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The Role of Interpersonal Comfort, Attributional Confidence, and Communication Quality in Academic Mentoring Relationships

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The aim of this study was to explore mentoring between supervisors and their postgraduate students by (a) investigating types of mentoring functions offered in academic mentoring relationships, (b) exploring perceptions of supervisors and their postgraduate students about provisions for mentoring support, and (c) examining how interpersonal comfort, attributional confidence, and communication quality relate in mentoring relationships. Structural equation modelling (SEM) was used on 148 students matched with their supervisors. Results indicated that interpersonal comfort, attributional confidence, and communication quality were positively associated with psychosocial and instrumental support in mentoring relationships. Supervisors rated themselves as providing significantly more support than their students rated them.

Introduction

According to the Australian Bureau of Statistics (2011), student enrolments in postgraduate courses increased 89.7% between 2000 and 2009. Doctoral degrees conferred in the United States

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increased by 29.1% between 2000 and 2009 (National Centre for Education Statistics, 2011). This increase in students entering into postgraduate work has concomitantly increased the need for student supervision by postgraduate supervisors. Effective supervisor relationships are important to postgraduate students because these relationships enhance students' academic and professional development and opportunities (Wilde & Schau, 1991).

Berk, Berg, Mortimer, Walton-Moss, and Yeo (2005) defined mentoring relationships in education as relationships "that may vary along a continuum from informal/short-term to formal/long-term in which faculty with useful experience, knowledge, skills and/or wisdom offers advice, information, guidance, support, or opportunity to another faculty member or student for that individual's professional development" (p. 67). At the postgraduate level, students' reported benefits in mentoring relationships have included development of professional skills and identities, enhanced confidence, dissertation success, increased networking, and satisfaction with one's doctoral program (Clark, Harden, & Johnson, 2000; Johnson, Koch, Fallow, & Huwe, 2000). Good supervisor-student relations facilitate students' socialisation into academia (Austin, 2002) and development of research skills, collaboration, and shared decision-making on research projects (Koro-Ljungberg & Hayes, 2006). Academic mentoring also allows supervisors to feel more fulfilled and stimulated by seeing students grow professionally and intellectually (Busch, 1985). Additionally, successful mentorships benefit universities because students who have mentors are more likely to be aware of their universities' missions and values than are students who do not have mentors (Ferrari, 2004).

Tenenbaum, Crosby, and Gliner (2001) found that mentoring among university supervisors and their postgraduate students has three functions: psychosocial, instrumental, and networking support. For psychosocial support, mentors empathize with protégés' feelings and concerns. Instrumental support provided by supervisors is skill specific: Supervisors teach students to use

specific software or help them with their writing skills. For networking support, mentors introduce postgraduate students to other prominent researchers in their fields.

Tenenbaum et al. (2001) were the first and only researchers to explore the three functions of mentoring. However, their research was conducted within one university as such, they suggested that "it would be useful to repeat the survey at another postgraduate school to replicate the three [functions]" (p. 228). Therefore, the overarching goal of this study was to gain greater insights into postgraduate-supervisor relationships by studying processes and outcomes that occur among supervisors and their postgraduate students from seven Australian universities. More specifically, we had three aims: (a) to confirm whether the three-function model of mentoring that Tenenbaum et al. proposed would apply to a group of supervisors and students from seven Australian universities; (b) to investigate whether academic supervisors rate themselves as providing significantly higher psychosocial, instrumental, and networking support than their students rate them; and (c) to examine intrapersonal and interpersonal processes that impact academic mentoring functions. Specifically, we examined the relationships among three specific processes (interpersonal comfort, communication quality, and attributional confidence) within psychosocial, instrumental, and networking support (see Figure 1 on page 19).

Dyadic Research About Mentoring

Ragins (1997) suggested that the developmental experience of mentoring relationships involves a reciprocal exchange of responsibility and effort among mentors (supervisors) and protégés (postgraduate students). Although mentorships involve both mentors and protégés, there is a lack of dyadic research about mentoring relationships (Chao, 1998). Tennenbaum et al. (2001) explored the functions provided by academic supervisors to their postgraduate research students, but Tennenbaum et al. only surveyed students and did not survey academic supervisors.

Chao (1998) noted that dyadic research about mentorship is vitally important because it allows for more in-depth analyses of both parties involved in mentoring relationships. In the limited dyadic research about mentoring that is available, findings have suggested that mentors and protégés perceive mentoring relationships differently (Ensher & Murphy, 1997; Godshalk & Sosik, 2000; Waters, 2004; Waters, McCabe, Kiellerup, & Kiellerup, 2002). Results from Atwater's and Yammarino's (1997) self-other agreement model indicated that supervisors will engage in self-enhancement biases and will overrate the positive nature of mentoring relationships and the degree to which they are providing beneficial supervision to their postgraduate students.

The dearth of dyadic research about mentoring relationships represents a significant gap in this field of inquiry and has prompted several researchers to call for empirical research exploring the unique behavioural and perceptual processes of dyadic mentoring relationships (Chao, 1998; Ragins, 1997). Based on the results from Atwater's and Yammarino's self-other agreement model, it is hypothesized that academic supervisors will rate themselves as providing significantly higher psychosocial, instrumental, and networking support than will their students.

Academic Mentoring Functions

Interpersonal comfort. Interpersonal comfort allows both parties in mentoring relationships to express their views freely with one another and to understand each other (Rusbult, Martz, & Agnew, 1998) and creates psychologically safe relationships for both parties through interpersonal support (Ortiz-Walters & Gilson, 2005). Witkowski and Thibodeau (1999) reported that interpersonal comfort helps supervisors and students successfully bond with each other. We posited that supervisors and students who experience higher degrees of interpersonal comfort in the mentorship will also experience more positive mentoring functions because interpersonal comfort facilitates unobstructed mentorship and greater understanding.

Communication quality. Communication quality also influences mentoring functions. In writing about their personal experiences in mentoring doctoral students, Kramer and Martin (1996) noted the importance of clear communication as a factor in effective academic mentoring. Better communication quality among mentors and protégés indicates greater understanding of each other's messages, allowing for mentors to provide mentoring support more easily. We posited that supervisors and students who have better communication quality will also experience better mentoring support.

Attributional confidence. Attributional confidence is defined as "the degree to which people are able to understand and predict how others will behave" (Gelfand, Kuhn, & Radhakrishnan, 1996, p. 58). The concept of attributional confidence stems from the concept of attributional processes, which enable people to make judgments about others' behaviours to understand, explain, and predict their behaviours. Berger and Calabrese (1975) suggested that greater attributional confidence results from fewer alternative explanations for others' behaviours.

To date, the role of attributional confidence in mentoring relationships has not been studied. However, indirect evidence for the role of attributional confidence in postgraduate-supervisor relationships was presented by Gelfand et al. (1996) who found that people in employee-supervisor relationships that had higher attributional confidence reported greater relationship satisfaction. We posited that supervisors and students who can accurately recognize and predict each other's behavioural patterns because of greater attributional confidence will exhibit higher degrees of mentoring support.

Original Hypotheses

> H01: Academic supervisors will rate themselves as providing significantly higher psychosocial, instrumental, and networking support than their matched students will rate them. Additionally, supervisors will indicate greater

interpersonal comfort, communication quality, and attributional confidence in their mentoring relationships than will their postgraduate students.

H02: Interpersonal comfort will be positively associated with the three functions of mentoring (psychosocial, instrumental, and networking support).

H03: Communication quality will be positively associated with the three functions of mentoring (psychosocial, instrumental, and networking support).

H04: Attributional confidence will be positively associated with the three functions of mentoring (psychosocial, instrumental, and networking support).

Methods

Participants

Seven major Australian universities agreed to participate in this research. A total of 403 Master's-by-research and PhD students completed an online questionnaire. Their nominated supervisors were subsequently contacted by email. Of those contacted, 148 supervisors responded by completing the online questionnaire (37.0% response rate). The majority of the student sample in the dyad group were female (64.9%) and were earning their PhDs (76.4%) on a full-time basis (71.6%). Students ranged in age from 23 to 69 years (M = 34.12; SD = 10.83). Supervisors who responded to the invitation email were mostly males (52.7%) from different faculties, including Arts (26.4%), Engineering (9.5%), Science (12.2%), Medicine and Health Sciences (25.0%), and Economics (7.4%). Supervisors ranged in age from 23 to 66 years (M = 48.03; SD = 9.05). The median number of mentorship years among supervisors and students was 2 years (M = 2.37; SD = 1.39), and the majority of dyads met once a fortnight (N = 55; 37.2%), followed by once a month (N = 37; 25.0%).

Materials and Procedures

Materials. A self-report questionnaire for each dyad member was developed comprising the measures described in the following subsections. Question wording in the student and supervisor questionnaires was changed to be appropriate for each respective dyad member who was responding.

Independent variables. The independent variables of this study included the following:

Interpersonal comfort. Interpersonal comfort was measured using a 10-item scale. Two items of the 10 items were taken from the study by Allen et al. (2005) about interpersonal comfort in organizational mentorships. We constructed the remaining eight items to increase the reliability of this scale, and scores ranged from 10 to 70, with higher scores indicating greater levels of interpersonal comfort being experienced in the mentorship. The following is an example item from the scale for interpersonal comfort: "I can approach problems openly with my supervisor (student)."

The scale for interpersonal comfort was subjected to factor analysis to establish the validity of the scale. Cronbach's alpha coefficients for interpersonal comfort on both the supervisor and student questionnaires displayed high internal consistency ($\alpha = .96$ and .97, respectively). Also, an exploratory factor analysis (EFA) conducted on the scale indicated a one-factor solution, explaining 80.4% of the variance for the student scale, and 72.3% of the variance for the supervisor scale. Based on the results of these analyses, we determined that the scale was valid and could be reliably used to interpret results.

Communication quality. Communication quality was measured by an index developed by Gelfand et al. (1996). The 3-item index was designed to measure supervisor' and students' perceived understanding of one another's communications. The following is an example item from the index for communication quality: "My

supervisor (student) always tries to make sure I understand what he/she is saying." Scores for the three items in the index could range from 3 to 21, with higher scores indicating greater communication quality experienced in the mentoring relationship. Cronbach's alpha coefficients for communication quality on both the supervisor and student questionnaires displayed high internal consistency (α = .78 and .80, respectively).

Attributional confidence. Attributional confidence was measured using three items from Gudykunst's and Nishida's (1986) attributional confidence scale and one item added by Gelfand et al. (1996). This 4-item scale was developed to reflect supervisors' and students' ability to predict one another's behaviour. The following is an example item from the scale for attributional confidence: "How confident are you in your general ability to predict how he/she will behave?" Scores on this scale could range from 4 to 20, with higher scores indicating greater confidence in predicting behaviours. Cronbach's alpha coefficients for attributional confidence on both supervisor and student questionnaire displayed high internal consistency (α = .82 and .84, respectively).

Dependent variables. The following mentoring functions were the dependent variables of this study: psychosocial, instrumental, and networking support. Psychosocial, instrumental, and networking support were measured using 15 items selected from the 17-item survey by Dreher and Ash (1990). Following Tenenbaum's et al.'s (2001) suggestion, two items were excluded because they were irrelevant to this study because they measured aspects of organizational mentoring, not academic mentoring. To replace those two items, Tenenbaum et al. added four items to the 15-item scale to measure specific aspects of networking support, and we did the same. Items were measured using a 7-point Likert scale, and responses ranged from 1 (not at all) to 7 (a great deal). The final 19-item scale had 10 psychosocial items, 6 instrumental items, and 3 networking items, and Tenenbaum et al. reported that Cronbach's alpha coefficients for these items were .93, .83, and .80 respectively.

Procedures. Procedures for this study included factor analysis and modelling dyadic data using SEM. To assess the validity of the questionnaire, study variables were subjected to EFA, followed by a confirmatory factor analysis (CFA). The latter was used to refine the solutions initially provided by the EFA and to identify and address any weak secondary relationships among items and functions (Neilands & Choi, 2002). Given that supervisors' and students' perceptions are not independent, Kenny, Kashy, and Cook (2006) recommended a specific method for modelling dyadic data. Following their instructions, each structural model was drawn twice, one for each dyad member (i.e., first for supervisors and then for students). Exogenous variables (i.e., intrapersonal and interpersonal processes) were correlated across supervisors and students, and between-dyad member covariation between the same residual variable for each dyad member was also allowed (Kenny et al., 2006).

Fit indices. The goodness-of-fit of the models was estimated using both "absolute fit" and "incremental fit" indices. Absolute fit values indicate the difference between the implied covariance matrix and the observed covariance matrix, and incremental fit indices estimate the degree to which the model in question is "superior to an alternative model" (Hoyle & Panter, 1995, p. 165), which is invariably the null model in which no covariation is being explained by the model specification.

Chi-square (χ^2) statistics are recommended to measure absolute fit of a model (Boomsma, 2000; Hoyle & Panter, 1995). However, χ^2 can be sensitive to minor misspecifications in a model, and in such circumstances, its sole use can lead to rejection of the model for larger samples with non-normally distributed data when trivial differences between the model and the data are present. Following the recommendations of Hu and Bentler (1999) and Hoyle and Panter (1995), we used several other goodness-of-fit measures in addition to χ^2.

The root mean square error of approximation (RMSEA) was used to estimate the degree of population discrepancy per degree of freedom (Spence, Rapee, McDonald, & Ingram, 2001). RMSEA values range from 0, which indicates an exact fit, upwards. According to Browne and Cudeck (1993), RMSEA values less than .05 indicate close fit, and RMSEA values between .05 and .08 indicate reasonable fit.

Standardised root mean square residual (SRMR) was also used to measure model fit. SRMR represents the average of the model residuals in a standardized metric and has a range of 0 to 1. In a close fitting model, SRMR should preferably be less than .05 (Byrne, 2001); values less than .08 indicate adequate fit, especially in moderate-sized samples.

Finally, comparative fit index (CFI) was used to measure incremental fit. CFI provides a population-based measure of complete covariation in the data, effectively taking sample size into account (Byrne, 2001). CFI values range from 0 to 1. A cut-off value of approximately .95 or greater indicates close fit (Byrne, 2001), with values exceeding .90 indicating adequate fit (Spence et al., 2001).

SEM was used to determine closeness of fit between the over-identified hypothesised model (a restricted covariance matrix) and the sample covariance matrix. Large discrepancies for any individual covariance between covariance matrices of the sample and the model were identified by inspecting the size of the standardised residual covariance matrix in AMOS, which was used in this study to identify areas of obvious misfit in the model for any of the covariances between two observed variables. Values greater than ±2.58 in magnitude are considered large and indicative of inadequate fit for the two variables involved (Byrne, 2001). All standardized residuals should preferably be less that ±2.00 in value, which indicates that the model was an acceptably close approximation to the data (more so than the values of various global fit measures like CFI and RMSEA).

Results

Tenenbaum et al. (2001) were the first to examine the three mentoring functions of postgraduate-supervisor relationships and concluded that their survey needed to be validated in further samples. Therefore, we used Horn's parallel test (1965) to test the three-function structure of Tenenbaum's et al.'s survey. The parallel test for each group indicated that mentoring functions were best reflected by a two-function solution instead of the three-function solution proposed by Tenenbaum et al., so the two-function model was further investigated. A CFA was used to test mentoring functions for both supervisors and students. A two-function model was specified and tested against the three-function model found by Tenenbaum et al. Specifically, an initial two-function model was determined by combining the three items from the networking-support function to the six items from the instrumental-support function identified by Tenenbaum et al.

SRMR values indicated that the two-function model (SRMR = .067) is equivalent to the three-model (SRMR = .069) in its degree of fit. Additionally, the three-function model revealed a total of 20 standardized residual covariances exceeding an absolute value of two; the two-function model only had 15 standardized residuals exceeding an absolute value of two. Subsequently, data gathered from the three-function model was also tested against the modified two-function model to ascertain its fit. The two-function mentor model was recursive and produced 190 distinct sample moments, 44 distinct parameters to be estimated, and 146 degrees of freedom. Results yielded the following values: χ^2 (146) = 410.46; $p < .001$; SRMR = .077; CFI = .79; and RMSEA = .110 (90% CI: .098, .128). Because of these results, we decided that the two-function model of mentoring was the preferred model and was the best fit to the data for supervisors and students. The model revealed that both supervisors and students conceptualised mentoring functions as consisting of psychosocial and instrumental support, with no separate function being identified for networking support. Therefore, subsequent analyses of

mentoring functions were based on psychosocial and instrumental support.

Given that networking support was not found to represent a third distinct mentoring function based on the CFA, the hypotheses could not be directly tested as they were originally conceptualised. Therefore, the hypotheses were modified to remove the networking function. The modified hypotheses were still used to test the same underlying predictions and relationships (i.e., intrapersonal and interpersonal processes are positively associated with mentoring).

Modified Hypotheses

> H01a: Academic supervisors will rate themselves as providing significantly higher psychosocial and networking support than their matched students will rate them. Additionally, supervisors will indicate greater interpersonal comfort, communication quality, and attributional confidence in their mentoring relationships than will their postgraduate students.
>
> H02a: Interpersonal comfort will be positively associated with the two functions of mentoring (psychosocial and instrumental support).
>
> H03a: Communication quality will be positively associated with the two functions of mentoring (psychosocial and instrumental support).
>
> H04a: Attributional confidence will be positively associated with the two functions of mentoring (psychosocial and instrumental support).

Testing H01a

Table 1 presents descriptive statistics for both supervisors and students for interpersonal comfort, communication quality, attributional confidence, psychosocial support, and instrumental support.

Table 1. *Descriptive Statistics and F-Values for Dependent and Independent Variables Across Supervisor and Student Samples*

Variables	Mean	*SD*	Max	*F*	*p*
Interpersonal Comfort			7	4.04	.040
Supervisors	5.69	1.06			
Students	5.39	1.52			
Communication Quality			7	25.92	<.001
Supervisors	4.55	1.20			
Students	5.24	1.48			
Attributional Confidence			5	.24	.620
Supervisors	3.83	.66			
Students	3.87	.71			
Psychosocial Support			5	1.26	.260
Supervisors	3.69	.64			
Students	3.59	.95			
Instrumental Support			5	1.63	.200
Supervisors	3.12	.84			
Students	2.99	1.04			

A one-way between subjects MANOVA was performed to assess differences in scores for mentoring support (psychosocial and instrumental support) and intrapersonal and interpersonal processes (interpersonal comfort, communication quality, and attributional confidence) between supervisors and students. Pillais' test revealed a global difference between the two groups ($F(5,289) = 15.10$, $p < .001$). Supervisors rated mentoring relationship as having significantly higher interpersonal comfort and themselves as having significantly higher communication quality than their students rated them, which supported H01a.

Testing H02a, H03a, and H04a

Tables 2 and 3 present intercorrelations for the dependent and predictor variables for supervisors and students, which will be discussed further in another section of this paper. The same general trend was observed for both groups: there were significant correlations among interpersonal comfort, communication quality, and attributional confidence.

Table 2. *Correlations Among Dependent and Predictor Variables for Supervisors*

	Instrumental Support		Psychosocial Support		Attributional Confidence		Communication Quality	
Attributional Confidence	.300	*	.550	*				
Communication Quality	.150		.390	*	.570	*		
Interpersonal Comfort	.250	*	.490	*	.680	*	.770	*

Note. $N = 148$. $^*p < .05$, 2 tailed.

Table 3. *Correlations Among Dependent and Predictor Variables for Students*

	Instrumental Support		Psychosocial Support		Attributional Confidence		Communication Quality	
Attributional Confidence	.370	*	.540	*				
Communication Quality	.400	*	.640	*	.520	*		
Interpersonal Comfort	.560	*	.810	*	.660	*	.680	*

Note. $N = 148$. $^*p < .05$, 2 tailed.

Figure 1 presents the path diagram and the respective standardised direct effects for the relationships among interpersonal comfort, communication quality, and attributional confidence, psychosocial support, and instrumental support. In assessing Figure 1 and standardised direct effects from intrapersonal and interpersonal processes to mentoring functions, the largest observed standardised direct effect was from intrapersonal and intrapersonal processes to psychosocial support in students (.85). The second largest standardised direct effect was from intrapersonal and intrapersonal processes to instrumental support in students (.58). In comparison, the standardised direct effects for supervisors were not as large: intrapersonal and intrapersonal processes to psychosocial support was .57 and intrapersonal and intrapersonal

processes to instrumental support was .27. These findings indicate that H02a, H03a, and H04a were supported. Specifically, interpersonal comfort, communication quality, and attributional confidence were found to significantly and positively predict the two functions of mentoring (psychosocial and instrumental support) in both the student and supervisor samples.

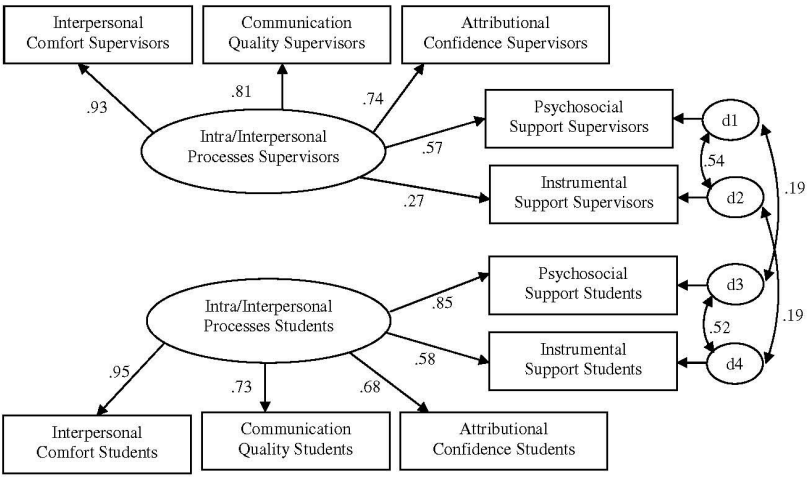

Figure 1. Path diagram representing the statistically significant standardized effects for the relationship between intrapersonal and interpersonal processes and mentoring functions. Unique functions for each observed indicator measures of intrapersonal and interpersonal support have been left out of the model depiction for ease of inspection.

Discussion and Implications

The aims of the present paper were threefold. First, we aimed to validate the three mentoring functions of Tennenbaum et al. (2001): psychosocial, instrumental, and networking support. Second, we used a dyadic methodology to investigate if supervisors and postgraduate students shared the same perspective about the degree to which interpersonal comfort, communication quality, attributional confidence, psychosocial support, and

instrumental support were present in their mentoring relationships. Third, we examined whether interpersonal comfort, communication quality, and attributional confidence influenced the provision of mentoring support between postgraduate research students and their supervisors.

Contrary to Tenenbaum's et al.'s (2001) assertion that academic mentoring had three functions of support, the results of this study revealed that academic mentoring consist of two distinct functions: psychosocial support and instrumental support. Networking support was conceptualized as being part of instrumental support. Academic psychosocial support includes being a role model, showing empathy for students' feelings and concerns, and encouraging students to prepare for the next steps of their careers. Instrumental support includes exploring career options with students, providing students with authorship opportunities, and helping students improve their writing skills. The results of this study also revealed that both supervisors and students considered mentor actions, such as "giving challenging assignments and opportunity to learn new skills" and "helping meet other people in the field either at the University or elsewhere" (Tenenbaum et al., 2001, n.p.), to be forms of instrumental support. These results should not be interpreted as suggesting that intrapersonal and interpersonal processes did not correlate with networking support. Rather, these results indicate that the present sample viewed networking as an activity within instrumental support.

A notable finding of this study is the significant difference in supervisors' and students' perceptions of interpersonal comfort and communication quality. Supervisors reported significantly higher levels of interpersonal comfort and communication quality than did their students. These findings are in line with those of other dyadic studies in which mentors and protégés perceived elements of mentorship differently (Waters, 2004). In particular, the findings of this study are somewhat similar to those by Godshalk and Sosik (2000), who found that mentors overestimated their behaviours in regards to transformational leadership.

Supervisors may have overestimated these functions due to lack of accurate feedback from their students. For instance, students may not have honestly communicated their feedback to supervisors, resulting in supervisors' overestimation. Furthermore, Atwater's and Yammarino's (1997) model of self-other rating agreement suggests a number of characteristics that may influence individuals' self-perceptions. Of particular interest to this study is the suggestion that people who are over-estimators are less sensitive to others' feelings, hold less accurate and realistic self-perceptions, and are less likely to monitor themselves than are people who are not over-estimators. According to Bass and Yammarino (1991), supervisors who overrate themselves may become complacent in the mentoring support they provide to students. This is in line with Ensher's and Murphy's (1997) suggestion that "a more positive mentoring relationship would produce higher levels of agreement between the mentor and the protégé than a less satisfying relationship in which the mentor may feel compelled to answer in a socially desirable matter" (p. 477).

The results of this study highlight the need for dyadic research methodologies to investigate supervisor-student relationships, which supports Chao's (1998) criticisms of the current practice of most mentoring researchers who investigate only one party (i.e., either supervisors or students). These results also highlight the need to educate supervisors and students about reducing perceptual gaps in mentoring relationship (see the Implications for Future Researchers section for more information about reducing perceptual gaps in mentoring relationships).

The results of this study support research by Allen et al. (2005) and by Ortiz-Walters and Gilson (2005) because the results show that interpersonal comfort is an important aspect of mentoring relationships. Interpersonal comfort allows both parties to express their views freely and create psychologically safe relationships for both parties through interpersonal support (Ortiz-Walters & Gilson, 2005). This finding may seem relatively straightforward, but few researchers have actually tested interpersonal comfort as a

function in mentoring relationships. Hence, this finding highlights the importance of interpersonal comfort in mentoring.

The results of this study suggest that when supervisors proactively develop interpersonal comfort with their students, their mentoring functions will be enhanced. Higher levels of interpersonal comfort can reduce barriers to mentoring relationships (e.g., anxiety and frustration), which then facilitates providing and receiving mentoring support. Furthermore, it has been suggested that protégés select mentors who have greater interpersonal competence over those who are perceived as being less interpersonally competent (Olian, Carroll, Giannantonio, & Feren, 1988). It can be inferred that supervisors and students who are interpersonally competent may be more able to increase the level of interpersonal comfort in mentoring relationships than are those who are not interpersonally competent. This may be because individuals who are interpersonally competent are more attentive to feedback cues of other parties (Atwater & Yammarino, 1997) and are subsequently more likely to adjust their behaviours appropriately.

Results of this study also supported H03a (i.e., communication quality would be positively associated with psychosocial and instrumental support). Supervisors and students who can communicate effectively and understand each other's points of view experience greater levels of mentoring support. In their theory of the coordinated management of meaning, Pearce and Cronen (2006) suggested that relationship quality is based on communication quality between persons. Additionally, the process of communication between two people enables meaning to be generated and discovered, which affects the way people interact (Pearce & Cronen, 2006). Pearce and Cronen argued that greater quality of communication can improve the way people interact and collaborate with one another. Hence, reciprocal understanding within mentorships is likely to increase the chances that guidance, suggestions, instructions, queries, advice, and expectations are communicated in a way that creates common understanding. Being understood, in turn, increases the effectiveness of

collaboration in relationships (Kramer & Martin, 1996) because supervisors and students are able to get their desired messages across, potentially reducing uncertainty and increasing rapport.

Results of this study also supported H04a (i.e., attributional confidence would be positively associated with psychosocial and instrumental support). Attributional confidence enables supervisors and students to make judgments about one other in order to understand, explain, and predict one another's behaviours (Gudykunst & Nishida, 1986). Findings from this study suggest that the benefits of communication quality and attributional confidence can be translated to academic mentoring relationships and that supervisors and students who confidently predict each other's attitudes and behaviours are also likely to have mentorships that are characterized by high levels by of psychosocial and instrumental support. In his uncertainty reduction theory, Berger (2006) asserted that increase in information-seeking, communication, and nonverbal warmth reduce relationship uncertainty, thereby increasing attributional confidence. Hence, supervisors and students who participated in this study may have experienced greater attributional confidence as their mentorships progressed. Greater attributional confidence may also reduce the number of alternative explanations of behaviours within supervisor-student relationships, thereby reducing relationship anxiety.

Methodological Considerations

This study has several theoretical and methodological strengths this study involved dyadic mentoring research about the unique perceptual processes of individual supervisor-student pairings. A comparatively large sample size within the mentoring research field was recruited for this study, and pre-established and well-validated measures were used to test the study's constructs.

Despite its strengths, the present study is limited by a number of methodological concerns. Given the cross-sectional field study, the capacity to establish cause and effect is limited (Fife-Schaw,

2000). For instance, we assumed that intrapersonal and interpersonal processes impact the provision of mentoring support. However, the provision of mentoring support may influence intrapersonal and interpersonal processes. Alternatively, another unknown function (e.g., personality traits, including openness and agreeableness) might be directly related both to mentoring support and to greater interpersonal comfort, communication quality, and attributional confidence.

Another methodological concern about this study is the nature of online surveys. The benefits of using online surveys are ease and efficiency of collection compared to paper-and-pencil surveys and minimal interaction between researchers and participants, which may reduce the risk of biasing participants with experimenter expectations (Heiman, 1995). These benefits were useful for this study, but using online surveys may have reduced the potential sample size because there were a large number of "return to sender," "bouncing" of email addresses that were no longer current, and "out of office" replies when participation invites were emailed. This is similar to other findings about how using online surveys that reduced potential sample size (Sheehan & McMillan, 1999). The length of the online surveys could also have reduced sample size because online surveys seem unduly long, especially because an average print page can take up the space of several computer screens (Sheehan & McMillan, 1999). However, it is doubtful that changing the mode of surveying to traditional mail techniques would have altered the present findings or significantly increased the number of participants, this study still had a larger sample size then most other dyadic mentoring studies.

In considering the study findings, it should be recognised that there is a potential sample bias towards the academic mentoring relationships coming from the sciences and this could have influenced our results. It may be that supervisors in the sciences exercise greater control and ownership of the research topic than do supervisors in humanities fields where students are expected to have proposed a topic of their own. This greater degree of control over the research project may have influenced the ways in which

instrumental support is provided by supervisors in the sciences compared to other fields. However, we do not believe that faculty/discipline area would promote differences in the psychosocial aspect of the mentoring relationship such as mentors empathy towrard students feelings and concerns. Moreover, the foundational relationship constructs assessed in this study (e.g. interpersonal comfort, attributional confidence, and communication quality) are not expected to differ in supervisor and student relationships across different faculties.

It should also be noted that the findings suggesting networking support to be a subset of instrumental support could reflect a bias toward the Australian context. It may be that in other contexts, networking support may play a larger part in the mentoring relationship.

Implications for Future Researchers

Notwithstanding these limitations, the findings of this study about academic mentoring were significant and have both practical and theoretical implications. Specifically, these findings are encouraging for academic supervisors because intrapersonal and interpersonal processes can be improved through faculty and student training. Given that the mentor-protégé dyad has been described as an intense and emotionally charged relationship (Hunt & Michael, 1983), it is important to improve the intrapersonal and interpersonal processes of these relationships.

Aspects of interpersonal comfort may be improved by hosting events for supervisors and students to interact with each other. Allen et al. (2005) suggested "offering opportunities for individuals to relate to each other and discover shared experiences in a relaxed atmosphere may help bridge difficulties encountered initially" (p. 166). Supervisors can also adopt strategies that increase the personal aspect of their mentorships, such as having occasional meetings over lunch with their students. Additionally, nonverbal positive teaching behaviours (e.g., smiling, nodding,

and maintaining eye contact) can also increase interpersonal comfort in mentorships (Jussim & Eccles, 1992).

Aspects of communication quality can be improved by training supervisors and students in effective communicative strategies to convey their expectations and voice any concerns when they arise. Verbal teaching behaviours (e.g., praising and providing detailed quality feedback) also potentially enhance communication among mentoring pairs (Jussim & Eccles, 1992). Jussim and Eeles (1992) suggested that encouraging more responsiveness and providing more opportunities for clarification are functions in conveying positive expectations to students. Another way to improve communication quality is to enhance how computer-mediated communication (CMC) is utilised. Whiting and de Janasz (2004) noted the benefits of CMC to "complement or substitute face-to-face mentoring sessions (p. 276). Supervisors and students may feel more comfortable emailing to communicate problematic issues, complex issues of theory or logic, or even personal matters with one another (Whiting & de Janasz, 2004). Email communications may allow messages to be communicated more clearly because writing emails requires some thought about the questions and matter being discussed. Communication training by academic institutions could use CMC to teach supervisors and students how to enhance their communication quality.

Attributional confidence may be improved by increasing the frequency of supervisors' and students' meetings. Increased contact between supervisors and students potentially increases the likelihood that they are able to pick up on each other's habits and behaviours, which will enable them to predict each other's actions. Mentorship training should aim to increase supervisors' and students' engagement with each other, which may decrease any discomfort experienced in mentoring relationships.

Academic institutions should also monitor and reward supervisors for positive mentoring. Supervisors' mentoring behaviours can be assessed through peer and student ratings (Johnson, 2002; Johnson et al., 2000). Monitoring and rewarding appropriate mentoring

behaviours of supervisors can not only improve intrapersonal and interpersonal processes in mentoring relationships but also increase supervisors' awareness of their behaviours, potentially reducing the likelihood for supervisors to overrate themselves.

Conclusions

Contrary to Tenenbaum's et al.'s (2001) three functions of academic mentoring (i.e., psychosocial, instrumental, and networking support), results of this study revealed that supervisors and students understood mentoring support to be delineated into two functions (i.e., psychosocial and instrumental support, which was incorporated into Tenenbaum's et al.'s separate concept of networking support). However, the results of this study confirmed that interpersonal comfort, communication quality, and attributional confidence are important elements to consider in mentoring relationships among academic supervisors and postgraduate students. Training initiatives can be developed to help supervisors improve interpersonal comfort, communication quality, and attributional confidence with their students. Given increasing trends towards greater postgraduate supervision, further research is required to understand antecedents in mentoring relationships that lead to supervisor-student success.

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