CHAPTER 5: ANALYSIS & INTERPRETATION OF RESULTS

5.1: Introduction

In the first chapter of this study, the objectives of the study were noted to be as follows:

i. whether or not there is a relationship between a small business owner-manager possessing specific management competencies, the attributes of the small business itself and the performance of their small business, as measured by growth in sales over the last three years or alternatively, as measured relative to other local business competitors;

ii.what these small business owner / manager competencies and small business attributes are; and

iii. whether or not these competencies and attributes are generic in nature and / or vary across geographic locations.

To enable these objectives to be met, four hypotheses were developed for testing. In chapter 2, a review of past research on the key concepts of small business performance and management, attitudinal/behavioural and educational/experiential competencies highlighted the need to break down these 4 main hypotheses into more specific questions. This led to the development of 24 sub-hypotheses which are outlined in 3.5.**2**.

In the previous chapter, chapter 4, the methodology for data collection and analysis was outlined briefly. In this chapter, chapter 5, the statistical techniques for analysing the data will be outlined more fully. The results yielded will be discussed and then compared with findings from previous research. In the chapter which follows, chapter 6, the implications of the results reported in this chapter, as well as the limitations of the study and future research opportunities will be highlighted.

5.2: Descriptive statistics & the survey respondents' & small business' profile

5.2.1: Background of survey respondents & industry

All of the potential survey respondents were members of the Newsagents Association of N.S.W. & the A.C.T. Thus it is possible to say that all potential respondents were / are:

* involved as owner/managers in the newagency sector, each operating within a pre-determined "territory";
* had an equal chance of responding to the survey given that all members receive a copy of the Association's monthly magazine;
* operate within the retail industry within N.S.W. and A.C.T.- specifically, that category within the Australian Bureau of Statistics classification known as "other retailing";
* on a macro-level are and will be effected by the same economic conditions which in turn impact on profitability - although regional economic growth rates and population income will vary;

* members of the Association's buying cooperative and therefore able to take advantage of group buying discounts and offers - thus it could be assumed stock would be purchased at the same price (excluding delivery costs);
* members of the Association who equally share access to the Association's services such as assistance and advice etc; and
* members of the Association who were required to undergo the same creditworthiness checks when seeking to purchase a newsagency and the rights to its defined "territory".

5.2.2: Attributes of survey respondents and their small businesses: one approach to measuring competencies

Much of the previous research on small business founders' characteristics and their firm's performance has relied on biographical data indicators such as education and preownership experience. As one approach to measuring competencies, this study also relied on biographical data (Chandler & Jansen, 1992, p.227).

Thus, the survey questionnaire included a number of attribute questions which aimed to develop a profile of respondents' attributes such as their gender and age at time of business start-up. Questions concerning the respondents' behaviour, attitudes and beliefs such as motivation for setting up own business or respondent's position in the small business, were also asked. Questions concerning the small business' attributes such as age of business, time in current location, geographic location of the business, were also asked.

Responses to these questions enabled the researcher to see whether or not patterns existed for respondents - in other words, could respondents be divided into various sub-groups (De Vaus, 1991, pp.81-2). Descriptive statistical analytical techniques, allowed any patterns in the responses of people in the sample to be summarised (De Vaus, 1991, p.134).

As a second approach to measuring competence, the above defined dimensions of competence were operationalised in the survey questionnaire by asking small business founders to provide self-ratings on their skill levels currently, prior to business ownership and relative to local business competitors.

The data generated by these questions is outlined in the various tables and graphs found in Appendix . From the data, frequency distribution tables were developed so that a "picture" and "shape" of the sample could be seen more easily and succinctly. Variances and standard deviations were also calculated to see how well the mean summarised the distribution of the sample, the extent to which any case(s) deviated from the mean and what the overall average of these deviations were in order to have an overall measure of dispersion. Finally, cross-tabulations of variables and correlation coefficients were calculated using chi-square distributions to determine:
* if a relationship existed between the two variables chosen; and
* what the character of that relationship was in terms of its strength, direction and nature (De Vaus, 1991, pp.157-161).

5.2.3: Results of descriptive statistics used for univariate analysis

Using descriptive statistical techniques allowed patterns regarding the small business attributes and survey respondents' attributes and competencies, behaviour, attitudes and beliefs to be summised from their responses. The results of the descriptive statistical techniques used are outlined below.

1. Frequency distributions: By collating the survey questionnaire responses in the format of frequency distributions and graphing them in the form of histograms, it was possible to determine the shape of the sample and thus answer three questions with respect to the sample's distribution:

i. Is the distribution skewed? If so, in what direction?
ii. How widely spread are cases? Are they mainly concentrated in a few categories or widely dispersed across the categories?
iii. What are the most typical responses? In which categories are cases most commonly found? (De Vaus, 1991, p.139)

a. Survey Respondents' Attributes & Competencies:

i. Gender: Reference: question 1
* as a nominal variable, the sample distribution was positively skewed towards male respondents
* 75.2% of respondents were male, 22.3% were female, 1.65% made up their own category & added "husband & wife" and 0.8% or 1 person did not respond!

The results whilst conclusive with respect to gender may mask the fact that often newsagencies are owned by couples - information which would not emerge (except if the respondent made up a category as 2 did) given that the question asked the respondent to indicate their gender only.

ii. Prior skills & education: Reference: questions 8(a) & (b)
* as a nominal variable, the sample distribution was positively skewed towards respondents having received no training.
* 40.5% of the respondents had received no training before starting up their small business. However, 20.7% of respondents did indicate that they had had previous business experience.

When looking at the variance for this variable, given the relatively high proportion outside the modal category, it may be summised that the modal category of no training is perhaps a poor reflection of the overall distribution. This may in part be explained by the fact that many respondents (27.3%) misread the question's instructions to tick a box and instead ticked more than 1 box. Although these multiple responses were fairly evenly spread between categories, the most popular combined response (12/33 or 36% total combined responses) was for no training but having had previous business experience, which "fits" the picture of the way in which the distribution is dispersed. This suggests that many respondents may have misinterpreted the category of "no training received i.e. had to hit the deck running" to refer specifically to previous newsagency experience as distinct from general business experience.

iii. Type of education received: Reference: question 8(b)
* With respect to type of formal training received, although no respondent ticked the initial category of "formal training" in question 8(a), 17.4% (or 21) of total sample ticked one of the categories of type of formal training.

* as a nominal variable, the sample distribution was positively skewed towards TAFE training (47%), closely followed by university training (38.1%). Some respondents gave details, although not asked to except if they ticked the "other" category. These comments suggested that accounting qualifications were the type of training undertaken by many.

iv.Previous occupation: Reference: question 8(a)
* this information could only be clearly gleaned from 2 categories in question 8(a): (iii) "previous "business experience" and (iv) "previous employment in newsagency or connected industries". Responses to the category (ii) "inherited or became involved in a family business" might also be part of this category especially given previous research which suggests the higher payoff for this type of experience (Lentz & Laband, 1990, p.12).
* 20.7% of respondents indicated they had had some previous business experience. However, for the other 2 categories of (iv) "previous employment in newsagency or connected industries" and (ii) "inherited or became involved in a family business", responses were low and nearly equal at 5.8% and 4.95% respectively.

Given the large percentage of the distribution concentrated in the "no training" category and the distribution of these responses, it is suggested that the majority of people starting newsagencies have previous business experience but not specifically in the newsagency or connected industries.

v. Family background: Reference: question 8(a)
* Inheriting a family business was not a very important factor in this sample - although this may reflect the fact that the business founder(s) are still working in the business as owner /manager(s) and may have family members working for them as employees rather than as managers or equal partners in the business. Alternatively, although this did not seem an important factor in this sample distribution, it may be a symptom of the small sample size or who actually responded to the survey rather than being a true measure for the industry.

vi.Number of businesses operated & time spent doing so: Reference: questions 9 & 10
* as an interval level variable, responses were grouped into broad categories. although these categories were of different widths, which may have distorted the distribution between categories but avoid the problems associated with having endless categories with very few people in them.
* the sample distribution was positively skewed towards the low end of the variable i.e. 1-2 businesses.
* 66.9% of respondents indicated that they had operated 1-2 businesses with the average number operated being 1.72 businesses. The maximum number of businesses operated was 10 and the minimum number zero.
* looking at the mean, variance and standard deviations for the sample for question 9, number of businesses operated, as shown in Appendix , it can be summised that whilst the mean number of businesses operated for the sample was 5, this mean was actually distorted by some of the high or "extreme" responses of respondents having operated 10 businesses. Thus, to check how well the mean summarised the distribution, the variance and standard deviations of the responses were calculated to measure the level of dispersion from the mean. Here, the sample variance was calculated to be 2.47 approximately which suggests that the mean is a fair summary measure for the sample if we assume that the lower the variance, the better the mean is a summary measure.

In calculating the standard deviation for the sample responses, it is important to note that from probability theory it is known that in a normal distribution, it is always true that 68% of cases will lie within 1 standard deviation above all below the mean (De Vaus, 1991, p.147). Here, the standard deviation was calculated at 1.57 i.e. 1.57 businesses operated with the mean being 5 businesses. If 68% of cases will be within the range of 5 businesses (the mean) plus or minus 1.57 businesses (i.e. 1 standard deviation), then 68% of this sample should be within the range of 3.43 to 6.57 businesses. Probability theory also tells us that 95% of cases always lie within plus or minus 2 standard deviations of the mean. In this case, that means 3.14 businesses of the mean, or between 1.86 and 8.14 businesses have been operated by respondents which fits our sample distribution's spread.

* looking at the mean, variance and standard deviations for the sample for question 10, number of businesses operated, as shown in Appendix , it can be summised that whilst the mean length of time for businesses operated for the sample was 22.5, this mean was actually distorted again by some of the high or "extreme" responses of respondents having operated businesses for up to 45 years. Thus, to check how well the mean summarised the distribution, the variance and standard deviations of the responses were calculated to measure the level of dispersion from the mean. Here, the sample variance was calculated to be 106.4 years approximately which suggests that the mean was not a fair summary measure for the sample if we assume that the lower the variance is from the mean, the better the mean is as a summary measure.

In calculating the standard deviation for the question's sample responses, the standard deviation was calculated at 10.27 i.e. 10.27 years of businesses operated with the mean being 22.5 years of operating businesses. If 68% of cases will be within the range of 22.5 businesses (the mean) plus or minus 10.27 businesses (i.e. 1 standard deviation), then 68% of this sample should be within the range of 12.23 to 32.77 years of operating businesses. Probability theory also tells us that 95% of cases always lie within plus or minus 2 standard deviations of the mean. In this case, that means 20.54 years of operating businesses of the mean, or between 1.96 and 43.04 years of operating businesses, which fits our sample distribution's spread.

Although responses to this question suggest little variability, some respondents may have misinterpreted the question to include in their answer, their current business. If all answers of "1" are excluded, then 24.8% of respondents have operated at least 2 businesses, which is still more than the next most frequent response of 3-5 businesses, which accounted for 16.5% of total responses. This means that whilst there is less variability in the sample distribution it is still skewed towards the low end of the variable, even after discounting responses due to possible misinterpretation.

vii. Age at time of business start-up: Reference: question 11
* as an interval level variable, ages were grouped together into broad, similar width categories of 5 years. However, for the lower and top end ages categories were open-ended i.e. "up to 20 years old" and "45 + years old", to avoid the problem of having endless categories with very few people in them.
* the sample distribution was widely and fairly evenly spread between the categories of 21-25 years and 46+ years.

* the most popular age of 19.8% of respondents was between 31-35 years when they first started their business. However, respondents aged between 21-25 years and 26-30 years represented 15.7% and 16.5% of respondents, with the categories of 36-40 years, 41-45 years and 46+ years equally representing 14.05% of respondents.

The results suggest that the age of the small business owner-manager for starting up their own business peaks between 31-35 years. Outside of this age category, the next most popular age groups for starting up a business were between 21 and 31 years, followed closely by people aged 36 years and up.

b: Respondents' behaviour, attitudes and beliefs: second approach to measuring competencies

i. Respondent's position in the small business: Reference: question 3
* as a nominal variable, the distribution was skewed positively and heavily towards the low end of the variable with 96.7% of the sample being working owner/managers in the small business. The remaining 3.3% was spread evenly between being a non-working owner, being an employed manager and no response.

Given the high proportion of working owner/managers, it is highly probable that the performance of the business will correlate strongly with the strengths and weaknesses of the owner/manager, as past research has noted (Sage, 1993, p.52; Bolton, 1971, p.112). Furthermore, given that this is a nominal variable and that there was little variation in the sample outside of the modal category, it can be summised that the high proportion of respondents in the sample found in the working owner/manager category is reflective of the overall distribution for the newsagency population as a whole in N.S.W. and the A.C.T.

ii. motivation for setting up own business: Reference: question 12
* as a nominal variable, the distribution was skewed negatively towards the category of multiple responses (64.5%), since this question allowed for 2 responses. Despite this instruction, 2 respondents gave 3 responses. Of total multiple responses, 33.3% (26/78) indicated that they had set up their own business because they "wanted personal & financial independence" and "to achieve- "be your own boss". The second and third most common multiple responses interestingly also featured at least one of these reasons, but also included "to gain job-satisfaction, "to make more money" and "had previous employment / business experience" - which fit in with responses to previous questions on type of previous education and experience.
* In looking at single responses, 19.8% of respondents did indicate that they set up their own business because they "wanted personal & financial independence". This interestingly, is at least one of the reasons identified by respondents who ticked more than 1 reason for setting up their own business.

iii. self-assessment of skills and attitudes relative to competitors: Reference: question 13
* as ordinal variables, for each factor of self-assessment of skills, attitudes and beliefs, the sample distributions were positively skewed and fairly even spread towards the low end of the variable. However, in terms of leadership skills, independence and self-confidence, respondents ranked

themselves as "a bit higher". In terms of creativeness and risk-taking respondents ranked themselves as "similar" to local business competitors.
* since ordinal variables can be ranked, cumulative percentages were also calculated for each variable. The calculation of these confirmed that the median value for each variable was at the low end of the variable's distribution, as seen in Appendix 3 , suggesting a low level of variability. Given that the range for each variable in question 13 was quite small (i.e. in all cases except 1, it was 5), the median appeared to provide a good summary of the group, across each variable.

iv. self-ratings on pre-business ownership skills levels: Reference: question 14
* as ordinal variables, for each factor of self-assessed skills prior to business ownership, the sample distributions were quite different. However generally speaking, respondents ranked themselves as "similar" or a bit higher in terms of their skills pre-business ownership.
* with respect to general management skills, from the calculation of cumulative percentages, it could be seen that the median fell in the first 3 categories. Since the majority of the distribution (76.04%) was in ranked categories close to the median category, the median provided a good summary of the group.
* with respect to finance and accounting skills, the distribution was fairly even spread between the first 4 categories. Calculation of cumulative percentages to find the median indicated that the median fell in the first 3 categories. Since most cases in the distribution were in ranked categories close to the median category, the median provided a good summary of the group.
* with respect to marketing and technology skills, the distributions were fairly symmetrical. Again the calculation of cumulative percentages to find the median suggested that in the case of marketing skills, the central tendency for the distribution was at the low end of the variable and concentrated in the first 3 categories, accounting for 57.85% of all respondents ranking themselves similar or higher with respect to marketing skills before operating their current business. In the case of technology, the central tendency for the distribution was in the middle category. With a small range for this variable, the median did seem to provide a good summary of the group.
* with respect to coordination/organising/planning skills, the distribution was skewed positively towards the low end of the variable. In looking at the central tendency of the distribution, the median fell just outside the second category, in the beginning of the third category, even ranked response scores were higher for category 2 than 3 by 1 response. Nevertheless the median did seem to provide a good summary of the group, with 81.82% of respondents indicating that their coordinating/organisation/planning skills were similar pre-current business operation to what they were currently.

v. self-ratings on their skill levels currently: Reference: question 15
* as ordinal variables, cumulative frequencies were calculated for each in order to rank the responses to each variable.
* in terms of self-assessment of current general management skills, the central tendency of the distribution lay in the first 2 categories, with 85.12% cumulatively assessing their skills now as "a bit higher". Since responses were concentrated in these 2 categories, the median would seem to provide a good summary of the group. The distribution skew towards the low end of the variable supported this.

* for the other variables, the central tendencies of the distributions told a similar story with respondents assessing their skills now as "a bit higher". Distribution skews towards the low end of the variables supported this.

vi. source of self-assessed skill improvements: Reference: question 16
* as nominal variables, the most common single response was for skills to be acquired "through work experience". This response represented 39.77% of the 88 single responses. The second most common response by respondents was for skill improvements to be acquired by "a combination of all of the above" i.e. factors listed as choices in the question. This response represented 31.82% of the total single responses.
* if multiple responses are excluded from the distribution (i.e. 121-33 = 88 single responses), then a high proportion of the sample (53/88 or 60.23%) fall outside the modal category. In this sense, the mode for this distribution poorly reflects the overall distribution.
* for those respondents who misread the question's instructions to tick a box, the most common multiple response was to tick the categories of "through work experience" and "through reading trade and business journals". This response represented 42.4% of the 33 multiple responses.

c. Results of descriptive statistics used: The small business' attributes

i. business location: Reference: question 2
* as a nominal variable, the distribution was fairly even spread across 6 of the 11 categories.
* in looking for the central tendency in the distribution, the even spread across 6 categories proved problematic given that the distribution had 2 modes, so the mode could not be used to pick out the single most common response. This reflected largely the way in which the categories of the variable were collapsed/combined. If the categories had been combined into say 3 categories of N.S.W.- Sydney, N.S.W - other than Sydney and A.C.T. the mode would obviously have been different.
* given that A.C.T. suburbs fall into the postcode brackets of 2600-2620 and 2900-2914, it is expected that there will be a bias in the distribution towards respondents located in N.S.W with only 6.6% (i.e. 8/121) respondents indicating a postcode location in the postcode range 2600-2620 and none in the postcode category of 2900-2914.

If the A.C.T. respondents are removed from the number of respondents located in postcode category 2601-2700, then the mode can be found in the postcode location category of 2301-2400. However, since 77.69% of respondents are outside the modal category, the modal category obviously is a poor reflection of the overall sample distribution. This supports the earlier statement of the graph showing the distribution of the responses being widely and evenly dispersed between categories.

ii. number of full time employees: Reference: question 4
* given that interval variables can have endless categories of values, for this question the number of full-time employees (including the respondent) was grouped into five broad categories with only the fourth category being open ended and the fifth category summarising non-responses.
* for this question the distribution was positively skewed towards the low end of the variable.

* the mean for this distribution was 3.474 people employed full-time. This is in keeping with Australian Bureau of Statistics figures which show that 78% of "other retailers" which includes newsagencies, employed between 0-9 people in 1991-92 (A.B.S., Small Business In Australia, 1991-92, p.127). Both the standard deviation and variance were calculated to see how far data was dispersed across the distribution and thus how well the mean summarised the distribution.

Given the 68% probability rule and that the standard deviation was calculated to be 2.3888, it is known that 68% of cases will be within the range of one standard deviation above or below the mean. In this case, 3.474 people (the mean) plus or minus 2.3888 full-time employees (one standard deviation) i.e. within the range of 1.0852 to 5.8628 full-time employees which accounts for more than 68% of the sample distribution responses. For 95% of cases, 95% will be distributed within plus or minus two standard deviations of the mean i.e. between 1.3036 and 8.2516 full time people (De Vaus, 1991, p.148).

iii. year of business start-up: Reference: question 5
* for this question, the interval variable of years of business start-up was grouped into seven broad five year categories except for the first and the last category which was for non-response.
* the distribution for this question was skewed negatively towards the high end of the variable, with the majority of the businesses having been started between 1981-1995. The most common time for starting up a business was between 1986-90 when 41.32% of respondents indicated they did so.
* the mean for this distribution was calculated to be approximately 1987.6, after multiplying the relevant year categories by the number of respondents in that category and dividing by the total responses. To see if the mean provided a good measure of dispersion, both the variance and standard deviation were calculated. As the variance, calculated by summing all the respondents' scores on the variables less the mean, all squared and divided by the total number of respondents in the sample, was pretty low at 0.7745, the mean was considered a good summary measure of the distribution.

Using the 68% rule for a normal distribution from probability theory, 68% of cases had to lie within one standard deviation above or below the mean. Here, the standard deviation was calculated to be 0.8775. Thus, 68% of cases will be within the range of 1987.6 (the mean) plus or minus 0.8775 (one standard deviation) i.e. within the range of 1986.7225 to 1988.4775. From our distribution this would seem to be true, confirming that the mean provides a good summary of dispersion for the distribution.

iv. length of time operating in newsagency industry: Reference: question 6(i)
* given that interval variables can have endless categories of values, for this question the number of years of operating was grouped into broad 10 year categories with only the top category being open ended.
* for this question the distribution was skewed positively towards the low end of the variable, with the majority of businesses having operated in the newsagency industry for between 1 - 30 years. The most common length of time of operation was in the category 11-20 years which accounted for 27.27% of respondents' businesses.

* unfortunately, given the existence of some extreme cases, the mean for this distribution was distorted and did not summarise the central tendency of the distribution very well. Thus both the variance and the standard deviation of the sample were calculated to see the overall average of these deviations from the mean and thus the measure of dispersion. For this sample, the variance was very high at 617.19, which indicates that the mean was a poor summary measure of the distribution.

From probability theory it is known that 68% of cases will lie within 1 standard deviation above or below the mean for a normal distribution (Anderson et al, 1991, p.169). In this case, 1 standard deviation is 24.74 i.e. 24.74 years and the mean is 55 years of operation. Thus, 68% of cases will be within the range of 55 years (the mean) plus or minus 24.74 years (1 standard deviation) i.e. between 30.26 and 79.74 years. Given that the standard deviation is such a large number, this supports the fact that the distribution curve of responses is relatively flat because the responses are widely dispersed between the categories.

v. years of operating in same location or change in location: Reference: question 6(ii)
* given that interval variables can have endless categories of values, for this question the number of years of operating was grouped into broad 10 year categories with only the top category being open ended.
* for this question the distribution was skewed positively towards the low end of the variable, with the majority of businesses having operated in the same location for between 1 - 30 years. The most common length of time in 1 location was 0-10 years which accounted for 37.2% of respondents' businesses.
* unfortunately, given the existence of some extreme cases, the mean for this distribution was distorted and did not summarise the central tendency of the distribution very well. Thus both the variance and the standard deviation of the sample were calculated to see the overall average of these deviations from the mean and thus the measure of dispersion. For this sample, the variance was very high at 531.43, which indicates that the mean was a poor summary measure of the distribution.
* the standard deviation was calculated at 22.96 years. Given the mean of 50 years in the 1 location, 68% of all businesses, assuming a normal distribution curve, should have been in the range of 50 years (mean) plus or minus 22.96 years i.e. between 27.04 and 72.96 years operating in their current location. For this distribution, this was true, indicating that there was a high level of dispersion in the responses, from the mean. This reflects the distorting effect that "extreme" cases had on the mean as a summarising value for the group.

vi. sources of external assistance: Reference: question 17
* as a nominal variable, there were many categories in this particular question. This caused some problems as many categories ended up with few responses in them. Nevertheless, if multiple responses (of which there were 55) were ignored, 40 / (121 less 55) or 60.6% of respondents cited their accountant as their most frequently used source of external assistance in the running of their business. Obviously, the mode in this distribution was not a good reflection of the overall distribution.
* Of the 45% (or 55 / 121) of respondents who chose more than one response despite the question requesting respondents to "tick a box" next to that source "to whom you most

frequently turn", the most popular combined response was to seek external assistance from their accountant, fellow business person(s) and trade association(s). Interestingly all but 8 / 55 combined responses included their accountant as a source of external assistance in the running of their business. Of those 8 combined responses excluding their accountant, fellow business person(s) and trade association(s) were considered most frequently used sources of external assistance.

vii. performance over last 3 years: Reference: questions 19 & 20:
* as an ordinal variable, the distribution for question 19 was skewed positively towards the low end of the variable
* with respect to current business performance, the most common response (33.8%) was that current business performance was "a bit higher" than 3 years ago. The next most common response was that current performance was "much higher" (28.93%).
* interestingly question 20, which asked respondents to quantify their question 19 response in terms of the increase in sales over the 3 year period, had a high proportion of responses (42.15%) in the category "0%", whilst the rest of the sample was evenly spread over the other categories of 10% - 50% increase, with the categories of "20%" and "30%" being the next most popular, representing 17.36% and 12.4% of the sample respectively.
* a possible explanation for the highest response being in the 0% sales increase category is that it represented those respondents whose business had not increased over the 3 years and whose responses to question 19 were clustered in the categories of "similar", "a bit lower" and "much lower".
* in looking at the central tendency of responses for question 19, the median fell in the second category of "a bit higher". Since the first two categories accounted for 62.81% of the cumulative responses, the median provided a good summary of the group. The small range of 5, also supported this.
* in looking at the central tendency of responses for question 20, the median fell in the second category of "10%" increase in sales. Since the first two categories accounted for 52.07% of the cumulative responses and the highest ranked categories in the distribution were close to the median category in categories 3 and 4, it can be summised that the median provided a good summary of the group. The range of scores in the distribution of 0-150 however, suggested otherwise. It may be that the size of the range, exaggerated by a few extreme cases, underestimates the summarising value of the median. However, if the bottom and top 10% of cases are dropped, the middle 80% of the cases suggest that the variability of the sample, in the absence of a few extreme cases, is not too great (De Vaus, 1991, p.144).

viii. performance over the next 3 years : Reference: question 21
* as an ordinal variable, the distribution of the responses was skewed to the left, towards the low end of the variable, with the most common response (65.29%) being that peformance in 3 years was expected to be "a bit higher" - as it was in question 19 concerning the improvement in performance in terms of sales over the last 3 years.
* calculation of cumulative percentage responses showed the median category for this distribution was found in the second category. Since most cases in the distribution were in the first 3 categories and thus close to the median category, the median provided a good summary of the group.

ix. current business performance relative to competitors: Reference: questions 18)a)i)-viii)
* each of these eight variables were ordinal in nature. For each variable, the distribution was skewed to the left towards the low end of the variable. The most common responses for each variable were as follows:

TABLE 5.1

Qu. 18a)	Variable description	Mode category	% of total distribution	Next most common category	% of total distribution	Median category
(i)	no. of customers	2	31.4	1	29.75	2
(ii)	product / services range	2	41.32	1	25.62	2
(iii)	no.sales / sales growth	2	34.71	3	31.4	2
(iv)	amount resale stock	2	31.4	3	29.75	2
(v)	net profitability	3	42.15	2	26.45	3
(vi)	return on investment	3	42.15	2	21.49	3
(vii)	market share	3	40.5	2	28.1	3
(viii)	overall business performance	2	38.02	3	28.93	2

Key to mode categories: 1 = much higher, 2 = a bit higher, 3 = similar, 4 = a bit lower, 5 = much lower

* calculation of cumulative percentage responses for each variable (found in Appendix 3), indicated that the median category as seen in the table above, provided a good summary of the group, since most cases in each distribution were ranked closely to the median category.

x. current business performance relative to when business first started: Reference: question 18)b)i)-viii)
* each of these eight variables were ordinal in nature. For each variable, the distribution was skewed to the left towards the low end of the variable. The most common responses for each variable were as follows:

TABLE 5.2

Qu. 18b)	Variable description	Mode category	% of total distribution	Next most common category	% of total distribution	Median category
(i)	no. of customers	2	38.84	1	31.4	2
(ii)	products / services range	2	38.02	1	37.2	2
(iii)	no.sales / sales growth	2	38.02	1	30.58	2
(iv)	amount of resale stock	1	40.5	2	31.4	2
(v)	net profitability	2	34.71	3	24.79	2
(vi)	return on investment	2	30.58	3	25.62	3
(vii)	market share	2	39.67	3	26.45	2
(viii)	overall business performance	2	41.32	1	25.62	2

Key to mode categories: 1 = much higher, 2 = a bit higher, 3 = similar, 4 = a bit lower, 5 = much lower

* calculation of cumulative percentage responses (found in Appendix 3) for each ordinal variable, indicated that the median category as seen in the table above, provided a good summary of the group, since most cases in each distribution were ranked closely to the median category.

5.3: Inferential Statistics for univariate analysis - the use of interval estimates

In the previous sections, descriptive statistical techniques were used to summarise patterns in the responses of survey respondents in the sample with respect to single variables. From these results, it was then possible, using inferential statistics, to see whether or not the patterns seen in the sample would hold in the population. The most common inferential technique for univariate analysis - interval estimation - was used.

Given that samples are likely to be imperfect reflections of the population, due to sampling error, it was not possible to simply use the sample mean to calculate the actual mean for the population. Thus, to determine how close the sample mean was to the true population mean, a statistic called the standard error of the mean was calculated using the following formulae:

i. for interval level variables:

$$S_m = \frac{s}{\sqrt{N}}$$

where: Sm = standard error of the mean
s = standard deviation
N = total number in the sample

ii. for nominal & ordinal level variables:

$$S_B = \sqrt{\frac{PQ}{N}}$$

where: S_B = standard error for the binomial distribution
P = the per cent in 1 category of the variable
Q = the per cent in the other category of the variable
N = total no. in the sample

Next, given that probability theory states that 95% of samples the population mean will be within ± two standard error units of the sample mean, it was possible to estimate within a range where the population mean was likely to be. This range, called the confidence interval effectively meant that it was possible to be 95% certain that the population means would fall within that range.

The results from testing all the univariate variables in the previous section are outlined in the table 5.3 on the following page. These results give a glimpse of what the newsagency industry population as a whole, from which the sample was drawn, looks like in terms of its owner/managers' competencies i.e. their attributes, behaviours / skills / beliefs, as well as the attributes of the small business itself with respect to various performance indicators when compared to local business competitors, and when the small business first started.

Table 5.3: Results of Inferential Statistics & Univariate Analysis

						Interval estimates used			
Variable	**Ref (Qu no)**	**Var. level**	**Categories of Variables %**		**Sample mean**	**Std error for binomial distrib'n**	**Std dev. of sample**	**Std error of the mean**	**95% confidence level range of population mean**
a.SB Owner /mgr attributes									
i.gender	1	nom'l	75	25	n/a	3.94%	n/a	n/a	71.06-78.94%
ii.pre-bus skills & education	8a & 8b	nom'l	59.5	40.5	n/a	4.46%	n/a	n/a	55.04-63.95%
iii.type of education	8b	nom'l	85.7	14.3	n/a	7.64%	n/a	n/a	78.06-93.34%
iv.prev.occupation	8a	nom'l	67	33	n/a	4.27%	n/a	n/a	62.73-71.27%
v.family bkgrd	8a	nom'l	5.8	94.2					
vi.no.businesses operated & time spent doing so	9	interval	n/a	n/a	1.719	n/a	1.5652	0.14	1.58-1.86
	10	interval	n/a	n/a	11.3789	n/a	10.2722	0.93	10.45-12.31
vii.age at bus. startup	11	interval	n/a	n/a	4.1818	n/a	1.8182	0.17	4.01-4.35
b.Respondents' behaviour / beliefs / attitudes									
i.pos.in bus.	3	nominal	96.7	3.3	n/a	1.62	n/a	n/a	95.08-98.32
ii.motiv.n for startup	12	nominal	64.5	35.5	n/a	4.35	n/a	n/a	60.15-68.85
iii.l'ship skills cvf competitors	13a	ordinal	57.85	42.15	n/a	4.49	n/a	n/a	53.36-62.34
iii.creativeness cvf competitors	13b	ordinal	55.37	44.63	n/a	4.52	n/a	n/a	50.85-59.89
iii.risktaking cvf competitors	13c	ordinal	56.2	43.8	n/a	4.51	n/a	n/a	51.69-60.71
iii.indep.cvf competitors	13d	ordinal	64.46	35.54	n/a	4.35	n/a	n/a	60.11-68.81
iii.self-confidence cvf competitors	13e	ordinal	61.98	38.02	n/a	4.41	n/a	n/a	57.57-66.39

						Interval estimates used			
Variable	**Ref (Qu no)**	**Var. level**	**Categories of Variables %**		**Sample mean**	**Std error for binomial distrib'n**	**Std dev. of sample**	**Std error of the mean**	**95% confidence level range of population mean**
iv.pre-bus.gen.mgt skills	14a	ordinal	69.42	30.58	n/a	4.19	n/a	n/a	65.23-73.61
pre-bus.fin & a/cg skills	14b	ordinal	71.9	28.1	n/a	4.09	n/a	n/a	67.81-75.99
pre-bus.mktg skills	14c	ordinal	67.77	32.32	n/a	4.25	n/a	n/a	63.52-72.02
pre-bus.tech. skills	14d	ordinal	65.29	34.71	n/a	4.33	n/a	n/a	60.96-69.62
pre-bus.coord'g / organising / planning	14e	ordinal	66.94	33.06	n/a	4.28	n/a	n/a	62.66-71.22
v.curr.bus.gen.mgt skills	15a	ordinal	51.24	48.76	n/a	4.54	n/a	n/a	46.7-55.78
curr.bus.fin & a/cg skills	15b	ordinal	57.02	42.98	n/a	4.5	n/a	n/a	52.52-61.52
curr.bus.mktg skills	15c	ordinal	55.37	44.63	n/a	4.52	n/a	n/a	50.85-59.89
curr.bus.tech. skills	15d	ordinal	59.5	40.5	n/a	4.46	n/a	n/a	55.04-63.96
curr.bus.coord'g / organising / planning	15e	ordinal	58.68	41.32	n/a	4.48	n/a	n/a	54.20-63.16
vi.source skill improvements	16	nominal	71.07	28.93	n/a	4.12	n/a	n/a	66.95-75.19
c.SB attributes									
i.bus.location	2	nominal	93	7	n/a	2.24	n/a	n/a	88.52-97.48
ii.no.full time employees	4	interval	n/a	n/a	3.4339	n/a	2.3888	0.22	3.21-3.65
iii.yr bus. startup	5	interval	n/a	n/a	1,987.6	n/a	0.88	0.08	1987.44-1987.76
iv.yrs op'g in ind	6i)	interval	n/a	n/a	26.3306	n/a	24.7404	2.25	24.08-28.58
v.yrs op'g in same loc'n	6ii)	interval	n/a	n/a	22.1354	n/a	22.9573	2.09	20.05-24.23
vi.ext'l assist. sources	17	nominal	45.45	54.55	n/a	4.53	n/a	n/a	50.02-59.08
vii.perf'c over last 3 yrs	19 20	ordinal ordinal	76.86	23.14	n/a n/a	3.83 4.46	n/a n/a	n/a n/a	73.02-80.69 55.04-63.96
viii.perf'c over next 3 yrs	21	ordinal	65.3	34.7	n/a	4.33	n/a	n/a	60.97-69.63

						Interval estimates used			
Variable	**Ref (Qu no)**	**Var. level**	**Categories of Variables %**		**Sample mean**	**Std error for binomial distrib'n**	**Std dev. of sample**	**Std error of the mean**	**95% confidence level range of population mean**
ix.curr.perf'c- no customers cvf comp.	18ai)	ordinal	68.6	31.4	n/a	4.22	n/a	n/a	64.38-72.82
curr perf'c- prodt rg cvf competitors	18 a)ii	ordinal	58.68	41.32	n/a	4.48	n/a	n/a	54.2-63.16
curr perf'c- no sales cvf competitors	18 a)iii	ordinal	65.29	34.71	n/a	4.33	n/a	n/a	60.96-69.62
curr perf'c-resale stk purch's cvf competitors	18 a)iv	ordinal	68.6	31.4	n/a	4.22	n/a	n/a	64.38-72.82
curr perf'c- net profit'y cvf competitors	18 a)v	ordinal	57.85	42.15	n/a	4.49	n/a	n/a	53.36-62.34
curr perf'c -ROI cvf competitors	18 a)vi	ordinal	57.85	42.15	n/a	4.49	n/a	n/a	53.36-62.34
curr perf'c - mkt share cvf competitors	18 a) vii	ordinal	59.5	40.5	n/a	4.46	n/a	n/a	55.04-63.96
curr perf'c- o'all bus cvf competitors	18 a) viii	ordinal	61.98	38.02	n/a	4.41	n/a	n/a	57.57-66.39
x.curr.perf'c- no customers cvf startup	18bi)	ordinal	61.16	38.84	n/a	4.43	n/a	n/a	56.73-65.59
curr perf'c- prodt rg cvf startup	18 b)ii	ordinal	61.98	38.02	n/a	4.41	n/a	n/a	57.57-66.39
curr perf'c- no sales cvf startup	18 b)iii	ordinal	61.98	38.02	n/a	4.41	n/a	n/a	57.57-66.39
curr perf'c-resale stk purch's cvf startup	18 b)iv	ordinal	59.5	40.5	n/a	4.46	n/a	n/a	55.04-63.96
curr perf'c- net profit'y cvf startup	18 b)v	ordinal	65.29	34.71	n/a	4.33	n/a	n/a	60.96-69.62
curr perf'c -ROI cvf startup	18 b)vi	ordinal	69.42	30.58	n/a	4.19	n/a	n/a	65.23-73.61

						Interval estimates used			
Variable	**Ref (Qu no)**	**Var. level**	**Categories of Variables %**		**Sample mean**	**Std error for binomial distrib'n**	**Std dev. of sample**	**Std error of the mean**	**95% confidence level range of population mean**
curr perf'c -mkt share cvf startup	18 b) vii	ordinal	60.33	39.67	n/a	4.45	n/a	n/a	55.88-64.78
curr perf'c- o'll bus cvf- startup	18 b) viii	ordinal	58.68	41.32	n/a	4.48	n/a	n/a	54.20-63.16

5.4: Bivariate analysis: descriptive measures of association & inferential tests of significance: Cross tabulations, simple linear regression & correlation coefficients & the use of chi-square correlation coefficients, *F* tests and *t* tests to test for significance

In the previous section, various types of univariate analysis were used to look at single variables. In this section, two methods of bivariate analysis, cross-tabulations and correlation coefficients, are used to examine:
* the relationships between two variables;
* the character of the relationship with respect to its strength, direction and nature;
* whether or not there are any clear patterns in terms of direction or linearity of relationship (De Vaus, 1991, pp.157-61).

Given the past research in chapter 2 which identified relationships between different variables, several sub-hypotheses in section 3.5.2 were developed from the hypotheses outlined in section 1.5. From these identified relationships, this study sought to test their applicability to the sample used, by examining the relationships between various independent variables and the 2 dependent variables chosen as the proxies for small business performance, namely:
i. current business performance as measured by percentage increase in sales over last 3 years (question 20); and
ii. current overall business performance compared to other local business competitors (question 18(a)(viii).

The tables below summarise the variables chosen, the relationships / associations that were tested and the correlation coefficients generated together with the results of the chi-squared probability distributions for goodness of fit with respect to the null hypotheses being tested.The results of the simple linear regression analysis and corresponding correlation analysis are also found in the tables below. The actual contingency tables used to determine observed and expected frequencies and then calculate a chi-square value are found in Appendix 3 .

TABLE 5.4.1

Appendix 3 — EXCERPT

a. Survey respondents' attributes - their characteristics, skills & experiential competencies

Question numbers	Independent variable	Dependent variable	Degrees of freedom i.e. (n-1)(n-1) = d.f.	.05 (95%) confid.c level	Chi squared coeffic.	Accept / reject Ho at .05 signif.c level	Pearson's correl. coeffic. i.e r	r squared	Regression coeffic. b
1&20	Q.1.gender	Q.20.	30	43.77	23.23	Accept	0.18	0.03	10.3
1&18(a)(viii)	Q.1.gender	Q.18(a)(viii)	10	18.307	3.8773	Accept	0.0536	.0029	0.1192
8(a)&20	Q.8(a).source of bus.skills pre current business	Q.20	60	79.08	45.23	Accept	0.0426	0.0018	0.9494
8(a)&18(a)(viii)	Q.8(a).source of bus.skills pre current business	Q.18(a)(viii)	30	43.7729	32.9959	Accept	-0.0046	.00002	-0.0038
8(b)&20	Q.8(b)source of formal training skills	Q.20	30	43.77	11.91	Accept	-0.06325	0.0040	-2.472
8(b)&18(a)(viii)	Q.8(b)source of formal training skills	Q.18(a)(viii)	15	24.9958	0.2167	Accept	-0.1102	.0121	-0.1604
9&20	Q.9.no.businesses operated	Q.20	30	43.77	22.91	Accept	0.1706	0.0291	2.9717
9&18(a)(viii)	Q.9.no.businesses operated	Q.18(a)(viii)	15	24.9958	19.9275	Accept	-0.1175	.0138	-0.0762
10&20	Q.10.no.yrs operating businesses	Q.20	50	67.5	68.75	Reject	0.1414	.02	.3753
10&18(a)(viii)	Q.10.no.yrs operating businesses	Q.18(a)(viii)	25	37.6525	16.513	Accept	-0.045	0.002	-0.0044
11&20	Q.11.age at business startup	Q.20	70	90.53	53.9	Accept	-0.1586	.0252	-2.3773
11&18(a)(viii)	Q.11.age at business startup	Q.18(a)(viii)	42	55.7585	35.8235	Accept	0.1302	.017	0.0727

Question numbers	Independent variable	Dependent variable	Degrees of freedom i.e. (n-1)(n-1) = d.f.	.05 (95%) confidence level	Chi squared coefficient	Accept or reject null hypothesis at .05 (95%) significance level	Pearson's correl. coeffic. i.e r	r squared	Regression coeffic. b
3&20	Q.3.position in business	Q.20	40	55.76	11.2	Accept	0.0094	0.0001	0.6334
3&18(a)(viii)	Q.3.position in business	Q.18(a)(viii)	20	31.4104	6.5383	Accept	0.0757	0.0057	0.1904
12&20	Q.12reason for business startup	Q.20	110	124.342	54.6098	Accept	-0.0754	0.0057	-0.854
12&18(a)(viii)	Q.12.reason for business startup	Q.18(a)(viii)	55	67.5048	27.9461	Accept	0.0892	0.008	0.0376
13(a)&20	Q.13.(a) leadership skills	Q.20	50	67.5048	66.9067	Accept	-0.2889	0.0835	-8.6636
13(a)&18(a)(viii)	Q.13.(a) leadership skills	Q.18(a)(viii)	25	37.6525	78.8614	Reject	0.4175	0.1743	0.4664
13(b)&20	Q.13.(b) creativeness	Q.20	50	67.5048	28.996	Accept	-0.1571	0.0247	-5.1361
13(b)&18(a)(viii)	Q.13.(b) creativeness	Q.18(a)(viii)	25	37.6525	77.164	Reject	0.4167	0.1736	0.5077
13(c)&20	Q.13.(c) risk-taking	Q.20	50	67.5048	54.5078	Accept	-0.2503	0.0627	-7.2881
13(c)&18(a)(viii)	Q.13.(c) risk-taking	Q.18(a)(viii)	25	37.6525	67.0262	Reject	0.3069	0.0947	0.3329
13(d)&20	Q.13.(d) independence	Q.20	50	67.5048	45.5431	Accept	-0.2409	0.058	-6.4206
13(d)&18(a)(viii)	Q.13.(d) independence	Q.18(a)(viii)	25	37.6525	43.512	Reject	-0.2607	0.068	0.2588
13(e)&20	Q.13.(e) self-confidence	Q.20	50	67.5048	41.5919	Accept	-0.2752	0.0757	-8.3369
13(e)&18(a)(viii)	Q.13.(e) self-confidence	Q.18(a)(viii)	25	37.6525	96.3479	Reject	0.3274	0.1072	0.3695
14(a)&20	Q.14(a)general mgt	Q.20	50	67.5048	32.414	Accept	-0.158	0.025	-3.714
14(a)&18(a)(viii)	Q.14(a)general mgt	Q.18(a)(viii)	25	37.6525	39.8861	Reject	0.154	0.0237	0.1348
14(b)&20	Q.14(b) finance & accounting	Q.20	50	67.5048	30.5910	Accept	0.0215	0.0005	0.4748
14(b)&18(a)(viii)	Q.14(b) finance & accounting	Q.18(a)(viii)	25	37.6525	39.6098	Reject	0.1901	0.0361	0.1566

TABLE 5.4.2

b. Survey respondents' behaviour, attitudes & beliefs

Question numbers	Independent variable	Dependent variable	Degrees of freedom i.e. (n-1)(n-1) = d.f.	.05 (95%) confidence level	Chi squared coefficient	Accept or reject null hypothesis at .05 (95%) significance level	Pearson's correl. coeffic. i.e r	r squared	Regression coeffic. b
14(c)&20	Q.14(c) marketing	Q.20	50	67.5048	57.7985	Accept	-0.157	0.0246	-3.5313
14(c)&18(a)(viii)	Q.14(c) marketing	Q.18(a)(viii)	25	37.6525	39.6242	Reject	0.2401	0.0576	0.2012
14(d)&20	Q.14(d) technology	Q.20	50	67.5048	41.7112	Accept	- 0.0744	0.0055	-1.7503
14(d)&18(a)(viii)	Q.14(d) technology	Q.18(a)(viii)	25	37.6525	34.4397	Accept	0.0943	0.0089	0.0827
14(e)&20	Q.14(e) coordinating / organising / planning	Q.20	50	67.5048	54.0592	Accept	- 0.1668	0.0278	-4.1354
14(e)&18(a)(viii)	Q.14(e) coordinating / organising / planning	Q.18(a)(viii)	25	37.6525	50.0848	Reject	0.2848	0.0811	0.2631
15(a)&20	Q.15(a) general management	Q.20	50	67.5048	25.1465	Accept	- 0.2144	0.0460	-7,856
15(a)&18(a)(viii)	Q.15(a) general management	Q.18(a)(viii)	25	37.6525	48.1953	Reject	0,2091	0 0437	0,2854
15(b)&20	Q.15(b) finance & accounting	Q.20	50	67.5048	38.2493	Accept	0.0427	0.0018	1.4135
15(b)&18(a)(viii)	Q.15(b) finance & accounting	Q.18(a)(viii)	25	37.6525	27.5590	Accept	0.1276	0.0163	0.1574
15(c)&20	Q.15(c) marketing	Q.20	50	67.5048	33.8505	Accept	-0.181	0.0328	-5.624
15(c)&18(a)(viii)	Q.15(c) marketing	Q.18(a)(viii)	25	37.6525	59.0693	Reject	0.254	0.065	0.2939
15(d)&20	Q.15(d) technology	Q.20	50	67.5048	28.7849	Accept	-0.1057	0.0112	-3.0425
15(d)&18(a)(viii)	Q.15(d) technology	Q.18(a)(viii)	25	37.6525	36.6958	Accept	0.1722	0.0297	0.1847
15(e)&20	Q.15(e) coordinating / organising / planning	Q.20	50	67.5048	24.7547	Accept	-0.2647	0.0701	-9.2257
15(e)&18(a)(viii)	Q.15(e) coordinating / organising / planning	Q.18(a)(viii)	25	37.6525	58.3239	Reject	0.3411	0.1163	0.4429

16&20	Q.16. improvements in skills	Q.20	70	90.53	48.68	Accept	0.0653	0.0043	0.8979
16&18(a)(viii	Q.16. improvements in skills	Q.18(a)(viii)	35	43.7729	55.8778	Reject	-0.0707	.005	-.0362

TABLE 5.4.3 **c. The small business' attributes**

Question numbers	Independent variable	Dependent variable	Degrees of freedom i.e. (n-1)(n-1) = d.f.	.05 (95%) confidence level	Chi squared coefficient	Accept or reject null hypothesis at .05 (95%) significance level	Pearson's correl. coeffic. i.e r	r squared	Regression coeffic. b
2&20	Q.2.postcode location	Q.20	100	124.342	78.1934	ACCEPT	-0.0502	0.0025	-0.0054
2&18(a)(viii)	Q.2.postcode location	Q.18(a)(viii)	50	67.5048	38.1289	ACCEPT	-0.0318	0.0010	-0.0001
4&20	Q.4.no.full-time employees	Q.20	50	67.5048	48.6267	ACCEPT	0.0231	0.0005	0.2631
4&18(a)(viii)	Q.4.no.full-time employees	Q.18(a)(viii)	20	31.4104	38.6111	REJECT	-0.1726	0.0298	-0.0734
5&20	Q.5.yr of bus.startup	Q.20	60	79.0819	33.1747	ACCEPT	0.0021	0.00004	0.0002
5&18(a)(viii)	Q.5.yr of bus.startup	Q.18(a)(viii)	30	43.7729	53.3167	REJECT	0.1293	0.0167	0.0005
6(i)&20	Q.6(i).no.yrs op'g in ind.	Q.20	70	90.5312	51.2927	ACCEPT	-0.0288	0.0008	-0.0318
6(i)&18(a)(viii)	Q.6(i).no.yrs op'g in ind.	Q.18(a)(viii)	35	43.7729	55.4522	REJECT	0.0185	0.0003	0.0008
6(ii)&20	Q.6(ii).no.yrs op'g in same location	Q.20	70	90.5312	56.2225	ACCEPT	-0.1549	0.0240	0.184
6(ii)&18(a)(viii)	Q.6(ii).no.yrs op'g in same location	Q.18(a)(viii)	35	43.7729	35.7596	ACCEPT	0.0789	0.0062	0.0035
17&20	Q.17.external assistance source	Q.20	130 ~100	124.3420	69.0727	ACCEPT	0.0842	0.0071	0.9809
17&18(a)(viii)	Q.17.external assistance source	Q.18(a)(viii)	65 ~60	79.0819	41.3794	ACCEPT	0.0415	0.0017	0.018
18(a)&20	Q.18(a)(i)-(viii).performance measures cvf local competitors	Q.20	N.A	N.A	N.A	N.A	N.A	N.A	1.256
18(a)(i)-(vii)&18 (a)(viii)	Q.18(a)(i)-(vii).performance measures cvf local competitors but excluding overall performance	Q.18(a)(viii)	N.A	N.A	N.A	N.A	0.8281	0.6857	SEE APPENDIX 3

TABLE .4.3

Question numbers	Independent variable	Dependent variable	Degrees of freedom i.e. (n-1)(n-1) = d.f.	.05 (95%) confidence level	Chi squared coefficient	Accept or reject null hypothesis at .05 (95%) significance level	Pearson's correl. coeffic. i.e r	r squared	Regression coeffic. b
18(b)&20	Q.18(a)(i)-(viii).performance measures cvf local competitors	Q.20	N.A	N.A	N.A	N.A	N.A	N.A	N.A
18(b)(i)-(vii)&18 (a)(viii)	Q.18(a)(i)-(vii).performance measures cvf local competitors but excluding overall performance	Q.18(a)(viii)							
19&20	Q.19.current performance cvf 3 yrs ago	Q.20	N.A	N.A	N.A	N.A	-0.476	0.2266	-10.6686
19&18(a)(viii)	Q.19.current performance cvf 3 yrs ago	Q.18(a)(viii)					0.3008	0.0905	0.2512
20&18(a)(viii)	Q.20.percentage increase in sales over last 3 yrs	Q.18(a)(viii)					-0.2069	0.0428	N.A
21&20	Q.21.performance in 3 yrs time	Q.20	N.A	N.A	N.A	N.A	-0.0552	0.003	-2.3218
21&18(a)(viii)	Q.21.performance in 3 yrs time	Q.18(a)(viii)					0.2486	0.0618	0.3897

5.4.1: Results

Both measures of association and tests of statistical significance need to be used in conjunction. As can be seen from the tables on the previous pages which tested hypotheses which focused on survey respondents' competencies (i.e. their attributes, behaviour, attitudes and beliefs) and the attributes of the small business itself, both measures of association and tests of significance were used. The use of frequency distributions allowed the survey responses to be seen in terms of how the sample was spread or distributed in the various categories for each variable. Cross-tabulations, simple linear regression analysis and correlations were used to measure the strength, direction and nature of the association or relationships between two variables. Chi-square based probability distributions as well as *F* tests and *t* tests were used to test the statistical significance of those relationships between two variables i.e. whether any relationship that does exist (weak or strong) is likely to occur in the population from which the sample was drawn.

i. Results of measures of association: cross-tabulations, simple linear regression analysis & correlations

Cross-tabulations were used to see whether two variables were related (or associated). From these, contingency tables were produced which are found in Appendix 3. Both Pearson's r and r-squared were calculated to test the direction and strength of the relationships between variables, respectively. The results of these calculations are outlined in table no.s.5-4 above. The results of the simple linear regression analysis is outlined in table5.4. The following summarises those relationships:

* cross-tabulations:

Setting up cross-tabulations between the different independent variables and the two dependent variables which were the proxies used for performance, made it possible to detect fairly easily any association between variables. The results of the cross-tabulations are found in Appendix 3 .

In looking at whether or not there was a relationship or association between variables, four aspects were looked at:

- strength: large differences between subgroups indicate a strong relationship;
- direction: positive or negative for either ordinal or interval variables;
- nature: association of ordinal or interval variables can either be linear (i.e. a "straight line" relationship) or curvilinear (i.e. extremes of scale are similar but middle is different); and
- whether or not there was a clear pattern in the table with respect to direction or linearity: but there may be some association (De Vaus, 1991, pp.159-162).

The significance of the identified associations was tested using chi-square distributions for goodness of fit.

* simple linear regression & correlations:

The calculation of both simple linear regression equations in conjunction with the calculation of correlation coefficients show:

* whether or not two variables are associated; and
* the strength of such an association.

Whilst regression uses the regression line to make predictions or estimates on how much impact one variable has on another, correlation coefficients provide a way of assessing the accuracy of those estimates (De Vaus, 1991, p.183). So, both regression coefficients and correlation coefficients were calculated in this study.

Given that the values of the correlation coefficient are always between -1 and +1, a value of +1 will indicate that *x* and *y* (or the independent and dependent variable respectively), are perfectly related in a positive linear sense. The converse is also true. Values of the correlation coefficient close to zero indicate that *x* and *y* are not linearly related. In other words, the more the cases depart from the regression line, the lower the correlation coefficient and the less likely one variable has affected the other. So, the correlation coefficient (i.e. r squared) acts as an index of the accuracy of the predictions from the regression line.

In tables 6 & 7, the full results of the correlation and regression analysis are shown.

In looking at the results of the simple regression analysis found in Appendix the regression coefficients calculated provided estimates of how much impact the independent variable had on the dependent variables i.e. in this case the proxies used to measure performance. From this analysis, the variables which seemed to make the greatest difference to performance are outlined in the table below:

Table 6: Regression Coefficients which seemed to have the greatest impact on business performance, as measured by Q20 & Q18a)viii)

Independent variable "x"	**Dependent variable "y" i.e. proxy for performance**	**Regression Coefficient i.e. "b"**
a. Small business owner/mgrs' attributes		
Q1. gender	Q20.	10.298
Q8b. source of formal training skills	Q20.	-2.4719
Q9. no businesses operated	Q20.	2.9717
Q11. age at business startup	Q20.	-2.3773
Independent variable "x"	**Dependent variable "y" i.e. proxy for performance**	**Regression Coefficient i.e. "b"**
b. Small business owner/mgr's behaviour / attitudes / beliefs		
Q13a. leadership skills cvf competitors	Q20.	-8.6636
Q13b. creativeness cvf competitors	Q20.	-5.1361
Q13c. risk-taking cvf competitors	Q20.	-6.4206
Q13d. independence cvf competitors	Q20.	-6.4206
Q13e. self-confidence cvf competitors	Q20.	-8.3369
Q14a. gen.mgt skills cvf skills at startup	Q20.	-3.714
Q14c. mktg skills cvf skills at startup	Q20.	-3.5313

Q14e. coord'g / org'g / planning skills cvf skills at startup	Q20.	-4.1354
Q15a. current gen.mgt skills	Q20.	-7.856
Q15c. current mktg skills	Q20.	-5.624
Q15d. current technology skills	Q20.	-3.0425
Q15e. current coord'g / org'g / planning skills	Q20.	-9.2257
c. Small business' attributes		
Q18a)iii). no. sales / sales growth cvf competitors	Q20.	-6.817
Q18a)vi). return on investment cvf competitors	Q20.	-2.8572
Q19. curr.bus.perform'c cvf 3yrs ago	Q20.	-10.6686
Q21. bus.perform'c in 3 yrs time	Q20.	-2.3218

Table 7: Correlation analysis results

Indep.t variable	**Dep.t variable -curr.business performance by % increase in sales over last 3 yrs-Q20**	**Dep.t variable - curr.business performance cvf competitors-Q18(a)(viii)**	**Pearson's correl.n coefficient to indicate direction & strength i.e. r =**	**Correl.n coefficient to indicate strength of relationship i.e. r squared =**	**Type of relationship i.e. positive or negative, weak, moderate or strong**
a.Small bus.owner/mgr attributes					
all correlation coefficients were close to zero indicating that *x* and *y* were not linearly related					
b.Small bus.owner/mgr behaviour/ attitudes/beliefs					
Q13a.leadership skills	yes	no	-0.2889	0.0835	negative, weak
Q13a.leadership skills	no	yes	0.4175	0.1743	positive, moderate-weak
Q13b.creativeness	no	yes	0.4167	0.1736	positive, moderate-weak
Q13c.risk-taking	yes	no	-0.2503	0.0627	negative, weak
Q13c.risk-taking	no	yes	0.3069	0.0942	positive, weak
Q13d.independ'c	yes	no	-0.2409	0.058	negative, weak
Q13d.independ'c	no	yes	0.2607	0.068	positive, weak
Q13e.self-confid'c	yes	no	-0.2752	0.0757	negative, weak
Q13e.self-confid'c	no	yes	0.3274	0.1072	positive, weak
Q14c.pre-bus.mkt	no	yes	0.2401	0.0576	positive, weak
Q.14e.pre-bus.coord'g/org'g/plan'g	no	yes	0.2848	0.0811	positive, moderate-weak

TABLE 7 (CONTINUED)

b.Small bus.owner/mgr behaviour/ attitudes/beliefs					
Q15a.curr.gen.mgt	yes	no	-0.2144	0.046	negative, weak
Q15a.curr.gen.mgt	no	yes	0.2091	0.0437	positive, weak
Q15c.curr.mkt'g	no	yes	0.254	0.0645	positive, weak
Q15e.curr.coord'g/org'g/ plan'g	yes	no	-0.2647	0.0701	negative, weak
Q15e.curr.coord'g/org'g/ plan'g	no	yes	0.3411	0.1163	positive, moderate-weak
c.Small business' attributes					
all correlation coefficients were close to zero indicating that *x* and *y* were not linearly related					

From the above table it can be seen that across all the variables tested, no single relationship showed any strength although the majority of the moderate to weak correlations were positively linearly related. For small business owner attributes, this was in line with previous research (Milne & Thompson, 1986, p.60). Thus it might be concluded from this analysis that no one variable is likely to have had any real impact on the dependent variables used in this study as proxies for business performance.

These results in providing an assessment of the accuracy of the regression analysis, seemed to indicate that at best the regression coefficients were mixed in their accuracy of estimating how much impact specific independent variables had on the dependent variables i.e. the proxies for performance. This is because the regression analysis highlighted some independent variables as having either a large negative or positive relationship on the dependent variable, question 20 (rather than question 18 a)viii). The correlation analysis in assessing the accuracy of these estimates both agreed and disagreed with these results. Table 8 below compares the two.

Table : 8 Comparison of Selected Regression & Correlation Analysis Results

Indep't Var.	**Regression Results - Q20 as dep't var.**	**Correlation results - Q20 as dep't var.**
Q1.	strongly positive (10.3)	not related (0.17)
Q8b	negative (-2.5)	not related (-0.06)
Q9	positive (2.9)	not related (0.17)
Q11	negative (-2.4)	not related (-0.16)
Q13a	strongly negative (-8.66)	negative,weak (-0.29)
Q13b	moderately negative (-5.14)	not related (-0.15)
Q13c	strongly negative (-7.29)	negative,weak (-0.25)
Q13d	moderately negative (-6.42)	negative,weak (-0.25)
Q13e	strongly negative (-8.34)	negative,weak (-0.28)
Q14a	negative (-3.71)	not related (-0.16)

TABLE 8

Q14c	negative (-3.53)	not related (-0.16)
Q14e	negative (-4.14)	not related (-0.17)
Q15a	strongly negative (-7.86)	negative,weak (-0.21)
Q15c	moderately negative (-5.62)	not related (-0.11)
Q15d	negative (-3.04)	not related (-0.11)
Q15e	strongly negative (-9.23)	negative,weak (-0.26)
Q18a)iii)	moderately negative (-6.82)	negative,weak (-0.25)
Q18a)vi)	negative (-2.86)	negative,weak (-0.13)
Q19	strongly negative (-10.67)	negative,moderate-weak (-0.48)
Q21	negative (-2.32)	not related (-0.06)

However in keeping with the regression estimates of greatest impact on the dependent variable, the correlation coefficients also indicated that leadership skills, creativeness, risk-taking and self-confidence relative to other local businesses and current coordinating / organising / planning skills seemed likely to have had a moderate impact on performance. Interestingly, with the correlation coefficients this relationship was only seen when these independent variables were correlated with question 18 a)viii) which asked respondents to make a self-assessment of their small business' current overall business performance compared with other local business competitors. In the regression analysis these variables were highlighted only in terms of the dependent variable as measured by question 20 and not by question 18 a)viii). However, in most cases, the direction of the relationship be it positive or negative was in agreement.

ii. Results of F tests and t tests of significance

To draw conclusions concerning statistical significance again means taking into consideration sample size. Given the small sample size of 121 respondents, it was important to undertake significance tests in order to draw some conclusions about the existence of a regression relationship between two variables. Since the underlying regression equation is assumed to be $E(y)=B_o + B_1x$, the F statistic test and the t tests can be used to determine whether or not the relationship between x and y is statistically significant. That is, a conclusion regarding the significance of the relationship can be tested using the following hypotheses:

$$H_o: B_1 = 0$$
$$H_1: B_1 \# 0$$

In this instance where the regression models have only one independent variable, $F = t$ squared. Given any sample size, the numerator of the F statistic will increase as more of the variability in y is explained by the regression model and decrease as less is explained. The same is true for the denominator. So, for large values of F, doubt is cast on the null hypotheses i.e. it is rejected, because it can be concluded $B_1 \neq 0$ and there is a significant relationship between x and y. Conversely, small values of F lead to acceptance of H_o (De Vaus, 1991, pp.475-480).

In appendix 3 the full results of all variables tested using F tests plus the F distribution significance tests are outlined.Given that the F tests and t tests for regression models with only

one independent variable yield the same results, t tests were not undertaken (Anderson et al, 1991, p.478). From these *F* tests, the following independent variables showed a significant statistical relationship at the .05 significance level with the dependent variables (the proxies for overall business performance) i.e. using the decision rule, the null hypothesis of no relationship was rejected:

Table 9 : Excerpt from table of F distribution significance tests at 95% confidence level

Indep't var. (x)	**Dep't var. (y)**	**Accept / reject null hypoth. at .05signif.c level & 1 d.f for numerator & n-2=119 d.f for denominator**
a.Small business owner/mgr attributes		
each variable tested (using responses to questions 1, 8, 9, 10 &11) led to an acceptance of Ho indicating no significant statistical relationship existed		
b.Small business owner/mgr behaviour / attitudes / beliefs		
Q13a-leadership skills cvf competitors	Q18a)viii)-overall bus. performance relative to local bus. competitors	reject Ho - indicating significant relationship exists betw. leadership skills (relative to competitors) & performance
Q13b-creativeness cvf competitors	Q18a)viii)	reject Ho - indicating significant relationship exists betw. creativeness (relative to competitors) & performance
Q13c-risk-taking cvf competitors	Q18a)viii)	reject Ho - indicating significant relationship exists betw. risk-taking (relative to competitors) & performance
Q13d-independence cvf competitors	Q18a)viii)	reject Ho - indicating significant relationship exists betw. independence (relative to competitors) & performance
Q13e-self-confidence cvf competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. self-confidence (relative to competitors) & performance
Q14b-finance & a/c.g skills pre-bus. startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. finance & a/c.g skills pre-bus. startup & performance
Q14c-mktg skills pre-bus. startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. mktg skills pre-bus. startup & performance
Q14e-pre-bus.coord'g / organising / planning skills	Q18a)viii)	reject Ho- indicating significant relationship exists betw. coord'g / organising / planning skills pre-bus. startup & performance
Indep't var. (x)	**Dep't var. (y)**	**Accept / reject null hypoth. at .05signif.c level & 1 d.f for numer.r & n-1=119 d.f for denom.r**
Q15a-current gen.mgt skills	Q18a)viii)	reject Ho- indicating significant relationship exists betw. current gen. mgt skills & performance
Q15c-current mktg skills	Q18a)viii)	reject Ho- indicating significant relationship exists betw. current mktg skills & performance
Q15e-current coord'g / org'g / planning skills	Q18a)viii)	reject Ho- indicating significant relationship exists betw. current coord'g / org'g / planning skills & performance
Q18a)i)-curr.no.customers cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. no. customers relative to competitors & curr. performance

TABLE 9

Q18a)ii)-curr.prodt / services range cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. prod't /services range relative to competitors & curr. performance
Q18a)iii)-curr.no.sales / sales growth cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. no. sales / sales growth relative to competitors & curr. performance
Q18a)iv)-curr.amt resale stock purchased cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. amt resale stock purchased relative to competitors & curr. performance
Q18a)v)-curr.net profit'y cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. net profitability relative to competitors & curr. performance
Q18a)vi)-curr. R.O.I. cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. return on investment relative to competitors & curr. performance
Q18a)vii)-curr.mkt share cvf local competitors	Q18a)viii)	reject Ho- indicating significant relationship exists betw. mkt share relative to competitors & curr. performance
Q18b)ii)-curr.prodt / services range cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. curr. prodt / services range relative to startup & curr. performance
Q18b)iii)-curr.no.sales / sales growth cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. curr. no.sales / sales growth relative to startup & curr. performance
Q18b)iv)-curr.amt resale stock purchased cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. amt resale stock purchased relative to startup & curr. performance
Q18b)v)-curr. net profitability cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. net profitability relative to startup & curr. performance
Q18b)vi)-curr. R.O.I. cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. return on investment relative to startup & curr. performance
Q18b)vii)-curr. mkt share cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. mkt share relative to startup & curr. performance
Q18b)viii)-curr.overall bus. performance cvf startup	Q18a)viii)	reject Ho- indicating significant relationship exists betw. overall bus. performance relative to startup & curr. performance
Q19-bus.perf'c compared to 3 yrs ago	Q18a)viii)	reject Ho- indicating significant relationship exists betw. overall bus. performance relative to 3 yrs ago & curr. performance
Q21-expected bus.perf.c in 3 yrs time	Q18a)viii)	reject Ho- indicating significant relationship exists betw. expected bus. performance in 3 yrs time & curr. performance

iii. Results of chi-squared tests of significance for goodness of fit

Given the small sample size of 121 respondents, a significance level of 0.05 was chosen. Looking at the results of the chi-squared tests of significance, the following positive or "biased" relationships between variables emerged:

TABLE 10

a. respondents' attributes:

Attributes positively related i.e. null hypothesis that variables are not related was rejected	**Performance measure**
Q.10.number of years operating businesses	20: current business performance as measured by percentage increase in sales over last 3 years

Here, it is interesting to note that in line with past research, previous experience in operating businesses was positively related to current business performance, as measured by percentage increase in sales over the last three years. Gender or number of businesses operated was not considered by respondents to be related to current business performance.

Perhaps this link between number of years operating businesses and current business performance can be explained by the fact that the three year period from 1991-94 was a period in which the Australian economy moved slowly out of recession. It is suggested that in this instance, previous experience in operating businesses, as indicated by past research studies, would have assisted the small business owner/manager to take the necessary measures needed to assist the business to perform at a time of economic downturn- at least in terms of sales, over the last three years.

TABLE II

b. respondents' behaviour, attitudes & beliefs:

Behaviour, attitudes & beliefs positively related i.e. null hypothesis that variables are not related was rejected	**Performance measure**
Q13a.leadership skills	18(a)(viii): overall business performance,compared to local business competitors
Q13b.creativeness	18(a)(viii): overall business performance,compared to local business competitors
Q13c.risk-taking	18(a)(viii): overall business performance,compared to local business competitors
Q13d.independence	18(a)(viii): overall business performance,compared to local business competitors
Q13e.self-confidence	.18(a)(viii): overall business performance,compared to local business competitors
Q14a.general mgt skills pre-current business	18(a)(viii): overall business performance,compared to local business competitors
Q14b.finance & accounting skills pre-current business	18(a)(viii): overall business performance,compared to local business competitors
Q14c.marketing skills pre-current business	18(a)(viii): overall business performance,compared to local business competitors
Q14e.coordinating/organising/planning skills pre-current business	18(a)(viii): overall business performance,compared to local business competitors
Q15a.current general mgt skills	18(a)(viii): overall business performance,compared to local business competitors
Q15c.current marketing skills	18(a)(viii): overall business performance,compared to local business competitors
Q15e.current coordinating/organising/planning skills	18(a)(viii): overall business performance,compared to local business competitors

It is interesting to note that none of the variables when combined with the dependent variable of current business performance as measured by percentage increase in sales over last 3 years (question 20) showed any bias or dependence in the tested relationships i.e. the null hypothesis

across all tested combinations of independent variables with this dependent variable was always accepted. This may indicate two things:

i. that respondents believe that their current overall business performance is related to the independent variables or perceived skills outlined above, when compared to other local businesses;
and / or
ii.current business performance in terms of increased sales over the last three years, is not related to or dependent on any particular skill - or at least those skills tested in the survey.

It is suggested that further research is needed on this point to identify and test other possible explanatory variables.

TABLE 12
c. small business' attributes:

Attributes positively related i.e. null hypothesis that variables are not related was rejected	**Performance measure**
Q4.number of full time employees	18(a)(viii): overall business performance,compared to local business competitors
Q5.year of business start-up	18(a)(viii): overall business performance,compared to local business competitors
Q6i).number of years business operating in industry	18(a)(viii): overall business performance,compared to local business competitors

As with the self-assessed behaviour, attitudinal and belief competencies of the previous section, none of the small business attribute variables when combined with the dependent variable of current business performance as measured by percentage increase in sales over last 3 years (question 20) showed any bias or dependence in the tested relationships i.e. the null hypothesis across all tested combinations of independent variables with this dependent variable was always accepted. This may indicate two things:
i. that respondents believe that their current overall business performance of their small business is only related to the independent variables outlined above, when compared to other local businesses. Location, experience in the industry or use of external assistance are not considered important;
and / or

ii.current business performance in terms of increased sales over the last three years, is not related to or dependent on any particular factor including the commonly identified retail performance measure of location or number of full-time employees, which is often a measure of business growth and performance and sometimes of service levels.

It is suggested that further research is needed on this point to identify and test other possible explanatory variables.

5.5: Measures of association & tests of significance: multivariate analysis, F tests & t tests

In sections 5.1 and 5.2, methods of univariate and bivariate analysis were used to examine firstly one and then two variables. In this section, techniques for multivariate analysis were used to test the significance and measures of association between multiple variables, identified in past research as outlined in section 2.3 as being related to business performance. These included:

* personal characteristics of the small business founder, previous experience and willingness to use external financing and mentors (Perry, Meredith & Cunningham, 1988);
* entrepreneurial, technical-functional and managerial skills as identified by Chandler & Janssen (1992);
* personal belief of small business founder in own skills plus education and /or experience in general management (Chandler & Janssen, 1992);
* diversity in age and education but low or little management education and / or experience (Bosworth & Jacobs, 1989; Bates, 1990; Tosterud & Habbershon, 1992);
* experience and gender (Cooper, Woo & Dunkelberg, 1989);
* gender, race, age, education (Boyle & Desai, 1991);
* former occupation and management experience (Mangum et al, 1988);
* external assistance and financial and technical skills (Steiner & Solem, 1988; Dailey & Dalton, 1992);
* internal controls (financial, stock, records, human) and education / training, experience, knowledge and planning (Boyle & Desai, 1991);
* operating and financial strategies (Milne & Thompson, 1986);
* personal (attitudes, knowledge) and managerial skills (Burns, 1989);
* education and financial skills (Wood, 1989; Dadzie & Cho, 1989);
* influence of parental background for entrepreneurial career and increased training / education aspirations (Scherer et al, 1989); and
* importance of planning, location and changing and developing managerial competencies over time to accommodate growth and expansion (Dodge & Robbins, 1992).

All of the techniques used involve the use of one dependent variable and two or more independent variables (De vaus,1991, p.213). However, before undertaking multiple regression analysis it was necessary to do *F* tests to determine if there was a significant relationship in the multiple regression cases being considered. Then, *t* tests were undertaken whenever the *F* tests indicated that the multiple regression relationship between variables was significant. The *t* tests were conducted to test the significance of individual parameters (Anderson et al, 1991, pp.533-5). Several assumptions were also made when undertaking regression analysis. They were as follows:
* the dependent variable should be linearly related to each of the independent variables for regression analysis to be undertaken correctly;
* the variance and amount of variation in errors remains constant over the range of observations i.e homoscedasticity prevails;
* the residuals are independent of one another i.e. of values coming before and after it i.e. serial or auto-correlation exists among successive residual values; and
* the residuals are normally distributed (De Vaus, 1991, pp.538-40).

i. Results of *F* & *t* tests

The full results of the tests *F* tests and *t* tests undertaken prior to multiple regression analysis are found in Appendix 3. The tests of this study's sample highlighted the following significant relationships between variables:

TABLE 13

Indep.t var.s	Dep't var.	F test id.d signif. r.ships	T test id.d signif.parameters
8-pre-business skills source 13a-leadership skills cvf competitors 13b-creativeness cvf competitors 13c-risk-taking cvf competitors 13d-indep.c 13e-self-confidence 15a-curr. gen. mgt skills	18a)viii)	yes	13a-leadership skills 13b-creativeness
13a-leadership skills cvf competitors 13b-creativeness cvf competitors 13c-risk-taking cvf competitors 13d-indep.c cvf competitors 13e-self-confidence cvf competitors 14a-pre-business gen.mgt skills 14b-pre-business finance & accounting skills 14c-pre-business mktg skills 14d-pre-business technology skills 14e-pre-business coord'g/ org'g / planning skills	18a)viii)	yes	13b-creativeness
8-pre-business skills source 13e-self-confidence cvf competitors 14a-pre-business gen.mgt skills 15a-current gen. mgt skills	18a)viii)	yes	13e-self-confidence
2-postcode location 15e-current coord'g / org'g / planning skills 16-source of improved skills	18a)viii)	yes	15e-coord'g / org.g / planning skills
15a-current gen. mgt skills 15b-current finance & accounting skills 15c-current marketing skills 15d-current technology skills 15e-current coord'g / org'g / planning skills	18a)viii)	yes	15e-coord'g / org.g / planning skills
Indep.t var.s	**Dep't var.**	**F test id.d signif. r.ships**	**T test id.d signif.parameters**
8-pre-business skills source 11-age at business startup 14a-pre-business gen.mgt skills 14b-pre-business finance & accounting skills 14c-pre-business mktg skills 14d-pre-business technology skills 14e-pre-business coord'g/ org'g / planning skills	18a)viii)	yes	11-age at business startup 14c-pre-business marketing skills 14e-pre-business coord'g / org'g / planning skills

TABLE 13

8-pre-business skills source 9-no. businesses operated 15a-current gen. mgt skills 15b-current finance & accounting skills 15c-current marketing skills 15d-current technology skills 15e-current coord'g / org'g / planning skills	18a)viii)	yes	15e-current coord'g / org'g / planning skills

From these multiple regression relationships showing significance, where at least one of the B*i* # 0 was shown, *t* tests were then undertaken to see which individual parameters B*i* were / are significant. Whilst, the overall results of these tests are found in Appendix 3 , those independent variables which seem to be contributing information for prediction by the multiple regression equation are shown in table 13 above.

The one factor from all of those variables which seemed to be contributing information for prediction across the majority of the multiple regression equations was coordinating / organising / planning skills. This is in line with past research outlined in chapter 2 which suggested that there was a strong relationship shown in different studies between overall business performance and planning (Dodge & Dobbins, 1992, Chandler & Janssen, 1992, Boyle & Desai, 1991).

ii. **Results of multiple regression analysis**

Multiple regression analysis was used to test measures of association between multiple variables, identified in past research as outlined in section 2.3 as being related to business performance. The following table highlights the strongest relationships, as indicated by the correlation coefficients. Details of relationships tested and the results are outlined in appendix .

TABLE 14

Indep't variables (x*i*)	**Dep't var. (y)**	**Pearson's correlation coefficient (R squared)**
8,13a,13b,13c,13d,13e & 15a	18a)viii)	0.2506 - positive but weak relationship
8,13a-13e & 15a	20	0.1271 - positive but very weak relationship
13a-13e,14a-14e	18a)viii)	0.2809 - positive but weak relationship
13a-13e,14a-14e	20	0.1756 - positive but very weak relationship
8,13e,14a,15a	18a)viii)	0.1088 - positive but very weak relationship
2,15e,16	18a)viii)	0.1169 - positive but very weak relationship
15a-15e	18a)viii)	0.1276 - positive but very weak relationship
Indep't variables (x*i*)	**Dep't var. (y)**	**Pearson's correlation coefficient (R squared)**
15a-15e	20	0.1326 - positive but very weak relationship
8,11,14a-14e	18a)viii)	0.1641 - positive but very weak relationship
8,11,14a-14e	20	0.1357 - positive but very weak relationship
8,9,15a-15e	18a)viii)	0.148 - positive but very weak relationship
8,9,15a-15e	20	0.1638 - positive but very weak relationship

The weakness of these correlation coefficients indicates that the independent variables x_i and y were not closely or perfectly related in a linear sense, since the correlation coefficients were close to zero.

Regression coefficients for each x variable were also calculated. The results of these are found in appendix 3. However, both the x or regression coefficients and variation around y (i.e. the standard deviation of y about the regression line which measures the dispersion of observed y values around values predicted by the regression equation) when using question 18a)viii), were quite low for all equations indicating that whilst the regression line was quite acceptable in terms of variation about y, the relationships were nevertheless quite weak.

When using question 20 as the response or dependent variable, both the x coefficients and standard deviation / error estimate of y were much larger. The large size of the deviation estimate of y seems unacceptable and suggests that perhaps the way in which responses to question 20 were inputted i.e. in large percentage bands, should have been coded to minimise any possible distortions when analysing the data.

5.6 Results of quantitative research

In order to summarise the results of the quantitative analysis of the survey data it is easier to look at the results of the multivariate analysis plus the three subgroups into which the bivariate analysis was undertaken:

a. small business owner / manager's personal competencies i.e. attributes;
b. small business owner / manager's behaviour / attitudinal / belief competencies; and
c. small business' attributes.

This study identified several independent variables from these three subgroups and multivariate analysis as being linked to the performance of the small business. These are found in table 15 on the following page:

Table 15: Variables identified as linked to & significant in terms of their impact on the performance of the small newsagency business

Sub-group	Independent variable(s) identified as linked to & significant in terms of its impact on performance	Dependent variable i.e. proxy for small business performance
a.small business owner / manager's personal competencies i.e. attributes	Bivariate analysis: none identified as significant Bivariate analysis: Q10-yrs of operating businesses	18a)viii): overall business performance cvf local competitors 20: current performance cvf 3 years ago, in terms of increase in sales
b.small business owner / manager's behaviour / attitudes / beliefs	Bivariate analysis: 13a-13e:skills, attitudes, beliefs relative to competitors including: leadership, creativeness, risk-taking, independence, self-confidence 14a,b,c,e:pre-business skills including: gen. mgt, fin. & a/c.g, mktg, tech., coord'g / org'g / planning 15a,c,e:current skills including:gen. mgt, mkt'g, coord'g / org'g / planning 18a)i)-vii): performance criteria relative to competitors including: no. customers, prod't/ services range, amt stock purchased for resale, net profitability, ret.on investment, mkt share 18b)i)-viii):performance criteria relative to startup including: no. customers, prod't/ services range, amt stock purchased for resale, net profitability, ret.on investment, mkt share & overall business performance	18a)viii)
c. small business' attributes	Bivariate analysis: 4: no.full time employees including respondent 5: yr of business startup / purchase 6i): length of time business operating in industry	18a)viii)
Multivariate analysis	Variables identified in combination with other variables included: 11: age at startup 13a: leadership skills cvf competitors 13b: creativeness cvf competitors 13e: self-confidence cvf competitors 14c: pre-business mktg skills 14e: pre-business coord'g / org'g / planning skills 15e: current coord'g / org'g / planning skills	18a)viii)

It is interesting to note from these results that independent variables identified as having a significant impact on performance, only did so when performance was measured by the proxy variable question 18a)viii) which asked respondents to self-assess performance relative to local

business competitors rather than question 20 which asked competitors to self-assess performance in terms of increase in sales over the last three years.

These results should be treated with caution therefore, since respondents may be biased in assessing their business' performance relative to local business competitors in the absence of actual financial data on competitors' businesses and given that self-confidence was significant with respect to its impact on performance!!!

5.7: Non-response problem

One of the most significant factors which affects studies is sample size. In this study, the sample of consisted of only 121 responses or 12% of the newsagency population, who in turn were members of the Newsagents Association of NSW & ACT Inc - another possible bias to be considered in and of itself. Of these 12% of the industry, many questions' instructions were misread by respondents, resulting in multiple responses. In order for responses to be quantified and analysed statistically, this meant that for many questions, multiple responses had to be reduced to zero or non-response. This in effect "wasted" data and perhaps reduced the ability of the results to be approximated for the population as a whole.

Although the low response rate raises questions regarding the reliability of the data collected, information concerning the characteristics of the non-respondents and thus industry members can be gleaned given the homogenous nature of the sample i.e. all potential respondents were members of the Newsagents Association of N.S.W. & the A.C.T. Thus it is possible to say that all potential respondents were / are:

* involved as owner/managers in the newagency sector, each operating within a pre-determined "territory";
* had an equal chance of responding to the survey given that all members receive a copy of the Association's monthly magazine;
* operate within the retail industry within N.S.W. and A.C.T.;
* on a macro-level are and will be effected by the same economic conditions which in turn impact on profitability - although regional economic growth rates and population income will vary;
* members of the Association's buying cooperative and therefore able to take advantage of group buying discounts and offers - thus it could be assumed stock would be purchased at the same price (excluding delivery costs);
* members of the Association who equally share access to the Association's services such as assistance and advice etc; and
* members of the Association who were required to undergo the same creditworthiness checks when seeking to purchase a newsagency and the rights to its defined "territory".

Given that these characteristics of the general newsagency sector population were and are known, it is thus possible to equate with some degree of confidence the competencies and characteristics obtained in the sample with those of the population. However, this study's results should be applied with caution. Any differences should indicate any areas of bias and the extent of differences, the degree of bias (De Vaus, 1991, pp.73-74)

5.8 Qualitative research

It is important to note that descriptive statistics cannot be used or interpreted directly as showing cause and effect relationships. Regression and correlation analyses indicate only to what extent and how variables are associated with each other. Whilst inferential statistics can be used to indicate the significance of results for the sample specifically and the population at large generally, they are only calculating significance at a certain confidence level which is never 100 percent certain. Furthermore, the particular sample size used in a study will also impact on results obtained.

For these reasons, qualitative research was also undertaken to complement and compare the quantitative research undertaken in this study and to ensure consistency and confidence in the results obtained. Interviews with three industry participants, two by telephone and one in person, were conducted. The full text of these interviews are found in appendix4.

i. **Interview 1 with Mr J.Dickie, Accountant for The Newsagents Association of NSW & ACT Inc.** (late February 1995)

In this interview, the interviewee highlighted the following:

* best performance indicator: purchases of stock for resale. This assumes purchases is equal to cost of goods sold. Interestingly, this variable, denoted by questions 18a)iv) and 18b)iv) did not correlate highly with performance as measured by responses to question 18a)viii) and 20 in this study;
* number of customers is best measured by: number of transactions plus number of Lotto customers. In this study however, although number of customers (questions 18a)i) and 18b)i) was used as a contributing performance variable, when correlated against performance compared to competitors as measured by question 18a)i) the correlation was only moderate and weak against question 20;
* gross profit margin with respect to sales and excluding "soft" gambling (i.e. revenue from Lotto, lottery and "scratch" tickets) is approximately 26%. According to Australian Bureau of Statistics figures the average turnover for the period 1985/86 to 1991/92 for "Other retailers" which includes newsagencies, was approximately 21% (A.B.S., Small Business in Australia, 1991-92, p.126). Also supporting this estimate were figures from independent bodies' publications including Pracdev Key Indicator Report, which indicated a gross profit range of 22-30% was the norm for 1994-95 (Auchintea Pty Ltd, Pracdev Key Indicator Reports, Vol. VI, 1994/95, p.125) and the Financial Management Research Centre's Business Benchmarks for the 1993 financial year for Newsagencies which indicated an average gross profit of 25.76% (F.M.R.C. Business Benchmarks - Newsagencies, 1994).

In this study, the average increase in sales over the three years to 1994 as measured by question 20 was 19.6%. In addition, this variable was found to be true i.e. the variable for number of sales or sales growth (questions 18a)iii) and 18b)iii) correlated moderately with performance measure question 18a)viii) but negatively against performance measure question 20 - which was further confirmed by the F tests at the .05 significance level. ; and

* potential newsagency business purchasers have their financial position checked and can borrow no more than 60% of the purchase price, which covers stock, fixtures and fittings.

ii. **Interview with Ms Barbara Oswald, Executive Assistant to Chief Executive, The Newsagents Association of NSW & ACT Inc.**(April 1995)

In this interview, the following was highlighted:

* newsagency businesses for sale: they are advertised in newspapers, the Association's bulletin and "National Newsagent" by the Association's brokerage service or can be advertised by the individual vendor;
* pilot studies undertaken by the Association have shown that business performance is higher for owners with previous industry experience;
* potential vendors of newsagency businesses are interviewed by the Newsagency Council and notified of their rights and obligations with regard to territories (which is what the vendors are in large part buying). Potential vendors are financially checked. A strict equity / debt ratio of 60/40 is set to safeguard publishers;
* purchasers of newsagency businesses buy the business' goodwill, fixtures and fittings and exclusive rights to territory which includes home delivery areas and supply of sub-agencies. They do not become franchisees;
* newsagency owner / managers have tight credit terms with publishers - generally seven days. As John Dickie, in an article in the Association's February 1995 News Bulletin, (p.6) notes, this means stringent control and management of cash flows is necessary for businesses to remain solvent especially when they are expanding. Furthermore, this necessitates proper, timely budgets which are not necessarily reflected in traditional financial documents to ensure cash flow crises are prevented;
* the Association disagrees with the Trade Practices Commission (TPC) decision in Victoria in November 1994 in favour of 7-Eleven Stores (for direct supply of newspapers), which stated that the monopoly enjoyed by newsagencies in Victoria was against public policy interests and should be removed by 1997. As an update to this: in November 1995, the renamed TPC, the Australian Competition and Consumer Commission again examined the immunity of the industry to competition. To this point in time, the system has remained in spite of its essentially anti-competitive nature because of the extensive, low cost public benefits it delivers - namely, low cost home delivery and a wide variety of publications (Australian Financial Review,Nov.24,1995,p.11). Furthermore, direct supply to Woolworths stores by News Limited has proved to be uneconomic (The News Bulletin, Feb.1995,p.2), so it seems that the status quo is likely to continue;
* the roles of the Association are to: provide brokerage services, lobby the government on issues of industry significance, provide financial advice if requested or if a business is failing, hold seminars for incoming newsagents on their daily operations and obligations, organise and manage a TAFE course (three months part-time on newsagency operations and obligations) and offer group buyers discounts from suppliers. Through their brokerage service they also assistance vendors and purchasers with due diligence, financial advice, insurance, brokerage services and documentation, management and accreditation (with the Newsagency Council) assistance; and
* the Association is developing a voluntary standard of excellence for the industry in 1995.

iii. **Interview with Mr Dennis Campbell, Broker for the Newsagents Association of NSW & ACT Inc (April 1995)**

In this interview, the interviewee said that the Association had 2 brokers who work for the Newsagents Business Broking Services Pty Limited of the Newsagents Association of NSW & ACT Inc. Their main function apart from those listed above is to broker newsagency businesses. A fax outlining the businesses for sale, their location, selling price, goodwill, weekly turnover and profit and return on goodwill was sent to highlight the indicators prospective purchasers consider important when purchasing a newsagency business.

A copy of these details is found in Appendix 3 . From these details, it is possible to see that even within regions for both NSW and the ACT, performance in terms of the indicators used, differ widely. It could be summised from this that other factors which this study has attempted to focus on such as the management competencies and attributes of the small business owner / manager and the small business itself are important determinants of small business performance.

5.9: Results of qualitative research

From the interviews undertaken as part of the qualitative analysis of this study it would seem that the following variables are linked with the performance of a newsagency small business:
* small business owner / manager attributes: especially their ability to manage cash flows; and
* the nature of the industry itself: its controls with respect to the vetting of potential newsagency owners in terms of equity to debt and a lack of competition due to a protected local market or territory "owned" by the newsagency owner would seem to be positive contributory factors to business performance. However, it may also place more emphasis on ongoing management skills, choice of location, technology etc and external and perhaps uncontrollable variables such as taxes, public policy (such as competition laws).

Furthermore, measures of performance noted seem industry specific and financial in nature. They also reflected the nature of the business of personalised, customer-driven selling of high-volume, low cost items and tight credit terms imposed by suppliers. They included:
* gross profit margin based on sales;
* goodwill; and
* turnover and profit on a weekly basis.

As was noted in the interview with Ms Oswald, all of these would probably be negatively impacted by an external development such as that envisaged by the Australian Competition & Consumer Commission.

5.10: Results in terms of the study's sub-hypotheses

Throughout this chapter the 24 sub-hypotheses developed in chapter 3 have been tested. However, given that there are so many of them, the results are outlined in Appendix 5 .
The main results yielded by this chapter's quantitative analysis highlighted the impact and significance of the small business owner / manager's competencies in terms of attributes, behaviour, attitudes, beliefs and knowledge with respect to the performance of their small business. Six specific independent variables were identified as having a significant impact on the performance of the small business in the newsagency industry. These variables included:

i. leadership skills;

ii. creativeness;
iii. self-confidence;
iv. pre-business marketing skills;
v. age at business start-up; and
vi. pre-business and current coordinating / organising / planning skills.

Qualitatively, the interviews undertaken supported the quantitative analyses findings. However, whilst the competencies of the small business owner/manager were seen as important, the nature of the industry itself was seen as equally important with respect to its controls on entry into the industry and its maintenance of distribution monopolies for the main products of the industry.

In terms of this study's sub-hypotheses, the following null hypotheses were rejected indicating that there was a relationship between the variables:

H14o: that there is no relationship between age at commencement of business start-up and the performance of the business in terms of sales growth and compared to other businesses;

H16o: that there is no relationship between self-perception of skills, attitudes and behaviours relative to other businesses in the local area and the performance of the business in terms of sales growth and compared to other businesses;

H17o: that there is no relationship between management skills acquired before the commencement of current business and the performance of the business in terms of sales growth and compared to other businesses.

5.11: Comparisons of survey's quantitative & qualitative results with previous research, industry studies & benchmarks

In comparing the results of this study's statistical research methodology of triangulation which utilitsed both quantitative and qualitative analysis, with previous studies and industry average/benchmarks, it is important to restate some of the limitations noted earlier in section 2.3 which make comparisons of results more difficult:
* differences in definitions of key concepts such as small business owner / manager", "performance", "management competencies" for example;
* variations in samples with respect to the participating industries, small business-forms and stage of life that studies are undertaken in; and
* variations in research methods / analytical techniques and performance measures.

Having noted these limitations, the following table highlights the differences and similarities between this study's quantitative results and previous studies.

TABLE 16

Variables highlighted by previous research & studies as being linked to small business performance	Research undertaken by & date undertaken	This studies' conclusions on previously identified variable

TABLE 16

personal characteristics of the small business founder, previous experience and willingness to use external financing and mentors	Perry, Meredith & Cunningham, 1988	using responses to Q1,8,11,12,17 as indep't variables with Q18a)viii & Q20 as dep't variables - poor correlation & no significant relationship between variables
Variables highlighted by previous research & studies as being linked to small business performance	**Research undertaken by & date undertaken**	**This studies' conclusions on previously identified variable**
entrepreneurial, technical-functional and managerial skills	Chandler & Janssen (1992)	using responses to Q13a-e, 14a-e as indep't variables with Q18a)viii) & Q20 as dep't variables - poor correlation & no significant relationship between variables
personal belief of small business founder in own skills plus education and /or experience in general management	Chandler & Janssen, 1992	using responses to Q8,13a-e,15a as indep't variables with Q18a)viii) & Q20 as dep't variables - moderate to weak correlation & moderately significant relationship between variables. T test indicated largest contribution from 13a & b: leadership & creativeness
diversity in age and education but low or little management education and / or experience	Bosworth & Jacobs, 1989; Bates, 1990; Tosterud & Habbershon, 1992	using responses to Q8,11 & 14a-e as indep't variables with Q18a)viii) & Q20 as dep't variables - weak correlation & moderately significant relationship between variables. T test indicated largest contribution from 11 (age at business startup), 14c (pre-bus.mktg skills) & 14e (pre-bus.coord'g/ org'g / planning skills)
experience and gender	Cooper, Woo & Dunkelberg, 1989	using responses to Q1 & 8 as indep't variables with Q18a)viii) & Q20 as dep't variables - poor correlation & no significant relationship between variables
gender, race, age, education	Boyle & Desai, 1991	using responses to Q1 & 8 as indep't variables with Q18a)viii) & Q20 as dep't variables - poor correlation & no significant relationship between variables
former occupation and management experience	Mangum et al, 1988	using responses to Q8, 9 & 14a as indep't variables with Q18a)viii) & Q20 as dep't variables - poor correlation & no significant relationship between variables
external assistance and financial and technical skills	Steiner & Solem, 1988; Dailey & Dalton, 1992	using responses to Q15b,15d & 17 as indep't variables with Q18a)viii) & Q20 as dep't variables - poor correlation & no significant relationship between variables

TABLE 16

internal controls (financial, stock, records, human) and education / training, experience, knowledge and planning	Boyle & Desai, 1991	using responses to Q8, 9 & 15a-e as indep't variables with Q18a)viii) & Q20 as dep't variables - moderate correlation & moderately significant relationship between variables. T test indicated largest contribution from 15e-current coord'g / org'g / planning skills.
operating and financial strategies	Milne & Thompson, 1986	using responses to Q15a-e as indep't variables with Q18a)viii) & Q20 as dep't variables - weak correlation & moderately significant relationship between variables. T tests indicated largest contribution from 15e- curr. coord'g / org'g / planning skills.
personal (attitudes, knowledge) and managerial skills	Burns, 1989	using responses to Q8,13e,14a & 15a as indep't variables with Q18a)viii) & Q20 as dep't variables - weak correlation & moderately significant relationship between variables. T tests indicated largest contribution from 13e:self confidence.
education and financial skills	Wood, 1989; Dadzie & Cho, 1989	using responses to Q8 & 15b as indep't variables with Q18a)viii) & Q20 as dep't variables - weak correlation & no significant relationship between variables
influence of parental background for entrepreneurial career and increased training / education aspirations	Scherer et al, 1989	using responses to Q8 & 12 as indep't variables with Q18a)viii) & Q20 as dep't variables - weak correlation & no significant relationship between variables
importance of planning, location and changing and developing managerial competencies over time to accommodate growth and expansion	Dodge & Robbins, 1992	using responses to Q2, 15e & 16 as indep't variables with Q18a)viii) & Q20 as dep't variables - weak correlation & moderately significant relationship between variables. T tests indicated largest contribution from 15e: curr. coord'g / org'g / planning skills.
average turnover for "other retailers" which includes newsagencies between 1985/85 and 1991/92 was calculated to be 20.975%	Australian Bureau of Statistics, Small Business in Australia, 1991-92	higher level of 26% identified in qualitative research but no quantitative support given by any independent variable & Q20- the dependent variable assessing performance in terms of increase in sales over the 3 yrs to 1994. However, an average of 19.6% to responses to Q20 indicates some growth but it is not associated with any other variable.
reasons for starting own small business included: being own boss, security, financial gain, job satisfaction, needed a job, saw opportunity, a challenge, better lifestyle	Brian Sweeney & Associates, May 1994-pilot study for the Australian Newsagents Federation	all these variables except "better lifestyle" were tested by Q12 but no significant relationship seemed to exist with the dependent variables of Q18a)viii) & Q20.

Differences between this study and previous research may be accounted for by the following:

* small sample size meant less diversity in terms of respondents;
* large proportion of male respondents meant gender bias in the results;
* no questions asked for specific quantified financial information - broad ranges were used to enhance willingness to respond;
* ethnicity was not considered in this study; and
* no specific question was asked on family background - it was only a choice response for question 8.

Similarities between this study and previous ones may be accounted for by some factors such as coordinating / organising / planning, self-confidence and leadership skills being generic qualities for all businesses be they large or small. In addition, they may reflect a bias in so far as these competencies may develop or flourish in small business owner / managers whose businesses are performing or their existence in small business owner / managers may enhance performance. The analysis undertaken in this study has not sought to work out the direction of causation between these variables but rather assumed as stated in section 2.1 that the small business owner / manager's competencies and the small business' attributes impact on performance. Further study and data outside the focus of this study is required to ascertain the direction of causation.

The results of the qualitative research in this study also compare favourably with past research. Whilst more general in nature, the small business owner / manager's competencies i.e. his/her attributes (skills, education), behaviour, attitudes and beliefs and the nature of the newsagency industry itself were seen as both having an association with and an impact on the performance of the small business itself. This was in line with both the results of this study's quantitative analysis and past research.

5.12 Conclusion

Descriptive and inferential statistical techniques provide an indication of how and to what extent different variables are associated with each other and whether or not any associations identified in a sample are likely to apply in the population from which the sample was drawn. In this study, in adopting a triangulation approach to statistical research, variables identified in past research studies were tested both quantitatively and qualitatively.

Not all the variables identified as having an association and significant impact on the performance of the small business in past research were found to be true for this study's sample. In fact only six independent variables from past research were identified by quantitative analysis as both having an association with and impact on the study's proxy measures for performance, with the variable of coordinating / organising / planning skills appearing to have the most impact. These variables were as follows:

i. leadership skills;
ii. creativeness;
iii. self-confidence;
iv. pre-business marketing skills;
v. age at business start-up; and
vi. pre-business and current coordinating / organising / planning skills.

Interestingly these variables highlight the impact and significance of the small business owner / manager's competencies in terms of attributes, behaviour, attitudes, beliefs and knowledge with respect to the performance of their small business.

Qualitatively, the interviews undertaken supported the quantitative analyses findings. However, whilst the competencies of the small business owner/manager were seen as important, the nature of the industry itself was seen as equally important with respect to its controls on entry into the industry and its maintenance of distribution monopolies for the main products of the business.

The limitations of the study itself including all associations being linked to the performance measure which compares respondents to competitors rather than in terms of the business itself with respect to increase in sales, small sample size, gender bias and high levels of non-response due to question misinterpretation by respondents plus lack of questions on variables identified in past research such as ethnicity and specific questions on family background may account for the differences between this study's results and conclusions and those of previous studies. However, the homogenous nature of the industry from which this sample is drawn may be an alternative explanation. Additionally, this industry-homogeneity may enhance confidence in this study's results in spite of the small sample size.

In the next chapter, the implications of this study's results and conclusions and limitations affecting these will be discussed. From this discussion, future research possibilities will be highlighted.

CHAPTER 6:

DISCUSSION & CONCLUSIONS

6.1: Introduction

In the first chapter of this study, the objectives of the study were noted to be as follows:

i. whether or not there is a relationship between a small business owner-manager possessing specific management competencies and the performance of their small business, as measured by growth in sales over the last three years;

ii.what these competencies are and what is meant by "performance" given that firms are subject to both external and internal pressures within their operating environment; and

iii. whether or not these competencies are generic in nature and / or vary across geographic locations.

To enable these objectives to be met, four hypotheses were developed for testing. In chapter 2, a review of past research on the key concepts of small business performance and management, attitudinal/behavioural and educational/experiential competencies highlighted the need to break down these 4 main hypotheses into more specific questions. This led to the development of 24 sub-hypotheses which are outlined in 3.5.1.

In chapter 4, the methodology for data collection and analysis was outlined. In chapter 5, the quantitative statistical techniques for analysing the data were outlined and used to calculate and test the associations between independent variables identified in past research and the proxy dependent variables used to measure small business performance. The significance of those associations was also tested quantitatively. Six variables, identified in previous studies, were found to have a signicant impact on small business performance.

Qualitative research in the form of interviews with three industry participants was also undertaken. The results yielded whilst more general in nature, were in keeping with both past research conclusions and this study's quantitative conclusions, except that the nature of the industry itself was also mentioned as impacting on the performance of the small business.

The implications of the results from chapter 5 will be discussed in this chapter. In doing so, issues such as sample size and other limitations of the study will be highlighted and future research opportunities noted.

6.2: Overview

The results yielded from the previous chapter's quantitative analysis highlighted the impact and significance of the small business owner / manager's competencies in terms of attributes, behaviour, attitudes, beliefs and knowledge with respect to the performance of their small

business. Six specific independent variables were identified as having a significant impact on the performance of the small business in the newsagency industry. These variables included:

i. leadership skills;
ii. creativeness;
iii. self-confidence;
iv. pre-business marketing skills;
v. age at business start-up; and
vi. pre-business and current coordinating / organising / planning skills.

Qualitatively, the interviews undertaken supported the quantitative analyses findings. However, whilst the competencies of the small business owner/manager were seen as important, the nature of the industry itself was seen as equally important with respect to its controls on entry into the industry and its maintenance of distribution monopolies for the main products of the industry.

Given recent moves by the Australian Competition & Consumer Commission, formerly the Trade Practices Commission to abolish the newsagency industry's distribution monopoly, this latter point that the nature of the industry is an important variable impacting on the performance of small businesses in the industry would seem to be true. This is because this situation of a deregulated newsagency environment has never existed before. Thus it is unknown what impact such a change would have on the performance of small businesses in the newsagency industry and whether or not the small business owner / manager possessing the specific competencies identified above as being linked to performance could offset the impact of such a change to the industry on the performance of their small business.

6.3: Discussion & implications of the results

It has been seen from the results of the analyses undertaken, that specific competencies of the small business owner / manager including: leadership skills, creativeness, self-confidence, pre-business marketing skills, age at business start-up, pre-business and current coordinating / organising / planning, and, the nature of the newsagency industry are the most important variables impacting on the performance of the small business in the newsagency industry. However, of what importance this is to the industry itself, trade and professional groups, government policy makers, educational institutions and small business owner / managers themselves is the focus of this section.

i. Implications of the results for the newsagency industry, trade & professional groups:

It is important that the small business owner / manager competencies identified as impacting on performance are recognised and incorporated by both trade groups and industry participants into training and assistance programmes and assessment of potential industry entrants. Of course this assumes that the competencies incorporating behaviours and attitudes such as self-confidence and creativeness can be taught. For some, this is a moot point;

In addition, the fundamental changes to the nature of the industry such as those proposed by the Australian Competition & Consumer Commission need to be assessed in terms of their impact on

the performance of the industry as a whole and small businesses within it specifically. Whilst lobbying efforts have been undertaken, economically justifiable and quantifiable reasons as to why the status quo should be maintained need to be prepared and presented by the relevant national industry body to the Australian Competition & Consumer Commission.

ii. Implications for government policy makers:
The Australian Bureau of Statistics figures for 1991-92 for the retail trade industry indicate that the largest percentage contribution (85%) to retail trade turnover came from the "Other Retailer" group of which newsagents are a member (A.B.S., Small Business in Australia, 1991-92, p.124). Furthermore, the retail trade provided approximately 20% of all employment in Australia in 1991-92 or the peak of the recession. Of this 20%, approximately half the employment came from small businesses such as newsagents employing 0-9 people. In the light of these contributions to the Australian economy and the results of this study it would seem to be in the government's interests to:
* have industry, training and investment policies which support and nurture further growth in the small business sector generally as this will overflow to the newsagency industry; and
* seriously consider whether or not it is economically sensible, given that employment and turnover contributions from retail trade are highest for small businesses and especially from "other retailers".

iii. Implications for educational institutions:
The importance of small business generally and the retail trade specifically for the Australian economy in terms of growth, investment and employment suggests that educational institutions need to establish courses which are industry-relevant and which would teach those competencies identified in this study as being linked to performance. Furthermore, research could be undertaken jointly with the industry to further identify those variables impacting positively on performance, especially those which will allow small businesses within the newsagency industry to not be adversely impacted by any fundamental changes which may affect the nature of the industry and the way in which it does business.

iv. Implications for small business owner / managers:
The findings of this study suggest that small business owner / managers of newsagencies need to develop the identified small business owner / manager competencies which were shown to have a significant positive impact on performance, if they do not already possess them. Although some such as marketing skills can be acquired through traditional training and education courses others such as self-confidence may need to be developed via non-traditional paths. Nonetheless, given that coordinating / organising / planning skills stood out as the most significant skill linked to performance, it is important that the small business owner / manager if nothing else, has developed these management competencies to as high a standard as possible. The voluntary standards of excellence to be introduced by the Newsagents Association of NSW & ACT Inc to its members should help both small business owners and managers to identify what standard is required and defined as "excellent".

clear bias towards associations between various independent variables and business performance as measured by question 18a)viii) i.e. overall business performance relative to other local business competitors. It is suggested that this is because the other performance variable, question 20 asked respondents to measure current business performance in terms of increase in sales growth compared to three years ago. Obviously, if the businesses were less than three years old or there was no increase in sales they could not respond with anything other than 0%. Furthermore, because the question asks respondents to quantify their performance they may have been reluctant to do so.

The major drawback of not having quantified performance levels is that this study's results are less precise and difficult to compare to industry benchmarks such as those published by the Australian Bureau of Statistics or private companies such as the Financial Management Research Centre or Auchinlea Pty Ltd who publish Pracdev Key Indicator Reports for industries.

* The small sample size and the large level of non-response or incorrect responses for some questions suggests that the study's results may be unreliable. Given more time, a pilot survey may have identified which questions were not clear cut or might possibly be answered with more than one equally important response. Furthermore, a pilot survey might have identified those businesses who had been operating for at least three years and thus could measure any improvement in performance.
* For some questions, particularly question 20, one of the dependent performance variables, actual increases in sales were entered in the data base of results. In hindsight, these responses should have been coded to minimise distortions to the analyses which involved question 20.
* Because of the small sample size, the effects of business age on sales growth and thus the proxy for performance (question 20) were not accounted for in the analysis prior to entering other variables into the model. This meant that the data was distorted with respect to the age distribution of respondent's businesses and also the analysis was distorted with respect to performance as measured by sales growth. This is because, in keeping with the life cycle theory of the firm, older firms can be expected to pull down sales growth levels but experience higher levels of business volume (Chandler & Hanks, 1994, p.84).

iv. Self-report performance data:
There is little research to substantiate the accuracy of self-report performance data. Nevertheless, performance information was requested in broad categories only, in order to enhance response. This in effect meant that precision of measurement was sacrificed. Further, some researchers have cautioned that use of such broad measures which focus on self-reported satisfaction with performance may be as much a function of the small business founder's expectations as of objective performance. This means in effect that the validity of the response may be doubtful in so far as different people may not be equally satisfied with the same level of performance. So, this throws doubts over whether or not satisfaction with performance provides a good proxy indicator of firm performance (Chandler & Hanks, 1993, pp.393, 395).

To overcome this limitation it has suggested that follow-up studies, using "experts" or peer or subordinate assessments other than business founders could be used to develop alternative measures of competence. Assessment centres might also be used to observe sujects and rate their

performance of tasks and decision-making abilities relevant to founding and managing a small business (Chandler & Hanks, 1994).

v. Time dimension of the study:
Statistically, like the U.S. study by Chandler & Hanks (Spring 1994, p86), the data was weakened by being cross-sectional rather than longitudinal. In effect this meant that causality could not be implied. Relatively strong associations between self-perceived competencies and firm performance only served to highlight the fact that the evidence was/is correlational rather than causal (Chandler & Hanks, 1994, p.86; Chandler & Jansen, 1992, p.233).

6.5: Opportunities for future research

This study's focus, coverage, results and limitations are such that there are many opportunities for further research, especially given the economic importance of small businesses. The opportunities include:

* comparing the results of the survey with other small businesses in other industry sectors and with medium and large businesses in the same or different industry sectors (although the use of professional managers due to division of management from ownership would need to be noted). Any similarities in results may enable researchers and policy makers to generate a list of generic management competencies that are linked to particular levels of performance, irrespective of business-size, industry type or business location;
* developing quantifiable and thus comparable performance measures applicable across industries;
* testing different proxy variables for performance to see if similar or different results are yielded against the same competencies; and
* looking for the direction of causation between variables rather than as this study has done to merely identify how and to what extent variables are related.

6.6: Conclusion

This study has shown that there is an association between specific competencies possessed by small business owner / managers in the newsagency industry in NSW and the ACT and the performance of their small business. Such competencies included

i. leadership skills;
ii. creativeness;
iii. self-confidence;
iv. pre-business marketing skills;
v. age at business start-up; and
vi. pre-business and current coordinating / organising / planning skills.

However, the possession of such competencies by small business owner / managers needs to be seen in the context of the nature of the industry in which their business operates. As this study shows, both the possession of the identified specific competencies by the small business owner /

manager's and the nature of the newsagency industry have a significant impact on the performance of the small business.