

VICTORIA UNIVERSITY
DEPARTMENT OF PSYCHOLOGY

POWER RELATIONSHIPS IN GRADUATE DEGREE SUPERVISION

by

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ABSTRACT

Supervision of graduate students has been well-studied from many different angles, but the power relationships have been the subject of only a few investigations. This thesis reports on a survey of the power relationship perceptions of Victoria University graduate students and supervising staff. A US instrument (Aguinis, Nesler, Quigley, Lee & Tedeschi, 1996) was used in a modified to obtain power relationship factors based on French and Raven's categorisation of power relationships. These Victoria university power instrument (VUPI) scales were those of Aguinis, modified for Australian intitutions. Item analysis showed that the new scales to be well behaved and to replicate and extend the US findings. The VUPI scales provide a basis for further Australian work. Coercive power was confirmed to be negatively related to the perceived Trustworthiness of the supervisor. Compliance with and Credibility of supervisors were both positively correlated to expert and referent power. The extended VUPI scales were also used to assess the students view of supervisors, and to estimate what supervisors thought themselves - and what they thought were the students perceptions. This considerably extended the range of power perceptions under study from the basic student views recorded in the US study. Supervisors were found to systematically overestimate both the degree of coercive power that they are seen to exert and the Expert and Referent power that they are seen to have. A full scale survey using the VUPI scales would be cost effective to undertake, and yield useful results.

DECLARATION

“I declare that this report does not incorporate any material previously written by another person except where due reference is made in the text”

“I further declare that this study had adhered to the principles as established by the Psychology Ethics Committee of Victoria University”

Signature:

Name:

Date:

The Australian University system has been undergoing progressive strains due to simultaneous expansion and tightening of funding bases (Becher, Henkel & Kogan, 1994). Questions about the role and nature of Masters and Doctoral programs have been raised by Governments. A combination of progressively tighter political direction and control of funding for this area has been accompanied by reductions by the same governments in funding for many universities, a considerable fall in sources and levels of direct student financial support and a rapidly rising fee structure for unsupported students. Under these circumstances it is not surprising that the mixed objectives of education for the students and the expansion of knowledge (a view held by a large fraction of university staff (Clark, 1992)) can place additional stresses on the staff-student relationships. The power relationships between student and supervisor are now more salient and significant, at the same time as the resources devoted to the students are under pressure. The observed steady increases in fees will raise the pressure from students for teaching assistantships - a method that the US adopts to ensure access to graduate courses by the better students - and to gain greater input and more benefit from their supervisors.

This combination of circumstances is could make students even more reluctant to respond to power imbalances or exertion (Moses, 1984), at a time when most students are also carrying an increasing fiscal burden in addition to their research - and with fewer options to sustain it. On the other hand, if greater use of graduate students is made in the teaching program, then the power relationships between supervisors and students will be stronger. Australia might then move closer to a US model, where the dual relationships of power over academic progress and financial support are frequently held by the same person. Strains in the US system are regularly reported, though few with as extreme an outcome as the murder of professors by a disgruntled masters student (Leatherman, 1996).

The issue of power imbalances and exertion in the student supervisor relationship have been recognised, but only a very limited amount of work has been published on this subject. The issue is further complicated by the substantial differences in culture between disciplines, and the different expectations in different disciplines and faculties of supervisor roles and accountabilities (Cullen, Pearson, Saha & Spear, 1994).

The relationships between doctoral students and supervisors differ substantially across disciplines (Becher et al., 1994): ranging from

“...repeatedly, students spoke of supervision as an arrangement in which the onus for all initiative was laid on them...” (p145),

to, in the case of science, where there was a high degree of dependence on supervisors for the environment and physical equipment to carry out the work.

“... the imbalance of power between supervisor and student was such as to make students highly vulnerable. It was not surprising that one student in the study felt that there was no safe way to complain and get the problem addressed” (p148).

In the context of negotiating the academic environment,

“.. In some cases the motivation ... students was heightened by the sense that the supervisory relationship was itself unsafe...” (p152).

The project reported in this thesis project was aimed at providing a firm foundation for subsequent more substantive studies. The key steps were to complete the initial phase of testing and validating suitable instruments and analysing a restricted range of aspects of the results of their administration. A key area of novel investigation was the degree to which students and supervisors correctly perceived the views of the other.

Any subsequent study might begin with focus groups, one of staff members and one of students to elicit the issues as perceived by the two types of players in this scenario, to confirm or otherwise the issues covered by the restricted initial exploration reported here.

The prime objectives are to obtain a picture of the power relationships between students and staff, and to undertake the initial validation of a power instrument suitable for use in Australian Universities. It is desirable that any instrument to measure the dyadic relationships between student and supervisor be based on an appropriate theory of power and influence. Most previous work identified in this field neglected views of power held in such relationships (Aguinis, Nesler, Quigley, Lee & Tedeschi, 1996), and did not look closely at the stage in career at which the students were entering postgraduate research. The present work focuses on power relationships specifically in the context of the goals of staff and students and with attention paid to any differences in modes of interaction and socialisation that might emerge between study areas (Cullen Pearson, Saha & Spear, 1994).

The power instruments previously used (Aguinis et al., 1996) formed the basis of the survey instrument battery. However the characteristics of supervisor/supervised

behaviour identified in ANU work (Cullen, Pearson, Saha & Spear, 1994) suggested that it would be desirable to add some subject categorisation or coverage to pick up the hard/soft and the other dimensions identified by ANU. Victoria University has several campuses, and may still show some effects due to its formation by merging at least two distinctively different cultures of the Western Institute and Footscray Institute of Technology. Faculty and campus details were included in the instrument. The work at ANU (Cullen et al, 1994) found substantial cultural differences between arts and science disciplines in the style and approach taken towards higher degree students. The potential differences between arts and science cultures, or between campuses, were not directly addressed in the present study, although some limited information was obtained

Power relationships have been identified as having significant impacts on learning at all levels of university study (Madonna, Wesley, Bailey & Anderson, 1988). These power relationships have to date been studied on only a limited basis. For a more comprehensive understanding of the issues, additional information is needed on the views of staff on students, of students on staff, and staff and students on their own perceived levels of power in the relationship.

Most work on student and staff evaluation by students has been concentrated on the undergraduates (Doyle, 1975; Wilson, Gaff, Dienst & Bavry). The goals of the postgraduate research and other controlling factors for the students have been comparatively neglected.

The basic questions were drawn from Aguinis et al. (Aguinis et al., 1996), but required expansion and adjustment to be applied to the rather different Australian university environment. The scales used by Aguinis et al. were adapted from the classic French and Raven (1959) scales, as modified by Hinken and Schriesheim (1989). Aguinis et al. also added issues related to the financial power that many American supervisors hold over students, in terms of teaching assistantships and other paid work. This key financial support complement to the user-pays fee systems in the USA have yet to develop to such a pervasive extent in Australian universities.

The present work has built on the French and Raven approach to power relationships initiated by Aguinis et al. (Aguinis et al., 1996), as these formulations of different forms of dyadic power perception and exertion are specifically designed to address relationships between student and supervisor. The French and Raven taxonomy of power has five dimensions (Table 1), in each case the operational construct is the perception by the student of the power held by the supervisor. Each of these constructs

were the subject of four items in the Aguinis power measurement instrument (See Appendix A).

It was necessary to establish that such French and Raven-based scales would be effective in Australia, as work on other scales based on this categorisation produced little evidence of convergent, discriminant or test retest validity (Rahim, 1986). The results reported by Aguinis et al. (Aguinis et al., 1996) indicated that some of these deficiencies had been adequately addressed in the US University involved. An initial hypothesis for the present study was therefore that useable scales could be developed for Australia students.

The exertion or perception of each of these power aspects will lead to perceptions of relationship quality, credibility and trustworthiness of the supervisor from the standpoint of the student. There are a number of power relationships that are much more strongly represented in US Universities than at Victoria University. The wide range of available scholarships, assistantships and other forms of paid support complements US fee structures. The rapid shift to substantial fees in Australia has not yet been matched by these extensive support systems to anything like the same extent.

TABLE 1. FRENCH AND RAVEN SOCIAL POWER CATEGORIES

Power category	Description
Referent power	Influence of the supervisor through a students' wish to be affiliated or associated with a supervisor
Coercive power	Influence exerted by a supervisor through the students' perception of the supervisors ability to apply sanctions to the student
Expert power	Influence exerted by a supervisor through the perceived ability to provide the student with special knowledge or advice
Legitimate power	Influence exerted by a supervisors on a student through the perception that the student has an obligation to respond to direction
Reward power	Influence exerted on the student through the expected ability of a supervisor to provide concrete rewards

If power is perceived, then attitudes and behaviours may be expected to respond. There is other evidence that some of the social power dimensions have a key role to play in graduate supervision: eg. Expert power was found to be the most important in studies of management education (Harrow & Loewenthal, 1992), and Referent power in same gender supervision (Gilbert, 1985). Some possible gender-related effects could be expected as a result of Gilbert's work.

The scales used by Aguinis (Aguinis et al., 1996) were modified versions of those developed by Hinkin and Schreishiem (Hinkin & Schreishiem, 1989) and are

summarised in Appendix A and Table 2. The ability of Aguinis et al. to restrict their substantial sample to graduate students with teaching assistantships could not be readily replicated in the present study. The questions on the number of papers published with staff were also omitted, as the focus of the present study was to set up and test a power instrument suitable for the conditions generally prevalent in Australian universities. The inclusion of questions to test the quality of the staff-student relationship was considered, but as Aguinis et al. did not specify the instrument used, these were also omitted from this pilot project

The literature is framed largely in terms of staff performance, with only minor attention paid to student characteristics. The implicit power relationships are ignored by almost all writers, although they clearly condition and mediate many of the interactions between the staff and students in the structured task of graduate degree acquisition.

TABLE 2 AGUINIS ATTITUDES AND BEHAVIORAL RESPONSES

Student perceptions	
Relationship quality	Measured by direct question
Trustworthiness	Constructed from several specific items
Credibility	Constructed from several specific items
Student intentions	
Invitation on to thesis committee	Ask supervisor to join thesis committee
Cooperative research	To conduct research with the supervisor
Student behaviours	
Joint publication	How many papers with the supervisor
Compliance	Constructed from several specific items

Mutual views of students and supervisors in graduate study are fairly limited. There are published examples solely from the student perspective (Battersby & Battersby, 1980; Nangle, 1974; Parry & Hayden, 1994; van der Heide, 1994), and of academic and student views about specialised aspects of the relationships (Powles, 1993). It is considerably more common to see surveys of supervisory practice from a staff standpoint (McMichael, 1993; Moses, 1984; Ratsoy, 1991; Wilcoxon, 1994), and for distance education (Evans & Green, 1995; Northcott, 1987), where the student-supervisor interaction is potentially critical. Few studies of the student-supervisor interaction have been reported (Johnston, 1995; Maor & Fraser, 1995), and indicate that all may not be well in the model of staff driven instruction (Walford, 1981).

The importance of cultural transmission in the supervisory process (Aguinis et al., 1996) is another aspect of the power and conditioning aspects of this relationship, and

the development from student to peer implies the shift in expert and referent power, as shown by Aguinis et al. for US circumstances.

Victoria University provides a diverse pattern of graduate student demographics. The faculty and campus variations making it an appropriate exploratory site for research on the mutual perspectives of supervisors and the supervised. Recent work has, for example, examined the perceptions of staff and students on the importance of different aspects of teaching (Fisher, Alder, & Avasalu, 1998). The major dimensions of variation potentially available at this University include:

- Campus (metropolitan, regional and associated cultures)
- Faculty (arts, science and vocational (including business))
- Students (part time, full time, previous educational environment)
- Staff (duration of tenure at Victoria University, previous academic and other employment history, experience of supervision)

A comprehensive study could take account of these factors, which would either be controlled for, or form part of the experimental design.

An exploration of the power relationships between staff and students at VUT was therefore undertaken to replicate (and extend) the work of Aguinis et al. (Aguinis, et al., 1996), and test those hypotheses that could be replicated in addition to determining if there are faculty or other major qualifying factors in the specific cultural matrix of VUT. The present work substantially extends the work of Aguinis et al., and allows several related studies to be undertaken using the same general framework and instrument.

Study 1 Student perceptions of power relationships: Replication (Aguinis et al., 1996)

Study 2 Student perceptions of supervisor perceptions

Study 3 Supervisor perceptions of their own and their students views

Study 4 Cultural, gender and subject area variations

Study 1: Replication of Aguinis et al. in the US

The major thrust of the present study is to replicate, as far as possible, the Aguinis et al. (Aguinis et al, 1966) study in a US university, and to develop scales for wider use in Australia. From this work several hypotheses would be expected to be transferable:

- 1.1 A series of scales based broadly on the Aguinis approach could be constructed and meet satisfactory levels of inter item correlation in an item analysis.
- 1.2 Student perceptions of supervisor trustworthiness are negatively related to Coercive power and positively to Referent and Expert power.
- 1.3 Student perceptions of supervisor credibility are positively related to Expert and Referent power
- 1.4 Student compliance is positively related to the student's view of the supervisor's Legitimate, Reward and Expert and Referent power.

In addition, through requesting the reflected views of the other party in the student-supervisor dyad and the additional supervisor survey, further hypotheses may be tested through two further studies which allow for a broader range of power scales. These have the potential to support a more effective approach to identifying and addressing power imbalances and perceptions between the two groups in the graduate student/supervisor relationship.

Study 2: Student assessments of their supervisors perceptions

- 2.1 Student views of supervisor perceptions of power relationships would differ from their own.
- 2.2 Student estimates of supervisors views, and supervisors estimates of students views would differ.

Study 3: Supervisors own and their views of student perceptions

- 3.1 Supervisors underestimate the extent of coercive power that they are perceived to exert.
- 3.2 Supervisors overestimate the degree of expert and referent power that they held.

Although not the prime focus of this work, some evidence of variations across other factors could be expected to occur.

Study 4: Gender, campus and faculty power perception variations

- Gender, campus and faculty variations in power perceptions would occur.

PROCEDURES

Subjects

Survey forms were mailed to all (N=510) Masters and Doctoral students (15% response rate) and (N=225) staff (35% response rate) at Victoria University. 69% of the supervisors were male, while only 50% of the students were male. Just under 49% of the students were Victoria University staff (academic or tutorial), 52% were 35 years of age or older and 55% were full time students. 38% of the supervisors had had supervision training, and 54% had four or more Masters or Doctoral students.

The survey instrument was embedded in the 1997 Annual graduate student survey administered by the Research Office of Victoria University. In addition, a slightly modified survey was sent to graduate supervisors to obtain their views. The French and Raven taxonomy of power has five dimensions (Table 1), in each case the operational construct is the perception by the student of the power held by the supervisor. The exertion or perception of each of these power aspects will lead to perceptions of relationship quality, credibility and trustworthiness of the supervisor from the standpoint of the student. The students and supervisors responded both in their own right, and by taking the standpoint of the other.

The response rates were low, possibly due to the length of the overall survey. 78 students returned completed surveys and 39 supervisors. This was adequate only to undertake an initial validation of the scales on the power instrument for Australian usage, and to explore the initial hypotheses.

Scale construction issues

The need to drop the research and teaching assistantship items from the US survey reflects the smaller range of direct power aspects inherent in the current Australian system. This left the Coercive power scale with three items rather than four.

The survey instrument was embedded into the regular Victoria University Research Office postgraduate student survey sent to all Masters and Doctoral students in late 1997. It was also sent to supervisors, with an appropriate covering letter signed by the Director of the Office, Dr Fisher, covering confidentiality of the results (Appendix C). No attempt was made to link specific students with specific supervisors in this study, as an added measure of confidence in the use of the data. The questionnaire in its final form was approved by the Department of Psychology Ethics Committee.

The survey forms were sent out and returned by mail. The structure of the study did not allow follow up reminders to be sent, as the non-respondents could not be identified.

The data was put into SPSS format by the Research Office, and editing, internal validation, correction and analysis was carried out by the author of this thesis. Use of the SPSS “.sav” format allowed data to be moved easily from one machine to another, and permitted analysis to be done transparently on both Apple and IBM systems.

TABLE 3. VUPI MODIFICATIONS TO THE AGUNIS SCALES

Scales	Q24 & Q24a Scale	Items Changed	Original wording (the new VUPI wording is shown in Appendices D, E)
Coercive	v,l,f	c	can give me undesirable assistantship-related requirements [deleted]
Legitimate	ae, b, x, ag	b	can make me feel like I should satisfy my assistantship requirements
Reward	o, ad, q, w	o	can give me extra time off
		ad	can write a strong letter of recommendation for me
		w	can make my work week easier

Scale construction and modification tasks were done by exporting to Microsoft Excel, and reimporting back in to SPSS. Some of the questions had to be altered to suit the Australian university environment, where thesis committees are less common and teaching assistantships are less widespread. Consequently several items had to be removed for the present project. The full survey instruments are given as Appendices B, D and E. The VUPI (Victoria University Power Instrument) comprises Questions 24 and 24a in each survey. The differences from the Aguinis instrument are summarised in Appendix B and Table 3.

ANALYSIS

The student responses to the student survey, rating their own views, is the only set that can be directly compared to the US work. The reflection of these views are the students estimates of what they think are the views the supervisors hold themselves.

In Table 4 each scale is specified in two ways. First as the view of the student him/herself, and secondly as the view that the student feel the supervisor would think the student would say. The naming of the scales for SPSS summaries is drawn from the titles of scales, with a suffix of T for the students own view and V for his/her assessment of the supervisors estimate of the students own view. The same variable

names and conventions are used for the supervisors survey : ie. T for the supervisors own views and V for their estimates of the students views.

TABLE 4. RELIABILITY ANALYSIS OF STUDENT SURVEY SCALES

Student Survey Scale	Variable	Cronbach Alpha	N	Items removed
Coercive (own view)	<i>COT</i>	0.76	71	
Coercive (view of supervisor)	<i>COV</i>	0.86	64	“can make my work difficult for me”
Expert (own)	<i>EXT</i>	0.91	75	
Expert (supervisor)	<i>EXV</i>	0.87	66	
Legitimate (own)	<i>LET</i>	0.87	74	‘can make me feel like I should satisfy my university-paid work requirements‘
Legitimate (supervisor)	<i>LEV</i>	0.87	65	‘can make me feel like I should satisfy my university-paid work requirements‘
Referent (own)	<i>RET</i>	0.86	30	‘can make me feel personally accepted‘
Referent (supervisor)	<i>REV</i>	0.84	66	‘can make me feel personally accepted‘
Reward (own)	<i>RWT</i>	0.68	62	
Reward (supervisor)	<i>RWV</i>	0.78	57	
Credibility (own)	<i>CRT</i>	0.93	73	‘does what (S)he says (s)he will do‘ and ‘is a person who keeps her/his word‘
Credibility (supervisor)	<i>CRV</i>	0.93	63	
Compliance (own)	<i>CMT</i>	0.80	77	
Compliance (supervisor)	<i>CMV</i>	0.78	65	
Trustworthiness (own)	<i>TRT</i>	0.81	70	
Trustworthiness (supervisor)	<i>TRV</i>	0.77	64	‘would not have me work on a project without giving me credit for it‘

The levels of inter item correlation (Cronbach’s Alpha) are almost all at an acceptable level. Good practice suggests that Alpha values of 0.8 and above a desirable, but values of 0.7 are frequently accepted (Nunally, 1978). In these terms, the new VUTPI scales are of very similar quality to the Aguinis scales.

The patterns of the values inter item correlation are also similar, with reward power showing the lowest inter item correlation in both cases.. The results from applying the new VUTPI scales can therefore be approached with some confidence, although the numbers of respondents in the present study are far smaller than in the US work.

The Cronbach Alpha values are satisfactory for almost all these scales, once the items have been adjusted. However, although the low value for Reward power is marginal

and further items should probably be developed for this scale, hypothesis 1.1 is supported.

TABLE 5. MEANS AND ALPHAS FOR THIS AND THE AGUINIS' STUDY

US-Aust Comparison Student self reports	Student responses (this study)	Mean	SD	N	Student responses (Aguinis)	Mean	SD	N
	Alpha				Alpha			
Coercive Power	0.76	-4.1	3.5	76	0.84	-1.2	5.0	323
Expert Power	0.91	4.2	4.4	64	0.90	5.1	4.0	328
Legitimate Power	0.87	5.0	3.4	65	0.87	5.4	3.0	321
Referent Power	0.86	3.8	4.6	74	0.90	4.8	3.9	328
Reward Power	0.68	1.6	3.2	62	0.73	3.7	3.5	324
Compliance	0.80	4.1	3.5	76	0.81	5.2	3.3	326
Credibility	0.93	5.1	4.0	73	0.94	5.6	3.8	323
Trustworthiness	0.81	5.8	4.1	64	0.75	3.6	4.0	319

Means and Sds from the total sample

The scales for the US and Australia differ slightly, but it is useful to assess the mean levels of the different forms of power seen by the students in both visual and tabular formats.

The mean levels of each power and derived construct are summarised in Figure 1. The key distinctions are that the Australian subjects in the present study display lower levels of Reward and Coercive power in association with higher levels of Trustworthiness when contrasted with the US subjects.

This pattern reflects the weaker reward power available to the Australian supervisors, who generally have less teaching assistant funds than their US counterparts, as well as other differences between the Australian and US universities involved. This replication of the Aguinis study has been extended in the present work to include responses on the perception of the supervisors own views allows further exploration of the differences between the two parties.

Students rated supervisors view of legitimate power as weaker than they did themselves, but indicated that supervisors overestimated their credibility (Table 6). Students also indicated that supervisors overestimated student compliance and substantially overestimated the degree of trust that they established in the relationship. There are significant differences between the ratings given by the students for their own

views and the views they ascribe to their supervisors. The results for trustworthiness are particularly noteworthy.

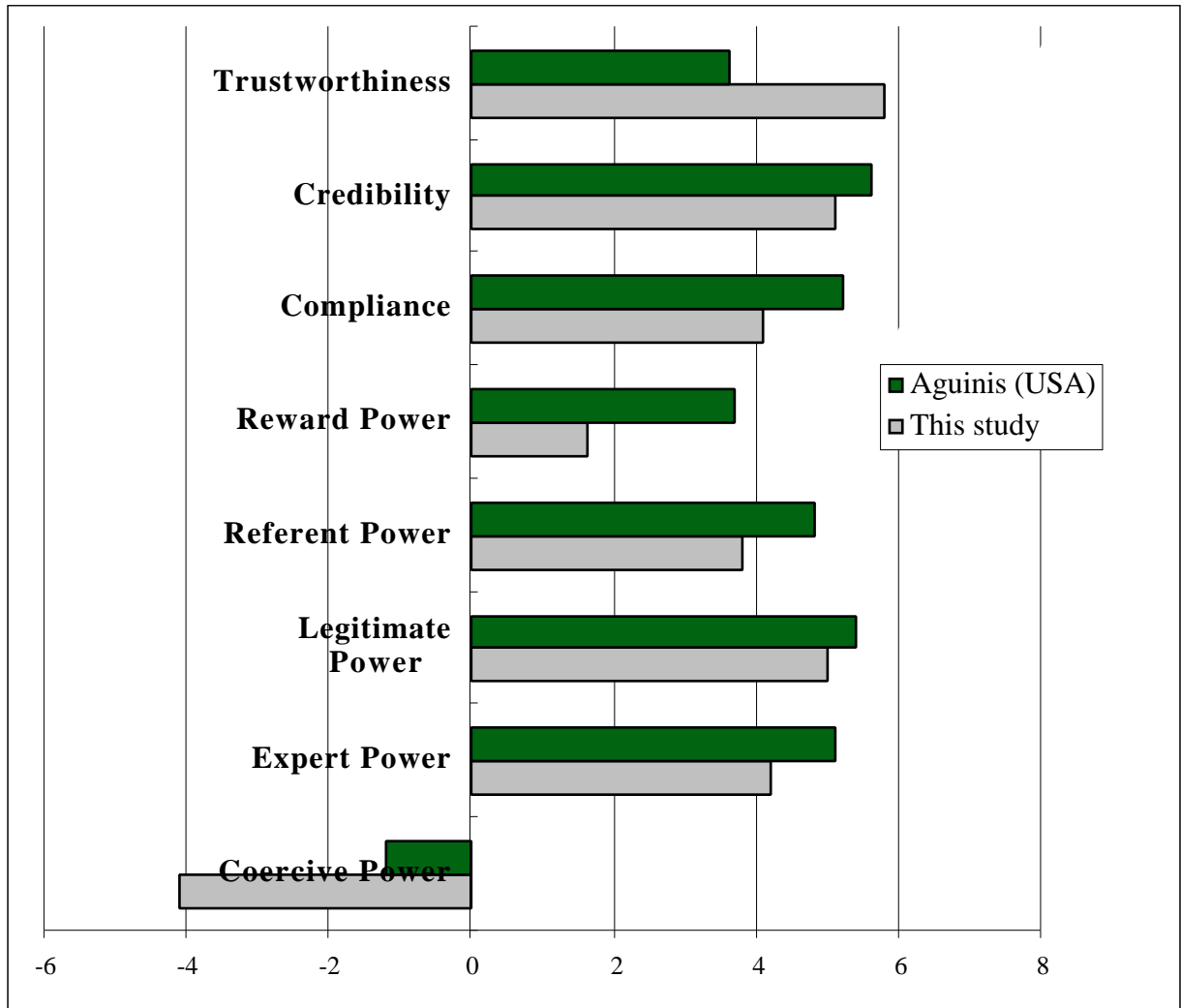


FIGURE 1. MEAN LEVELS OF POWER PERCEIVED BY US AND AUSTRALIAN STUDENTS

TABLE 6. PAIRED T-TESTS AND MEAN VALUES OF STUDENT SURVEY SCALE VARIABLES

Student scales	Student View	Student estimate of supervisor view	Paired sample t test
Coercive Power	-4.9	-5.5	
Expert Power	4.4	5.4	
Legitimate Power	5.0	4.5	*
Referent Power	4.2	5.0	
Reward Power	1.8	2.5	
Compliance	4.2	4.8	*
Credibility	5.3	6.4	*
Trustworthiness	6.1	7.7	***

Means derived from valid pairs in paired t-tests *= p<0.05, *** = p<0.001

TABLE 7. PEARSON CORRELATIONS: STUDENT SURVEY RESPONSES

	CAMPUS	CMT	CMV	COT	COV	CRT
CMT	.04	1.00				
CMV	.08	.79**	1.00			
COT	.14	-.38**	-.19	1.00		
COV	.11	-.48**	-.44**	.65**	1.00	
CRT	-.12	.71**	.45**	-.71**	-.51**	1.00
CRV	-.11	.58**	.56**	-.39**	-.50**	.65**
EXT	-.06	.66**	.47**	-.69**	-.44**	.89**
EXV	-.01	.53**	.56**	-.22	-.39**	.46**
FACULTY	-.04	-.27*	-.14	.26*	.27*	-.30*
LET	.13	.78**	.84**	-.10	-.28*	.42**
LEV	.12	.86**	.74**	-.27*	-.28*	.62**
SEX	.20	.01	-.02	.04	-.07	.01
RFT	-.03	.55**	.39**	-.68**	-.59**	.79**
RFV	-.18	.55**	.60**	-.45**	-.63**	.60**
RWT	.04	.60**	.51**	-.21	-.14	.53**
RWV	.19	.43**	.42**	-.09	-.12	.28*
TRT	-.06	.30*	.25	-.70**	-.79**	.54**
TRV	.01	.30*	.31*	-.39**	-.75**	.32*

	CRV	EXT	EXV	FACULTY	LET	LEV
EXT	.56**	1.00				
EXV	.81**	.52**	1.00			
FACULTY	-.20	-.28*	-.18	1.00		
LET	.50**	.41**	.51**	-.00	1.00	
LEV	.53**	.59**	.49**	-.17	.88**	1.00
SEX	.14	-.01	.15	.01	.03	-.03
RFT	.53**	.74**	.40**	-.24*	.30*	.40**
RFV	.77**	.54**	.65**	-.21	.43**	.46**
RWT	.54**	.51**	.48**	-.05	.55**	.66**
RWV	.51**	.27*	.46**	.10	.54**	.54**
TRT	.42**	.45**	.25	-.38**	.07	.12
TRV	.55**	.23	.48**	-.31*	.20	.19

	SEX	RFT	RFV	RWT	RWV	TRT
RFT	-.06	1.00				
RFV	.13	.67**	1.00			
RWT	.10	.43**	.55**	1.00		
RWV	.18	.24	.46**	.84**	1.00	
TRT	.01	.64**	.52**	.08	-.01	1.00
TRV	.19	.40**	.43**	.05	.10	.65**

* p<0.05 ** p<0.01 (2-tailed)

The patterns of correlations between student self and supervisor ratings are given in Table 7. The values of each construct as reported by the students and as they estimate for their supervisors are positively and significantly correlated (bold and italic entries in Table 7).

Both Compliance and Credibility are positively correlated with Legitimate, Referential and Reward power (p<0.01). Credibility is positively correlated with Expert,

Legitimate, Referential and Reward power ($p < 0.01$). These results support hypotheses 1.3. and 1.4.

Trustworthiness and Coercive Power are negatively correlated ($p < 0.01$), and Trustworthiness is positively correlated with Referential and Expert power ($p < 0.01$). This supports hypothesis 1.2.

The same power issues were also explored in the survey program from the supervisors position. The supervisor survey also has two parts. The supervisors own personal views, and how the supervisors surmised how their students would have responded. These additional results also permit investigation of the matches or mismatches between student and supervisor perspectives of social power exertion in the relationship. These areas were not explored by Aguinis. Consequently no comparable US scales or results are available.

A number of questions had to be removed from the survey instrument tested in the present work. The questions concerned are listed in Table 8.

TABLE 8. RELIABILITY ANALYSIS OF SUPERVISOR SURVEY SCALES

Supervisor Survey Scale	Cronbach Alpha	N	Items removed
Coercive (own view)	0.48	33	'can make being at the lab/office distasteful'
Coercive (view of student)	0.88	25	'can make things unpleasant here'
Expert (own)	0.58	31	'can provide me with sound advice related to our field of study'
Expert (student)	0.86	26	'can provide me with sound advice related to our field of study' and 'can share with me her/his considerable experience/training'
Legitimate (own)	0.80	31	'can make me feel like I should satisfy my university-paid work requirements'
Legitimate (student)	0.92	25	'can make me feel like I should satisfy my university-paid work requirements'
Referent (own)	0.86	30	
Referent (student)	0.88	25	'can make me feel important'
Reward (own)	0.66	29	'can give me a strong reference'
Reward (student)	0.66	33	'can give me a strong reference'
Credibility (own)	0.92	32	'is accurate in her./his statements to me' and 'makes accurate statements of fact to me' and 'does what (S)he says (s)he will do'
Credibility (student)	0.82	25	
Compliance (own)	0.40	32	
Compliance (student)	0.72	25	
Trustworthiness (own)	0.63	29	No Scale items could be confirmed
Trustworthiness (student)	-	-	

TABLE 9: PEARSON CORRELATIONS: SUPERVISOR SURVEY SCALES

	CAMPUS	CMT	CMV	COT	COV	CRT
CMT	-.09	1.00	.			
CMV	-.25	.46*	1.00			
COT	.06	.37*	.33	1.00		
COV	.13	.28	.03	.63**	1.00	
CRT	-.16	.22	.37	.14	-.18	1.00
CRV	-.06	.09	.36	-.18	-.37	.72**
EXT	-.23	.13	.29	.20	.13	.35
EXV	-.10	-.04	.18	.07	-.02	.12
FACULTY	-.18	-.18	.02	-.08	-.21	.08
LET	-.33	.42*	.54**	.34	.23	.32
LEV	-.36	.24*	.68**	.17	.08	.15
SEX	.29	.26	.17	.28	.36	.08
RFT	-.05	.31	.12	.01	.09	.23
RFV	.22	.05	.34	.03	-.07	.14
RWT	-.04	-.04	.16	.13	-.44*	.22
RWV	.48*	-.13	-.05	-.23	-.29	-.17
TRT	.07	-.86	-.24	-.20	.05	.05

	CRV	EXT	EXV	FACULTY	LET
LEV					
EXT	.18	1.00			
EXV	.23	.91**	1.00		
FACULTY	.04	-.04	.05	1.00	
LET	.19	.30	.18	-.29	1.00
LEV	.20	.04	.01	-.21	.82**
SEX	-.06	.11	-.02	-.20	.24
RFT	.40	.11	-.01	.02	.34
RFV	.46*	-.00	.00	.10	.21
RWT	.29	-.06	-.18	.06	.04
RWV	.03	-.37	-.28	-.02	-.06
TRT	.08	-.15	-.17	-.28	-.01

	SEX	RFT	RFV	RWT	RWV	TRT
RFT	.22	1.00				
RFV	.27	.71**	1.00			
RWT	-.09	.02	.25	1.00		
RWV	.05	.07	.25	.63**	1.00	
TRT	.12	.21	.01	-.27	-.37	1.00

* p < .05 ** p < .01 (2-tailed)

Using these new scales (as summarised in Appendix F) , the correlation matrix of these scale variables is shown in Table 9. The personal and projected views on the different power scales are closely correlated ($p < 0.05$) for all pairings of supervisors own and supervisors estimate of student views.

The cluster of both forms of Legitimate power and Compliance all show significant correlations ($p < 0.05$). Coercive power and Compliance (both from supervisors own views) are significantly positively correlated ($r=0.37$, $p < 0.05$). Coercive power

(supervisors own views) is significantly negatively correlated with Reward power (supervisors own views) ($r=-0.44$, $p < 0.05$).

There are no significant correlations between any of the scale variables and gender, or between the Trustworthiness construct and any other variable.

A positive correlation exists between Reward power (in supervisor assessments of the student view) and Campus ($r=0.48$; $p<0.05$). Analysis of variance confirmed this as significant ($F(3,22)=3.3$, $p<0.05$). Further, there is a strong correlation between Faculty and Legitimate power as asserted to be perceived by the student

TABLE 10. PAIRED T-TESTS AND MEAN VALUES OF SUPERVISOR SURVEY SCALE VARIABLES

Supervisor scales	Supervisor View	Supervisor estimate of student view	Paired sample t test
Coercive Power	-5.0	-6.1	
Expert Power	6.3	5.5	*
Legitimate Power	5.5	5.8	
Referent Power	5.8	6.3	
Reward Power	2.1	1.5	
Compliance	4.6	5.7	*
Credibility	7.9	7.5	**
Trustworthiness	8.64	Undefined scale	

Means derived from valid pairs in paired t-tests

*= $p<0.05$, ** = $p<0.01$

The small response sample of supervisors does not permit many firm deductions to be drawn from Table 9. Examining the means using paired t-tests (Table 10) shows that the supervisors considered that students would overestimate the degree of expert power exerted by the supervisor ($p < 0.5$), have a higher degree of compliance than they felt they would achieve ($p<0.05$), and offer a lower level of credibility than they considered for themselves ($p<0.01$). The complete lack of an ability to generate a reliable scale for the Trustworthiness construct suggests that supervisors are not good as estimating what students perceive in this power relationship

Predicting the levels of power from the set of own and estimated student power values and consequential variable values offers one way to reduce the different interacting factors summarised in the Pearson correlations of Table 9.

Table 11 shows the results of stepwise regression of the different power scales on the full set of supervisors own (T) and supervisors estimates of student views (V),

excluding the complement (ie. xxT for regressions on xxV and xxV for regressions on xxT) of each power scale. Coercive power is positively related to Compliance from the supervisors own stance, and negatively with Reward power when they take the view of what they expect the students to state. Expert power and Credibility, and Reward power did not yield any result from these stepwise regressions.

TABLE 11. REGRESSIONS FOR SUPERVISOR SURVEY SCALE VARIABLES

Supervisor Regressions	Variable	Coefficient	Constant	Conditions
Expert Power (t)	Credibility (t)	0.96**	0.94	excluded EXV
Expert Power (v)	Credibility (v)	1.51***	-5.14	excluded EXT
Coercive Power (t)	Compliance (t)	0.68*	-7.70***	excluded COV
Coercive Power (v)	Reward power (t)	-0.69*	-4.44***	excluded COT
Legitimate Power (t)	Compliance (v)	0.68**	1.51	excluded LEV
Legitimate Power (v)	Compliance (v)	1.00***	-0.16	excluded LET
Referent Power (t)	No equation			excluded RFV
Referent Power (v)	No equation			excluded RFT
Reward power (t)	No equation			excluded RWV
Reward power (v)	No equation			excluded RWT

TABLE 12. DERIVED POWER AND RESPONSE MEANS BASED ON THE INITIAL A PRIORI VUT SCALES

Initial a priori scales	Student	se	Student view of supervisor	se	Supervisor	se	Supervisor view of student	se
Coercive power	-4.6	0.5	-5.4	0.5	-5.9	0.5	-5.9	0.1
Expert power	4.2	0.5	5.5	0.4	6.3	0.3	6.3	0.4
Legitimate power	4.2	0.4	3.7	0.4	4.4	0.7	4.9	0.1
Reference Power	4.0	0.5	5.0	0.4	5.7	0.5	6.1	0.5
Reward power	1.6	0.4	2.5	0.5	2.5	0.6	2.7	0.6
Credibility	5.0	0.5	6.5	0.4	7.3	0.2	7.5	0.2
Compliance	2.2	0.1	4.1	0.4	4.2	0.6	5.4	0.6
Trustworthiness	5.8	0.5	7.2	0.4	8.5	0.4	7.8	0.4

Student and Student view of supervisor: n=78;

Supervisor and Supervisor view of student: n=39

The full range of scale comparisons

The scales defined for this trial can be applied to the data without correcting for the reliability of the different scales. This does not provide a basis for assessment of the most effective method for reliably measuring the different aspects of power and response, but does provide a broad comparable set of values for an overall view. Table 12 summarises the complementary views of different types of power. There are

substantial differences in the implied levels of power assertion between the different views of the two parties.

Figure 2 shows a broad pattern of the student holding less positive views than supervisors on almost all of the scales used for comparison. Students also appear to consider that their supervisors would think that they would be slightly more positive. Supervisors in turn felt slightly more positive than the students thought that they would be, and the most positive views of all are where the supervisors thought students would be responding.

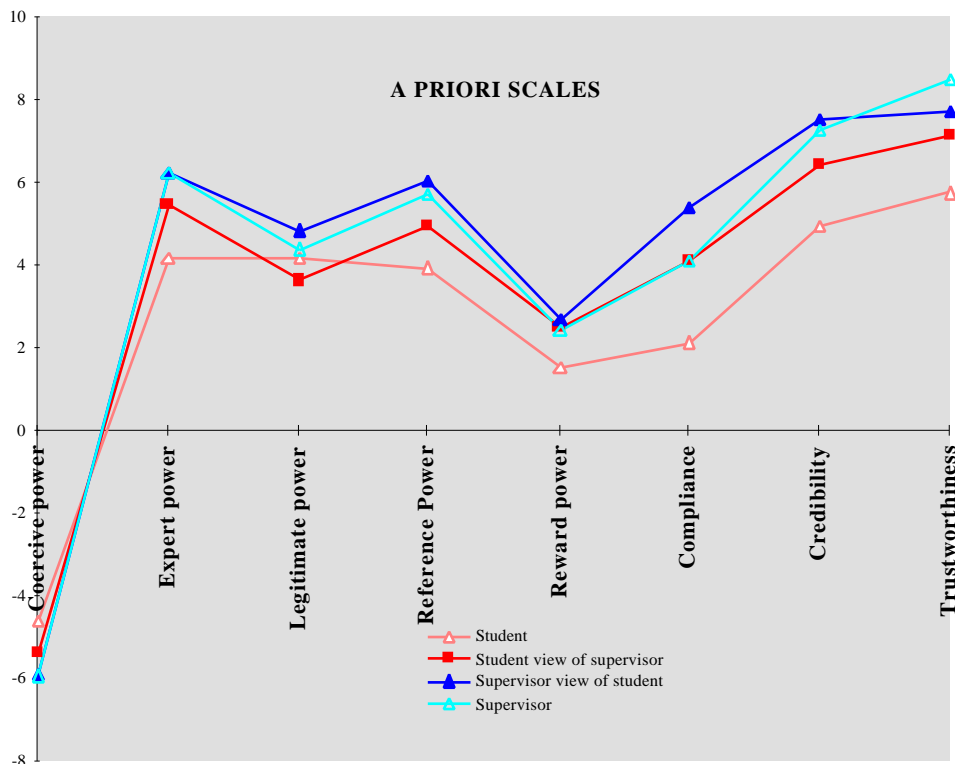


FIGURE 2: TRENDS OF POWER AND DERIVED VARIABLES BASED ON THE INITIAL A PRIORI VUT SCALES

Improving the quality of the initial trial scales by systematic item removals to maximise the Alpha values led to the results in Fig. 3, where the better quality scales still provide a very similar qualitative view. These are the scales that are now suggested for wider trials in other Australian institutions.

The major effect of the refinement of the scales is to reduce the differences between the students own views and the others, and to reduce the importance of reward power.

Reliability analysis using Cronbach Alpha values showed that the items used for Trustworthiness (for the Supervisor view of student views) did not lead to any scale structure at all. Consequently this point is missing in Figure 3.

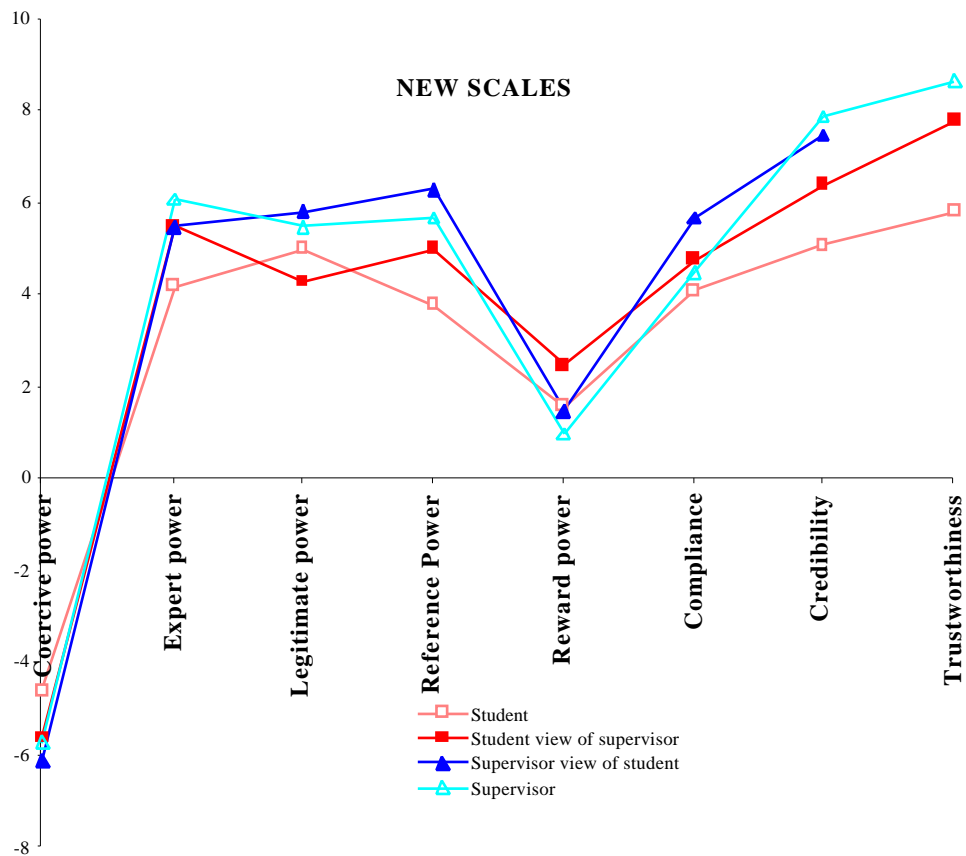


FIGURE 3: TRENDS OF POWER AND DERIVED VARIABLES BASED ON THE NEW VUT SCALES

The scales finally obtained reached an adequate Alpha level for wider usage (Table 12). Values of Alpha of 0.8 or above indicate a sound scale, while values of 0.7 and above are commonly used in a range of practical situations (Nunally, 1978).

TABLE 12: CRONBACH ALPHAS FOR THE FOUR DIFFERENT TYPES OF SCALES

Cronbach Alpha values	Student responses (t)	Supervisor as seen by Student (v)	Supervisor responses (t)	Student as seen by Supervisor (v)
Coercive Power	0.76	0.86	0.48	0.88
Expert Power	0.91	0.87	0.58	0.86
Legitimate Power	0.87	0.87	0.80	0.92
Referent Power	0.86	0.84	0.86	0.88
Reward Power	0.68	0.78	0.66	0.66
Compliance	0.80	0.78	0.40	0.70
Credibility	0.93	0.93	0.92	0.82
Trustworthiness	0.81	0.77	0.63	n/a
	0.XX	below 0.70	0XX	below 0.80

The sample sizes are fairly small. Further variations in item phrasing - and possibly additional items - are required to improve the performance of these scales. The

straightforward addition of further items would generally improve scale performance but, although results from the unassessed *a priori* scales have been presented to illustrate the effects, and the newly validated scales have been used for the analyses presented. This initial study confirms the need to extend and validate further individual items for Australian usage.

The strongest group of results for the new scales are those for students estimating how supervisors would complete the student survey form, and the weakest the views that supervisors ascribed to students.

Student views on how supervisors would complete the survey instrument questions offer a full range of scales at a practical level (Alpha ≥ 0.7), while the supervisors own responses show critical gaps. The Reward power scale performs poorly for the students' own responses.

The key Coercive power scale needs further work, and the results already suggest that supervisors do not see the impact of Coercive Power in the same terms as the graduate students.

Table 13 summarises the means and standard errors of the power scales for the full set of views for both types of survey. With these refined scales there are substantial differences in both mean levels of power perceived, and in the influence and attitude scales.

TABLE 13. DERIVED POWER AND RESPONSE MEANS BASED ON NEW SCALES

New scales	Student	se	Student view of supervisor	se	Supervisor view of student	se	Supervisor	se
Coercive power	-4.6	.47	-5.6	.54	-6.1	.80	-5.7	.59
Expert power	4.2	.50	5.5	.44	5.5	.71	6.1	.42
Legitimate power	5.0	.42	4.3	.41	5.8	.65	5.5	.48
Reference Power	3.8	.53	5.0	.45	6.3	.46	5.7	.49
Reward power	1.6	.40	2.5	.50	1.5	.75	1.0	.69
Compliance	4.1	.40	4.8	.39	5.7	.43	4.5	.54
Credibility	5.1	.47	6.4	.41	7.5	.20	7.9	.17
Trustworthiness	5.8	.49	7.8	.44	undefined scale		8.64	.39

Table 14 summarises T-tests of two of the several different forms of pair wise comparisons. Whilst there are marked differences are between supervisor and student views of several different power scales, there a significant differences between student

and supervisor on the influence and attitude scales of credibility, compliance and trustworthiness.

The attempts of each side to assess the others views lead to no significant differences in mean levels for any of the power scales other than Reward power – which is the scale that is weakest in terms of levels, and presents the lowest consistent Cronbach Alpha values across the different forms of scale. As distinct from the performance of the scale *per se*, the low levels of Reward power may also reflect a general lack of such incentives in the University environment, or a poor level of deployment of those that are available. The overall pattern of these results support the hypothesis 2.1: students and supervisors differ in their views and assessments of power relationships between them.

TABLE 14 COMPARISONS BETWEEN POWER PERSPECTIVES

	Supervisor \diamond student	Supervisor view of student view V Student view of supervisor view
Coercive power	*	
Expert power	*	
Legitimate power		
Reference Power	***	
Reward power		*
Credibility	***	
Compliance	***	***
Trustworthiness	No scale	*

The differences between the self (T) and other (V) scales for both student and supervisor surveys can also be addressed through analysis of variance and covariance of the hypothesised consequent are then the main effects, and the five power scale variables as covariates. Covariance analysis can also be used to explore the hints that there are campus or faculty effects.

The analyses of variance and covariance summarised in Table 16 confirm that the supervisor views relate poorly to the three consequential variables of Compliance, Credibility and Trustworthiness. However the student responses almost all show clear relationships for all bar Credibility implied by their personal views. All of the student views, whether or not they are estimates of their personal views or attempts to assess their supervisors views, show significant covariance influences. Significant main effects arose only for Trustworthiness and Compliance for Faculty, Campus and Gender.

The students own responses suggest that Trustworthiness varies with Faculty, and that when they try to assess the views of the supervisor, there are significant gender effects as well.

There are no significant relationships with Campus, which suggests that the cultures of the different faculties might have some influence, but that the merger impacts on different campuses do not appear to show up in this study. Only one consequent scale (Compliance as estimated by the supervisor for student views) showed a significant covariance; none of the estimates based on the supervisor's views showed any main effects.

TABLE 16. ANALYSIS OF VARIANCE: MAIN AND POWER SCALE COVARIANCE EFFECTS

	Scales	Covariates	Coercive	Expert	Legitimate	Referent	Reward	Main effects	Gender	Campus	Faculty
Students											
Trustworthiness (t)	Own (t)	***	COT***				RFT*	*			*
Trustworthiness (t)	Other (v)	***	COV***								
Supervisors											
Trustworthiness (t)	Own (t)										
Trustworthiness (t)	Other (v)						*				
Students											
Trustworthiness (v)	Own (t)	***	COT**	EXT*	LET*			**	**		**
Trustworthiness (v)	Other (v)	***	COV***								
Supervisors											
Trustworthiness (v)	Own (t)										
Trustworthiness (v)	Other (v)										
Students											
Compliance (t)	Own (t)	***			LET***						*
Compliance (t)	Other (v)	***	COV***		LEV***						
Supervisors											
Compliance (t)	Own (t)										
Compliance (t)	Other (v)										
Students											
Compliance (v)	Own (t)	***			LET***						
Compliance (v)	Other (v)	***			LEV***						
Supervisors											
Compliance (v)	Own (t)										
Compliance (v)	Other (v)				LFV*						
Students											
Credibility (t)	Own (t)	***		EXT***		RFT**					
Credibility (t)	Other (v)	***			LEV*						
Supervisors											
Credibility (t)	Own (t)										
Credibility (t)	Other (v)										
Students											
Credibility (v)	Own (t)	***									
Credibility (v)	Other (v)	***		EXV***		RFV*					
Supervisors											
Credibility (v)	Own (t)										
Credibility (v)	Other (v)										

Relationships to other survey variables

There are consistent indications in Table 16 that there is a relationship between Trustworthiness as perceived by the students, and the faculty. These will need further investigation, and a larger number of subjects.

TABLE 17 PEARSON CORRELATIONS BETWEEN VUPI POWER SCALES AND SATISFACTION WITH SUPERVISION LEVELS

Student survey responses #	Supervisor knowledge	Personal relationship	Supervisor compatibility	Supervisor problems	CMT	CMV
Supervisor knowledge	1.00				.22	.09
Personal relationship	.57**	1.00			.30**	.16
Supervisor compatibility	.32**	.44**	1.00		.17	.05
Supervisor problems	.28*	.21	.70**	1.00	.19	.18

	COT	COV	CRT	CRV	EXT	EXV	TRT
Supervisor knowledge	-.46**	-.15	.43**	.28*	.57**	.29*	.22
Personal relationship	-.64**	-.46**	.59**	.26*	.56**	.15	.58**
Supervisor compatibility	-.41**	-.20	.46**	.26*	.45**	.24	.23
Supervisor problems	-.25*	-.26*	.31*	.28*	.39**	.34**	.10

	LET	LEV	RFT	RFV	RWT	RWV	TRV
Supervisor knowledge	-.01	.14	.24*	.23	.22	.01	.03
Personal relationship	.04	.15	.63**	.59**	.33**	.09	.26*
Supervisor compatibility	.03	.20	.47**	.25*	.46**	.22	.00
Supervisor problems	.17	.27*	.26*	.28*	.32*	.20	.02

Supervisor survey responses #	Supervisor knowledge	Personal relationship	Supervisor compatibility	Supervisor problems	CMT	CMV
Supervisor knowledge	1.00				.33	.31
Personal relationship	.29	1.00			.05	.41*
Supervisor compatibility	-.06	.11	1.00		.00	.20
Supervisor problems	-.10	-.03	.80**	1.00	.12	.18

	COT	COV	CRT	CRV	EXT	EXV
Supervisor knowledge	.16	-.19	.42*	.39	.29	.31
Personal relationship	-.19	-.24	.38*	.42*	.12	.06
Supervisor compatibility	-.02	.21	-.13	.19	.65*	.76**
Supervisor problems	.04	.30	-.02	.03	.57**	.52**

	LET	LEV	RFT	RFV	RWT	RWV	TRT
Supervisor knowledge	.15	.03	.10	.02	.40*	-.12	-.04
Personal relationship	.32	.51**	.36	.33	.23	.13	-.13
Supervisor compatibility	-.01	.08	.04	.18	.22	-.38	-.25
Supervisor problems	-.08	-.11	.10	.03	.34	-.52*	.14

* p<0.05, ** p < 0.01 (two tailed test) # Coding: 1 for major difficulties to 5 for strong satisfaction

The student and supervisor surveys as a whole contain a number of questions which can be used to expand on the picture emerging from the previous analyses. The supervisor surveys showed no significant Pearson correlations with the number of students supervised - or even the undertaking of supervision training.

There are several key explicit questions on the degree of difficulty encountered between supervisor and student which can be used to check on the deductions from the power and consequent scales. These are: Q19c ('Supervision'), Q19d ('Compatibility with

supervisor'), and Q23f ('Personal relationship') and Q23h ('Shows a good knowledge of my research area').

Pearson correlations between these responses and the different power scales are shown in Table 17 for each of the surveys separately. The differences between the two halves of this Table are striking and show a broad-ranging asymmetry between the power perceptions of the two parties.

There are, however, a number of significant similarities. The student view of Compliance to the supervisor shows the same correlation with 'Personal relationship' as the supervisors own view of the students options. Supervisor compatibility and Supervisor problems are highly correlated for both students and supervisors indicating that student/supervisor mismatches are generally evident to both parties.

The differences illuminate the relationship further. For students, supervisor knowledge issues are a critical factor, significantly positively related to personal relationships, compatibility and general supervision problems - and significantly negatively related to Coercive power (COT for the students own view, COV for their view of the supervisors view). The students own views of Expert power, Referential power and Credibility of the supervisor are all positively related to all the left hand variables in Table 17. Reward power is significantly related to the personal relationship, compatibility and general supervisor satisfaction

Supervisors demonstrate a very different pattern of personal belief and belief about their students views. Coercive and Referential power show no significant relationships with the four supervisor satisfaction variables. Credibility is significantly related only to views on knowledge and supervisor relationship. In their view, students will consider that their Reward power will decline if there are few problems with their supervisor and that their legitimate power will rise with the quality of the personal relationship that the student feels exists between them.

Students relate Trustworthiness to their personal relationship with the supervisor, while the supervisors show no significant relationships between Trustworthiness and the four supervisor relationship variables.

Overall, these results lend support to the premise that the VUPI scales developed in this project are valid for use in examining the supervisor-graduate student relationship.

In the student survey (Table 6), the Campus of the subject was positively related to Coercive Power, and negatively to Credibility. Faculty was related negatively to both Compliance and Trustworthiness.

TABLE 18: REGRESSIONS FOR STUDENT SURVEY SCALE VARIABLES

Regressions(T T)	COT	LET	EXT	Faculty	RFT	Campus	Constant
<i>Coercive Power (t)</i>		0.27*			-0.61***	0.72*	1.1
Compliance (t)		0.71***	0.23***	-0.49**			0.88
Credibility (t)			0.53***		0.37***	-0.41*	2.37***
Trustworthiness (t)	-0.77***			-0.78*			4.07**

Regressions(T V)	COV	LEV	EXV	Faculty	RFV		Constant
<i>Coercive power (t)</i>	0.59***						-1.50
Compliance (t)	-0.28***	0.72***					-0.94*
Credibility (t)		0.43**			0.51***		1.06
Trustworthiness (t)	-0.68***			-0.66*			4.00**

Regressions(V V)	COV	LEV	EXV	Faculty	RFV	Campus	Constant
<i>Coercive Power (v)</i>			0.82*	-0.64***			-5.06***
Compliance (v)		0.50***			0.21*		1.59**
Credibility (v)			0.43***		0.39***		2.09***
Trustworthiness (v)	-0.64***						4.21***

Regressions(V T)	COT	LET	EXT	Faculty	RFT		Constant
<i>Coercive Power (v)</i>	0.66***	-0.30*					-0.92
Compliance (v)	-0.13*	0.73***					0.45
Credibility (v)		0.29*	0.39***				3.03***
Trustworthiness (v)	-0.53***						5.01***

*= p<0.05, ** = p<0.01, *** = p<0.001

The hints of interactions between faculty and campus with outcomes of the power scales was examined in more detail using analysis of variance, using gender, campus and faculty as main effects and with covariates from the same group of power variables as the factor being examined (ie. consistent with the T T (ie. Own view and own view) and V V (ie. Guessed view of the other and guessed view of the other) options in Table 18, which refer to the self reports (T) and assessments of the others' views (V)).

Linear stepwise multiple regression was used to explore the interactions between the scale variables, Campus, Faculty and Gender (Q2). The outcome variables were estimated using the power scale variable. Once for the same group of attitudes (ie student views) and again using the complementary views (ie. the student Trustworthiness assessment was predicted from the set of power variables attributed to the supervisor). Coercive Power was also predicted on the same basis as a key factor in all three of the outcomes, using all of the other power and outcome variables.

The results summarised in the last two tables suggest that further study of the campus and faculty effects would be desirable. The confounding of Campus and Faculty effects remains a problem in taking the analysis of the present project any further.

Table 19 shows some of the complementary supervisor and student perspectives on problems in the supervision relationship. The patterns reinforce the findings from the VUPI Power scales, where the supervisors underestimate the degree of concern in the relationship and the effects of the unequal power relationships involved.

Had it been possible to link student and supervisor responses, the potential links between the levels of problems encountered by the students and those perceived by the supervisors could have been explored. The asymmetries for supervisor knowledge suggest that perceived Expert power might be lacking in some such cases.

TABLE 19. PERCENTAGE OF PARTIES REPORTING PROBLEMS ON EACH SIDE OF THE SUPERVISORY RELATIONSHIP

Party	Student		Supervisor	
	Great problems	Some problems	Great problems	Some problems
Supervisor Problems	8	18		10
Supervisor Compatibility	8	13		2
Personal Relationship	7	7		5
Supervisor Knowledge	7	7		

DISCUSSION

Study 1 is the core of this thesis. It is the replication of the Aguinis et al (Aguinis et al., 1996) work using scales modified and developed for Australians. This study was restricted to the student perceptions of power relationships.

The analysis has been restricted to a specific area of the current survey, with only Faculty, Campus and gender being drawn from outside the instrument scales being tested. There are many other aspects of power and perception relationships that can be examined using this data. Some of these have been addressed in the other three studies.

- A series of scales based broadly on the Aguinis approach could be constructed and meet satisfactory levels of inter item correlation in an item analysis.

The scales for student self report required some modifications (Tables 3, 4), but the resulting scales demonstrate very similar quality of results (Table 15 shows the Cronbach Alpha values), although the mean levels of response were substantially different between the US and Australian samples for Coercive and Reward power.

The VUT modified power and consequent scales tested here confirmed that the Australian and American University environments and cultures have differences. The key difference being the prevalence of teaching assistantships in the US, leading to more complex - and possibly more salient - power relationships between supervisor and supervised. In addition, further scales covering mutual perceptions of power were also successfully developed allowing the subsequent and more complex hypotheses to be tested..

- Student perceptions of supervisor trustworthiness are negatively related to coercive power and positively to referent and expert power.

The Pearson correlations (Table 6) are significant and negative between Coercive power (COT) and Trustworthiness (TRT) ($r=-0.70$; $p<0.01$); and positive and significant between Referent power (RFT) and Trustworthiness ($r=0.64$; $p<0.01$) and between Expert power (EXT) and Trustworthiness ($r=0.45$; $p<0.01$). In the stepwise regressions reported in Table 18 for student self-perceptions, Trustworthiness is strongly negatively correlated with Coercive power ($p<0.001$). These results support this first hypothesis.

- Student perceptions of supervisor credibility are positively related to expert and referent power

Pearson correlations between Credibility (CRT) and Expert power are strongly positively correlated ($r=0.89$; $p<0.01$), and also between Credibility and Referent power ($r=0.79$; $p<0.01$). Stepwise regression analysis of the student perceptions of supervisor views (Table 18, (T V) group) picks out both Referent and Expert power as having strong positive coefficients ($p<0.001$) with Credibility (CRT) for students own views. These results support the second hypothesis.

Extending beyond the basic hypothesis to include other views on power relationships collected in the surveys, Referent and Expert power are both positively and significantly correlated with Credibility for the other variations in the current surveys. In the regression analysis reported in Table 18, Expert power is replaced by Legitimate power in some cases

- Student compliance is positively related to the student's view of the supervisor's Legitimate, Reward and Expert and Referent power.

The Pearson correlations between Compliance and these scales are all positive and significant (LET: $r=0.78$; $p<0.01$), (RWT: $r=0.60$; $p<0.01$), EXT: $r=0.66$; $p<0.01$) and (RFT: $r=0.55$; $p<0.01$). These results support this third hypothesis. However, regression analysis (Table 3) shows a more complex set of relationships than for the first two hypotheses. Legitimate and Expert power have significant positive coefficients in the stepwise regression results, but Faculty has a strong negative coefficient suggesting that there are effects across faculties that may need to be explored.

In the extended circumstances of the other versions of the power scales, Coercive power has a negative coefficient, and Legitimate power and Referent power both appear in some of the final stepwise regressions. Compliance as measured by supervisors and by students guessing at supervisor views, appears to vary more from the students own views than the other factors considered.

The initial hypotheses raised for testing have been supported, and the findings are in tune with the similar findings of Aguinis et al. for a US university.

The regression analysis (Table 3) shows that Coercive power and Faculty are both strongly negatively related to Trustworthiness, suggesting that there may be a relationship between the perception of Coercive power and the different Faculties

Extending beyond the basic hypotheses, which relate only to the students own perceptions, Coercive power remains the key variable (negatively in all cases) for student assessments of student Trustworthiness, and Expert and Referent power both appear as positive correlates, although not at a significant level in all cases when supervisor views and estimates of student options are included.

Extended hypotheses

Table 13 summarises differences between student views and student estimates of their supervisor's views: Coercive, Expert and Reference/Referent power and the derived attitude scales of Credibility and Trustworthiness all differ substantially. The levels of Trustworthiness held by the student and ascribed to the supervisor shows the largest difference, with the students assessing the supervisor as assuming a far higher level of

Trustworthiness than the students are prepared to ascribe. These results support hypothesis 2.1.

- Supervisors underestimate the extent of Coercive power that they are perceived to exert.

This does not appear to be the case. On the contrary, although there is a significant difference between the levels of Coercive power perceived between the parties ($p < 0.05$), the supervisors not only consider that they have a greater degree of Coercive power than the students think, but also their view as to what students think about this issue also is more severe than the students own views (Fig. 3, and Tables 13, 14). Hypothesis 3.1 is therefore **not** supported.

- Supervisors overestimate the degree of Expert and Referent power that they held.

This does appear to be the case (Fig. 3, and Tables 13, 14). The size and the direction of the difference are both significant (Expert power, $p < 0.05$; Referent power, $p < 0.001$). Hypothesis 3.2 is therefore supported.

As a result of obtaining the reflected views of the other party in the student-supervisor dyad and the additional supervisor survey, further insight can be obtained on the accuracy of the estimates of each party of the other.

Tables 13, 14 show that there are few significant differences between the mutual estimates of each others' views for Reward power, Compliance and Trustworthiness. The power of statistical tests for hypotheses concerning Reward power are not likely to be high using the current scales. The values obtained from all aspects are small, and there are few significant difference between any of the values (Tables 13, 14 and Figs. 2, 3).

The two parties appear to be fairly good at estimating what each other thinks are the levels of power exertion, although the derived attitudinal and behavioural outcome variables (of Compliance and Trustworthiness) still show significant differences. Hypothesis 2.2 is therefore supported for Coercive, Expert, Legitimate and Referent power, but is not supported for Reward power ($p < 0.05$).

Further work on items to measure Reward power is clearly desirable. Fresh or additional items for the Reward scale are needed to determine if the low values of Reward power obtained in the present work are an accurate representation of the limited

Reward power scope of VUT supervisors, or if this is an artefact of the scale items currently adopted.

Further implications of the study

The development of a series of scales (VUPI) for assessing power relationships between supervisors and graduate students provides a basis for further investigations of the relationships between these two groups. The context within which the scales have been administered has provided a broader context within which further support for the use of these scales has been adduced.

The resulting scales are in good agreement with those of Aguinis (Table 14), and with some care other cross-country comparisons and norms may profitably be pursued.

The further use of these scales on a larger sample would permit the hints of effects of cultural aspects of the different environments offered by different campuses and faculties to be examined more closely.

Some specific differences in perspective of the two groups (supervisors and graduate students) has been brought out in this study, and these offer a useful basis for improving the relationships between the two groups. There are persistent indications that there are differences between faculties. However, in the present design the associations between campuses and faculties operating on them partially confounds the effects of these two variables.

Analysis of covariance (Table 15) and regression results suggest that faculty variations have a influence on Trustworthiness both from a student standpoint - and from what the students perceive to be what the supervisors might assert. When examining the levels of Trustworthiness that the supervisor would surmise students would have, there is a significant Gender effect. Are there perhaps gender-related differences in the perceptions of supervisor assessments of students as suggested by the findings of Gilbert, 1985) that Expert power is a key factor in the development of the supervisor-graduate student role?.

The VUPI scales developed provide a useful starting point for further investigations. The differences between the USA and Australia may be more extensive than already identified. A series of focus groups should be used to tease out the constructs and issues related to supervisory power and student and indeed staff attitudes involve. It is

significant that some of the comments made by survey recipients on the staff included a acknowledged lack of knowledge as to what the students might be thinking.

The next stage of this work could then include the administration of the VUPI scales to a different University in order to establish the reliability and utility on a broader basis. This would also allow cultural differences between the Universities to be examined, a larger sample to be obtained to enhance the reliability of the scales and items, and help to determine if the VUPI may be developed into a broadly useful tool for Australian universities.

The issues raised in terms of the major differences in perception between students and supervisors are timely and it is hoped that this work will encourage further investigations in this important area.

Table 19 in particular demonstrates that there is a major gap to be bridged which is unlikely to be corrected solely by supervisor training and experience.

The availability of these scales provides a neutral basis for examining and discussing the difficult and sensitive issues of power in the relationships between graduate students and supervisors, in a manner that can open up this area for constructive development.

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APPENDIX A. THE AGUINIS ET AL (1996) US UNIVERSITY QUESTIONNAIRE

19 point Likert scale: -9 Strongly disagree (moderately)(slightly)neither(slightly agree)(moderately)(Strongly) +9. The coding was done from 18 (indicating strong disagreement to 1 indicating strong agreement. This is a range of 18 compared to -9 to +9 (a range of 19). The emboldened headings categorise the different groupings within the instrument

Coercive Power

can make my work difficult for me

can make things unpleasant here

can make being at the lab/office distasteful

* can give me undesirable assistantship-related assignments

Expert Power

can share with me her/his considerable experience/training

can give me good technical suggestions

can provide me with needed technical knowledge

can provide me with sound advice related to our field of study

Legitimate Power

can make me feel I have commitments to meet

* can make me feel like I should satisfy my assistantship requirements

can give me the feeling that I have responsibilities to fulfil

can make me recognise I have tasks to accomplish

Referent Power

can make me feel valued

can make me feel like (s)he approves of me

can make me feel personally accepted

can make me feel important

Reward Power

* can give me extra time off

can write a strong letter of recommendation on my behalf

can provide me with special benefits

can make my work easier

Trustworthiness

tends to take my ideas as her/his own (*Reversed scoring*)

manipulates me for her/his own ends (*Reversed scoring*)

gives me tasks to do which are not related to my graduate training (*Reversed scoring*)

is a manipulative person (*Reversed scoring*)

would not have me work on a project without giving me credit for it

Credibility

is a person who keeps her/his word

does what (S)he says (s)he will do

tells the truth

makes accurate statements of fact to me

is accurate in her/his statements to me

is honest

Compliance

is someone with whose directives I comply

is someone whose suggestions I follow

* denotes items that were modified and were further changed for Australian conditions.

APPENDIX B. VUPI VERSION OF THE POWER INSTRUMENT

Dimension **Survey question used** My supervisor

Coercive power

Coercive can make being at the lab/office distasteful

Coercive can make things unpleasant here

Coercive can make my work difficult for me

Coercive **<question deleted>**

Behavioural consequence

Compliance is someone with whose directives I comply

Compliance is someone whose suggestions I follow

Behavioural consequence

Credibility makes accurate statements of fact to me

Credibility does what (S)he says (s)he will do

Credibility is honest

Credibility is a person who keeps her/his word

Credibility tells the truth

Credibility is accurate in her/his statements to me

Expert power

Expert can provide me with needed technical knowledge

Expert can give me good technical suggestions

Expert can provide me with sound advice related to our field of study

Expert can share with me her/his considerable experience/training

Legitimate power

Legitimate **can make me feel like I should satisfy my university-paid work requirements**

Legitimate can give me the feeling that I have responsibilities to fulfil
Legitimate can make me feel I have commitments to meet
Legitimate can make me recognise I have tasks to accomplish

Referent

power

Referent can make me feel valued
Referent can make me feel like (s)he approves of me
Referent can make me feel important
Referent can make me feel personally accepted

Reward power

Reward can make my work easier
Reward can secure me conference funding support
Reward can provide me with special benefits
Reward can give me a strong reference

Outcome

Attitude

Trustworthiness gives me tasks to do which are not related to my graduate training
Trustworthiness tends to take my ideas as her/his own
Trustworthiness is a manipulative person
Trustworthiness would not have me work on a project without giving me credit for it
Trustworthiness manipulates me for her/his own ends

Bold type Indicates questions altered for the Australian trial application of the instrument

APPENDIX C SURVEY INTRODUCTION LETTER

TO: ALL RESEARCH STUDENTS
FROM: DIRECTOR
POSTGRADUATE STUDIES UNIT
SUBJECT: ANNUAL SURVEY

Each year, Victoria University of Technology surveys its research students. The questionnaire is based on one developed by Professor Ingrid Moses, then at ANU -- with some variations for our local conditions.

The survey tries to identify areas of strengths and weaknesses in the ways in which the University conducts its research education and training. The results are used to develop those areas which are seen needing further enhancement, new policies, needs identification, etc.

For this year, the survey has been modified to include a new perceptual scale about supervision. A lot of questions, but we hope useful information in identifying training needs for supervisors.

We are also sending a very similar to supervisors this year. This will allow us to find out how they see the research education at the University, and how this compares to the responses of students.

We ask that you complete the survey and return it to the Postgraduate Studies Unit, Footscray Campus, by 10 November 1997.

All surveys are voluntary and anonymous. If you have any questions, please call.

Thank you for your cooperation.

Adrian Fisher PhD

Head, Postgraduate Studies Unit

APPENDIX D SUPERVISOR SURVEY

CONFIDENTIAL

POST-GRADUATE RESEARCH STUDENT QUESTIONNAIRE **SUPERVISOR VERSION**

This questionnaire is a modification of a similar document prepared by Professor Ingrid Moses for students enrolled at the University of Technology, Sydney in 1992. Each year we survey the research students at VUT to find areas in which to improve our performance. New sections have been added for 1997.

In 1997, we are also using the survey with research student supervisor. This is an attempt to see their perceptions of the research training the University provides and the environment in which the students receive it. Various items have been added, removed or re-worded to be more suitable for supervisors.

PARTICIPATION IS VOLUNTARY. YOU MAY ANSWER, ALL, ANY OR NO QUESTIONS.

Please circle the most appropriate response(s)

- Q2 What is your sex?
- | | |
|--------|---|
| Male | 1 |
| Female | 2 |
- Q4 What is your highest tertiary qualification?
- | | |
|-------------------------------|---|
| Bachelor's degree | 1 |
| Postgraduate diploma | 2 |
| Bachelors degree with honours | 3 |
| Masters degree | 4 |
| PhD | 5 |
| Other (please specify.....) | 6 |
- Q4A Where did you earn your highest degree?
- | | |
|--|---|
| Victoria University of Technology | 1 |
| Other university in Melbourne | 2 |
| Other Australian university | 3 |
| A North American university | 4 |
| A European or British university | 5 |
| An Asian university | 6 |
| Other university (please specify)..... | 7 |
- Q5 How many research students do you currently supervise?
- | | |
|--|-----------|
| | 1 |
| | 2 |
| | 3 |
| | 4 |
| | 5 or more |
- Q5A How many research students have you supervised to graduation?
- | | |
|--|-----------|
| | 0 |
| | 1 |
| | 2 |
| | 3 |
| | 4 |
| | 5 or more |
- Q6 In which Faculty are you employed?.....
- Q6A On what campus are you based?
- Q12 Predominantly, how do YOUR STUDENTS finance their study?
- | | |
|---------------------------------------|---|
| Family assistance | 1 |
| Part-time employment | 2 |
| Full-time employment | 3 |
| Scholarship | 4 |
| Social security | 5 |
| Employer sponsorship (e.g. cadetship) | 6 |
| Other (please specify) | 7 |
- Q13 If any of YOUR STUDENTS has a scholarship, please indicate the source
- | | |
|-----------------------------------|---|
| Australian Postgraduate Award | 1 |
| Victoria University of Technology | 2 |
| Other, please specify..... | 3 |

- Q14 If YOUR STUDENTS are employed, what kind of work are they doing?
- | | |
|---|---|
| Research assistant | 1 |
| Academic appointment at VUT | 2 |
| Demonstrator/tutor appointment at VUT | 3 |
| Academic appointment at other university in Melbourne | 4 |
| Teacher in TAFE or school | 5 |
| Private professional practice | 6 |
| Industry appointment | 7 |
| Other (please specify) | 8 |

- Q16 Have YOU had any training for your supervision role?
- | | |
|-----|---|
| Yes | 1 |
| No | 2 |
- If yes, please give details.....

- Q18 To what extent did each of the following influence YOUR STUDENTS' decision to undertake a research higher degree? (You may circle more than one response)

Not at all	A lot
------------	-------

- | | | | | | |
|--|---|---|---|---|---|
| A. Aspiring to an academic career | 1 | 2 | 3 | 4 | 5 |
| B. To improve job prospects | 1 | 2 | 3 | 4 | 5 |
| C. Wanted to develop high level research skills for current profession | 1 | 2 | 3 | 4 | 5 |
| D. Extension of knowledge for current profession | 1 | 2 | 3 | 4 | 5 |
| E. Personal satisfaction from being engaged in research and discovery | 1 | 2 | 3 | 4 | 5 |
| F. Interested in change of career | 1 | 2 | 3 | 4 | 5 |
| G. Frustration, limited employment or promotion opportunities | 1 | 2 | 3 | 4 | 5 |
| H. Encouragement by family, friends, colleagues | 1 | 2 | 3 | 4 | 5 |
| I. Natural progression through education system | 1 | 2 | 3 | 4 | 5 |
| J. Satisfaction of being in a university environment | 1 | 2 | 3 | 4 | 5 |
| K. Got a scholarship | 1 | 2 | 3 | 4 | 5 |
| L. Could not find adequate employment | 1 | 2 | 3 | 4 | 5 |

- Q19 These are commonly experienced problems in higher degrees study. How much of a problem is each of the following for YOUR STUDENTS? Please circle one number on each line. (1 = great problem; 2 = some problem; 3 = minor problem; 4 = no problem;) (0 = not applicable)

Great	None	Not Applicable
-------	------	----------------

- | | | | | | |
|--|---|---|---|---|---|
| A. Workload | 1 | 2 | 3 | 4 | 0 |
| B. Availability of original source material or access to | | | | | |

- subjects for interviews and surveys
 1 2 3 4 0
- C. Supervision
 1 2 3 4 0
- D. Compatibility with supervisor
 1 2 3 4 0
- E. Access to supervisor
 1 2 3 4 0
- F. Intellectual isolation
 1 2 3 4 0
- G. Inability to progress further in research
 1 2 3 4 0
- H. Course not what expected
 1 2 3 4 0
- I. Own inadequate preparation for higher degree
 1 2 3 4 0
- J. Lost sight of original aim of study after leave of absence
 1 2 3 4 0
- K. Doubt about the value of degree for career
 1 2 3 4 0
- L. Competing demands of family and study
 1 2 3 4 0
- M. Competing demands of job and study
 1 2 3 4 0
- N. General financial problems
 1 2 3 4 0
- O. Language ability
 1 2 3 4 0
- P. Motivation
 1 2 3 4 0
- Q. Writing draft chapters
 1 2 3 4 0
- R. Statistical analysis
 1 2 3 4 0
- S. Research design and planning
 1 2 3 4 0
- T. Seminar presentation
 1 2 3 4 0
- U. Clear picture or requirements for a successful thesis
 1 2 3 4 0
- V. Access to laboratory or field equipment
 1 2 3 4 0
- W. Access to library resources
 1 2 3 4 0

ASPECTS OF HIGHER DEGREE SUPERVISION

Q20 In face-to-face consultations with YOUR STUDENT(s), what is the average frequency of meetings?

- | | |
|---------------------------|---|
| Daily | 1 |
| At least weekly | 2 |
| Fortnightly | 3 |
| Monthly | 4 |
| Every two to three months | 5 |
| Half yearly | 6 |
| Yearly | 7 |

Q22 If you have more than one supervisor how much does any of the following need improvement?

- Not at all A lot
- A. Balance of the contributions from each of the supervisors
 1 2 3 4 5
- B. Contribution between the supervisors
 1 2 3 4 5
- C. Contribution of second supervisor
 1 2 3 4 5

Q23 How satisfied are YOUR STUDENTS with the following aspects of your supervision?

- Not at all Very satisfied
- A. Frequency of consultations
 1 2 3 4 5
- B. Guidance on topic selection and definition
 1 2 3 4 5
- C. Guidance on research design, fieldwork/experiments
 1 2 3 4 5
- D. Feedback on reports/presentations and written work
 1 2 3 4 5
- E. Encouragement/stimulation
 1 2 3 4 5
- F. Personal relationship
 1 2 3 4 5
- G. Interaction with supervisor(s)
 1 2 3 4 5
- H. Shows a good knowledge of my research area
 1 2 3 4 5
- I. Engages in constructive discussions with me about my work
 1 2 3 4 5
- J. Has the supervisor participated substantially towards a joint publication
 1 2 3 4 5

Q24 Please mark the response YOU believe best represents YOU as a supervisor. MY SUPERVISOR:

a. can make me feel valued

Strongly Disagree Moderately Disagree Slightly Disagree Neither Disagree Slightly Agree Moderately Agree Strongly Agree

b. can make me feel like I should satisfy my university-paid work requirements

Strongly Disagree Moderately Disagree Slightly Disagree Neither Disagree Slightly Agree Moderately Agree Strongly Agree

c. gives me tasks to do which are not related to my graduate training

Strongly Disagree Moderately Disagree Slightly Disagree Neither Disagree Slightly Agree Moderately Agree Strongly Agree

d. can provide me with needed technical knowledge

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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e. makes accurate statements of fact to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

f. can make being at the lab/office distasteful

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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g. can make me feel like (s)he approves of me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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h. tends to take my ideas as her/his own

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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i. can make me feel important

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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j. does what (S)he says (s)he will do

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

k¹. can make me feel important

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

l. can make things unpleasant here

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

m. is someone with whose directives I comply

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

n. is honest

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

^{1 1} An item i was included on the Research Office form identical to item k subsequent to the submission of the instrument, and this additional item I was also erroneously printed (as shown here) as a runon for item h. Item k has been used for the analyses.

o. can secure me conference funding support

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

p. is a manipulative person

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

q. can provide me with special benefits

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

r. can give me good technical suggestions

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

s. would not have me work on a project without giving me credit for it

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

t. can provide me with sound advice related to our field of study

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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u. can make my work difficult for me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

v. is a person who keeps her/his word

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

w. can help me get paid work at the university

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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x. can give me the feeling that I have responsibilities to fulfil

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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y. tells the truth

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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z. can share with me her/his considerable experience/training

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

aa. manipulates me for her/his own ends

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

ab. can make me feel personally accepted

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ac. is someone whose suggestions I follow

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ad. can give me a strong reference

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ae. can make me feel I have commitments to meet

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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af. is accurate in her./his statements to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ag. can make me recognise I have tasks to accomplish

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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Q **S24A** Please mark the response you believe YOUR STUDENTS would make. MY SUPERVISOR:

a. Can make me feel valued

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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b. can make me feel like I should satisfy my university-paid work requirements

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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c. gives me tasks to do which are not related to my graduate training

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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d. can provide me with needed technical knowledge

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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e. makes accurate statements of fact to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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f. can make being at the lab/office distasteful

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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g. can make me feel like (s)he approves of me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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h. tends to take my ideas as her/his own

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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j. does what (S)he says (s)he will do

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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k². can make me feel important

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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l. can make things unpleasant here

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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m. is someone with whose directives I comply

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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n. is honest

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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o. can secure me conference funding support

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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p. is a manipulative person

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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q. can provide me with special benefits

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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² An item i was included on the Research Office form identical to item k. Item k has been used here.

Disagree Disagree Disagree Agree Agree Agree

r. can give me good technical suggestions

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

s. would not have me work on a project without giving me credit for it

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

t. can provide me with sound advice related to our field of study

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

u. can make my work difficult for me

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

v. is a person who keeps her/his word

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

w. can help me get paid work at the university

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

x. can give me the feeling that I have responsibilities to fulfil

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

y. tells the truth

Strongly Disagree Moderately Disagree Slightly Disagree Neither Slightly Agree Moderately Agree Strongly Agree

z. can share with me her/his considerable experience/training

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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aa. manipulates me for her/his own ends

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ab. can make me feel personally accepted

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ac. is someone whose suggestions I follow

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ad. can give me a strong reference

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ae. can make me feel I have commitments to meet

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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af. is accurate in her./his statements to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ag. can make me recognise I have tasks to accomplish

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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RESEARCH CULTURE

Q26 Please indicate how much the following assist YOUR STUDENTS in their studies. Please circle one response on each line. (SA = strongly agree; A = agree; N = Neutral; D = disagree; SD = strongly disagree;) (NA = not applicable)

FUNDING ACCESS

The level of funding is sufficient for their research work in each area:

A. Funding for library database searches/electronic document delivery

SA A N D SD NA

B. Funding for photocopying in the department/centre

SA A N D SD NA

C. Funding for photocopying in library	SA	A	N	D	SD	NA
D. Funding for incidentals	SA	A	N	D	SD	NA
E. Funding for conferences	SA	A	N	D	SD	NA
F. Funding for other travel connected with study	SA	A	N	D	SD	NA
G. Funding for fieldwork	SA	A	N	D	SD	NA
H. Funding for experimental work	SA	A	N	D	SD	NA
I. Funding for visits to other research teams or laboratories	SA	A	N	D	SD	NA
J. Opportunities for casual tutoring	SA	A	N	D	SD	NA

INFRASTRUCTURE ACCESS

K. Computing facilities	SA	A	N	D	SD	NA
L. Library books	SA	A	N	D	SD	NA
M. Library journals	SA	A	N	D	SD	NA
N. Library technical reports	SA	A	N	D	SD	NA
O. Access to data bases and electronic document delivery	SA	A	N	D	SD	NA
P. Laboratory space	SA	A	N	D	SD	NA
Q. Technical equipment	SA	A	N	D	SD	NA
R. Room or office space	SA	A	N	D	SD	NA
S. Desk	SA	A	N	D	SD	NA
T. Phone	SA	A	N	D	SD	NA
U. Audio-visual facilities	SA	A	N	D	SD	NA
V. Common Room	SA	A	N	D	SD	NA

SUPPORT FACILITIES

The level of support is sufficient for their research work

W. Training for library database access	SA	A	N	D	SD	NA
X. Training for general library use`	SA	A	N	D	SD	NA
Y. Intra-library loans	SA	A	N	D	SD	NA
Z. Loans from other universities	SA	A	N	D	SD	NA
aa. Representation on departmental committees	SA	A	N	D	SD	NA

bb. Technical support	SA	A	N	D	SD	NA
cc. Editorial support for writing	SA	A	N	D	SD	NA
dd. Typing	SA	A	N	D	SD	NA
ee. Mentor system	SA	A	N	D	SD	NA
ff. Seminars to present work	SA	A	N	D	SD	NA
gg. Research group meeting	SA	A	N	D	SD	NA
hh. Research methods seminars/advice	SA	A	N	D	SD	NA
ii. Access to visiting speakers and other experts	SA	A	N	D	SD	NA
jj. English language assistance programs	SA	A	N	D	SD	NA
kk. Orientation program of the department and/or the university	SA	A	N	D	SD	NA

AWARENESS OF OPPORTUNITIES

I make my students aware of the following opportunities

ll. Made aware of opportunities to publish	SA	A	N	D	SD	NA
mm. Made aware of opportunities to present at conferences	SA	A	N	D	SD	NA
nn. Made aware of opportunities for project funding	SA	A	N	D	SD	NA
oo. Made aware of visiting scholars to the university	SA	A	N	D	SD	NA

Q27 What kind of work do YOUR STUDENTS generally hope to undertake upon completion (or part completion) of their higher degree?

- A. Post doctoral fellowship or short term research fellowship
1
- B. Industry appointment
2
- C. Academic appointment
3
- D. Private professional practice
4
- E. Other (specify)
5

Q30 Please feel free to make any other comments regarding research studies at VUT.

THANK YOU
APPENDIX E STUDENT QUESTIONNAIRE

CONFIDENTIAL

POST-GRADUATE RESEARCH STUDENT QUESTIONNAIRE

This questionnaire is a modification of a similar document prepared by Professor Ingrid Moses for students enrolled at the University of Technology, Sydney in 1992. Each year we survey the research students at VUT to find areas in which to improve our performance. New sections have been added for 1997.

Please circle the most appropriate response(s)

- Q1 What is your age?
- | | |
|-------------|---|
| Under 25 | 1 |
| 25 - 29 | 2 |
| 30 - 34 | 3 |
| 35 - 39 | 4 |
| 40 and over | 5 |
- Q2 What is your sex?
- | | |
|--------|---|
| Male | 1 |
| Female | 2 |
- Q3 Is English your first language?
- | | |
|-----|---|
| Yes | 1 |
| No | 2 |
- Q4 What is the highest tertiary qualification you have prior to your enrolment as a research student at VUT
- | | |
|-------------------------------|---|
| Postgraduate diploma | 1 |
| Bachelor's degree | 2 |
| Bachelors degree with honours | 3 |
| Masters degree | 4 |
| Other (please specify.....) | 5 |
- Q5 In what degree are you enrolled?
- | | |
|---------------------|---|
| PhD | 1 |
| DBA | 2 |
| Masters by research | 3 |
- Q6 In which Department or Centre are you enrolled?
- Q6A On what campus are you based?
- Q7 What has been your enrolment status during this degree?
(please circle one number)
- | | |
|--|---|
| Always part-time | 1 |
| Always full-time | 2 |
| Commenced part-time and converted to full-time | 3 |
| Commenced full-time and converted to part-time | 4 |
| If 3 or 4, please explain..... | |
- Q8 When did you enrol in this degree?
- | | |
|-----------------|---|
| 1997 | 1 |
| 1996 | 2 |
| 1995 | 3 |
| 1994 | 4 |
| 1993 | 5 |
| 1992 | 6 |
| 1991 | 7 |
| 1990 | 8 |
| 1989 or earlier | 9 |

Q9	Have you ever taken leave of absence from your studies?	
	Yes	1
	No	2
Q10	If you answered YES to Q9 please explain why and for how long?	
Q11	Where did you earn your first degree?	
	Victoria University of Technology	1
	Other university in Melbourne	2
	Other Australian university	3
	Overseas university (please specify)....	4
Q12	How are you financing your study?	
	Family assistance	1
	Part-time employment	2
	Full-time employment	3
	Scholarship	4
	Social security	5
	Employer sponsorship (e.g. cadetship)	6
	Other (please specify)	7
Q13	If you have a scholarship please indicate the source	
	Australian Postgraduate Award	1
	Victoria University of Technology	2
	Other, please specify.....	3
Q14	If you are employed, what kind of work are you doing?	
	Research assistant	1
	Academic appointment at VUT	2
	Demonstrator/tutor appointment at VUT	3
	Academic appointment at other university in Melbourne	4
	Teacher in TAFE or school	5
	Private professional practice	6
	Industry appointment	7
	Other (please specify).....	8
Q15	If you are teaching in a university, for how many hours per week are you teaching?	
	2 or less	1
	3 - 4	2
	5 - 6	3
	7 or more (please specify)	4
Q16	Have you had any training for your teaching role?	
	Yes	1
	No	2
	If yes, please give details	
Q17	How many years of full-time paid employment have you had?	
	None	1
	Less than a year	2
	1 - 3 years	3
	4 - 5 years	4
	5 years or more	5

Q18 To what extent did each of the following influence your decision to undertake a research higher degree? (You may circle more than one response)

Not at all A lot

- | | | | | | |
|--|---|---|---|---|---|
| A. Am aspiring to an academic career | 1 | 2 | 3 | 4 | 5 |
| B. To improve job prospects | 1 | 2 | 3 | 4 | 5 |
| C. Wanted to develop high level research skills for current profession | 1 | 2 | 3 | 4 | 5 |
| D. Extension of knowledge for current profession | 1 | 2 | 3 | 4 | 5 |
| E. Personal satisfaction form being engaged in research and discovery | 1 | 2 | 3 | 4 | 5 |
| F. Interested in change of career | 1 | 2 | 3 | 4 | 5 |
| G. Frustration, limited employment or promotion opportunities | 1 | 2 | 3 | 4 | 5 |
| H. Encouragement by family, friends, colleagues | 1 | 2 | 3 | 4 | 5 |
| I. Natural progression through education system | 1 | 2 | 3 | 4 | 5 |
| J. Satisfaction of being in a university environment | 1 | 2 | 3 | 4 | 5 |
| K. Got a scholarship | 1 | 2 | 3 | 4 | 5 |
| L. Could not find adequate employment | 1 | 2 | 3 | 4 | 5 |

Q19 These are commonly experienced problems in higher degrees study. How much of a problem is each of the following for you in your postgraduate course? Please circle one number on each line. (1 = great problem; 2 = some problem; 3 = minor problem; 4 = no problem;) (0 = not applicable)

Great None Not Applicable

- | | | | | | | |
|--|---|---|---|---|---|---|
| A. Workload | 1 | 2 | 3 | 4 | 0 | |
| B. Availability of original source material or access to subjects for interviews and surveys | 1 | 2 | 3 | 4 | 0 | |
| C. Supervision | 1 | 2 | 3 | 4 | 0 | |
| D. Compatibility with supervisor | 1 | 2 | 3 | 4 | 0 | |
| E. Access to supervisor | | 1 | 2 | 3 | 4 | 0 |
| F. Intellectual isolation | 1 | 2 | 3 | 4 | 0 | |
| G. Inability to progress further in research | 1 | 2 | 3 | 4 | 0 | |
| H. Course not what expected | 1 | 2 | 3 | 4 | 0 | |
| I. Own inadequate preparation for higher degree | 1 | 2 | 3 | 4 | 0 | |
| J. Lost sight of original aim of study after leave of absence | | | | | | |

	1	2	3	4	0
K. Doubt about the value of degree for career	1	2	3	4	0
L. Competing demands of family and study	1	2	3	4	0
M. Competing demands of job and study	1	2	3	4	0
N. General financial problems	1	2	3	4	0
O. Language ability	1	2	3	4	0
P. Motivation	1	2	3	4	0
Q. Writing draft chapters	1	2	3	4	0
R. Statistical analysis	1	2	3	4	0
S. Research design and planning	1	2	3	4	0
T. Seminar presentation	1	2	3	4	0
U. Clear picture or requirements for a successful thesis	1	2	3	4	0
V. Access to laboratory or field equipment	1	2	3	4	0
W. Access to library resources	1	2	3	4	0

ASPECTS OF HIGHER DEGREE SUPERVISION

- Q20 In face-to-face consultations with your supervisor(s), what is the average frequency of meetings?
- | | |
|---------------------------|---|
| Daily | 1 |
| At least weekly | 2 |
| Fortnightly | 3 |
| Monthly | 4 |
| Every two to three months | 5 |
| Half yearly | 6 |
| Yearly | 7 |
- Q21 How many supervisors do you have?
- | | |
|----------------------|---|
| One | 1 |
| Two | 2 |
| More? (specify.....) | 3 |
- Q22 If you have more than one supervisor how much does any of the following need improvement?
- | | | | | |
|--|-------|---|---|---|
| Not at all | A lot | | | |
| A. Balance of the contributions from each of the supervisors | | | | |
| 1 | 2 | 3 | 4 | 5 |
| B. Contribution between the supervisors | | | | |
| 1 | 2 | 3 | 4 | 5 |
| C. Contribution of second supervisor | | | | |
| 1 | 2 | 3 | 4 | 5 |
- Q23 How satisfied are you with the following aspects of your supervision?

Not at all

Very satisfied

- A. Frequency of consultations
1 2 3 4 5
- B. Guidance on topic selection and definition
1 2 3 4 5
- C. Guidance on research design, fieldwork/experiments
1 2 3 4 5
- D. Feedback on reports/presentations and written work
1 2 3 4 5
- E. Encouragement/stimulation
1 2 3 4 5
- F. Personal relationship
1 2 3 4 5
- G. Interaction with supervisor(s)
1 2 3 4 5
- H. Shows a good knowledge of my research area
1 2 3 4 5
- I. Engages in constructive discussions with me about my work
1 2 3 4 5
- J. Has the supervisor participated substantially towards a
joint publication
1 2 3 4 5

Q24 Please mark the response YOU believe best represents your supervisor. MY SUPERVISOR:

a. Can make me feel valued

_____	_____	_____	_____	_____	_____	_____
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree

b. can make me feel like I should satisfy my university-paid work requirements

_____	_____	_____	_____	_____	_____	_____
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree

c. gives me tasks to do which are not related to my graduate training

_____	_____	_____	_____	_____	_____	_____
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree

d. can provide me with needed technical knowledge

_____	_____	_____	_____	_____	_____	_____
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree

e. makes accurate statements of fact to me

_____	_____	_____	_____	_____	_____	_____
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree

f. can make being at the lab/office distasteful

_____	_____	_____	_____	_____	_____	_____
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree

g. can make me feel like (s)he approves of me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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h. tends to take my ideas as her/his own

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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i. can make me feel important

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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j. does what (S)he says (s)he will do

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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k. can make me feel important

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Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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o. can secure me conference funding support

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v. is a person who keeps her/his word

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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w. can help me get paid work at the university

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x. can give me the feeling that I have responsibilities to fulfil

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y. tells the truth

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z. can share with me her/his considerable experience/training

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af. is accurate in her./his statements to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ag. can make me recognise I have tasks to accomplish

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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Q S24A Please mark the response you believe YOUR SUPERVISOR would make MY SUPERVISOR:

a. Can make me feel valued

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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b. can make me feel like I should satisfy my university-paid work requirements

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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c. gives me tasks to do which are not related to my graduate training

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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d. can provide me with needed technical knowledge

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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e. makes accurate statements of fact to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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f. can make being at the lab/office distasteful

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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g. can make me feel like (s)he approves of me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
-------------------	---------------------	-------------------	---------	----------------	------------------	----------------

h. tends to take my ideas as her/his own

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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i. can make me feel important

j. does what (S)he says (s)he will do

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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k. can make me feel important

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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l. can make things unpleasant here

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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m. is someone with whose directives I comply

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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n. is honest

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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o. can secure me conference funding support

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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p. is a manipulative person

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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q. can provide me with special benefits

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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r. can give me good technical suggestions

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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s. would not have me work on a project without giving me credit for it

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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t. can provide me with sound advice related to our field of study

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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u. can make my work difficult for me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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v. is a person who keeps her/his word

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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w. can help me get paid work at the university

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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x. can give me the feeling that I have responsibilities to fulfil

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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y. tells the truth

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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z. can share with me her/his considerable experience/training

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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aa. manipulates me for her/his own ends

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ab. can make me feel personally accepted

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ac. is someone whose suggestions I follow

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ad. can give me a strong reference

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ae. can make me feel I have commitments to meet

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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af. is accurate in her./his statements to me

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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ag. can make me recognise I have tasks to accomplish

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither	Slightly Agree	Moderately Agree	Strongly Agree
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Q25 Do you consider that any aspects of your supervision are seriously impeding your progress? If yes, please comment

RESEARCH CULTURE

Q26 Please indicate how much the following assist you in your studies. Please circle one response on each line. (SA = strongly agree; A = agree; N = Neutral; D = disagree; DS = strongly disagree;)
(NA = not applicable)

FUNDING ACCESS

The level of funding is sufficient for my research work

- | | | | | | | | |
|----|--|----|---|---|---|----|----|
| A. | Funding for library database searches/electronic document delivery | SA | A | N | D | DS | NA |
| B. | Funding for photocopying in the department/centre | SA | A | N | D | DS | NA |
| C. | Funding for photocopying in library | SA | A | N | D | DS | NA |
| D. | Funding for incidentals | SA | A | N | D | DS | NA |
| E. | Funding for conferences | SA | A | N | D | DS | NA |
| F. | Funding for other travel connected with study | SA | A | N | D | DS | NA |
| G. | Funding for fieldwork | SA | A | N | D | DS | NA |
| H. | Funding for experimental work | SA | A | N | D | DS | NA |
| I. | Funding for visits to other research teams or laboratories | SA | A | N | D | DS | NA |
| J. | Opportunities for casual tutoring | SA | A | N | D | DS | NA |

INFRASTRUCTURE ACCESS

K. Computing facilities	SA	A	N	D	DS	NA
L. Library books	SA	A	N	D	DS	NA
M. Library journals	SA	A	N	D	DS	NA
N. Library technical reports	SA	A	N	D	DS	NA
O. Access to data bases and electronic document delivery	SA	A	N	D	DS	NA
P. Laboratory space	SA	A	N	D	DS	NA
Q. Technical equipment	SA	A	N	D	DS	NA
R. Room or office space	SA	A	N	D	DS	NA
S. Desk	SA	A	N	D	DS	NA
T. Phone	SA	A	N	D	DS	NA
U. Audio-visual facilities	SA	A	N	D	DS	NA
V. Common Room	SA	A	N	D	DS	NA

SUPPORT FACILITIES

The level of support is sufficient for my research work

W. Training for library database access	SA	A	N	D	DS	NA
X. Training for general library use	SA	A	N	D	DS	NA
Y. Intra-library loans	SA	A	N	D	DS	NA
Z. Loans from other universities	SA	A	N	D	DS	NA
aa. Representation on departmental committees	SA	A	N	D	DS	NA
bb. Technical support	SA	A	N	D	DS	NA
cc. Editorial support for writing	SA	A	N	D	DS	NA
dd. Typing	SA	A	N	D	DS	NA
ee. Mentor system	SA	A	N	D	DS	NA
ff. Seminars to present work	SA	A	N	D	DS	NA
gg. Research group meeting	SA	A	N	D	DS	NA
hh. Research methods seminars/advice	SA	A	N	D	DS	NA
ii. Access to visiting speakers and other experts	SA	A	N	D	DS	NA
jj. English language assistance programs						

SA A N D DS NA
kk. Orientation program of the department and/or the university
SA A N D DS NA

AWARENESS OF OPPORTUNITIES

I have been made aware of the following opportunities

ll. Made aware of opportunities to publish
SA A N D DS NA
mm. Made aware of opportunities to present at conferences
SA A N D DS NA
nn. Made aware of opportunities for project funding
SA A N D DS NA
oo. Made aware of visiting scholars to the university
SA A N D DS NA

Q27 What kind of work do you hope to undertake upon completion (or part completion) of your higher degree?

- A. Post doctoral fellowship or short term research fellowship 1
- B. Industry appointment 2
- C. Academic appointment 3
- D. Private professional practice 4
- E. Other (specify) 5

Q28 If you are hoping to gain an academic appointment, what is it that makes academic work attractive to you?

Q29 If you are not intending to undertake an academic appointment upon completion of your higher degree what would encourage you to pursue an academic career?

Q30 Please feel free to make any other comments regarding your study at VUT.

THANK YOU

APPENDIX F Computation of power and outcome scores

Initial item structures

The coding of the survey was done on a basis of 18 from the left hand side ranging up to 1 at the right.: a range of 18 instead of 19 This requires adjustments to match the findings of Anguinis (1966) who used -9 to +9, a range of 19 points. Thus for comparability any appropriate Anguinis (1996) question responses in the present report have been scaled by 18/19 when compared with Anguinis.

Negative values of question responses are therefore agreement, positive are disagreement.

The computation of the values of the different power and outcome measures are therefore as follows for Student (the q24 series): for Supervisor (the s24 series). Student summary measure names end in **t** and supervisor in **v**. An **r** at the end of a

question number indicates a reversed value is used (ie q24hr = 17- q24h). These values are applied within the SPSS files.

Aguinis Student response scale items: Student views of selves

Power measures

- Coercive power (cot) = 9.5 - (q24f + q24l + q24u) / 3
- Expert power (ext) = 9.5 - (q24d + q24r + q24t+ q24z) / 4
- Legitimate power (let) = 9.5 - (q24b + q24x + q24ae + q24ag) / 4
- Referent power (ret) = 9.5 - (q24a+ q24g + q24k + q24ab) / 4
- Reward power (rwt) = 9.5 - (q24o + q24q + q24w+ q24ad) / 4

Outcome measures

- Trustworthiness (trt) = 9.5 - (q24s + q24cr + q24hr + q24aar + q24pr) / 5
- Credibility (crt) = 9.5 - (q24e + q24j + q24n + q24v + q24y + q24af) / 6
- Compliance (cmt) = 9.5 - (q24m + q24ac) / 2

Final VUPI Student response scale items: Student views of selves

Power measures

- Coercive power (cot) = 9.5 - (q24f + q24l + q24u) / 3
- Expert power (ext) = 9.5 - (q24d + q24r + q24t+ q24z) / 4
- Legitimate power (let) = 9.5 - (q24x + q24ae + q24ag) / 3
- Referent power (ret) = 9.5 - (q24a+ q24g + q24k) / 3
- Reward power (rwt) = 9.5 - (q24o + q24q + q24w+ q24ad) / 4

Outcome measures

- Trustworthiness (trt) = 9.5 - (q24s + q24cr + q24hr + q24aar + q24pr) / 5
- Credibility (crt) = 9.5 - (q24e + q24n + q24y + q24af) / 5
- Compliance (cmt) = 9.5 - (q24m + q24ac) / 2

Final VUPI Student response scale items: Student views of supervisors entries

Power measures

Coercive power (cov) = $9.5 - (s24f + s24l) / 2$

Expert power (exv) = $9.5 - (s24d + s24r + s24t + s24z) / 4$

Legitimate power (lev) = $9.5 - (s24x + s24ae + s24ag) / 3$

Referent power (rev) = $9.5 - (s24a + s24g + s24k) / 3$

Reward power (rwv) = $9.5 - (s24o + s24q + s24w + s24ad) / 4$

Outcome measures

Trustworthiness (trv) = $9.5 - (s24cr + s24hr + s24aar + s24pr) / 4$

Credibility (crv) = $9.5 - (s24e + s24j + s24n + s24v + s24y + s24af) / 6$

Compliance (cmv) = $9.5 - (s24m + s24ac) / 2$

Final VUPI Supervisor response scale items: Supervisors own views

Power measures

Coercive power (cot) = $9.5 - (q24l + q24u) / 2$

Expert power (ext) = $9.5 - (q24d + q24r + q24z) / 3$

Legitimate power (let) = $9.5 - (q24x + q24ae + q24ag) / 3$

Referent power (ret) = $9.5 - (q24a + q24g + q24k + q24ab) / 4$

Reward power (rwt) = $9.5 - (q24o + q24q + q24w) / 3$

Outcome measures

Trustworthiness (trt) = $9.5 - (q24s + q24cr + q24hr + q24aar + q24pr) / 5$

Credibility (crt) = $9.5 - (q24n + q24v + q24y) / 3$

Compliance (cmt) = $9.5 - (q24m + q24ac) / 2$

Final VUPI Supervisor response scale items: Supervisors ratings of the students views

Power measures

Coercive power (cov) = $9.5 - (s24f + s24u) / 2$

Expert power (exv) = $9.5 - (s24d + s24r) / 2$

Legitimate power (lev) = $9.5 - (s24x + s24ae + s24ag) / 3$

Referent power (rev) = $9.5 - (s24a + s24g + s24ab) / 3$

Reward power (rwv) = $9.5 - (s24o + s24q + s24w) / 3$

Outcome measures

Trustworthiness (trv) = **NO ITEMS CONTRIBUTED TO AN EFFECTIVE SCALE**

Credibility (crv) = $9.5 - (q24e + q24j + q24n + q24v + q24y + q24af) / 6$

Compliance (cmv) = $9.5 - (q24m + q24ac) / 2$