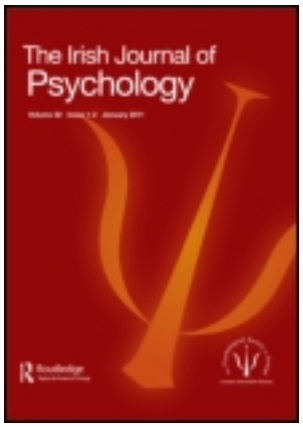

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Examination of importance ratings and self-estimates in ten domains of intelligence: Evidence among a sample of UK and Irish university students

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Previous research has demonstrated sex differences favouring males in self-estimates of logical-mathematical and spatial intelligence (e.g., Swami, Furnham, & Kannan, 2006), and has also examined the influence of beliefs about intelligence on how individuals estimate their own intelligence (e.g., Furnham & Ward, 2001). However, though research shows that individuals place a higher value on attributes that they feel they possess (e.g., Baumgardner, 1990), research has not examined the effect in the context of intelligence, for example, the influence of importance ratings of intelligence on self-estimates of intelligence, or whether sex differences exist in importance ratings of intelligence. A sample of 342 UK and Irish distance and evening educated university students provided self-estimates and importance ratings in ten domains of intelligence. Results indicated significant positive associations between importance ratings and self-estimates for each of the ten domains of intelligence. Additionally, males rated themselves significantly higher than did females in logical-mathematical and spatial intelligence, thus supporting previous research. However, a different pattern was evident in sex differences in importance ratings, with females providing significantly higher importance ratings in verbal and interpersonal intelligence than did males. These results provide an important insight into how males and females conceptualise and value intelligence.

Introduction

Previous research has demonstrated sex differences favouring males in self-estimates of domains of intelligence such as logical-mathematical and spatial (e.g., Furnham & Buchanan, 2005; Furnham & Bunclark, 2006; Furnham & Chamorro-Premuzic, 2005; Furnham, Clark, & Bailey, 1999; Furnham, Rakow, & Mak, 2002; Furnham, Reeves, & Budhani, 2002; Furnham, Tang, Lester, O'Connor, & Montgomery, 2002; Furnham

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& Thomas, 2004; Furnham & Ward, 2001; Swami, Furnham, & Kannan, 2006). These represent the 'male-normative' intelligences described by Furnham (2001), and are also the types of intelligence that underpin many traditional psychometric measures of intelligence. For example, the Raven's Progressive Matrices series of intelligence tests (e.g., Raven, 1938, 1958) are well-known, and commonly utilised, measures of general (fluid) intelligence, are comprised entirely of spatial rotation tasks, and purport to provide a training system for abstract reasoning ability.

Additionally, since the first study by Furnham and colleagues that investigated self-estimates in domains of intelligence (i.e., Furnham et al., 1999), many of the subsequent studies in this research area have included single-item questions designed to assess beliefs of participants about intelligence (e.g., "Do you believe that intelligence is primarily inherited?"; "Do you believe that some races are more intelligent than others?"), and attitudes of participants towards IQ testing (e.g., "Have you ever taken an IQ test before?"; "Do you believe that IQ tests measure intelligence fairly well?"), hypothesising that beliefs and attitudes about intelligence and intelligence testing may influence the way individuals estimate their own intelligence.

Results across many studies have to a large extent supported this hypothesis. For example, Furnham and Ward (2001) found that participants who believed that IQ tests were effective in measuring intelligence gave higher self-estimates in verbal intelligence. More recent studies (e.g., Furnham, Wytykowska, & Petrides, 2005) have focused on the beliefs of participants regarding the malleability of intelligence, based on the theory of entity versus incremental theories of intelligence (see Dweck, 2004) by including items such as "Do you believe one can learn to become more intelligent?". The item, however, that most consistently predicts self-estimation of overall IQ (aside from sex, which remains a consistent predictor) is whether the participant has ever taken an IQ test before, followed by the degree to which the participant believes that IQ tests are effective in measuring intelligence (e.g., Furnham & Buchanan, 2005; Furnham & Chamorro-Premuzic, 2005; Furnham & Ward, 2001; Furnham et al., 2005).

What has not been assessed to date is the degree to which the importance attached to a specific intelligence will influence how the individual rates themselves on that intelligence. Research suggests that individuals perceive their own attributes to be the equivalent of possessions (Abelson, 1986). Additionally, individuals place more importance on, and value more, those attributes that they believe that they possess, and equally may devalue or describe as unimportant or undesirable those attributes that they believe that they do not possess (e.g., Baumgardner, 1990; Hill, Smith, & Lewicki, 1989; Krueger, 1998 ['self-enhancement bias']; Lewicki, 1983 ['self-image bias'], 1984; Sinha & Krueger, 1998).

On the basis of previous research, therefore, it can be extrapolated that in order to enhance and maintain their self-image (i.e., 'self-enhancement bias', Krueger, 1998; 'self-image bias', Lewicki, 1983), an individual is more likely to rate as important to themselves those intelligences in which they have also given themselves higher estimates. Therefore, it would be expected that sex differences favouring males for logical-mathematical and spatial intelligence would be coupled with similar sex differences in importance ratings for these intelligences.

The present study was designed to examine this premise. The aims of the present

research were firstly to establish whether there were significant associations between self-estimates of intelligence and importance ratings in ten domains of intelligence, and secondly to establish whether sex differences in self-estimates of ten domains of intelligence were mirrored by sex differences in importance ratings of the same ten domains of intelligence. It was therefore hypothesised that the score attributed by a participant to a particular intelligence domain would be directly and positively related to the degree of importance attached by the participant to that domain of intelligence. Furthermore, it was hypothesised that males would rate themselves significantly higher than would females in self-estimates and importance ratings of what are termed the 'male-normative' intelligences (Furnham, 2001), namely logical-mathematical and spatial intelligence. Whilst specific hypotheses were not stated, exploratory analyses also considered sex differences in self-estimates and importance ratings in the non-male-normative domains of intelligence.

Method

Participants

The sample comprised a total of 342 UK and Irish university students aged 18 to 58 years (mean age 30.44, SD 10.01), of whom 97 were males aged 19 to 55 years (mean age 30.07, SD 9.67) and 245 were females aged 18 to 58 years (mean age 30.58, SD 10.16). The majority of participants were social science/psychology students (with the exception of eight computing students). The present sample comprised 110 distance learning students and 232 evening class students.

Materials

In addition to providing their age and sex, participants were required to complete the following measures:

i) Self-Estimated Intelligence Questionnaire (SEIQ; Furnham, 2000; Furnham, Tang, Lester, O'Connor, & Montgomery, 2002)

The SEIQ is a self-report measure comprising ten single items designed to allow participants to provide estimates of their own intelligence. Participants were shown a normal distribution curve with a mean of 100 and three standard deviations above and below the mean. Typical IQ scores were suggested, and a descriptor provided for each standard deviation (e.g., +2 = 130: 'superior'; -1 = 85: 'low average'). Below the normal distribution curve participants were provided with a table in which there were brief written descriptions of each of the ten multiple intelligences (based on Gardner, 1983, 1999: verbal, logical-mathematical, spatial, musical, body-kinesthetic, interpersonal, intrapersonal, existential, spiritual, and naturalistic) with an empty cell beside each description where participants recorded their self-estimates in each of these intelligences. The SEIQ has been shown to be temporally stable over one week, three weeks, 20 weeks, and one year (see Cruise, Lewis, & Mc Guckin, 2006).

ii) Importance Rating of Multiple Intelligences Scale (IRMIS; Cruise & Lewis, 2008)

The IRMIS is a self-report measure consisting of ten single items devised by the authors for the purpose of this research, and was designed to assess to what extent participants would positively/negatively endorse those items for which they had already provided

high/low self-estimates in the SEIQ. Participants were asked to rate the importance to themselves of each of the ten multiple intelligences based on the same brief descriptions that had been provided in the SEIQ (see item i) above), the precise wording of instructions being as follows: "Based on the descriptions given for each of the ten intelligences, and using the rating scale provided, please indicate by circling the appropriate number how important each intelligence is to you." Participants responded using a 5-point Likert-type format ('not at all important': 1; 'fairly important': 2; 'not certain': 3; 'important': 4; 'extremely important': 5). Scores per item range from 1 to 5, with higher scores reflecting a more positive endorsement of the importance of each item to the participant. As the IRMIS was developed specifically for this research, the psychometric properties of the measure (e.g., reliability, validity, factor structure) are as yet untested.

Procedure

Participation in the present research was voluntary, no credit was given for completion of questionnaire booklets, participants were advised of anonymity and confidentiality, and that they could withdraw from the study at any point (no participants withdrew from the study). The questionnaire was administered to distance educated students whilst they were attending class-based summer school courses associated with their degree courses, and to evening class students during the course of their normal classes.

Results

Means and standard deviations – SEIQ and IRMIS

Table 1 shows the means, standard deviations, and item rankings for the total sample on the SEIQ and the IRMIS. Examination of mean scores of the SEIQ indicated that nine out of ten of the items were above the population mean (100), with only musical intelligence being slightly below 100. Mean scores ranged from 113.33 (interpersonal intelligence) to 99.11 (musical intelligence). Rankings for self-estimates for the ten intelligences (see Table 1) indicated that the highest self-estimate was for interpersonal intelligence, followed by intrapersonal, existential, verbal, spatial, logical-mathematical, body-kinesthetic, naturalistic, spiritual, and musical intelligence. Examination of the mean scores of the IRMIS indicated that nine out of ten of the items were above the midpoint (3), indicating a positive attitude regarding the importance of all domains of intelligence, with only musical being marginally below the midpoint. Mean scores ranged from 4.65 (intrapersonal intelligence) to 2.98 (musical intelligence). Rankings for importance ratings for the ten intelligences (see Table 1) indicated that the highest importance rating was for intrapersonal intelligence, followed by interpersonal, verbal, existential, spatial, logical-mathematical, body-kinesthetic, spiritual, naturalistic, and musical intelligence.

Correlations of items in the SEIQ and IRMIS

Table 2 indicates that there was a consistent pattern of highly significant and positive correlations for each of the intelligence self-estimates and their matching importance ratings (e.g., verbal intelligence self-estimate and verbal intelligence importance rating), with correlations ranging from $r = 0.141$ ($p < 0.01$) for intrapersonal intelligence/importance to $r = 0.549$ ($p < 0.001$) for musical intelligence. Examination of correlations

Table 1. Means, standard deviations, and rankings for the total sample on the SEIQ and the IRMIS.

	SEIQ			IRMIS		
	Mean	SD	Rank	Rank	Mean	SD
Verb	108.14	13.40	4	3	4.41	0.74
LM	101.62	14.81	6	6	3.80	0.82
Spat	105.68	13.95	5	5	3.86	0.78
Mus	99.11	20.33	10	10	2.98	1.13
BK	101.93	14.71	7	7	3.46	0.95
IEP	113.33	12.54	1	2	4.63	0.63
IAP	111.24	13.85	2	1	4.65	0.65
Exis	109.75	14.77	3	4	4.04	0.94
Spir	101.01	18.67	9	8	3.27	1.15
Nat	101.15	13.61	8	9	3.05	1.00

Key: Verb = verbal; LM = logical-mathematical; Spat = spatial; Mus = musical; BK = body-kinesthetic; IEP = interpersonal; IAP = intrapersonal; Exis = existential; Spir =spiritual; Nat = naturalistic.

between unpaired items of the SEIQ and IRMIS indicated that out of a possible 81 associations, only 16 were significant, and of those 16, half were significant at the least stringent level of significance (i.e., $p < 0.05$ level) (see Table 2). Therefore, correlations between paired items constituted the strongest and most consistent associations. This was particularly so for the first seven domains of intelligence listed in Table 2. However, there was a single exception to this pattern, with the association between existential intelligence and existential importance being marginally weaker than that between existential intelligence and spiritual importance. There was also a degree of inter-item convergence for existential, spiritual, and naturalistic intelligence/importance which will be commented on in the Discussion.

Sex differences in SEIQ and IRMIS

Tables 3 and 4 show results of independent t-test analyses for self-estimates and importance ratings for ten domains of intelligence. Results for the SEIQ indicated significant differences between males and females for logical-mathematical and spatial intelligence, with males rating themselves significantly higher than did females in both of these domains of intelligence. Results for the IRMIS indicated significant differences between males and females for verbal, interpersonal, intrapersonal, and existential intelligence, with females providing significantly higher importance ratings than did males for each of these domains of intelligence. It should be noted, however, that the Levene's test of homogeneity of variance for mean importance ratings was significant for all four intelligence importance ratings for which there were significant differences. Application of a more stringent alpha level ($p < 0.01$) rendered sex differences in importance ratings for intrapersonal and existential intelligence as non-significant; sex differences in importance ratings for verbal and interpersonal intelligence, however, remained significant.

Table 2. Correlations between total scores on the SEIQ and the IRMIS.

	Verb IQ	**LM IQ**	**Spat IQ**	**Mus IQ**	**BK IQ**	**IEP IQ**	**IAP IQ**	**Exis IQ**	**Spir IQ**	**Nat IQ**
Verb importance	0.280***	0.015	-0.045	0.008	0.003	0.088	0.059	0.025	-0.016	-0.088
LM importance	0.013	0.386***	0.096	-0.106*	0.030	-0.055	-0.068	-0.049	-0.023	0.033
Spat importance	-0.007	-0.035	0.203***	0.005	0.173***	-0.021	-0.072	-0.065	-0.187***	-0.010
Mus importance	0.183***	0.041	0.108*	0.549***	0.184***	0.095	0.004	0.060	0.073	0.141**
BK importance	0.044	0.075	0.068	0.098	0.325***	0.049	0.027	0.047	-0.009	0.069
IEP importance	0.105	-0.056	-0.058	-0.027	0.024	0.198***	0.105	0.046	0.018	-0.045
IAP importance	-0.012	-0.107*	-0.024	-0.029	0.000	0.004	0.141**	0.026	0.028	-0.105
Exis importance	-0.002	-0.135*	-0.046	0.031	0.104	0.069	0.056	0.216***	0.135*	-0.103
Spir importance	0.013	-0.010	0.046	0.049	0.033	0.124*	0.083	0.239***	0.509***	0.125*
Nat importance	0.019	0.085	0.079	0.002	0.057	0.049	0.136*	0.188***	0.188***	0.388***

Key: Verb = verbal; LM = logical-mathematical; Spa t = spatial; Mus = musical; BK = body-kinesthetic; IEP = interpersonal; IAP = intrapersonal; Exis =existential; Spir = spiritual; Nat = naturalistic; * $p < 0.05$; ** $p < 0.01$; *** $p \leq 0.001$

For those intelligences where there were significant differences, both in self-estimates and in importance ratings, the effect sizes (shown in Tables 3 and 4 as Eta squared values) indicated that the magnitude of differences were small to moderate, but that those for importance ratings of intelligence were somewhat larger than those for self-estimates of intelligence. For self-estimates of intelligence, spatial intelligence showed a larger effect (2.2%) than logical-mathematical intelligence (1.2%). For importance ratings of intelligence, interpersonal intelligence showed a larger effect (4%) than verbal intelligence (2.4%).

Table 3. Means, standard deviations, t-values, and effect sizes for male and female responses on the SEIQ.

	Males (n = 97)		Females (n = 245)			
	Mean	SD	Mean	SD	t-value	Eta^2
Verb	107.85	13.46	108.25	13.40	-0.253	0.00
LM	104.22	15.42	100.59	14.46	2.054*	0.01
Spat	108.97	14.79	104.38	13.42	2.767**	0.02
Mus	98.55	24.32	99.34	18.57	-0.324	0.00
BK	101.86	14.64	101.96	14.76	-0.059	0.00
IEP	112.12	12.96	113.81	12.36	-1.123	0.00
IAP	109.41	14.82	111.97	13.42	-1.540	0.01
Exis	109.89	18.18	109.69	13.22	0.109	0.00
Spir	102.58	20.76	100.39	17.79	0.976	0.00
Nat	102.25	14.36	100.72	13.30	0.935	0.00

Key: Verb = verbal; LM = logical-mathematical; Spat = spatial; Mus = musical; BK = body-kinesthetic; IEP = interpersonal; IAP = intrapersonal; Exis = existential; Spir = spiritual; Nat = naturalistic; * $p < 0.05$; ** $p < 0.01$

Discussion

The aims of the present research were firstly to establish whether there were significant associations between self-estimates of intelligence and importance ratings in ten domains of intelligence, and secondly to establish whether sex differences in self-estimates of ten domains of intelligence were mirrored by sex differences in importance ratings of the same ten domains of intelligence. Examination of mean scores for the two measures demonstrated comparable patterns of response for each domain insofar as those intelligences that were afforded higher/lower self-estimates were also afforded a higher/lower degree of importance. Additionally, significant and positive correlations were observed between all ten paired items of the SEIQ and IRMIS. These results indicate, therefore, that high/low self-estimates in all domains of intelligence were significantly associated with high/low self-estimates of the degree of importance of each domain of intelligence. This, therefore, supports the first hypothesis of the present research that there would be a similarity and convergence between self-estimates and importance ratings for each of the domains of intelligence. These findings also support previous research (e.g., Krueger, 1998; Lewicki, 1983, 1984) that has highlighted the tendency of individuals to place a greater value on attributes that they believe they possess.

Table 4. Means, standard deviations, t-values, and effect sizes for male and female responses on the IRMIS

	Males (n = 97)		Females (n = 245)			
	Mean	SD	Mean	SD	t-value	Eta^2
Verb	4.20	0.91	4.49	0.64	-2.914**	0.02
LM	3.87	0.82	3.77	0.82	0.957	0.00
Spat	3.81	0.77	3.87	0.78	-0.633	0.00
Mus	2.98	1.24	2.98	1.09	-0.002	0.00
BK	3.40	0.92	3.48	0.96	-0.665	0.00
IEP	4.40	0.79	4.73	0.57	-3.701***	0.04
IAP	4.53	0.72	4.69	0.62	-2.015	0.01
Exis	3.84	1.09	4.11	0.87	-2.260	0.02
Spir	3.30	1.20	3.26	1.12	0.304	0.00
Nat	3.05	1.02	3.05	0.99	0.021	0.00

Key: Verb = verbal; LM = logical-mathematical; Spat = spatial; Mus = musical; BK = body-kinesthetic; IEP = interpersonal; IAP = intrapersonal; Exis = existential; Spi r =spiritual; Nat = naturalistic; ** $p < 0.01$; *** $p < 0.001$

A small minority of significant correlations were observed between unpaired items of the SEIQ and IRMIS. In particular, there was a clustering of significant, positive correlations around the last three intelligences (existential, spiritual, naturalistic) whereby they all correlated positively and significantly with one another. A possible explanation for these findings might be that these types of intelligence are not as familiar to the lay person as would be the case for the other seven domains of intelligence. Whilst domains such as verbal, logical-mathematical, or interpersonal intelligence are concepts that have been in the public domain since first proposed by Gardner (1983), and resonate with the lay person (e.g., Furnham, 2000), naturalistic intelligence is a domain that has only recently been verified by Gardner (1999) as an independent intelligence, and in the case of existential and spiritual intelligence, these are only postulated by Gardner (1999) as potential domains of intelligence for further exploration. Therefore, the convergence of positive correlations among these three domains is perhaps a reflection of a lack of clarity in participants as to the scope of these intelligences.

An alternative interpretation of the observed convergence of lay perceptions, of existential and spiritual intelligence in particular, could be that this provides evidence that these domains are not distinct from each other as Gardner (1999) suggests, and that within the public domain at least, existential and spiritual intelligence may represent 'fuzzy' concepts. This is supported by previous factor analytic studies of self-estimates of Gardner's ten domains of intelligence that indicate that, at least with respect to lay conceptions of the intelligences, they are not independent. For example, a Principal Components Analysis (PCA) by Furnham and Buchanan (2005) found that existential and spiritual intelligence loaded with musical, interpersonal (IEP), intrapersonal (IAP), and body-kinesthetic intelligence, and a PCA by Yuen and Furnham (2005) found that existential and spiritual intelligence loaded with IEP, IAP, and naturalistic intelligence. Future qualitative research may therefore find it useful to examine the lay person's

perception of their understanding of what it means to be 'spiritually' or 'existentially' intelligent.

Examination of sex differences in the SEIQ supported previous research (e.g., Furnham & Buchanan, 2005; Furnham et al., 2002; Furnham & Ward, 2001; Swami et al., 2006) that has established that males rate themselves significantly higher than do females in logical-mathematical and spatial intelligence, which are among the intelligences that are deemed to be 'male-normative' (e.g., Furnham, 2001), and which are generally associated with the type of intellectual abilities that underlie traditional psychometric measures of intelligence, thus partially supporting the second hypothesis of the present research that there would be sex differences favouring males in self-estimates of logical-mathematical and spatial intelligence. Effect sizes for those intelligences that showed significant sex differences were comparable with the findings of previous research in the area (e.g., Furnham & Buchanan, 2005; Furnham et al., 2002; Furnham & Ward, 2001; Swami et al., 2006).

However, examination of sex differences in the IRMIS yielded a different pattern of results insofar as there were no significant differences favouring males in importance ratings of any of the intelligences, and significant differences were confined to what could be considered the more 'female normative' intelligences of verbal and interpersonal intelligence, and favoured females. The hypothesis of the present research that sex differences in intelligence importance ratings would mirror those of intelligence self-estimates was thus not supported. However, these findings provide an important insight into the way in which males and females conceptualise and value intelligence, and thus warrant further investigation.

An obvious limitation to the present research concerns the fact that the present research was conducted amongst a sample of distance and evening educated university students and therefore results may not be generalisable to on-site daytime university student samples, or samples of non-students. In order to address this concern, it would be desirable to replicate the present study amongst a more heterogeneous sample of participants.

In terms of contextualising the implications of the findings of the present research, it is important to consider the extent to which it may be of value to Higher Education (HE) to recognise individual differences in males and females regarding their perceived competence in those domains of intelligence most associated with intelligence testing, bearing in mind that beliefs do not always reflect actual ability (e.g., Reilly & Mulhern, 1995). This assertion is supported by social cognitive researchers who suggest that the reluctance of females to consider degrees in mathematics and the hard sciences has more to do with low self-efficacy beliefs in these domains than it has to do with actual ability (Betz & Schifano, 1999; Hackett, 1995). Hackett and Betz (1989) also believe that females limit their choices about possible careers in male-dominated domains based on their beliefs about their own capabilities. Furthermore, they postulate that this is in part a result of gender socialisation and the extent to which females may have had exposure to masculine/male-oriented activities. This is supported by a qualitative study by Zeldin and Pajares (2000), among females who were successfully pursuing careers in male-dominated fields, which showed that socialisation with male family members exposed them to male-oriented domains, and this was frequently cited as an explanatory factor

for their confident perceptions of their ability in such domains. They had also received affirmation from both male and female significant others that they had the capability to succeed in these areas. These two studies highlight both the role of self-belief for females in terms of motivation to engage in male-oriented domains, and also the effect of exposure to such domains and positive affirmation from significant others.

What does this mean for HE providers in relation to improving academic performance and reducing attrition rates in psychology courses? There is certainly a concern within the context of psychology courses in relation to statistics and computer use – psychology classes are characterised by large numbers of female students, which in itself suggests that, in spite of the majority of the courses being advertised as science degrees, students are either unaware of, or unrealistic about the extent to which a scientific approach is required. It is therefore essential when advertising psychology courses that universities provide a realistic representation of the content of such courses. It is also imperative for research to establish (perhaps via longitudinal studies) what differentiates those students who persevere in the face of difficulties with statistics, and who manage to overcome this hurdle, from those who drop out early on in their courses. It is also important that universities ensure that first year students in particular have easy access to support; perhaps in the form of drop-in statistics clinics where students can avail of more one-to-one or small groups assistance. Additionally, research has demonstrated the role of influential others in helping females to establish more realistic beliefs about their ability: many participants in the Zeldin and Pajares (2000) study reported the role of an influential other (often male) who supported them as they developed their abilities in male-dominated fields, which in turn led to changes in self-beliefs about their abilities.

This research has also demonstrated that the value that is attributed to certain types of intelligence differs between males and females. Females in the present research showed that they valued verbal and interpersonal aspects of intelligence more so than did males, and more so than they valued more male-normative concepts of intelligence such as spatial or logical-mathematical intelligence. An interesting perspective that helps explain such sex differences is proposed by Gilligan (1982). She has suggested that a fundamental part of development in females relates to the importance and role of attachment to significant others, which highlights why females may value verbal and interpersonal intelligence more than other domains – these are the types of intelligence that are implicated in establishing and maintaining interpersonal relationships. This theory is supported by Erikson (1959/1980, 1968) who suggested differences in identity formation of males and females. He proposed that male identity is moulded by achievements in the work domain, whilst female identity formation hinges on how they establish and maintain relationships. Furthermore, it is likely that females choose psychology in the first place because they see it as one of the 'helping/caring' professions, and one in which they can make good use of their natural abilities in these domains. However, many of these females may not fully appreciate the rigorous scientific and analytical underpinnings of the typical undergraduate psychology degree programme. Furthermore, it could be extrapolated that female psychology students who are entering university valuing verbal and interpersonal intelligence, and perhaps holding perceptions that these are skills that are pertinent to a career in psychology, may also have negative attitudes towards quantitative research methodology that persist throughout the course of the degree, and

which subsequently impacts on performance. For example, research has shown that students enter university with fixed attitudes to quantitative versus qualitative research methodology, and such attitudes are shown to remain relatively stable throughout a degree course (Murtonen, 2005). Additionally, evidence suggests that statistics anxiety is common among students, especially mature students (e.g., Baloğlu, 2003; Onwuegbuzie & Wilson, 2003). In summary, therefore, there may be disparities between what female students, particularly more mature students, expect from a psychology degree and what they actually experience, and they may enter university with fixed attitudes towards mathematics and statistics, which may have very real implications in terms of retention and course completion rates.

To conclude, results of the present research indicated a degree of convergence between self-estimated intelligence and importance ratings, and that sex differences in self-estimates of intelligence differ from those in intelligence importance ratings dependent upon sex of participant. Additionally, although this study was limited by being correlational, and thus it is not possible to determine directionality, it can be concluded that self-estimates in each of ten domains of intelligence were significantly and positively associated with the degree of importance attached to each. The sex differences in importance ratings observed in the present research highlight differing conceptualisations of intelligence between males and females. Given the dichotomy of a preference by females for verbal and interpersonal intelligence on the one hand, and the rigorous scientific demands of the typical psychology undergraduate programme on the other, there is unquestionably a need for universities to ensure that prospective psychology students have realistic expectations of the demands of their chosen degree. Future research should therefore assess conceptions of prospective students at the point of recruitment, in particular with respect to their lay perceptions of psychology as a discipline, and also with respect to the way psychology degrees are 'marketed' by universities. Additionally, cross-sectional or longitudinal research across all three year groups would allow for an in-depth examination of the convergence between realistic/unrealistic conceptions of the requirements of the degree, and retention/attrition rates among psychology students.

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