
Classic Hits	26	48	30	17	28			18	21	30	21	20	19	28	19	18	17	22	15	19	14	9	12	13	11
Newstalk ZB	21	19	30	29	28	21	25			9	21	21	19	17	19	12	17	24	15	20	14	13	12	19	11
The Rock	21	49	30	12	28	36	25	9	21			31	19	29	19	28	17	13	15	14	14	10	12	9	11
The Edge	19	47	30	11	28	28	25	24	21	35	21			24	19	33	17	16	15	13	14	12	12	17	11
Solid Gold	19	35	30	16	28	39	25	19	21	34	21	24	19			17	17	20	15	17	14	13	12	9	11
ZM	17	40	30	11	28	27	25	15	21	35	21	36	19	18	19			11	15	15	14	13	12	9	11
The Breeze	15	27	30	15	28	37	25	33	21	19	21	19	19	25	19	13	17			16	14	9	12	14	11
Radio Sport	14	25	30	32	28	35	25	32	21	22	21	18	19	23	19	18	17	18	15			18	12	26	11
Radio Live	12	26	30	36	28	19	25	23	21	18	21	19	19	20	19	19	17	12	15	20	14			20	11
Radio Pacific	11	34	30	24	28	31	25	38	21	18	21	29	19	17	19	15	17	20	15	34	14	24	12		
Concert FM	9	26	30	52	28	21	25	7	21	36	21	12	19	16	19	18	17	8	15	10	14	9	12	9	11
Coast	9	16	30	38	28	17	25	37	21	7	21	4	19	18	19	12	17	21	15	15	14	8	12	14	11
Radio Rhema	6	24	30	38	28	24	25	17	21	15	21	15	19	13	19	17	17	10	15	11	14	22	12	14	11
Access	4	21	30	64	28	18	25	33	21	8	21	15	19	15	19	21	17	15	15	26	14	18	12	15	11
Kia Ora	3	32	30	11	28	24	25	34	21	32	21	47	19	26	19	42	17	50	15	8	14	13	12	18	11
Life	3	38	30	30	28	11	25	16	21	24	21	22	19	19	19	16	17	3	15	5	14	46	12	16	11
Radio Control	2	32	30	40	28	24	25	28	21	36	21	32	19	32	19	28	17	32	15	16	14	12	12	20	11
Others	8	31	30	35	28	24	25	18	21	23	21	11	19	18	19	15	17	20	15	15	14	9	12	8	11
Average	14	32	30	28	28	26	25	23	21	23	21	22	19	21	19	19	17	18	15	16	14	15	12	14	11

	Cumulative Audience	Concert FM		Coast		Radio Rhema		Access Radio		Kia Ora		Life FM		Radio Control		Others	
		O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T
More FM	30	8	9	5	9	5	6	2	3	4	3	4	3	2	2	8	8
National	28	18	9	12	9	9	6	8	3	1	3	4	3	3	2	10	8
Classic Hits	26	8	9	6	9	6	6	2	3	3	3	1	3	2	2	7	8
Newstalk ZB	21	3	9	16	9	5	6	5	3	5	3	2	3	3	2	7	8
The Rock	21	16	9	3	9	5	6	1	3	5	3	4	3	4	2	8	8
The Edge	19	6	9	2	9	5	6	3	3	8	3	4	3	4	2	5	8
Solid Gold	19	8	9	9	9	4	6	3	3	5	3	3	3	4	2	8	8
ZM	17	10	9	6	9	6	6	4	3	8	3	3	3	4	2	7	8
The Breeze	15	5	9	13	9	4	6	4	3	11	3	1	3	5	2	11	8
Radio Sport	14	7	9	10	9	5	6	6	3	2	3	1	3	3	2	8	8
Radio Live	12	7	9	6	9	12	6	5	3	4	3	12	3	2	2	6	8
Radio Pacific	11	8	9	12	9	8	6	5	3	6	3	5	3	4	2	6	8
Concert FM	9			8	9	8	6	5	3	7	3	2	3	2	2	14	8
Coast	9	9	9			5	6	9	3	5	3	1	3	6	2	20	8
Radio Rhema	6	11	9	7	9			7	3	6	3	21	3	3	2	11	8
Access	4	13	9	23	9	13	6			0	3	3	3	8	2	18	8
Kia Ora	3	18	9	13	9	11	6	0	3			0	3	8	2	5	8
Life	3	5	9	3	9	41	6	3	3	0	3			3	2	3	8
Radio Control	2	8	9	24	9	8	6	12	3	12	3	4	3			24	8
Others	8	17	9	24	9	9	6	8	3	2	3	1	3	7	2		
Average	14	10	9	11	9	9	6	5	3	5	3	4	3	4	2	10	8