



The FIRO-B instrument

European Data Supplement

English (European)

May 2010



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Chapter 1: Introduction

OPP Ltd is the European distributor of the FIRO-B instrument, and in 1996 it embarked on a programme to develop and launch a version of the questionnaire, standardised for the UK market. This version of the questionnaire has been available in European English since 1997. In 2005, the questionnaire was translated into several other European languages, including Danish, French and German.

This European data supplement has been written to provide FIRO-B users with a single source of information containing a summary of the research data gathered for European language versions of the FIRO-B questionnaire. As such, it includes a combination of new (previously unpublished) research, alongside information drawn from existing sources. The aim has been to produce a single, easily accessible resource that will better serve multilingual use of the instrument, written in a format that will allow it to be easily updated as more data become available. This supplement is intended to be used alongside the *FIRO-B User's Guide*, which is occasionally cross-referenced.

The supplement has been split into discrete chapters, with a core chapter providing reliability, validity and norm data for the instrument in general, followed by separate chapters for various European language versions of the questionnaire.

The data described within this supplement show the psychometric properties of the instrument to be credible, and demonstrate a high degree of consistency across the various European language versions of the FIRO-B questionnaire.

Chapter 2: Reliability and validity

Reliability refers to the consistency, dependability or reproducibility of measurements obtained from a measuring instrument. A measuring instrument that is reliable is one that will give very much the same relative scores for a group of people under different conditions or situations. Validity, on the other hand, refers to the instrument's ability to measure what it was intended to measure.¹

Refer to the *FIRO-B User's Guide* technical properties chapter for more information about the basis of reliability and validity.

Reliability²

There are three main types of reliability:

- Internal consistency reliability
- Test–retest reliability
- Alternate form reliability.

In relation to the FIRO-B instrument, data will be reported here concerning the internal consistency and test–retest reliability of the questionnaire. There is no directly comparable alternate form of the FIRO-B questionnaire.

Internal consistency

Gluck (1983) carried out split-half reliability studies for the FIRO-B scales by using the odd-even technique and then calculating the Spearman rank correlation coefficients. These coefficients are then corrected, using the Spearman-Brown Prophecy Formula, for the change in test length caused by the split-half, since test reliability is a function of the test length as measured by the number of items.

The original FIRO-B questionnaire was based on a US sample of 1000 subjects. OPP has collected data for a UK standardisation of the FIRO-B instrument, and the reliabilities obtained were as follows:

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Table 2.1: Split-half reliability coefficients for the recalibrated FIRO-B instrument for UK managers (n=1191)

Scale	Corrected coefficient (Spearman-Brown Formula)
Expressed Inclusion	0.86
Wanted Inclusion	0.93
Expressed Control	0.90
Wanted Control	0.84
Expressed Affection	0.62
Wanted Affection	0.73

All six scales reached acceptable levels of reliability, with four out of six achieving excellent split-half reliability.

While a split-half analysis is the usual way of establishing the internal consistency of a test, for Guttman scales, including the FIRO-B questionnaire, it is more appropriate to look at **reproducibility**. Reproducibility is also a more stringent criterion for reliability, since it requires not only that all items measure the same dimension, but also that they all occur in a discernible order. Coefficients of **scalability** are employed alongside those of reproducibility to measure the risk that reproducibility coefficients are simply an artefact of the sample on which they are based. As a guide, 0.50 is generally taken as an acceptable coefficient of scalability.

The usual criterion of reproducibility is that 90% of all responses are predictable from knowledge of the overall scale score. The reproducibility of all scales achieved the 0.90 standard or better (varying between 0.90 and 0.94), as shown in Table 2.2. These reproducibility scores are the coefficients of internal consistency for the FIRO-B instrument.

Table 2.2: Reproducibility and scalability coefficients of UK version for a UK sample (n=1392)

Scale	Reproducibility	Scalability
Expressed Inclusion	0.93	0.51
Wanted Inclusion	0.93	0.53
Expressed Control	0.94	0.66
Wanted Control	0.93	0.59
Expressed Affection	0.91	0.57
Wanted Affection	0.90	0.60

Test–retest reliability

Table 2.3 gives test–retest reliability coefficients among a sample of 112 adults over a two- to four-week period (reported in Gluck, 1983). The mean coefficient of the six scales is .77, which is quite acceptable.

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Table 2.3: Reliability (test–retest) of US FIRO-B scales (n=112)

Scale	r
Expressed Inclusion	0.76
Wanted Inclusion	0.80
Expressed Control	0.71
Wanted Control	0.75
Expressed Affection	0.78
Wanted Affection	0.82

Beak (2008) conducted a study to look at the test–retest reliability of the European English version of the FIRO-B instrument over a five-month period. This was conducted separately for two groups of people; those instructed to think about their behaviour at home when responding, and those instructed to think about their behaviour at work. Formally this is known as looking at the results across different frames of reference. The test–retest reliability coefficients are shown for the two groups in Table 2.4 below.

Table 2.4: Reliability (test–retest) of UK FIRO-B scales

Scale	Frame of reference	
	Home (n=54)	Work (n=63)
Expressed Inclusion	0.70	0.66
Wanted Inclusion	0.73	0.43
Expressed Control	0.67	0.72
Wanted Control	0.51	0.54
Expressed Affection	0.79	0.64
Wanted Affection	0.65	0.60

Due to the lengthy time period between administrations, the reliability coefficients are not as high as we might expect, especially amongst the work frame-of-reference group. The analysis needs to be conducted again on larger sample sizes for it to be conclusive.

However, these data, alongside the other measures of internal consistency, suggest that the items do provide a fairly consistent measure of each of the six sub-scales and that, without at least a lapse of six months or a structured intervention to purposely change or adjust his or her behaviour, an individual's scores should remain constant.³

Effect of different frames of reference on FIRO-B scores

It has been found (Orlans et al, 1983) that the frame of reference that respondents use when completing the FIRO-B questionnaire has an effect on scores. Subjects completed the questionnaire twice, once with a 'home' frame of reference and once thinking of themselves in a

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'work' context. With a home frame of reference, scores on Inclusion and Affection were higher. This had been predicted, as the home context can be assumed to be a generally 'safer' environment, with higher levels of trust. With a work frame of reference, Expressed Control was higher. Again this was predicted (being related to greater expectations of responsibility-taking and decision-making). Thus the results suggest that patterns of behaviour are influenced by expectations of the situation and that individuals appear to adapt their behaviour to different situations.⁴

Beak (2008) replicated this study on a UK sample, and found the results supported the findings of Orlandi et al (1983), in the sense that the mean Expressed Affection scores increase for the home frame of reference. However whilst the mean Expressed Control scores did increase from home to work they did not do so by as much as found by the Orlandi study, which may be a reflection of using the UK as opposed to the US version of the instrument.

These studies do need to be replicated on a larger sample, but the results do suggest that it is important to ensure during administration that respondents are using the most appropriate frame of reference – what this is will depend on how the results will be applied. For example, if using the FIRO-B instrument for selection one would be wise to administer it and make explicit that the candidate should consider their behaviour at work specifically when answering the questions.

For further information on administering the FIRO-B questionnaire, please see Chapter 3.

Validity

There are four main types of validity:

- Face validity
- Content validity
- Construct validity
- Criterion-related validity.⁵

This supplement will focus on construct validity. For further details of the other types of validity, and research data gathered for the FIRO-B instrument, please refer to the *FIRO-B User's Guide* technical properties chapter.

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Construct validity⁶

Construct validity relates to instruments that are designed to assess an underlying theoretical construct. As the FIRO-B instrument is based on Schutz's theory of interpersonal need, this form of validity is relevant and important. Establishing the construct validity of a test is typically a long and laborious process and involves gathering any data that clarify the nature of the construct. Construct validity can be shown through (a) demonstrating internal consistency (see pages 4–5 of this supplement); (b) gathering information, such as correlations with other tests, which confirm the meaning of the construct (ie 'convergent validity'); and (c) 'discriminant validity', the ability of a test to show that it is different from other, but related, constructs.

Construct validity is often studied by considering the relationships between scores for the test with those for other personality measures. It should be borne in mind that other tests were not designed to assess exactly the same things as the FIRO-B questionnaire. This means that one would not expect the relationships between measures to be especially strong. For instance, one would expect some connection between Extraversion–Introversion on the MBTI[®] instrument and Inclusion. However, these are not directly interchangeable constructs, and the degree to which they measure different things places an upper limit on the strength of the relationship.

FIRO-B instrument and the MBTI questionnaire

The results in Table 2.5 show, consistently, the kinds of relationships that would be predicted on the basis of the FIRO-B and MBTI theories underlying the respective measures. The results are shown separately for a large, nationally representative sample, and for a smaller subset of this sample that only includes individuals whose occupational level was described as middle management or above.

As expected, Extraversion was related to higher scores on Expressed and Wanted Inclusion and Expressed and Wanted Affection in the FIRO-B instrument. Thinking was significantly related to higher scores on Expressed Control, while Feeling correlated significantly with Expressed Affection.

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Table 2.5: Correlations between FIRO-B scale scores and MBTI Step I continuous scores⁷

UK general population sample (n=1512)

Myers-Briggs Type Indicator®	eI	wI	eC	wC	eA	wA
Extraversion–Introversion	-0.41**	-0.38**	-0.13**	0.07**	-0.36**	-0.27**
Sensing–Intuition	0.12**	0.19**	0.18**	0.02	0.10**	0.03
Thinking–Feeling	0.10**	0.10**	-0.24**	0.18**	0.25**	0.23**
Judging–Perceiving	0.02	0.07**	0.00	-0.02	0.00	0.00

Significant at: *p<0.05, **p<0.01

UK managerial sample (n=424)

Myers-Briggs Type Indicator®	eI	wI	eC	wC	eA	wA
Extraversion–Introversion	-0.42**	-0.42**	-0.12*	0.06	-0.41**	-0.35**
Sensing–Intuition	0.19*	0.26**	0.12*	-0.07	0.12*	0.13**
Thinking–Feeling	0.21**	0.21**	-0.25**	0.21**	0.28**	0.30**
Judging–Perceiving	0.04	0.16**	-0.04	-0.06	0.02	0.07

Significant at: *p<0.05, **p<0.01

This was a direct and almost perfect replication of a much larger study conducted in the US (Schnell et al, 1994) on a sample of over 20,000 managers.⁸

To test the hypothesis proposed by Schnell and Hammer (1993) that the strength of the Overall Score (sum of all rows or columns on the FIRO-B scores table) is representative of the clarity of preference within the E–I dimension, the correlation between the Overall Score and the E–I continuous score was calculated amongst the managerial sample. The correlation was found to be significant at -.50 (p<.001, n=360). This confirms the broadness of the Extraversion concept and the fact that the FIRO-B questionnaire focuses on social behaviours.

Analyses were also conducted to look at how psychological type relates to the average Overall Score on the FIRO-B instrument. Table 2.6 shows the average Overall Scores for each of the 16 types.

⁷ MBTI Step I continuous scores (Myers and McCaulley, 1985, p. 9) place an individual's score on each dimension onto a continuous scale with a mid-point of 100. To calculate continuous scores, Preference Clarity Index (PCI) scores for each dimension are either subtracted or added to 100, depending on which direction the overall preference is. PCI scores in the direction of E, S, T or J are subtracted from 100. PCI scores in the direction of I, N, F or P are added to 100. This means that negative correlations are associated with E, S, T & J and positive correlations are associated with I, N, F & P.

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Table 2.6: Average FIRO-B Overall Scores for each psychological type

Type	Mean Overall Score (SD)	N
ENTP	30.11 (6.05)	9
ENFP	30.08 (6.22)	26
ESFJ	29.73 (7.45)	41
ENFJ	29.47 (5.48)	15
ESFP	28.00 (5.84)	16
INFJ	27.14 (6.20)	7
ESTP	26.95 (5.68)	22
ESTJ	26.93 (6.30)	42
ENTJ	26.56 (4.89)	18
INTJ	26.11 (4.34)	9
INFP	25.00 (5.57)	13
ISFJ	24.48 (5.09)	40
ISFP	24.14 (4.63)	7
ISTJ	22.15 (5.59)	60
INTP	21.69 (6.22)	13
ISTP	21.09 (7.00)	22

The table confirms that (with the exception of INFJs) Extraverted types tend to have greater interpersonal needs than Introverted types. The next split is in terms of Thinking and Feeling. Amongst those with a preference for Extraversion, all Feeling types have greater interpersonal needs than do all Thinking types (with the exception of ENTPs). This is also the case amongst those with a preference for Introversion, with the exception of INTJs who have the second highest interpersonal needs amongst the Introverts.

Table 2.7 shows the highest FIRO-B scores for each MBTI type. Mean scores on the six FIRO-B dimensions were obtained for all psychological types, and the strongest interpersonal need dimension is listed first in each cell. A second dimension is listed if the difference between the highest two interpersonal needs was less than one.

Table 2.7: Highest FIRO-B Cell Scores for each Psychological Type

ISTJ Expressed Control Wanted Control	ISFJ Wanted Control Expressed Inclusion	INFJ Expressed Control Expressed Inclusion	INTJ Expressed Control Expressed Inclusion
ISTP Expressed Control	ISFP Wanted Control Expressed Inclusion* Expressed Control	INFP Wanted Affection Wanted Control	INTP Expressed Control Expressed Inclusion
ESTP Expressed Control Expressed Inclusion	ESFP Expressed Inclusion Wanted Affection	ENFP Expressed Inclusion Expressed Control	ENTP Expressed Control Expressed Inclusion
ESTJ Expressed Control Expressed Inclusion	ESFJ Expressed Inclusion Wanted Affection	ENFJ Expressed Inclusion Expressed Control	ENTJ Expressed Control Expressed Inclusion

*Expressed Inclusion and Expressed Control scores equally high in this case.

For the majority of types, Expressed Inclusion (13 instances) and Expressed Control (12 instances) were amongst the top one or two FIRO-B scores. Four of the Introversion types included Wanted Control amongst their top FIRO-B scores, and three of the Feeling types included Wanted Affection.

This differs notably from the sample studied by Schnell et al (1994), where Wanted Affection was amongst the top two FIRO-B scores for all types. Indeed, the authors of that study expressed their surprise that Affection needs were so prominent, reinforcing attempts to help leaders show more appreciation and support for their staff. It is possible, however, that the specific nature of their sample group (participants in the CCL Leadership Development Program) may have had an impact on this result.

Tables 2.8 and 2.9 show psychological types with the highest and lowest mean scores for each FIRO-B cell. Within each cell in Table 2.8, types are listed in descending order, with the type with the highest need score listed first. Within each cell in Table 2.9, types are listed in ascending order, with the type with the lowest need score listed first.

Table 2.8: Ranking of Psychological Type with highest mean scores within FIRO-B dimensions

	Inclusion	Control	Affection
Expressed	ESFP ENFP	INTJ ENTJ	ESFJ ENFP ENTP
Wanted	ENFP ESFJ INFJ ENTJ	INFJ ISFJ ENFJ	ESFJ ENFP INFP ENTP ESFP

Table 2.9: Ranking of Psychological Type with lowest mean scores within FIRO-B dimensions

	Inclusion	Control	Affection
Expressed	ISTP ISTJ	INFP ISFJ ESFP	INTP ISTP
Wanted	ISTJ	INTP	ISTP INTP

It can be seen that MBTI types that combine Extraversion and Feeling tend to exhibit consistently high Inclusion and Affection needs (but not necessarily particularly high Control needs). Conversely, types that combine Introversion and Thinking tend to exhibit low needs in all the categories except Expressed Control.

FIRO-B instrument and the 16PF questionnaire

Dancer and Woods (2006) explored the correlations between FIRO-B scores and 16PF factor scores amongst over four-thousand individuals who took the questionnaires as part of executive assessments in the US. The correlations are shown in Table 2.10. Note that, due to the large sample size, many of the correlations are statistically significant despite being quite small in real terms.

Table 2.10: Correlations between FIRO-B and 16PF factor scores (n=4,405)

16PF factor scale		eI	wI	eC	wC	eA	wA
Primary factors							
A	Warmth	0.36**	0.25**	0.10**	0.02	0.37**	0.30**
B	Reasoning	0.06**	0.08**	0.12**	0.07**	0.04*	0.09**
C	Emotional Stability	0.21**	0.10**	0.11**	-0.08**	0.16**	0.09**
E	Dominance	0.13**	0.08**	0.40**	-0.17**	0.05**	0.01
F	Liveliness	0.41**	0.40**	0.09**	-0.01	0.33**	0.24**
G	Rule-Consciousness	0.06**	0.03	-0.04**	-0.01	0.08**	0.07**
H	Social Boldness	0.39**	0.25**	0.24**	-0.09**	0.33**	0.22**
I	Sensitivity	0.03	0.00	-0.11**	0.06**	0.09**	0.07**
L	Vigilance	-0.15**	-0.09**	-0.01	-0.03*	-0.17**	-0.15**
M	Abstractedness	-0.04**	-0.01	0.11**	0.08**	-0.03	-0.03

Chapter 2: reliability and validity

N	Privateness	-0.31**	-0.27**	-0.05**	-0.05**	-0.42**	-0.31**
O	Apprehension	-0.08**	-0.01	-0.11**	0.18**	-0.03	0.02
Q1	Openness to Change	0.14**	0.09**	0.15**	-0.00	0.14**	0.07**
Q2	Self-Reliance	-0.47**	-0.35**	-0.06**	-0.04**	-0.30**	-0.25**
Q3	Perfectionism	0.05**	0.03	0.02	-0.09**	0.07**	0.04*
Q4	Tension	-0.15**	-0.10**	0.13**	-0.01	-0.17**	-0.10**
Global factors							
EX	Extraversion	0.53**	0.45**	0.09**	0.04*	0.47**	0.37**
ANX	Anxiety	-0.10**	-0.01	0.06**	0.04*	-0.11**	-0.06**
TM	Tough-Mindedness	0.05**	0.01	-0.06**	-0.05*	0.08**	0.07**
IND	Independence	0.13**	0.06**	0.40**	-0.19*	0.04*	-0.03*
SC	Self-control	0.04**	0.08**	-0.03	0.08	0.15**	0.11**

Significant at: * $p < 0.05$, ** $p < 0.01$

Looking at correlations with the 16PF instrument, many of the strongest relationships are with FIRO-B Expressed behaviours, particularly Expressed Inclusion and Expressed Affection.

A very similar pattern of results is found between the 16PF Primary Factors and both of these scales, with Warmth, Liveliness and Social Boldness correlating highly with both in a positive direction, and Privateness and Self-Reliance correlating with both in a negative direction. These five 16PF factors are the ones that combine to form the higher-order, Global Factor called Extraversion. Not surprisingly therefore, both Expressed Inclusion and Expressed Affection also correlate quite highly with the global Extraversion factor itself. This suggests that these scales show clear links with personality traits that influence the way in which individuals relate to others.

The Primary Factor found to correlate most highly with Expressed Control is Dominance, which is to be expected. This corresponds with a clear link between the Expressed Control and the global Independence scale, suggesting that those who score highly on Expressed Control are likely to be those who will want to go their own way/take charge of situations as opposed to cooperating and collaborating.

There are relatively few strong correlations between 16PF Primary Factors and Wanted behaviours, with the strongest being between Wanted Inclusion and Liveliness (positive direction) and Self-Reliance (negative direction), and between Wanted Affection and Warmth (positive direction) and Privateness (negative direction). Wanted Control showed few clear links with any of the 16PF Primary Factors.

Looking at the 16PF Global Factors, it can be seen that both Wanted Inclusion and Wanted Affection correlate quite highly with Extraversion. Interestingly, the Wanted Control scale correlates negatively with global Independence, suggesting that those who score highly on Wanted Control are likely to favour a more cooperative and accommodating approach to situations, as opposed to the more persuasive and determined approach taken by high scorers on Expressed Control.

The 16PF questionnaire measures broad personality factors that have a clear link to our likely behaviour. As such, we would expect to see relationships between 16PF factors and expressed behaviours on the FIRO-B instrument. However, the 16PF factors also relate to aspects of personality that drive behaviours aimed at meeting intrinsic needs, eg a need for variety or change, hence the correlations with Wanted behaviours.

FIRO-B instrument and the Adjective Checklist (ACL)

The UK general population sample completed a 164-item Adjective Checklist (ACL). Each person was asked to indicate whether each of the adjectives was like them or not.

Correlating FIRO-B results and Adjective Checklist (ACL) choices produces a range of relationships that lend support to the constructs underlying each of the scales in the FIRO-B instrument – for example, Inclusion with ACL items such as sociable and talkative, Expressed Control with items such as assertive and outspoken, etc.⁹

Remember, these data relate to how individuals see themselves rather than how others see them.

Table 2.11: Correlations between FIRO-B scales and Adjective Checklist items. OPP UK general population sample (n=1,632)

Adjective Checklist item	eI	wI	eC	wC	eA	wA
Adventurous	0.23	0.21				
Aggressive			0.24			
Aloof					-0.17	-0.19
Assertive			0.22			
Cold					-0.20	
Confident				-0.22		
Energetic	0.21					
Enthusiastic	0.23				0.20	
Has wide interests	0.26					
Opinionated			0.22			
Outgoing	0.27	0.23			0.18	
Outspoken			0.22			
Patient			-0.20			
Pleasure-seeking		0.23				
Quiet	-0.21	0.22				
Self-centred			0.21			
Sociable	0.33	0.24			0.23	0.22
Submissive				0.22		
Talkative	0.25	0.25			0.24	
Weak-willed				0.22		
Withdrawn	-0.21					

Correlations shown are significant at $p < 0.05$.

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FIRO-B scale intercorrelations¹⁰

Finally, the extent to which the FIRO-B scales represent separate and distinct psychological constructs may be inferred from the extent to which they intercorrelate. The amount that the scores on each of the six scales overlap (ie the level of intercorrelation) is of key importance when interpreting the full profile. Intercorrelations between scale scores for two UK samples, Tables 2.12(a) and (b) below, to a large extent replicate the results of studies reported by Schutz and Gluck.

Table 2.12: Intercorrelations among FIRO-B scales

(a) UK managerial sample (n=1,191)

	eI	wI	eC	wC	eA
eI					
wI	0.51**				
eC	0.10**	0.10**			
wC	0.11**	0.08**	-0.11		
eA	0.39**	0.38**	0.06*	0.07*	
wA	0.31**	0.44**	0.05	0.06*	0.55**

Significant at: *p<0.05, **p<0.01

(b) UK general population sample (n=1,683)

	eI	wI	eC	wC	eA
eI					
wI	0.59**				
eC	0.19**	0.24**			
wC	0.11**	0.12**	0.21**		
eA	0.39**	0.44**	0.03	0.05*	
wA	0.34**	0.49**	-0.10**	0.05*	0.58**

Significant at: *p<0.05, **p<0.01

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension. This means that there is a degree of redundancy in the scales, ie to some extent there is an overlap in what they are assessing. Schutz has stated his belief that, overall, the intercorrelations are sufficiently small to warrant having all six sub-scales. This is because he believes that predictions about specific individuals would be hampered by reducing the number of scales. Nevertheless, it is important to be aware of the fact that the FIRO-B instrument contains non-independent scales.

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Conclusion

Considered from any perspective, the FIRO-B questionnaire has shown itself over time to be both a robust and, given appropriate usage and interpretation, sensitive measure of interpersonal needs as defined by Schutz. The range of studies conducted, producing evidence of all the usual forms of validity, makes the FIRO-B instrument one of the most thoroughly researched measures of its kind. It is worth bearing in mind, however, that there is always scope for additional investigation, and you are invited to contact OPP Ltd for advice and support should you be considering a study of your own.¹¹

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Chapter 3: UK Normative Data for the FIRO-B instrument¹²

It is always best to collect your own sample data wherever possible and, once of reasonable size (ie in excess of 50 cases), this should be used as your local normative or reference group. Remember that care must be taken when using any normative group for **interpersonal** comparison that the two groups should be equivalent for that purpose. If this local normative group facility is not available, the data given in this section should be used as a guideline.

The following norms are available:

UK general population

Total sample

Breakdowns by:

Gender

- Males
- Females

Educational level (ie age at completion of education)

- <15 years
- 16–18 years
- 19–21 years
- 22–25 years

Organisational level

- Combined managerial
- Top/senior executive
- Upper/middle management
- Middle management
- First level management
- Employee

¹² This section, including bulleted lists, reproduced from *FIRO-B® User's Manual* with kind permission of CPP, Inc.

Industry sector

- Manufacturing
- Construction
- Retail
- Property sales/management
- Education
- Health/social work

UK managerial samples

Total sample

Breakdowns by:

Gender

- Males
- Females

Company

- International research and development company
- Metallurgical company
- Biochemical research company
- International chemicals companies
- International food and drinks company
- Communications company

Table 3.1: FIRO-B means and standard deviations for UK general population sample¹³

Total sample (n=1411)

Scale	Mean	Std Dev
eI	4.87	1.54
wI	3.22	2.04
eC	4.47	1.86
wC	4.38	1.73
eA	3.29	1.92
wA	4.13	2.10

UK general population sample broken down by Gender

Males (n=589)		
Scale	Mean	Std Dev
eI	4.79	1.65
wI	3.24	2.11
eC	4.87	1.83
wC	4.28	1.73
eA	3.07	1.97
wA	4.00	2.26

Females (n=788)		
Scale	Mean	Std Dev
eI	4.94	1.46
wI	3.27	2.02
eC	4.17	1.79
wC	4.48	1.72
eA	3.49	1.91
wA	4.27	1.97

UK general population sample broken down by Educational level (ie age at completion of full-time education)

<15 years (n=310)		
Scale	Mean	Std Dev
eI	4.52	1.53
wI	2.73	1.85
eC	3.78	1.98
wC	3.91	1.87
eA	3.13	1.82
wA	4.01	1.97

16-18 years (n=694)		
Scale	Mean	Std Dev
eI	4.86	1.51
wI	3.15	1.95
eC	4.47	1.76
wC	4.48	1.69
eA	3.24	1.89
wA	4.03	2.05

19-21 years (n=137)		
Scale	Mean	Std Dev
eI	5.03	1.60
wI	3.62	2.24
eC	5.21	1.86
wC	4.73	1.45
eA	3.49	2.16
wA	4.41	2.26

22-25 years (n=129)		
Scale	Mean	Std Dev
eI	5.37	1.56
wI	3.89	2.00
eC	5.24	1.51
wC	4.70	1.77
eA	3.61	2.15
wA	4.55	2.20

¹³ Tables 3.1 reproduced from *FIRO-B® User's Manual* with kind permission of CPP, Inc.

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UK general population sample broken down by Organisational level

Combined managerial (n=508)		
Scale	Mean	Std Dev
eI	5.04	1.50
wI	3.39	1.92
eC	5.22	1.66
wC	4.53	1.58
eA	3.37	2.04
wA	4.14	2.14

Top/senior executive (n=48)		
Scale	Mean	Std Dev
eI	4.98	1.62
wI	3.00	1.90
eC	5.56	1.78
wC	4.42	1.26
eA	2.93	2.04
wA	3.47	2.16

Upper/middle management (n=76)		
Scale	Mean	Std Dev
eI	4.95	1.48
wI	3.55	1.80
eC	5.57	1.70
wC	4.31	1.62
eA	3.51	2.25
wA	4.00	2.29

Middle management (n=258)		
Scale	Mean	Std Dev
eI	5.06	1.53
wI	3.37	1.93
eC	5.07	1.57
wC	4.68	1.60
eA	3.32	1.98
wA	4.27	2.04

First level management (n=118)		
Scale	Mean	Std Dev
eI	4.98	1.42
wI	3.47	1.90
eC	5.02	1.62
wC	4.41	1.72
eA	3.54	2.10
wA	4.18	2.21

Employee (n=534)		
Scale	Mean	Std Dev
eI	4.81	1.56
wI	3.22	2.14
eC	4.09	1.76
wC	4.40	1.68
eA	3.24	1.81
wA	4.26	2.09

UK general population sample broken down by Industry sector

Manufacturing (n=133)		
Scale	Mean	Std Dev
eI	4.70	1.59
wI	3.07	2.19
eC	4.19	2.05
wC	4.08	1.76
eA	3.26	2.01
wA	4.09	2.10

Construction (n=49)		
Scale	Mean	Std Dev
eI	4.66	1.82
wI	3.44	2.16
eC	4.45	1.95
wC	4.23	2.02
eA	3.13	1.74
wA	4.31	1.96

Retail (n=100)		
Scale	Mean	Std Dev
eI	4.89	1.55
wI	3.07	2.21
eC	4.12	1.88
wC	4.40	1.78
eA	3.14	1.87
wA	3.97	1.94

Property sales/management (n=66)		
Scale	Mean	Std Dev
eI	5.03	1.51
wI	3.38	1.97
eC	5.14	1.72
wC	4.71	1.73
eA	3.58	1.86
wA	4.22	2.18

Education (n=56)		
Scale	Mean	Std Dev
eI	5.08	1.64
wI	3.17	2.05
eC	4.53	1.85
wC	4.57	1.30
eA	3.37	1.83
wA	4.18	2.18

Health/social work (n=91)		
Scale	Mean	Std Dev
eI	4.97	1.65
wI	3.05	1.97
eC	4.11	1.71
wC	4.75	1.84
eA	3.40	2.02
wA	4.08	1.89

Table 3.2: FIRO-B means and standard deviations for UK managerial sample¹⁴

Total sample (n=1165)

Scale	Mean	Std Dev
eI	4.48	1.83
wI	3.00	3.13
eC	4.69	2.63
wC	2.36	1.66
eA	3.30	1.85
wA	4.65	2.00

UK managerial sample broken down by Gender

Males (n=1016)		
Scale	Mean	Std Dev
eI	4.42	1.83
wI	2.91	3.11
eC	4.90	2.58
wC	2.37	1.66
eA	3.25	1.89
wA	4.62	2.02

Females (n=149)		
Scale	Mean	Std Dev
eI	4.84	1.74
wI	3.59	3.29
eC	3.34	2.59
wC	2.27	1.61
eA	3.64	1.77
wA	4.78	1.84

UK managerial sample broken down by Company

International R&D company (n=366)		
Scale	Mean	Std Dev
eI	4.69	1.88
wI	3.46	3.21
eC	3.58	2.50
wC	2.47	1.85
eA	3.43	1.74
wA	4.72	1.97

Metallurgical company (n=101)		
Scale	Mean	Std Dev
eI	4.93	1.64
wI	3.25	2.99
eC	3.48	2.49
wC	2.13	1.30
eA	3.53	1.79
wA	4.71	1.89

Biochemical research company (n=68)		
Scale	Mean	Std Dev
eI	4.34	1.80
wI	2.88	3.00
eC	3.72	2.32
wC	2.69	1.46
eA	3.13	1.62
wA	4.79	1.34

International chemicals company A (n=243)		
Scale	Mean	Std Dev
eI	4.06	1.82
wI	2.19	3.02
eC	5.35	2.40
wC	2.47	1.69
eA	3.05	1.95
wA	4.51	2.22

¹⁴ Tables 3.2 reproduced from *FIRO-B® User's Manual* with kind permission of CPP, Inc.

International chemicals company B (n=119)		
Scale	Mean	Std Dev
el	4.63	1.67
wl	3.22	3.08
eC	5.60	2.20
wC	2.14	1.51
eA	3.27	1.92
wA	4.73	2.06

International food and drinks company (n=62)		
Scale	Mean	Std Dev
el	4.60	1.68
wl	3.77	3.20
eC	5.63	2.56
wC	2.06	1.47
eA	3.65	1.93
wA	5.02	1.86

Communications company (n=213)		
Scale	Mean	Std Dev
el	4.33	1.93
wl	2.68	3.05
eC	5.85	2.50
wC	2.24	1.61
eA	3.25	1.91
wA	4.44	1.99

Chapter 4: Gender differences in the FIRO-B instrument¹⁵

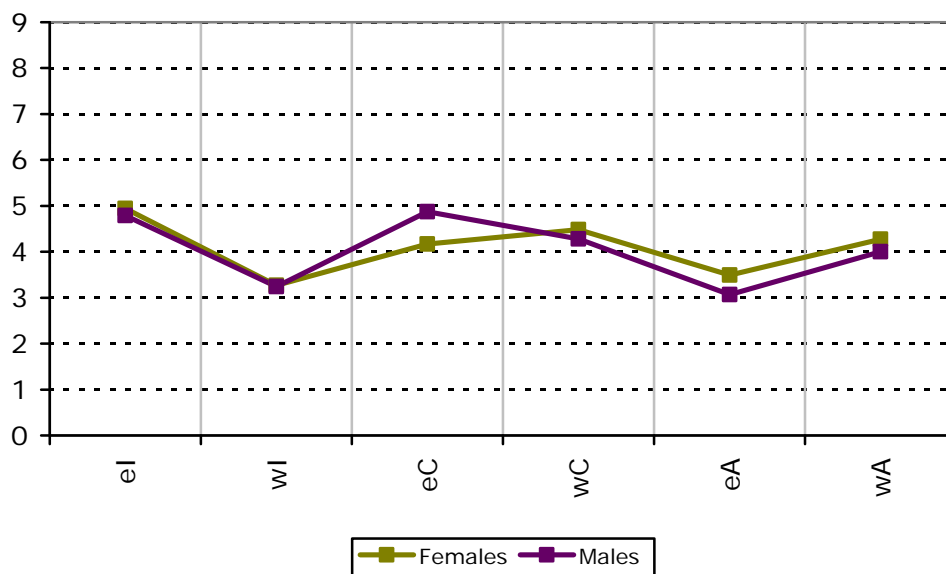
Gender differences in the UK were investigated using t-test statistics. Analysis was conducted on two levels: the general population, and a group of UK managers. In Tables 4.1 and 4.2 below, the last column indicates those scales where there is a significant difference between males and females. The differences are represented graphically in Figures 4.1 and 4.2.

Table 4.1: Gender differences in scale scores – UK general population

FIRO-B scale	Females (n=788)		Males (n=589)		Difference (F-M) ¹⁶
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	4.94	1.46	4.79	1.65	0.15
Wanted Inclusion (wI)	3.27	2.02	3.24	2.11	0.03
Expressed Control (eC)	4.17	1.79	4.87	1.83	-0.70**
Wanted Control (wC)	4.48	1.72	4.28	1.73	0.20*
Expressed Affection (eA)	3.49	1.91	3.07	1.97	0.42**
Wanted Affection (wA)	4.27	1.97	4.00	2.26	0.27*

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 4.1: Gender differences in scale scores – UK general population



Of the six scales, four showed significant differences in mean scores with males scoring higher on Expressed Control and females scoring higher on Wanted Control, Expressed Affection and Wanted Affection.¹⁷

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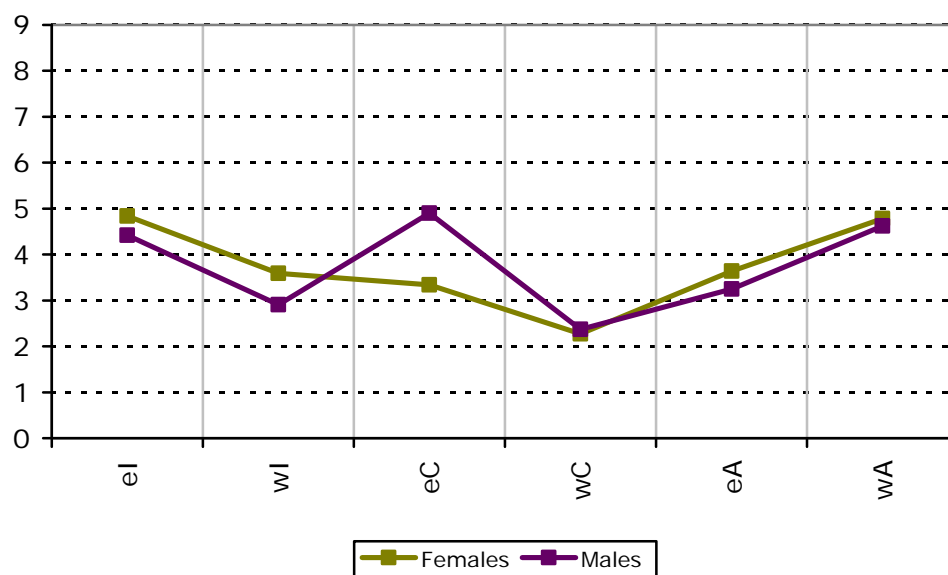
¹⁶ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Table 4.2: Gender differences in scale scores – UK managerial sample

FIRO-B scale	Females (n=149)		Males (n=1016)		Difference (F–M) ¹⁸
	Mean	SD	Mean	SD	
Expressed Inclusion (ei)	4.84	1.74	4.42	1.83	0.42**
Wanted Inclusion (wi)	3.59	3.29	2.91	3.11	0.68*
Expressed Control (eC)	3.34	2.59	4.90	2.58	-1.56**
Wanted Control (wC)	2.27	1.61	2.37	1.66	-0.10
Expressed Affection (eA)	3.64	1.77	3.25	1.89	0.39*
Wanted Affection (wA)	4.78	1.84	4.62	2.02	0.16

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 4.2: Gender differences in scale scores – UK managerial sample



For the managerial samples, four scales demonstrate significant gender differences. Males score higher on Expressed Control, while females score higher on Expressed Inclusion, Wanted Inclusion and Expressed Affection.¹⁹

¹⁷ This paragraph reproduced from *FIRO-B® User's Manual* with kind permission of CPP, Inc.

¹⁸ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

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Chapter 5: Supplementary data for the European English language questionnaire

This section contains supplementary data gathered for the European English language version of the FIRO-B questionnaire since its launch in 1997. These data can be used alongside those quoted in previous sections of this supplement

Sampling information

Two additional sets of psychometric data have been gathered for the European English language version of the instrument over recent years, based on the following groups of respondents.

Group 1

10,447 individuals, who completed the FIRO-B questionnaire in European English via the OPPassessment system between 2007 and the end of 2008.²⁰ This sample is considered to be representative of the groups of people with whom the European English FIRO-B instrument has been and will be used for applications such as management development, coaching, counselling and teambuilding. As such, it is likely to represent a cross-section of the European English-speaking professional and managerial population.

Group 2

317 respondents, who completed the questionnaire over a two-year period between August 2005 and December 2007. This data was collected as part of the project to collect data for the new European language versions of the instrument under development at the time.

Demographic data

Group 1

This sample consists of 10,447 individuals. Of these, 60% were male and 40% were female. Age ranged from 16 to 67 years, with a mean and median of 40.

Nationality was given by 90% of the respondents. Of these, 69% were British and 6% were Irish. Many other nationalities were represented, but each formed less than 4% of the total group.

Nationality	Percentage
British	69.0%
Irish	5.9%
Other	25.1%

²⁰ OPPassessment allows personality questionnaires such as the FIRO-B instrument to be administered via email and/or completed online.

Chapter 5: supplementary European English data

Ethnic origin was provided by 81% of respondents. Of these, 66% were White-British. Many other ethnic origins were represented.

Ethnic origin	Percentage
White-British	65.5%
White-Irish	6.4%
Asian-Indian	2.3%
Chinese	1.2%
Black-African	0.6%
Black-Caribbean	0.4%
Asian-Pakistani	0.4%
Asian-Bangladeshi	<0.1%
Other	23.1%

The majority of the group were in full-time employment:

Employment status	Percentage
Full-time	88.3%
Self-employed	6.7%
Part-time	4.0%
Unemployed	0.8%
Homemaker	0.2%
Retired	0.1%

The majority of the group were of managerial level or above, with the largest single group being upper middle management (24%):

Occupational level	Percentage
Top level	6.8%
Senior executive	20.4%
Upper middle management	23.7%
Middle management	21.6%
First level management/supervisor	10.5%
Employee	12.2%
Other	4.8%

And a range of work areas were represented:

Work area (job type)	Percentage
HR, training, guidance	16.4%
Finance	13.3%
Sales, customer service	10.9%
Health, social services, etc	8.8%
Business services	8.3%
Science, engineering	7.7%
IT	6.0%
Admin or secretarial	2.6%
Education	2.1%
Leisure, personal service	1.7%
Research and development	1.6%
Military, police, prison, fire	1.0%
Land, sea or air transport	0.9%
Skilled operative	0.4%
Unskilled operative	0.1%
Other private sector	5.6%
Other public sector	4.1%
Other	8.6%

Group 2

Of the 317 respondents, 195 (62%) were female and 122 (39%) were male. Ages ranged from 18 to 80, with a mean age of 36 years. 304 (96%) of the individuals stated that their country of residence was the United Kingdom, with the remaining 13 (4%) residing in Ireland.

The present employment status of the group is summarised in Table 5.1.

Table 5.1: Employment status

Employment status	Number	Percentage
Working full-time	221	69.7%
Working part-time	40	12.6%
Not working for income	21	6.6%
Retired	1	0.3%
Full-time student	16	5.0%
Other	18	5.7%

Scale properties

Descriptive statistics

Table 5.2 below shows the mean and standard deviation for each of the six scales for the two groups. There is a high degree of similarity amongst the mean scores for both groups.

Table 5.2: Scale means and standard deviations

Scale	Mean		Std Dev	
	Group 1	Group 2	Group 1	Group 2
Expressed Inclusion (eI)	5.59	5.22	1.35	1.39
Wanted Inclusion (wI)	4.05	4.36	1.90	2.16
Expressed Control (eC)	6.10	5.58	1.45	1.61
Wanted Control (wC)	4.94	4.91	1.43	1.78
Expressed Affection (eA)	4.11	4.09	2.20	2.20
Wanted Affection (wA)	4.92	4.91	1.95	2.02

The frequency distributions of the scales are shown in Figures 5.1 to 5.6. Again, these are similar across both groups

Figure 5.1: Expressed Inclusion (eI) score frequency distribution

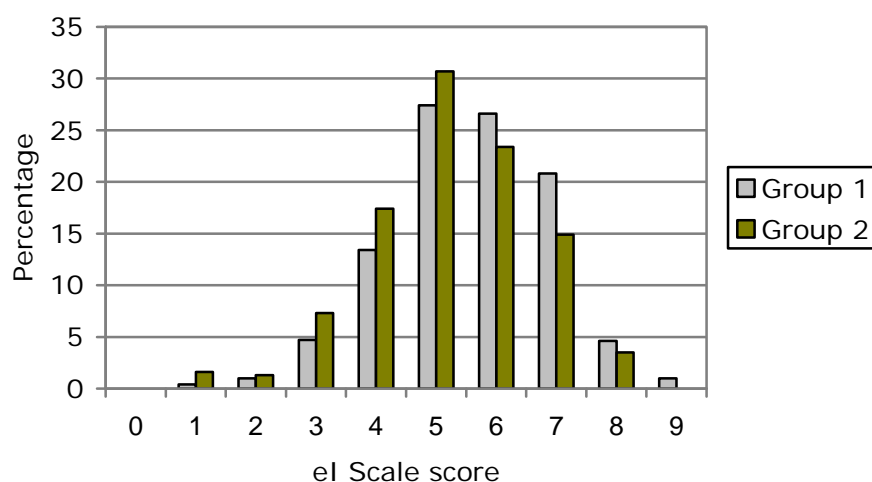


Figure 5.2: Wanted Inclusion (wI) score frequency distribution

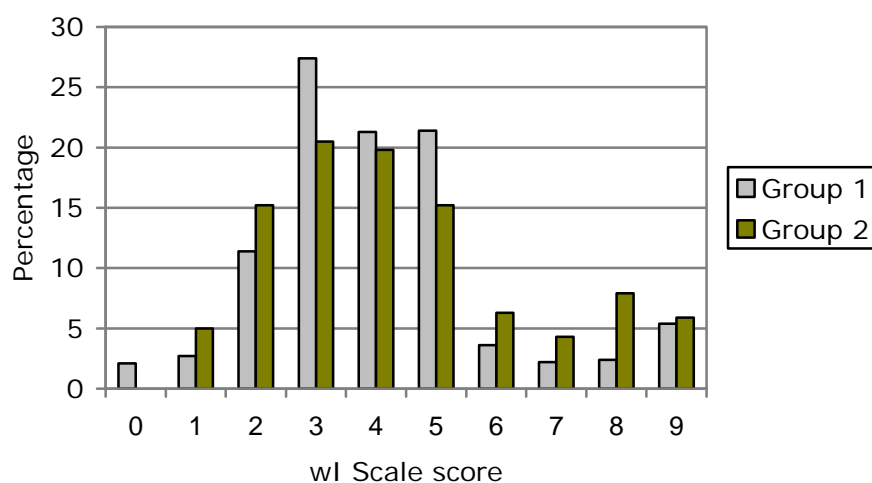


Figure 5.3: Expressed Control (eC) score frequency distribution

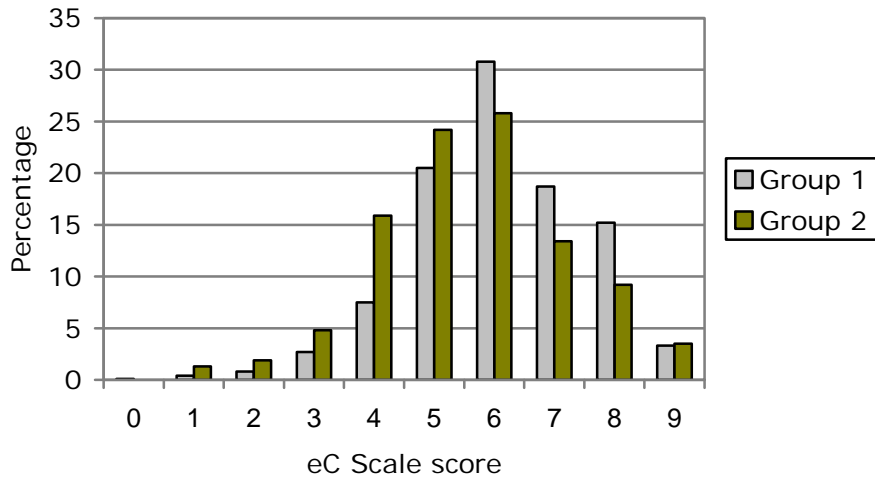


Figure 5.4: Wanted Control (wC) score frequency distribution

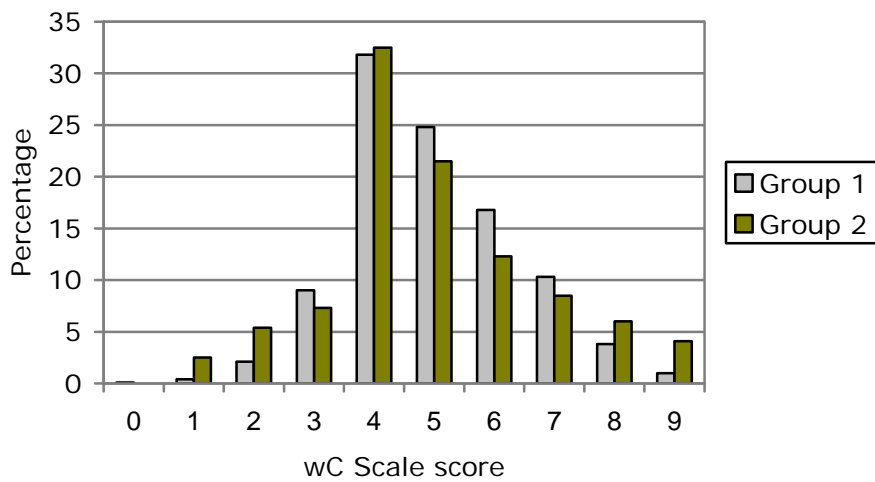


Figure 5.5: Expressed Affection (eA) score frequency distribution (n=308)

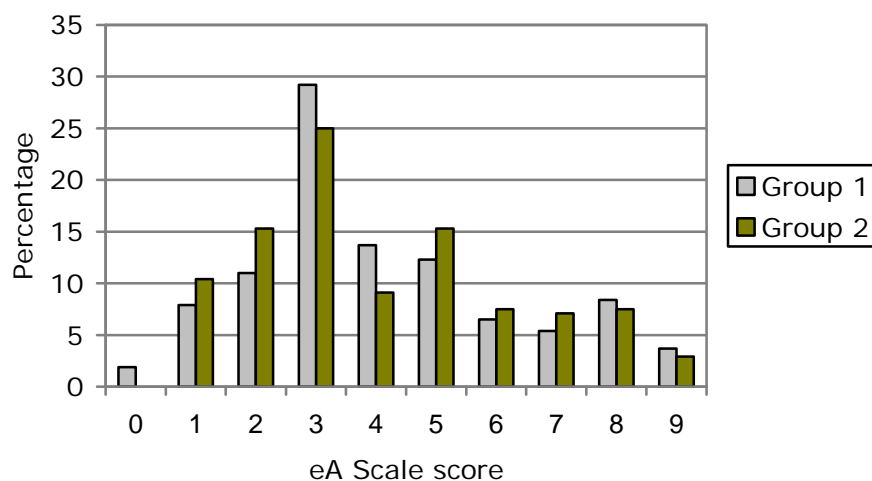
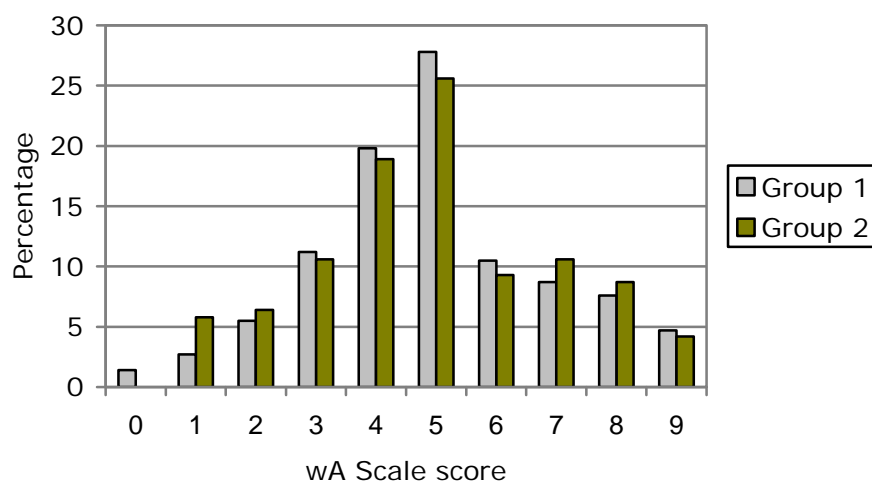


Figure 5.6: Wanted Affection (wA) score frequency distribution



Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the European English questionnaire are shown in Table 5.3.

Table 5.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha	
	Group 1	Group 2
Expressed Inclusion (eI)	0.84	0.85
Wanted Inclusion (wI)	0.95	0.95
Expressed Control (eC)	0.91	0.92
Wanted Control (wC)	0.84	0.89
Expressed Affection (eA)	0.86	0.87
Wanted Affection (wA)	0.85	0.85

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.²¹ On this basis, all the dimensions of the questionnaire show good internal consistency reliability across both groups.

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 5.4.

Table 5.4: Scale intercorrelations

Group 1

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.45**					
Expressed Control (eC)	0.09**	0.16**				
Wanted Control (wC)	0.12**	0.12**	-0.02*			
Expressed Affection (eA)	0.38**	0.39**	0.04**	0.08**		
Wanted Affection (wA)	0.29**	0.50**	0.03**	0.06**	0.60**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

Group 2

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.37**					
Expressed Control (eC)	0.02	0.07				
Wanted Control (wC)	0.09	0.06	-0.09			
Expressed Affection (eA)	0.43**	0.45**	-0.01	-0.01		
Wanted Affection (wA)	0.24**	0.55**	-0.02	0.11	0.57**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is very little correlation.

²¹ For example, see Nunnally (1978) or Kline (2000).

Group differences

Group differences amongst individuals, who completed the European English questionnaire, were explored on the basis of gender, age, education level, employment status, and work area.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 8.5, along with the difference in mean scores. This is represented graphically in Figure 5.7.

Table 5.5: Gender differences in scale scores

Group 1

FIRO-B scale	Females (n=4,132)		Males (n=6,315)		Difference (F-M) ²²
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.59	1.34	5.58	1.35	0.01
Wanted Inclusion (wI)	4.08	1.93	4.03	1.87	0.05
Expressed Control (eC)	5.79	1.51	6.29	1.38	-0.50**
Wanted Control (wC)	4.91	1.40	4.96	1.44	-0.05
Expressed Affection (eA)	4.32	2.13	3.97	2.24	0.35**
Wanted Affection (wA)	5.02	1.84	4.86	2.02	0.16**

Group 2

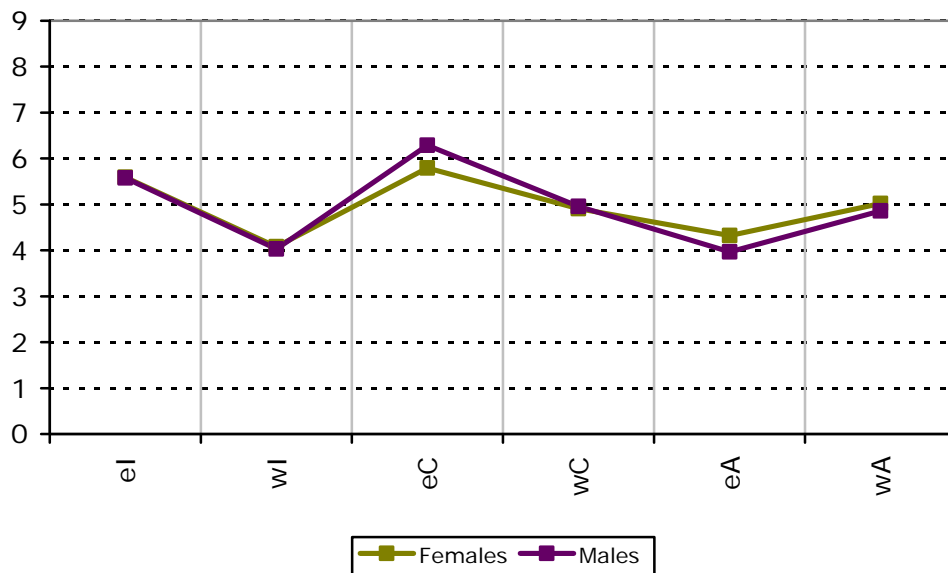
FIRO-B scale	Females (n=194)		Males (n=122)		Difference (F-M) ²²
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.28	1.41	5.11	1.36	0.17
Wanted Inclusion (wI)	4.44	2.24	4.23	2.04	0.21
Expressed Control (eC)	5.33	1.56	5.98	1.60	-0.65**
Wanted Control (wC)	5.04	1.69	4.70	1.89	0.34
Expressed Affection (eA)	4.40	2.16	3.59	2.17	0.81**
Wanted Affection (wA)	5.10	2.02	4.58	1.98	0.52*

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

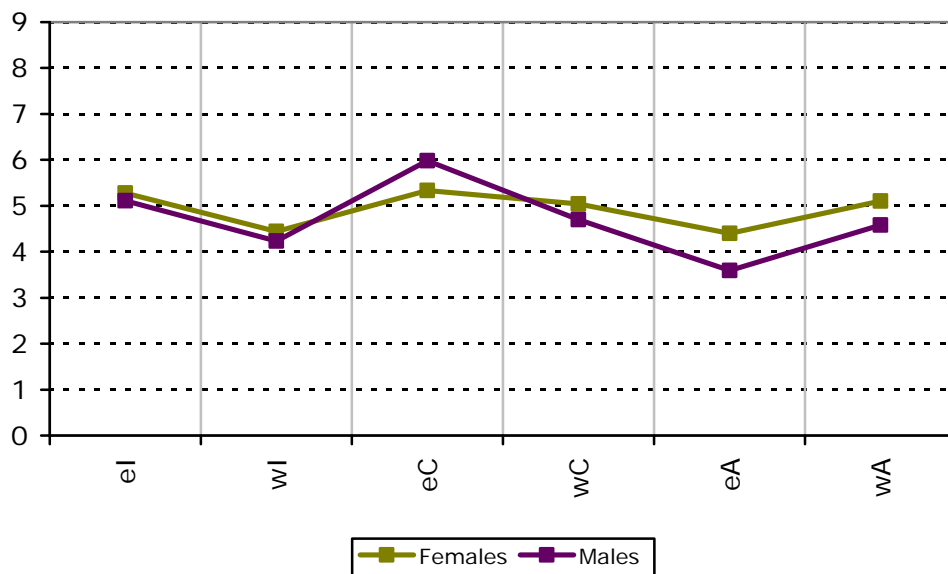
²² A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Figure 5.7: Gender differences in scale scores

Group 1



Group 2



A consistent pattern emerged across both groups. Of the six scales, three showed significant differences in mean scores with females scoring higher on Expressed Affection and Wanted Affection and males scoring higher on Expressed Control.

Age

Correlations between scale scores and age are shown in Table 5.6.

Table 5.6: Gender differences in scale scores

Scale	Correlation with age	
	Group 1	Group 2
Expressed Inclusion (eI)	-0.10**	-0.09
Wanted Inclusion (wI)	-0.13**	-0.22**
Expressed Control (eC)	0.07**	0.10
Wanted Control (wC)	-0.06**	0.02
Expressed Affection (eA)	-0.09**	-0.11
Wanted Affection (wA)	-0.07**	-0.05

Significant at: * $p < 0.05$, ** $p < 0.01$

Of the six scales, only Wanted Inclusion showed a significant correlation with age across both groups. The other significant correlations amongst Group 1 are likely to be more a reflection of the very large sample size than of a true relationship.

The negative correlation suggests that age is inversely related to scores on the Wanted Inclusion scale, meaning that younger respondents were more likely to achieve higher wanted Inclusion scores than older respondents.

Education level

Specific educational qualifications were not collected for either sample; however, the age at which individuals left full-time education was recorded for Group 1. No significant and meaningful differences were found between the age at which individuals left full-time education and scores on any of the scales.

Employment status

Table 5.7 shows the scale means and standard deviation for each employment status category where there are sufficient numbers of people for analysis. This is represented graphically in Figure 5.8.

The data from Group 1 showed a number of statistically significant differences, but none of these differences were large in real terms. This is reflected in the Group 2 data, which is based on a smaller sample size, where no significant differences were found between full-time and part-time workers.

The only real observable pattern across the two samples is that Expressed Control scores tend to be higher amongst full-time workers than part-time workers, and the Expressed Affection and Wanted Affection scores tend to be higher amongst part-time workers. This corresponds with the gender differences observed for these scales, and

is likely to be a reflection of the larger numbers of women in part-time roles.

Table 5.7: Scale scores by employment status

Group 1

Scale	Working full-time (n=7,712)		Working part-time (n=350)		Self-employed (n=586)		Sig
	Mean	SD	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.62	1.35	5.65	1.24	5.46	1.33	*
Wanted Inclusion (wI)	4.09	1.90	4.07	1.81	3.89	1.87	
Expressed Control (eC)	6.15	1.43	5.59	1.53	6.12	1.35	**
Wanted Control (wC)	4.98	1.44	4.98	1.40	4.77	1.28	**
Expressed Affection (eA)	4.10	2.21	4.32	1.85	4.41	2.32	**
Wanted Affection (wA)	4.94	1.95	5.15	1.63	5.14	2.01	**

Group 2

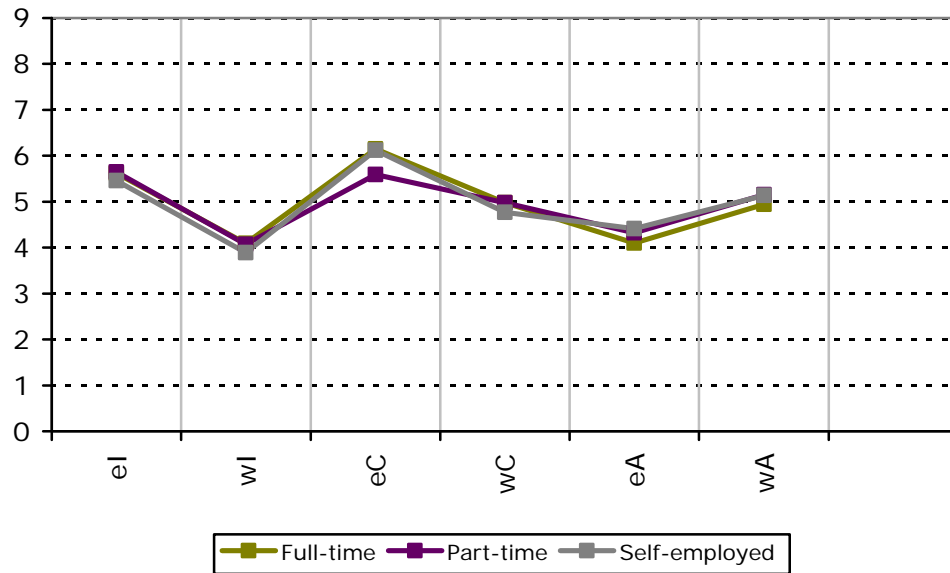
Scale	Working full-time (n=221)		Working part-time (n=40)		Difference (FT-PT) ²³
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.21	1.37	5.53	1.34	-0.32
Wanted Inclusion (wI)	4.32	2.08	4.54	2.33	-0.22
Expressed Control (eC)	5.75	1.56	5.30	1.57	0.45
Wanted Control (wC)	5.03	1.76	4.83	1.75	0.20
Expressed Affection (eA)	3.94	2.09	4.38	2.31	-0.44
Wanted Affection (wA)	4.84	2.03	5.13	1.91	-0.29

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

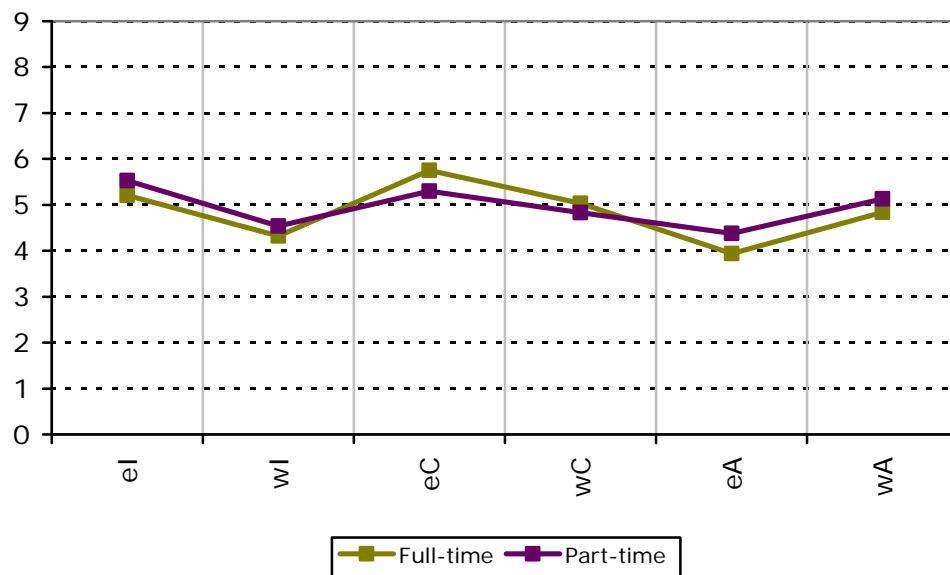
²³ A positive value indicates that full-time employee mean scores are higher and a negative value indicates that part-time employee mean scores are higher.

Figure 5.8: Employment status differences in scale scores

Group 1



Group 2:



Occupational level

Table 5.8 shows the scale means and standard deviation for different occupational levels. The findings can be summarised as follows.

- No clear patterns were found regarding the Expressed Inclusion and Wanted Inclusion scales. The mean scores on both scales were very consistent across different occupational levels.
- Scores on the Expressed Control scale increased with occupational level, meaning that those in higher level occupations tended to score higher. The differences from one occupational level to the next were not particularly large, but the combined affect across levels meant that people towards the top of organisations tended to score considerably higher than those in lower level occupations.
- Scores on the Wanted Control scales generally decreased with occupational level, meaning that those in lower level occupations tended to score higher. However, the differences were smaller than those observed for Expressed Control.
- Scores on the Expressed Affection and Wanted Affection scales were found to be fairly consistent across all levels, except Employee level, where they were higher. This is likely to be at least partially the result of the higher proportion of women in roles of this level amongst this group.

In addition to looking at differences across occupational levels within this group, it was also possible to compare mean scale scores for various levels amongst this group with comparable data collected for the instrument when it was first developed back in 1996.

Interestingly it was found that, for equivalent occupational levels, mean scores on all the scales were higher for the respondents, who completed the questionnaire in 2007/08, than for those who completed it a decade or so earlier. The extent of the differences varied across scales and occupational levels, but was typically in the region of one quarter to three quarters of a standard deviation.

These differences are illustrated for two key occupational levels in Figures 5.9. These groups were selected because they contained the largest number of people in the smaller of the two comparison groups (the 1996 sample). However, the same patterns were also found for other occupational levels.

Chapter 5: supplementary European English data

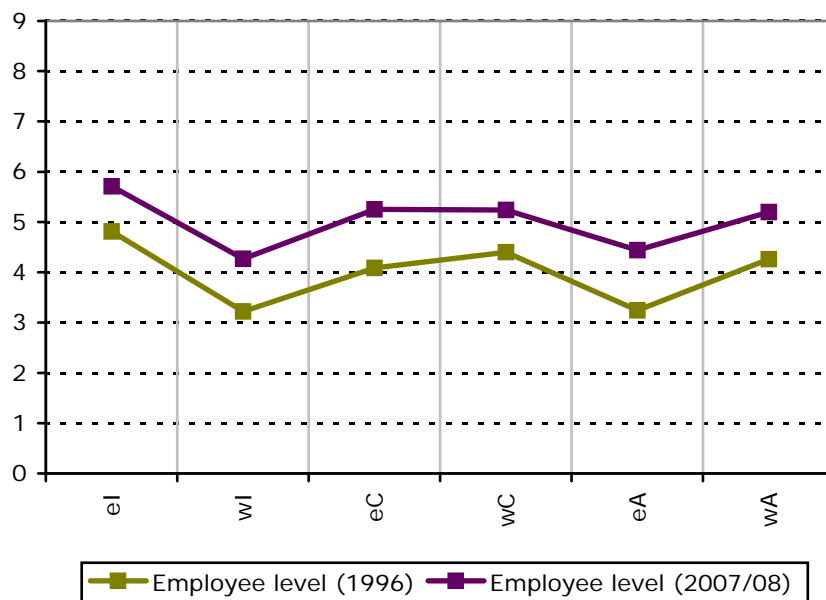
Table 5.8: Mean scale scores by occupational level

FIRO-B dimension	Top level (n=578)		Senior Executive (n=1,744)		Upper Middle Management (n=2,028)		Middle Management (n=1,844)		First Level Mgt /Supervisory (n=893)		Employee (n=1,046)		Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.61	1.31	5.59	1.32	5.55	1.30	5.65	1.35	5.66	1.32	5.71	1.43	*
Wanted Inclusion (wI)	4.02	1.88	4.04	1.79	4.02	1.84	4.11	1.89	4.11	1.89	4.27	2.18	*
Expressed Control (eC)	6.57	1.34	6.49	1.30	6.35	1.32	6.12	1.37	5.86	1.40	5.25	1.55	**
Wanted Control (wC)	4.84	1.38	4.81	1.35	4.96	1.35	5.02	1.43	5.05	1.54	5.24	1.57	**
Expressed Affection (eA)	4.12	2.23	4.10	2.25	4.03	2.18	4.09	2.11	4.12	2.18	4.44	2.33	**
Wanted Affection (wA)	4.98	2.03	4.92	1.97	4.88	1.91	4.88	1.90	4.99	1.96	5.20	2.03	**

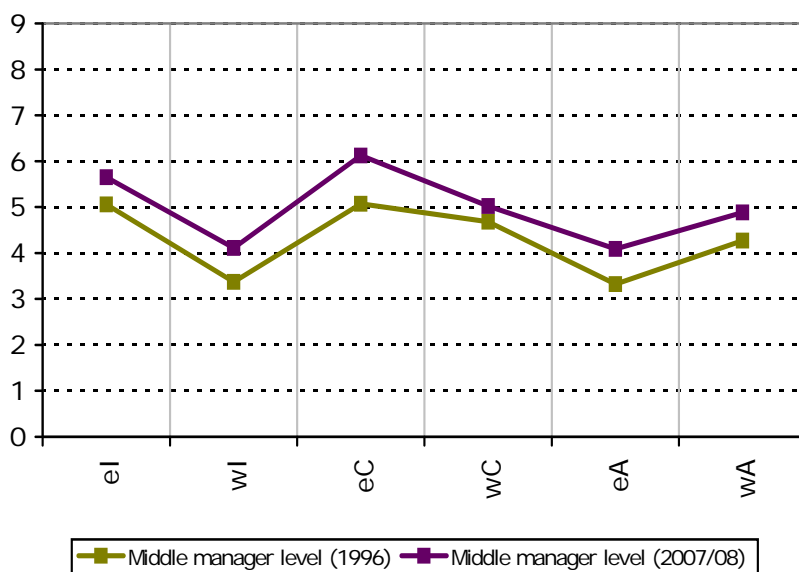
Significant at: * $p < 0.05$, ** $p < 0.01$ (based on a one-way analysis of variance).

Figure 5.9: Differences in mean scale scores over time

Employee level



Middle manager level



It is not known for sure why this difference has been found, but one suggestion is that it has resulted from the fact that the 2007/08 respondents would in most cases have completed the instrument as part of some kind of HR intervention. As such, they may have felt that it was in their interest to respond the questionnaire in a more socially desirable way, hence inflating the scores slightly. The respondents, who completed the questionnaire in 1996, did so as part of the project to develop the European English version of the questionnaire, so would not have felt under any pressure to respond in a particular way.

An alternative explanation is that the differences reflect a genuine shift in responses to the questionnaire over time. It would be interesting to explore this issue further at some stage.

Work area

Information regarding the area of work people engage in was collected for Group 1. Many different categories were used, but for the purposes of analysis the focus was on the six most commonly occurring. These were as follows:

- HR, training, guidance
- Finance
- Sales, customer service
- Health, social services, etc.
- Business services
- Science, engineering.

Table 5.9 shows the scale means and standard deviation for these six work areas. Whilst statistically significant differences were found across groups, it is difficult to identify any clear patterns. Within each scale, mean score differences across work areas tended to be in the region of 0.50 or less. This equates to between approximately one quarter and one third of a standard deviation, and hence is quite small.

Readers who are interested in personality differences across work areas might like to refer to the MBTI Step I and Step II European Data Supplements (available to download from the OPP website), which provide details of differences in terms of MBTI preferences and Step II facet scores.

FIRO-B European Data Supplement

Table 5.9: Mean scale scores by work area

Step II facet scale	HR, training, guidance (n=1,424)		Finance (n=1,161)		Sales, customer service (n=952)		Health, social services (n=769)		Business services (n=722)		Science, engineering (n=670)		Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.53	1.36	5.69	1.26	5.69	1.30	5.60	1.28	5.63	1.36	5.74	1.30	**
Wanted Inclusion (wI)	4.04	1.93	4.22	1.86	4.10	1.82	3.82	1.69	4.11	1.85	4.17	1.91	**
Expressed Control (eC)	5.83	1.43	6.29	1.30	6.39	1.38	5.90	1.47	6.15	1.30	6.32	1.39	**
Wanted Control (wC)	4.93	1.41	4.91	1.35	4.98	1.46	4.85	1.36	5.01	1.40	5.11	1.42	**
Expressed Affection (eA)	4.44	2.22	4.00	2.23	4.34	2.25	3.98	1.91	4.17	2.32	3.82	2.15	**
Wanted Affection (wA)	5.13	1.91	5.00	1.93	4.94	1.94	4.81	1.60	5.03	1.97	4.78	2.01	**

Significant at: *p<0.05, **p<0.01 (based on a one-way analysis of variance).

Chapter 6: Data from the Danish language questionnaire

Demographic data

The data in this supplement is based on responses from 531 respondents, who completed the Danish version of the questionnaire over a two-year period between August 2005 and December 2007.

Of these, 376 (71%) were female and 155 (29%) were male. Ages ranged from 18 to 65, with a mean age of 35 years. All the individuals stated that their country of residence was Denmark.

The present employment status of the group is summarised in Table 6.1.

Table 6.1: Employment status

Employment status	Number	Percentage
Working full-time	348	65.5%
Working part-time	44	8.3%
Not working for income	7	1.3%
Retired	3	0.6%
Full-time student	47	8.9%
Other	82	15.4%

Scale properties

Descriptive statistics

Table 6.2 below shows the mean and standard deviation for each of the six scales.

Table 6.2: Scale means and standard deviations

Scale	Mean	Std Dev
Expressed Inclusion (eI)	5.61	1.32
Wanted Inclusion (wI)	3.92	2.02
Expressed Control (eC)	5.42	1.61
Wanted Control (wC)	5.16	1.60
Expressed Affection (eA)	4.60	2.45
Wanted Affection (wA)	5.22	2.00

The frequency distributions of the scales are shown in Figures 6.1 to 6.6:

Figure 6.1: Expressed Inclusion (ei) score frequency distribution (n=530)

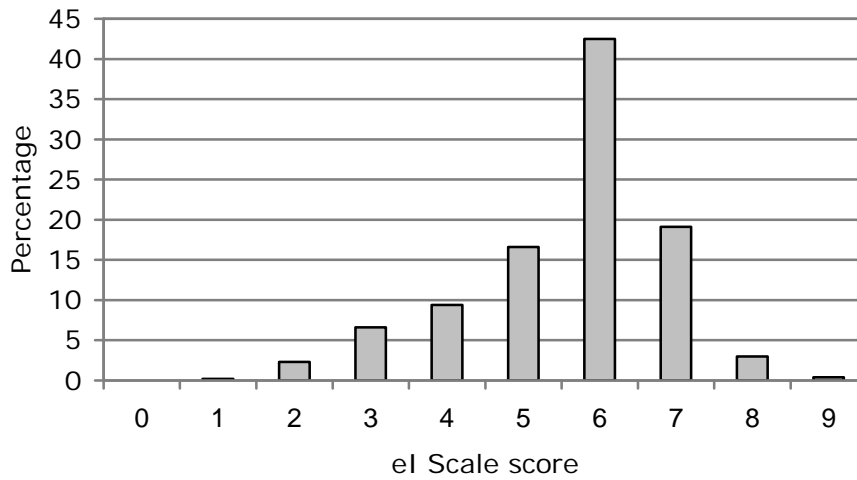


Figure 6.2: Wanted Inclusion (wi) score frequency distribution (n=513)

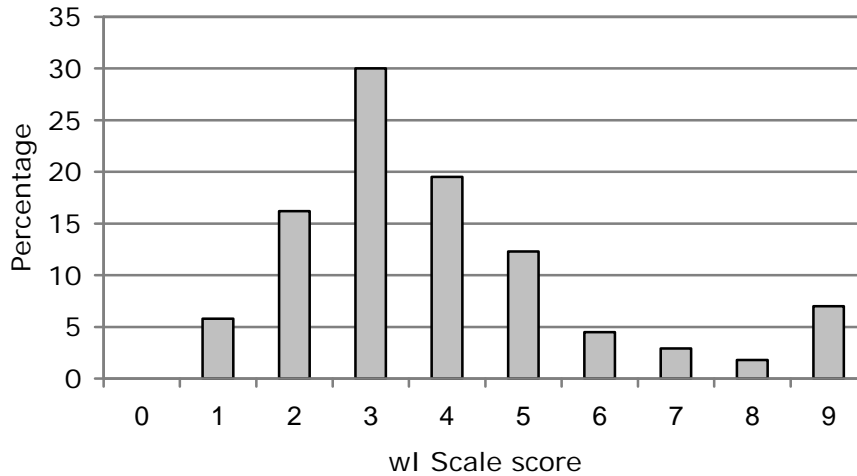


Figure 6.3: Expressed Control (eC) score frequency distribution (n=530)

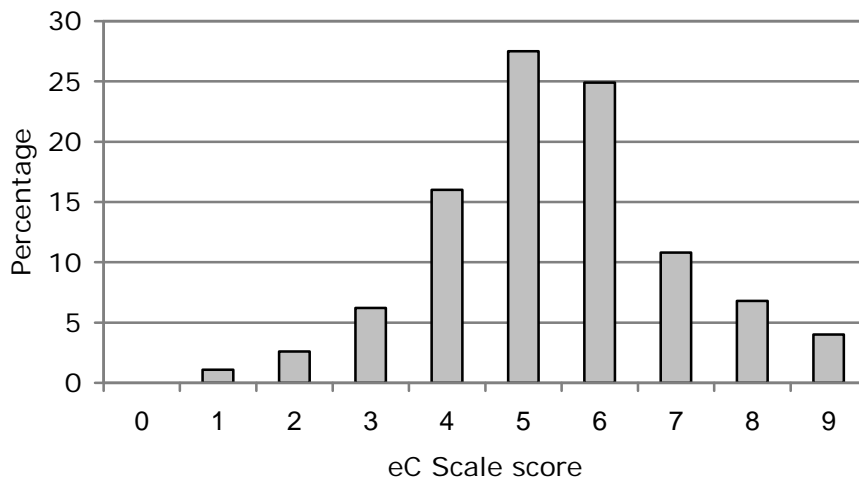


Figure 6.4: Wanted Control (wC) score frequency distribution (n=530)

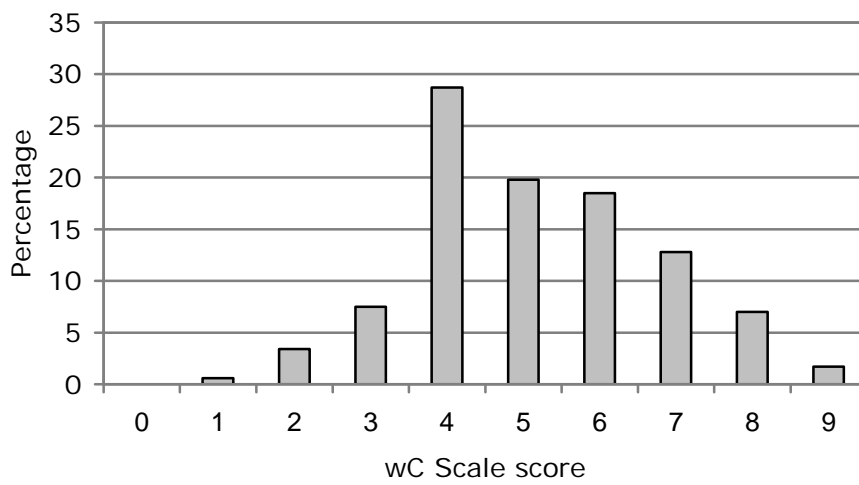


Figure 6.5: Expressed Affection (eA) score frequency distribution (n=520)

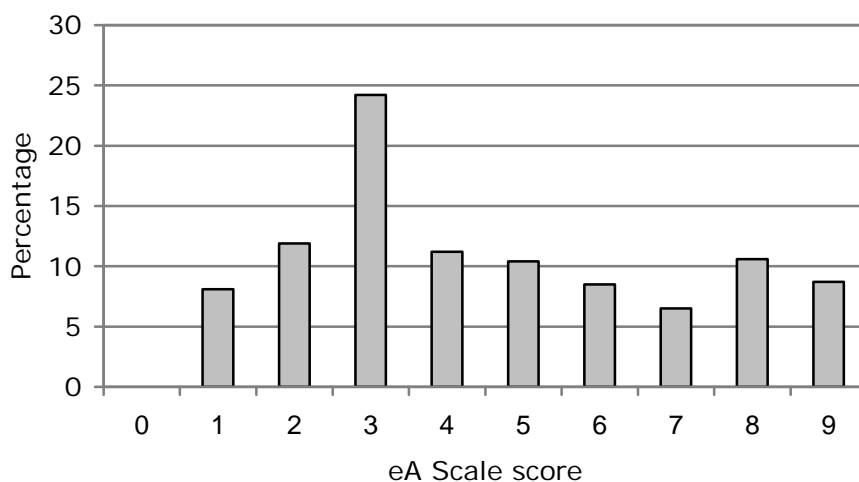
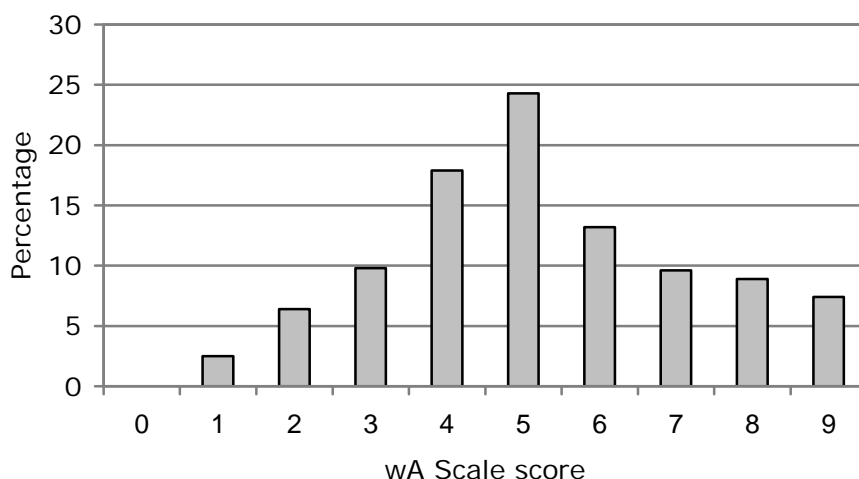


Figure 6.6: Wanted Affection (wA) score frequency distribution (n=530)



Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the Danish questionnaire are shown in Table 6.3.

Table 6.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha
Expressed Inclusion (eI)	0.84
Wanted Inclusion (wI)	0.94
Expressed Control (eC)	0.93
Wanted Control (wC)	0.91
Expressed Affection (eA)	0.90
Wanted Affection (wA)	0.80

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.²⁴ On this basis, all the dimensions of the questionnaire show good internal consistency reliability.

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 6.4:

Table 6.4: Scale intercorrelations

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.25**					
Expressed Control (eC)	0.14**	0.04				
Wanted Control (wC)	0.01	0.15**	-0.14**			
Expressed Affection (eA)	0.44**	0.28**	0.06	-0.13**		
Wanted Affection (wA)	0.30**	0.48**	-0.06	0.05	0.55**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is very little correlation.

Group differences

Group differences amongst individuals, who completed the Danish questionnaire, were explored on the basis of gender, age and employment status.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 6.5, along with the difference in mean scores. This is represented graphically in Figure 6.7.

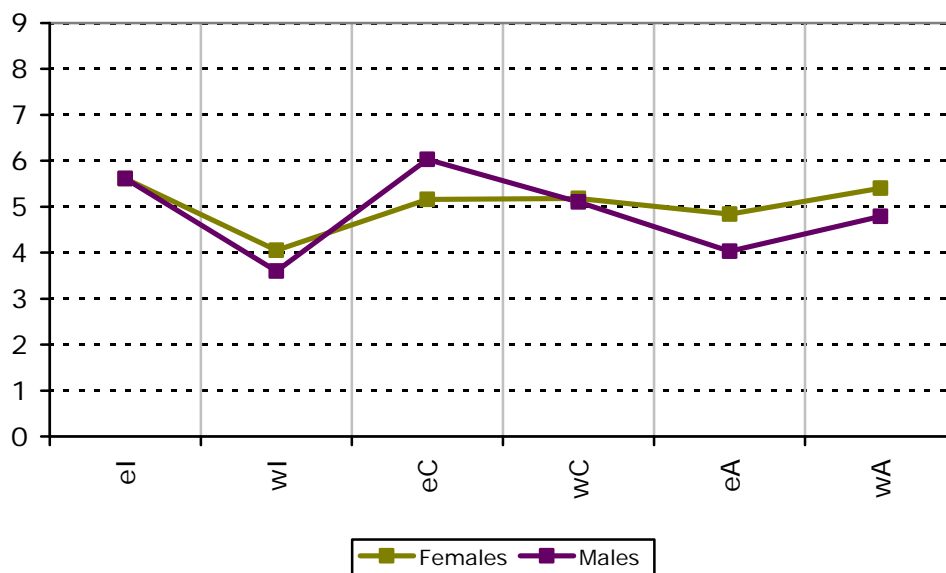
²⁴ For example, see Nunnally (1978) or Kline (2000).

Table 6.5: Gender differences in scale scores

FIRO-B scale	Females (n=375)		Males (n=155)		Difference (F-M) ²⁵
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.61	1.32	5.61	1.32	0.00
Wanted Inclusion (wI)	4.05	2.14	3.60	1.66	0.45*
Expressed Control (eC)	5.16	1.54	6.03	1.61	-0.87**
Wanted Control (wC)	5.18	1.65	5.10	1.49	0.08
Expressed Affection (eA)	4.84	2.42	4.03	2.42	0.81**
Wanted Affection (wA)	5.40	1.97	4.79	2.02	0.61**

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 6.7: Gender differences in scale scores



Of the six scales, four showed significant differences in mean scores with females scoring higher on Wanted Inclusion, Expressed Affection and Wanted Affection and males scoring higher on Expressed Control.

²⁵ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Age

Correlations between scale scores and age are shown in Table 6.6:

Table 6.6: Gender differences in scale scores

Scale	Correlation with age
Expressed Inclusion (eI)	0.02
Wanted Inclusion (wI)	-0.16**
Expressed Control (eC)	0.12**
Wanted Control (wC)	-0.09*
Expressed Affection (eA)	0.03
Wanted Affection (wA)	-0.11*

Significant at: * $p < 0.05$, ** $p < 0.01$

Of the six scales, four showed a significant correlation with age. However, in real terms, all the correlations were quite small with the exception, perhaps, of the one with Wanted Inclusion.

The negative correlation suggests that age is inversely related to scores on the Wanted Inclusion scale, meaning that younger respondents were more likely to achieve higher Wanted Inclusion scores than older respondents.

Employment status

Table 6.7 shows the scale means and standard deviation for each employment status category where there are sufficient numbers of people for analysis (30 or more, in this instance, not including the 'Other' category). This is represented graphically in Figure 6.8.

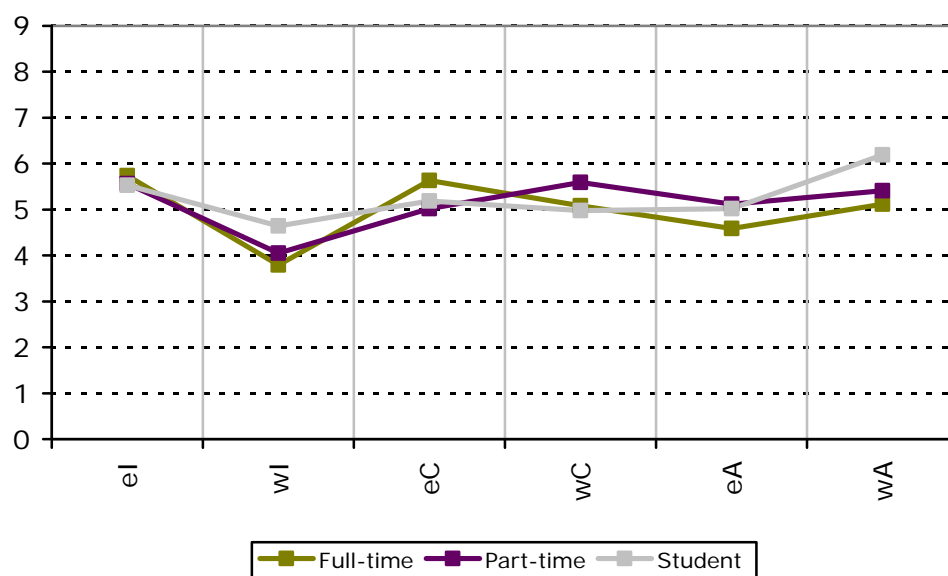
Whilst there are some observable differences across groups on several of the scales, the only statistically significant difference was found between individuals working full-time and full-time students on the Wanted Affection scale. The mean score amongst the student group was significantly higher than amongst the working full-time group.²⁶ However, these results should be treated with caution due to the relatively small sample sizes for the working part-time and full-time student groups.

²⁶ Significant at $p < 0.01$ (based on a one-way analysis of variance).

Table 6.7: Scale scores by employment status

Scale	Working full-time (n=348)		Working part-time (n=43)		Full-time student (n=47)	
	Mean	SD	Mean	SD	Mean	SD
Expressed Inclusion (eI)	5.74	1.21	5.56	1.30	5.53	1.49
Wanted Inclusion (wI)	3.79	1.94	4.05	1.87	4.64	2.48
Expressed Control (eC)	5.63	1.60	5.02	1.07	5.19	1.42
Wanted Control (wC)	5.08	1.53	5.59	1.54	4.98	1.86
Expressed Affection (eA)	4.59	2.46	5.12	2.41	5.02	2.56
Wanted Affection (wA)	5.12	1.97	5.41	2.00	6.19	2.02

Figure 6.8: Employment status differences in scale scores



Chapter 7: Data from the Dutch language questionnaire

Demographic data

The data in this supplement is based on responses from 265 respondents, who completed the Dutch version of the questionnaire over a five-month period between February 2009 and June 2009.

Of these, 159 (60%) were female and 106 (40%) were male. Ages ranged from 24 to 80, with a mean age of 43 years. 153 (58%) individuals stated that their country of residence was The Netherlands, whilst 109 (41%) resided in Belgium. The three other respondents lived elsewhere.

The present employment status of the group is summarised in Table 7.1.

Table 7.1: Employment status

Employment status	Number	Percentage
Working full-time	204	77.0%
Working part-time	61	23.0%

Scale properties

Descriptive statistics

Table 7.2 below shows the mean and standard deviation for each of the six scales.

Table 7.2: Scale means and standard deviations

Scale	Mean	Std Dev
Expressed Inclusion (eI)	5.41	1.35
Wanted Inclusion (wI)	4.48	1.91
Expressed Control (eC)	5.79	1.54
Wanted Control (wC)	5.69	1.46
Expressed Affection (eA)	5.42	2.20
Wanted Affection (wA)	6.93	1.96

The frequency distributions of the scales are shown in Figures 7.1 to 7.6:

Figure 7.1: Expressed Inclusion (ei) score frequency distribution (n=265)

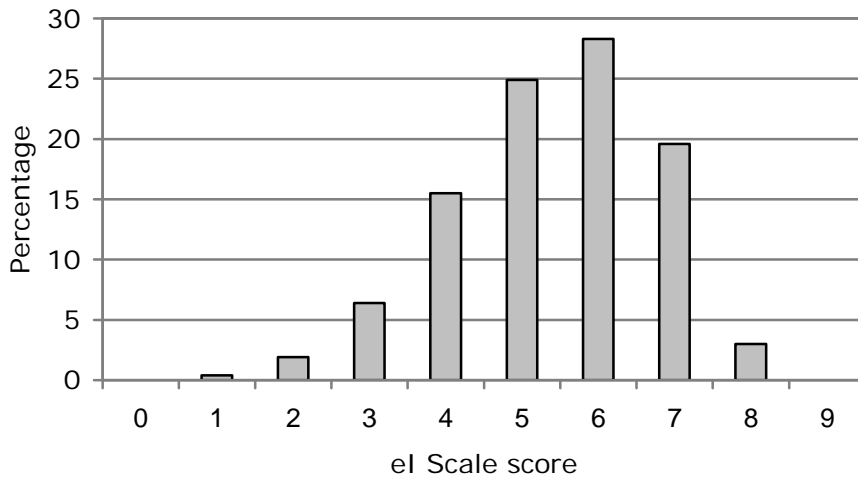


Figure 7.2: Wanted Inclusion (wi) score frequency distribution (n=265)

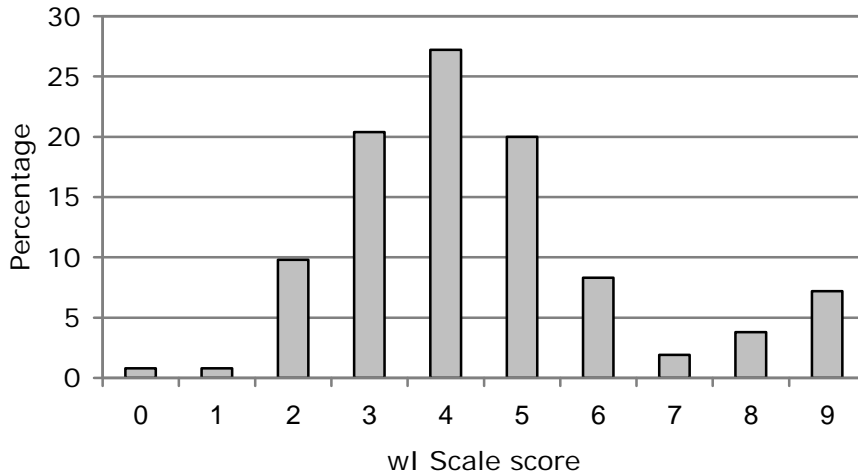


Figure 7.3: Expressed Control (eC) score frequency distribution (n=265)

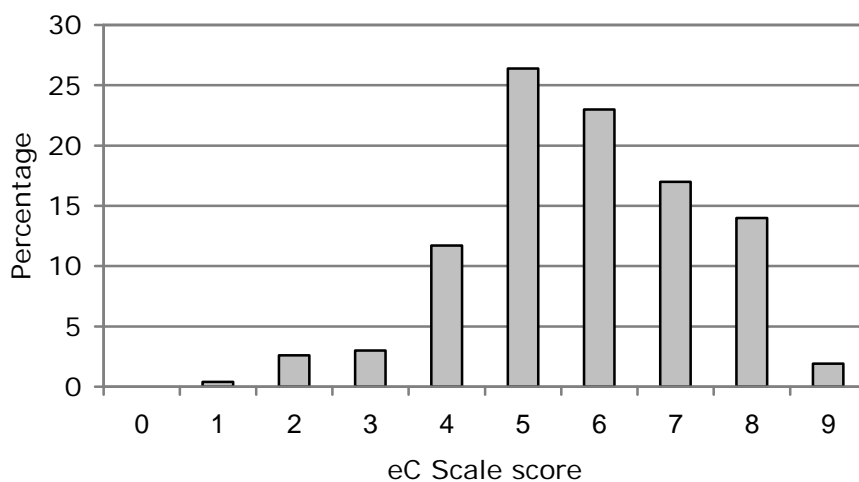


Figure 7.4: Wanted Control (wC) score frequency distribution (n=265)

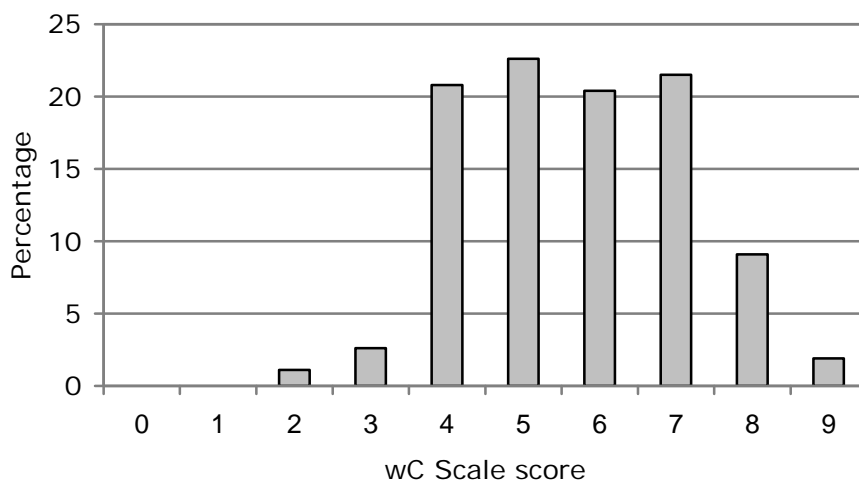


Figure 7.5: Expressed Affection (eA) score frequency distribution (n=265)

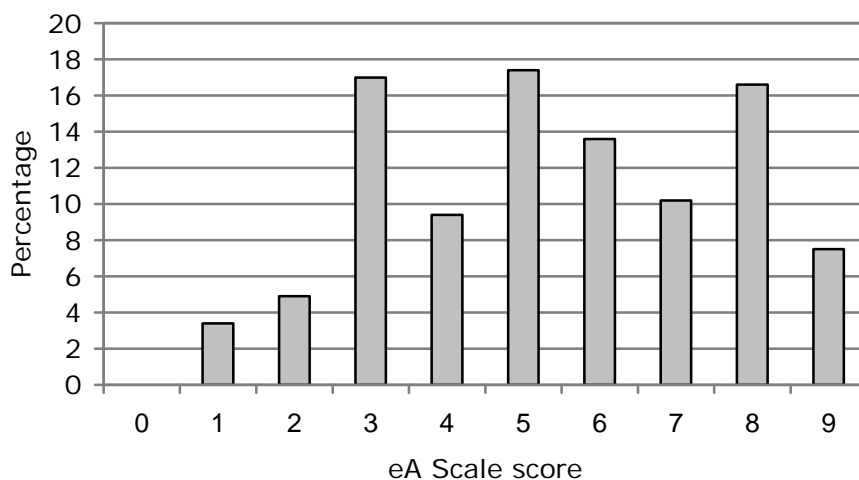
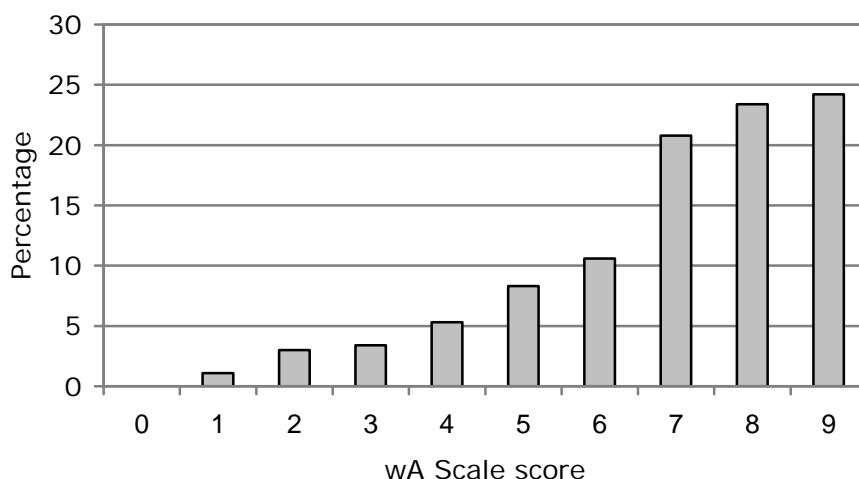


Figure 7.6: Wanted Affection (wA) score frequency distribution (n=265)



Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the Dutch questionnaire are shown in Table 7.3.

Table 7.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha
Expressed Inclusion (eI)	0.86
Wanted Inclusion (wI)	0.94
Expressed Control (eC)	0.92
Wanted Control (wC)	0.89
Expressed Affection (eA)	0.85
Wanted Affection (wA)	0.86

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.²⁷ On this basis, all the dimensions of the questionnaire show good internal consistency reliability.

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 7.4:

Table 7.4: Scale intercorrelations

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.47**					
Expressed Control (eC)	0.13*	0.16**				
Wanted Control (wC)	0.09	0.16**	-0.07			
Expressed Affection (eA)	0.33**	0.33**	0.07	0.10		
Wanted Affection (wA)	0.32**	0.46**	-0.06	0.19**	0.44**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is very little correlation.

Group differences

Group differences amongst individuals, who completed the Dutch questionnaire, were explored on the basis of gender, age, employment status and country of residence.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 7.5, along with the difference in mean scores. This is represented graphically in Figure 7.7.

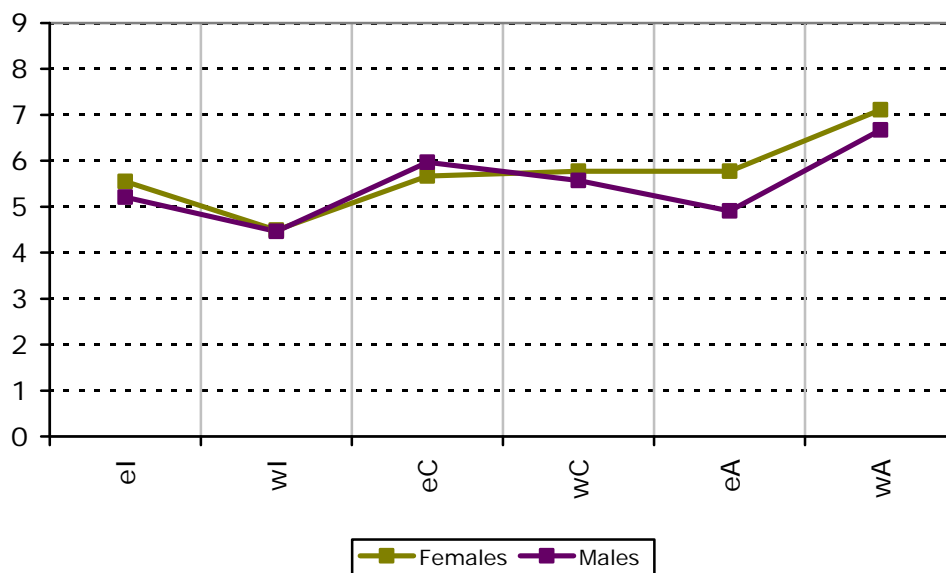
²⁷ For example, see Nunnally (1978) or Kline (2000).

Table 7.5: Gender differences in scale scores

FIRO-B scale	Females (n=159)		Males (n=106)		Difference (F-M) ²⁸
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.55	1.31	5.21	1.39	0.34*
Wanted Inclusion (wI)	4.49	1.88	4.46	1.98	0.03
Expressed Control (eC)	5.67	1.52	5.97	1.56	-0.30
Wanted Control (wC)	5.77	1.49	5.57	1.41	0.20
Expressed Affection (eA)	5.77	2.11	4.91	2.24	0.86**
Wanted Affection (wA)	7.11	1.98	6.67	1.90	0.44

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 7.7: Gender differences in scale scores



Of the six scales, two showed significant differences in mean scores with females scoring higher on Expressed Inclusion and Expressed Affection.

²⁸ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Age

Correlations between scale scores and age are shown in Table 7.6:

Table 7.6: Gender differences in scale scores

Scale	Correlation with age
Expressed Inclusion (eI)	-0.07
Wanted Inclusion (wI)	-0.06
Expressed Control (eC)	0.08
Wanted Control (wC)	-0.22**
Expressed Affection (eA)	-0.11
Wanted Affection (wA)	-0.15*

Significant at: * $p < 0.05$, ** $p < 0.01$

Of the six scales, two showed a significant correlation with age. However, in real terms, all the correlations were quite small with the exception, perhaps, of the one with Wanted Control.

The negative correlations suggest that age is inversely related to scores on the Wanted Control and Wanted Affection scales, meaning that younger respondents were more likely to achieve higher Wanted Control and Wanted Affection scores than older respondents.

Employment status

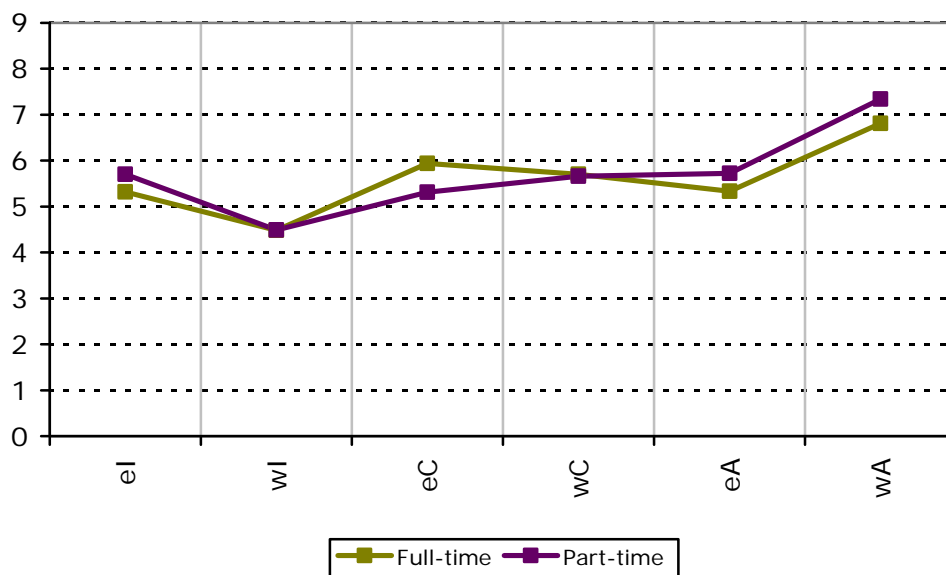
Table 7.7 shows the scale means and standard deviation for full-time and part-time workers. This is represented graphically in Figure 7.8.

The only statistically significant difference was found between groups on the Expressed Control scale. The mean score amongst full-time workers was significantly higher than amongst the part-time workers group.

Table 7.7: Scale scores by employment status

Scale	Working full-time (n=204)		Working part-time (n=61)		Difference (FT-PT) ²⁹
	Mean	SD	Mean	SD	
Expressed Inclusion (ei)	5.32	1.35	5.70	1.31	-0.38
Wanted Inclusion (wi)	4.48	1.94	4.49	1.86	-0.01
Expressed Control (eC)	5.94	1.51	5.31	1.58	0.63**
Wanted Control (wC)	5.70	1.44	5.66	1.54	0.04
Expressed Affection (eA)	5.33	2.23	5.72	2.10	-0.39
Wanted Affection (wA)	6.81	1.97	7.34	1.85	-0.53

Figure 7.8: Employment status differences in scale scores



Country of residence

The means and standard deviations of the FIRO-B scales are shown separately for respondents living in Belgium and The Netherlands in Table 7.8, along with the difference in mean scores. This is represented graphically in Figure 7.9.

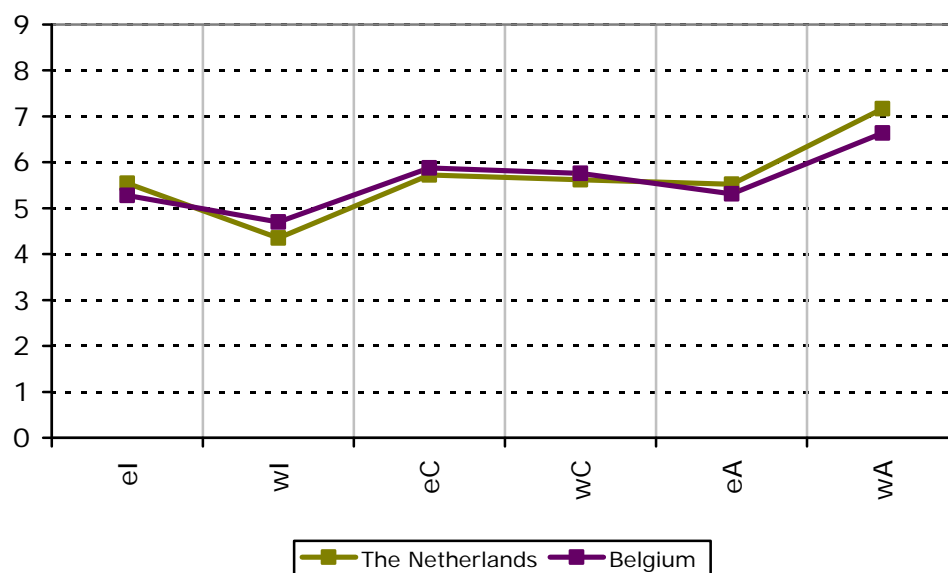
²⁹ A positive value indicates that full-time worker mean scores are higher and a negative value indicates that part-time worker mean scores are higher.

Table 7.8: Scale scores by country of residence

FIRO-B scale	The Netherlands (n=153)		Belgium (n=109)		Difference (N-B) ³⁰
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.54	1.16	5.28	1.52	0.26
Wanted Inclusion (wI)	4.35	1.76	4.70	2.10	-0.35
Expressed Control (eC)	5.72	1.56	5.88	1.54	-0.16
Wanted Control (wC)	5.62	1.44	5.76	1.48	-0.14
Expressed Affection (eA)	5.52	2.23	5.31	2.13	0.21
Wanted Affection (wA)	7.17	1.78	6.64	2.10	0.53*

Difference significant at: * $p < 0.05$, ** $p < 0.01$ (based on an independent samples t-test).

Figure 7.9: Scale scores by country of residence



Of the six scales, only one showed a significant difference in mean scores, with respondents living in The Netherlands scoring higher on Wanted Affection than those living in Belgium.

³⁰ A positive value indicates that mean scores from The Netherlands are higher and a negative value indicates that mean scores from Belgium are higher.

Chapter 8: Data from the French language questionnaire

Demographic data

The data in this supplement is based on responses from 786 respondents, who completed the French version of the questionnaire over a two-year period between August 2005 and December 2007.

Of these, 584 (74%) were female and 202 (26%) were male. Ages ranged from 18 to 67, with a mean age of 30 years. All except three of the individuals stated that their country of residence was France. The three other individuals resided in Belgium.

The present employment status of the group is summarised in Table 8.1.

Table 8.1: Employment status

Employment status	Number	Percentage
Working full-time	365	46.4%
Working part-time	88	11.2%
Not working for income	42	5.3%
Retired	2	0.3%
Full-time student	58	7.4%
Other	231	29.4%

Scale properties

Descriptive statistics

Table 8.2 below shows the mean and standard deviation for each of the six scales.

Table 8.2: Scale means and standard deviations

Scale	Mean	Std Dev
Expressed Inclusion (eI)	5.42	1.44
Wanted Inclusion (wI)	4.69	2.23
Expressed Control (eC)	5.30	1.97
Wanted Control (wC)	4.41	1.90
Expressed Affection (eA)	5.07	2.06
Wanted Affection (wA)	5.38	1.90

The frequency distributions of the scales are shown in Figures 8.1 to 8.6:

Figure 8.1: Expressed Inclusion (ei) score frequency distribution (n=530)

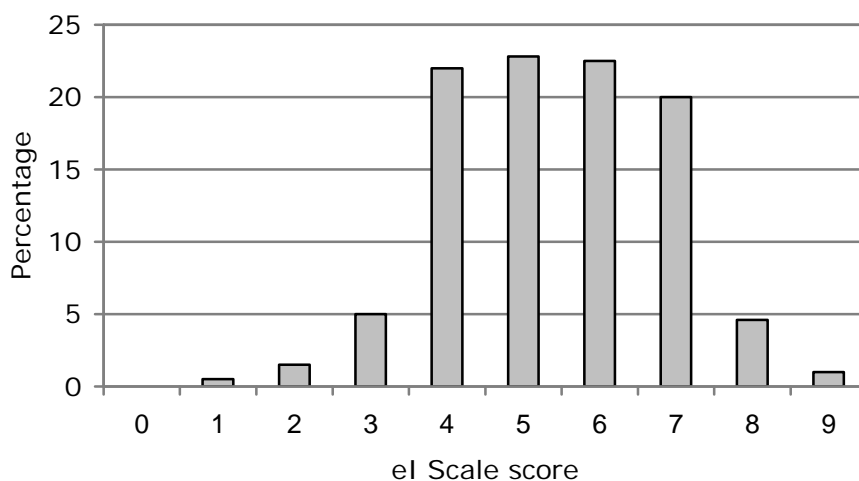


Figure 8.2: Wanted Inclusion (wi) score frequency distribution (n=513)

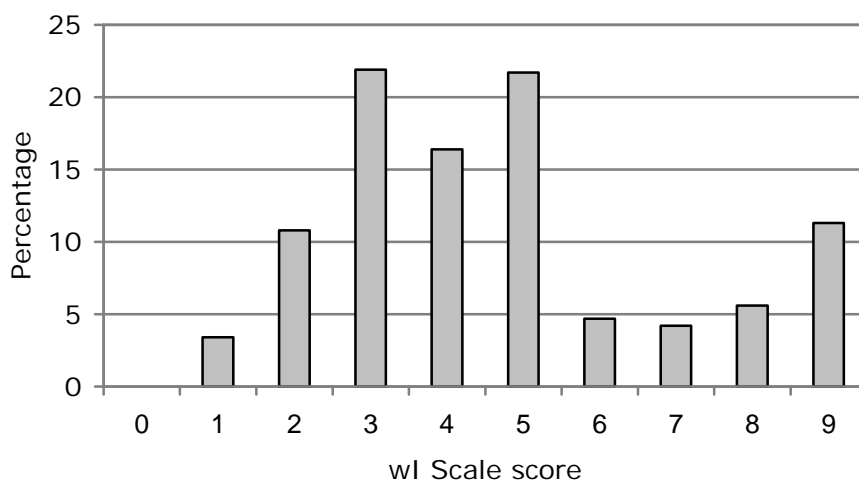


Figure 8.3: Expressed Control (eC) score frequency distribution (n=530)

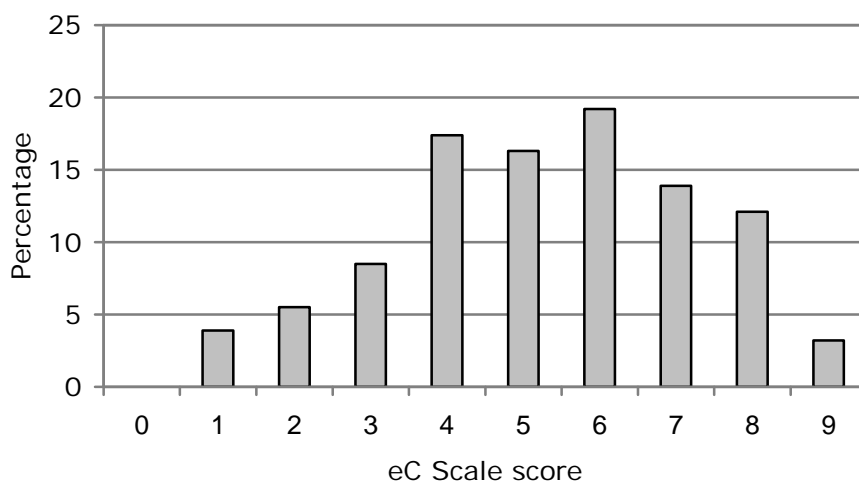


Figure 8.4: Wanted Control (wC) score frequency distribution (n=530)

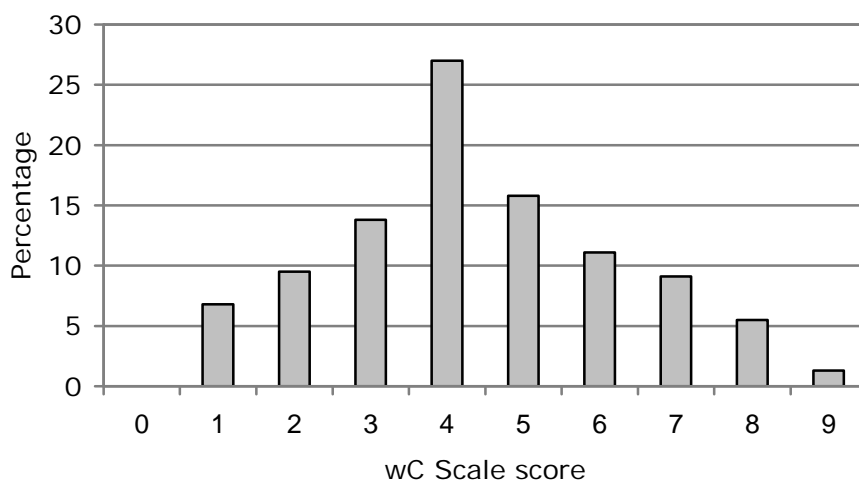
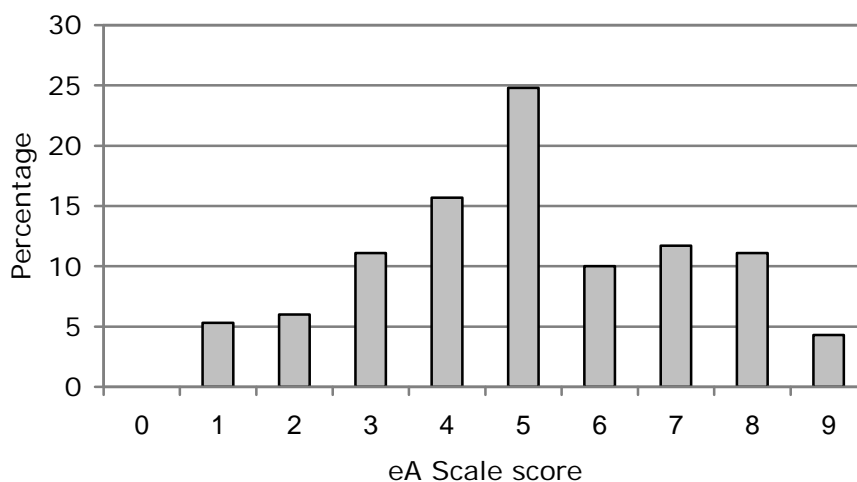
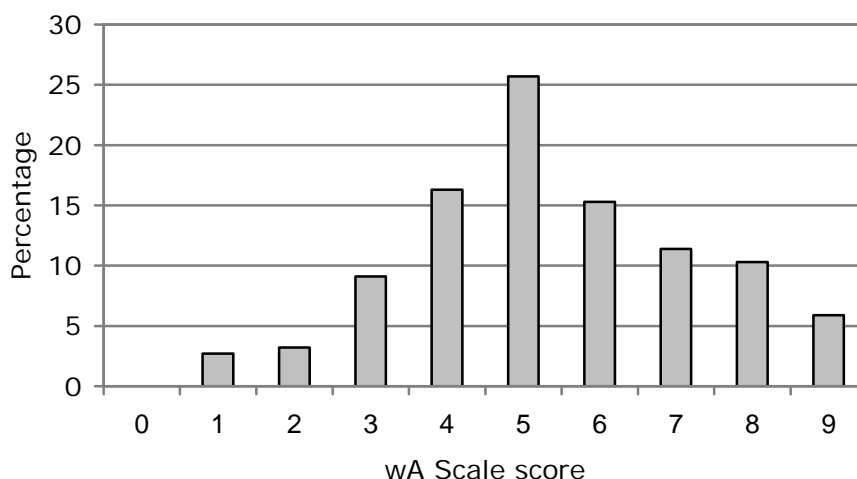


Figure 8.5: Expressed Affection (eA) score frequency distribution (n=520)*Figure 8.6: Wanted Affection (wA) score frequency distribution (n=530)*

Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the French questionnaire are shown in Table 8.3.

Table 8.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha
Expressed Inclusion (eI)	0.80
Wanted Inclusion (wI)	0.94
Expressed Control (eC)	0.91
Wanted Control (wC)	0.89
Expressed Affection (eA)	0.81
Wanted Affection (wA)	0.82

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.³¹ On this basis, all the dimensions of the questionnaire show good internal consistency reliability

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 8.4.

Table 8.4: Scale intercorrelations

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.36**					
Expressed Control (eC)	0.16**	0.13**				
Wanted Control (wC)	0.10**	0.08*	-0.01			
Expressed Affection (eA)	0.35**	0.37**	0.07*	0.06		
Wanted Affection (wA)	0.16**	0.53**	0.04	0.09**	0.55**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is very little correlation.

Group differences

Group differences amongst individuals, who completed the French questionnaire, were explored on the basis of gender, age and employment status.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 8.5, along with the difference in mean scores. This is represented graphically in Figure 8.7.

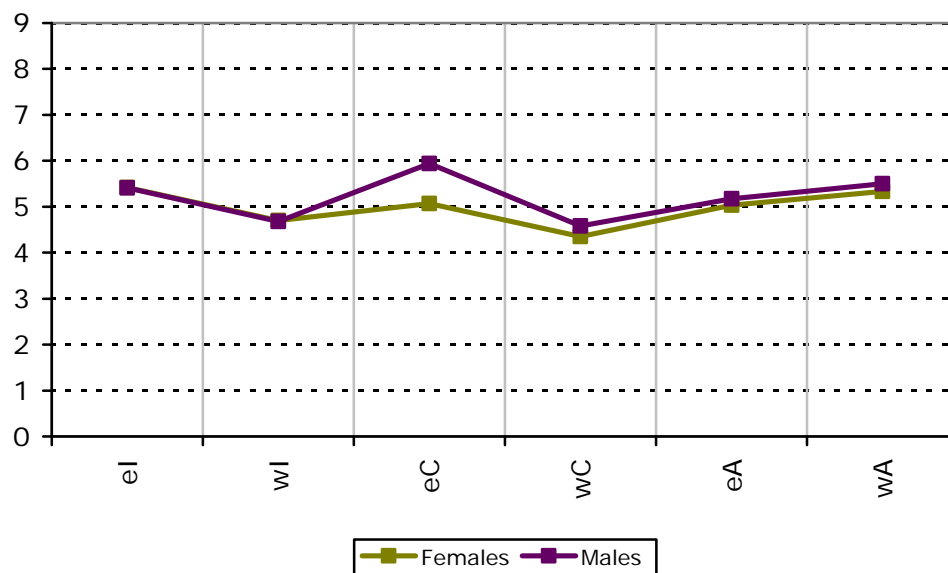
³¹ For example, see Nunnally (1978) or Kline (2000).

Table 8.5: Gender differences in scale scores

FIRO-B scale	Females (n=584)		Males (n=202)		Difference (F-M) ³²
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.42	1.44	5.41	1.44	0.01
Wanted Inclusion (wI)	4.70	2.30	4.68	2.05	0.02
Expressed Control (eC)	5.07	2.00	5.94	1.75	-0.87**
Wanted Control (wC)	4.35	1.95	4.58	1.75	-0.23
Expressed Affection (eA)	5.03	2.06	5.17	2.05	-0.14
Wanted Affection (wA)	5.33	1.84	5.50	2.04	-0.17

Difference significant at: * $p < 0.05$, ** $p < 0.01$ (based on an independent samples t-test).

Figure 8.7: Gender differences in scale scores



Of the six scales, only one showed a significant difference in mean scores with males scoring higher on Expressed Control.

³² A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Age

Correlations between scale scores and age are shown in Table 8.6.

Table 8.6: Gender differences in scale scores

Scale	Correlation with age
Expressed Inclusion (eI)	-0.06
Wanted Inclusion (wI)	-0.13**
Expressed Control (eC)	0.02
Wanted Control (wC)	0.00
Expressed Affection (eA)	-0.01
Wanted Affection (wA)	-0.06

Significant at: * $p < 0.05$, ** $p < 0.01$

Of the six scales, only Wanted Inclusion showed a significant correlation with age. In real terms, even this correlation was quite small. However, it does suggest that age is inversely related to scores on the Wanted Inclusion scale, meaning that younger respondents were more likely to achieve higher wanted Inclusion scores than older respondents.

Employment status

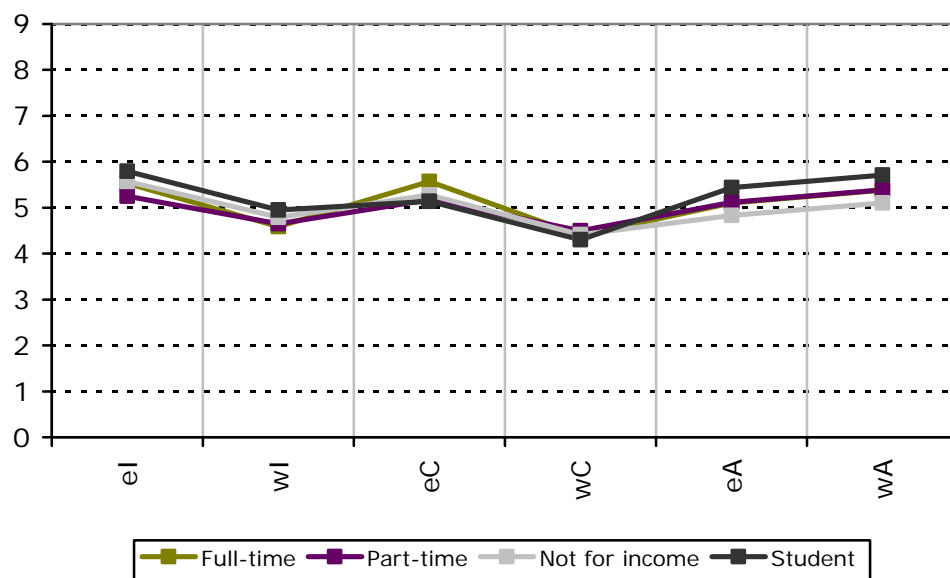
Table 8.7 shows the scale means and standard deviation for each employment status category where there are sufficient numbers of people for analysis (30 or more, in this instance, not including the 'Other' category). This is represented graphically in Figure 8.8.

The data shows the mean scores across groups to be very similar for all six scales, with no statistically significant differences.

Table 8.7: Scale scores by employment status

Scale	Working full-time (n=364)		Working part-time (n=88)		Not working for income (n=42)		Full-time student (n=58)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Expressed Inclusion (eI)	5.53	1.38	5.25	1.55	5.57	1.40	5.79	1.45
Wanted Inclusion (wI)	4.59	2.18	4.65	2.11	4.79	1.89	4.95	2.50
Expressed Control (eC)	5.57	1.89	5.17	2.07	5.28	1.96	5.14	2.00
Wanted Control (wC)	4.39	1.76	4.50	2.11	4.41	1.90	4.30	1.84
Expressed Affection (eA)	5.10	2.05	5.12	2.01	4.83	2.12	5.44	1.98
Wanted Affection (wA)	5.38	1.92	5.39	1.91	5.10	1.97	5.71	1.55

Figure 8.8: Employment status differences in scale scores



Chapter 9: Data from the German language questionnaire

Demographic data

The data in this supplement is based on responses from 430 respondents who completed the German version of the questionnaire over a two-year period between August 2005 and December 2007.

Of these, 282 (66%) were female and 148 (34%) were male. Ages ranged from 18 to 60, with a mean age of 34 years. 414 (96%) of the individuals stated that their country of residence was Germany, with the remaining 16 (4%) split amongst Switzerland, Austria and Belgium.

The present employment status of the group is summarised in Table 9.1

Table 9.1: Employment status

Employment status	Number	Percentage
Working full-time	192	44.7%
Working part-time	51	11.9%
Not working for income	17	4.0%
Retired	1	0.2%
Full-time student	29	6.7%
Other	140	32.6%

Scale properties

Descriptive statistics

Table 9.2 below shows the mean and standard deviation for each of the six scales.

Table 9.2: Scale means and standard deviations

Scale	Mean	Std Dev
Expressed Inclusion (eI)	5.01	1.62
Wanted Inclusion (wI)	4.40	2.25
Expressed Control (eC)	4.76	1.91
Wanted Control (wC)	4.71	1.66
Expressed Affection (eA)	4.40	2.17
Wanted Affection (wA)	5.41	2.31

The frequency distributions of the scales are shown in Figures 9.1 to 9.6:

Figure 9.1: Expressed Inclusion (ei) score frequency distribution (n=530)

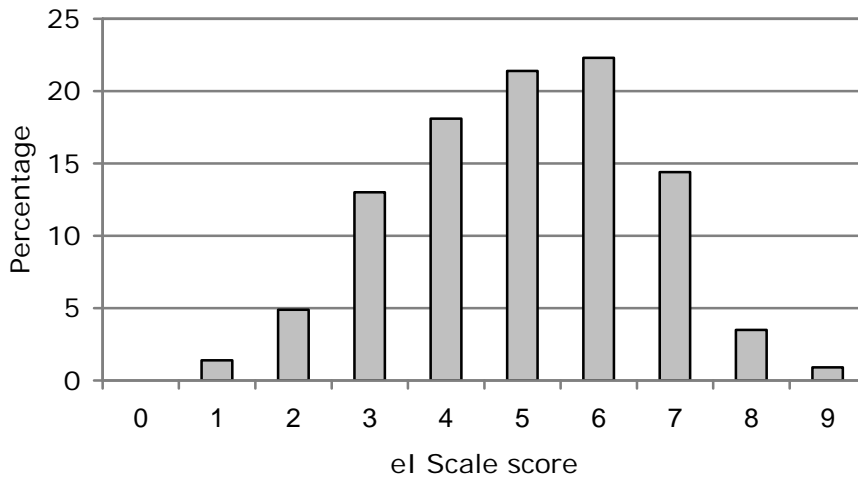


Figure 9.2: Wanted Inclusion (wi) score frequency distribution (n=513)

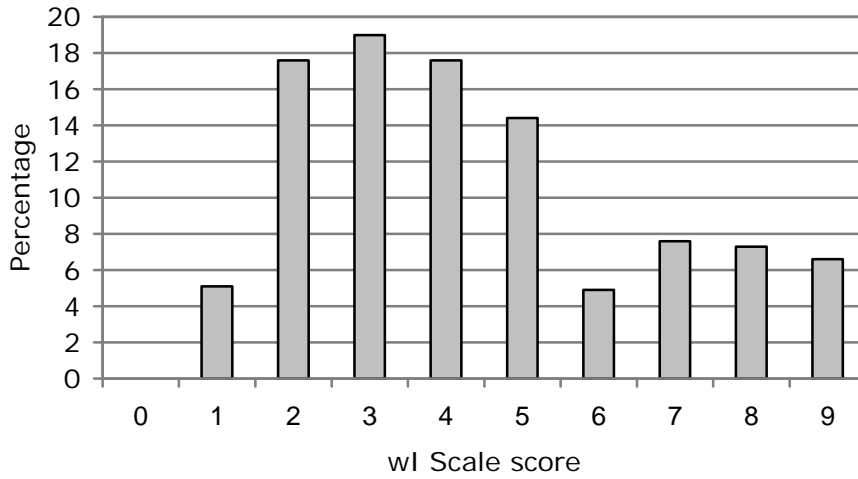


Figure 9.3: Expressed Control (eC) score frequency distribution (n=530)

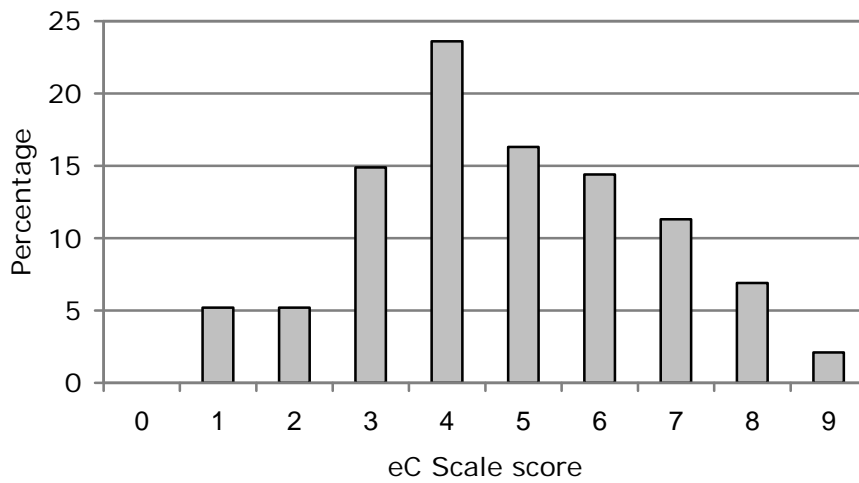


Figure 9.4: Wanted Control (wC) score frequency distribution (n=530)

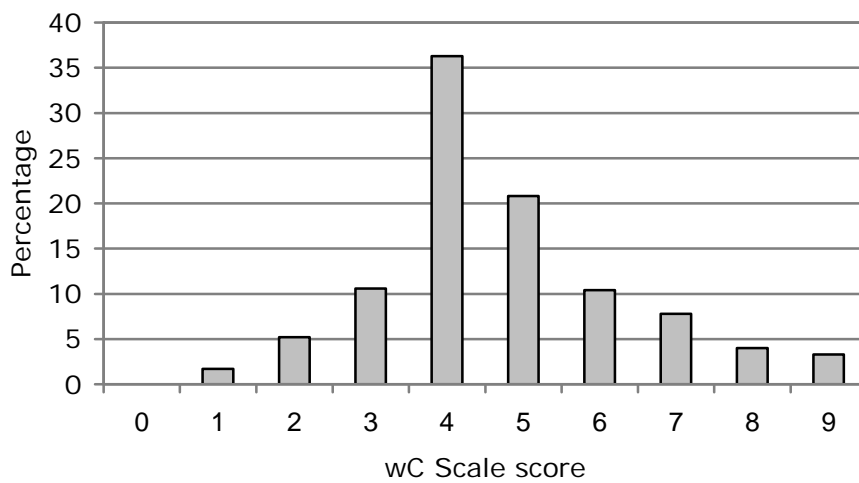


Figure 9.5: Expressed Affection (eA) score frequency distribution (n=520)

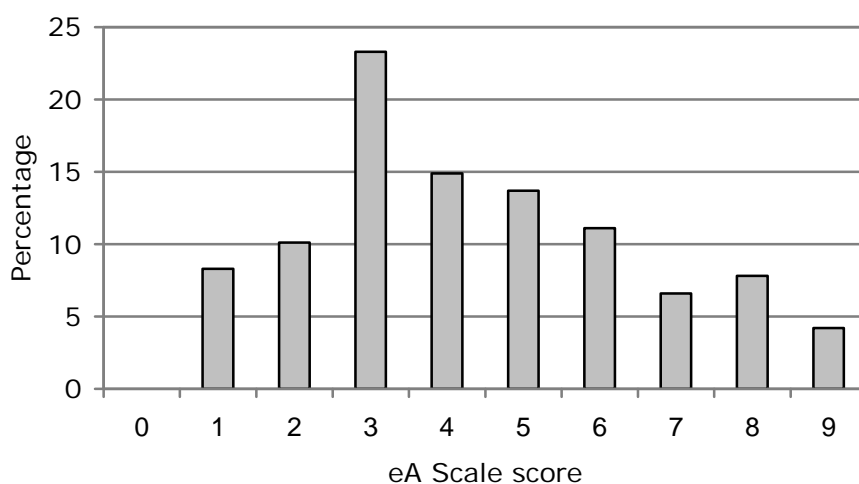
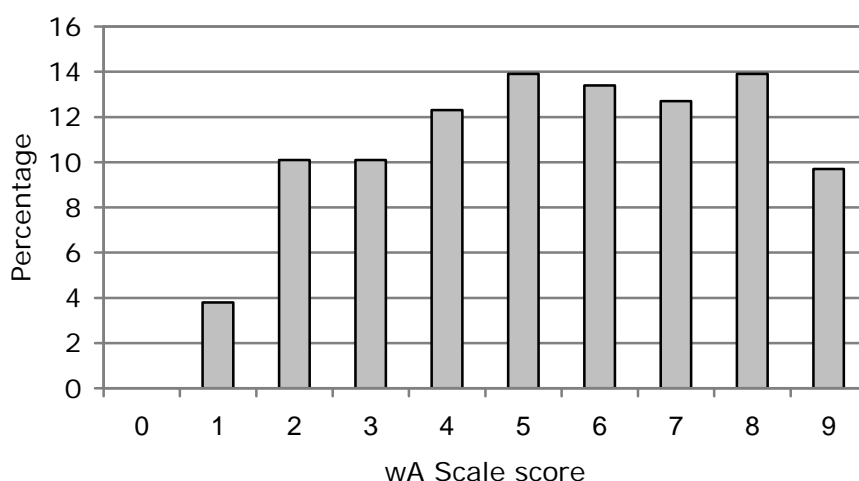


Figure 9.6: Wanted Affection (wA) score frequency distribution (n=530)



Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the Danish questionnaire are shown in Table 9.3.

Table 9.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha
Expressed Inclusion (eI)	0.80
Wanted Inclusion (wI)	0.95
Expressed Control (eC)	0.93
Wanted Control (wC)	0.91
Expressed Affection (eA)	0.86
Wanted Affection (wA)	0.89

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.³³ On this basis, all the dimensions of the questionnaire show good internal consistency reliability

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 9.4.

Table 9.4: Scale intercorrelations

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.40**					
Expressed Control (eC)	0.06	0.06				
Wanted Control (wC)	0.11*	0.17**	0.00			
Expressed Affection (eA)	0.45**	0.41**	0.07	0.08		
Wanted Affection (wA)	0.24**	0.55**	-0.01	0.17**	0.53**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is very little correlation.

Group differences

Group differences amongst individuals, who completed the German questionnaire, were explored on the basis of gender, age and employment status.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 9.5, along with the difference in mean scores. This is represented graphically in Figure 9.7.

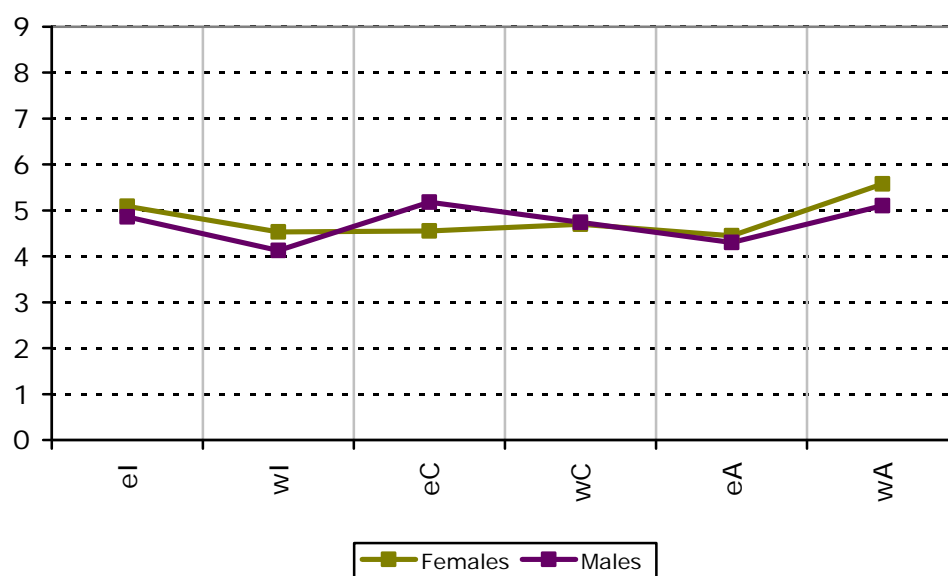
³³ For example, see Nunnally (1978) or Kline (2000).

Table 9.5: Gender differences in scale scores

FIRO-B scale	Females (n=282)		Males (n=148)		Difference (F-M) ³⁴
	Mean	SD	Mean	SD	
Expressed Inclusion (ei)	5.09	1.56	4.86	1.74	0.23
Wanted Inclusion (wi)	4.53	2.33	4.13	2.06	0.40
Expressed Control (eC)	4.55	1.87	5.18	1.93	-0.63**
Wanted Control (wC)	4.70	1.63	4.74	1.72	-0.04
Expressed Affection (eA)	4.45	2.09	4.30	2.32	0.15
Wanted Affection (wA)	5.58	2.26	5.10	2.38	0.48*

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 9.7: Gender differences in scale scores



Of the six scales, two showed significant differences in mean scores with females scoring higher on Wanted Affection and males scoring higher on Expressed Control.

³⁴ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Age

Correlations between scale scores and age are shown in Table 9.6.

Table 9.6: Gender differences in scale scores

Scale	Correlation with age
Expressed Inclusion (eI)	-0.22**
Wanted Inclusion (wI)	-0.33**
Expressed Control (eC)	0.07
Wanted Control (wC)	-0.23**
Expressed Affection (eA)	-0.24**
Wanted Affection (wA)	-0.31**

Significant at: *p<0.05, **p<0.01

Of the six scales, five showed a significant correlation with age. This is considerably more than has been found with other language versions of the questionnaire. The fact that they are negative correlations means that age is inversely related to scores on all the scales except Expressed Control, meaning that younger respondents tended to score higher on all these scales.

Employment status

Table 9.7 shows the scale means and standard deviation for each employment status category where there are sufficient numbers of people for analysis (30 or more, in this instance, not including the 'Other' category). This is represented graphically in Figure 9.8.

The data showed no statistically significant differences across groups for any of the scales.

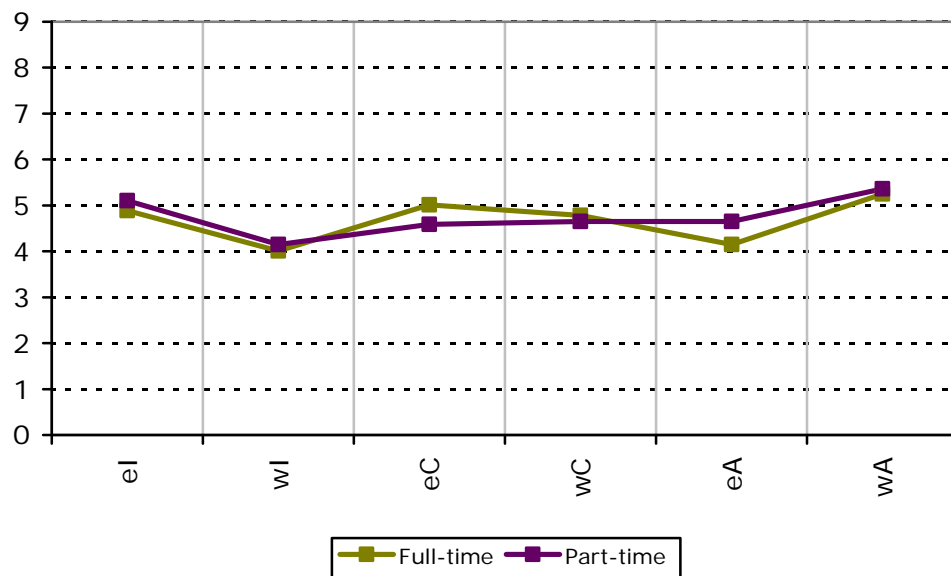
Table 9.7: Scale scores by employment status

Scale	Working full-time (n=192)		Working part-time (n=51)		Difference (FT-PT) ³⁵
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	4.89	1.60	5.10	1.43	-0.21
Wanted Inclusion (wI)	4.01	2.10	4.15	2.32	-0.14
Expressed Control (eC)	5.01	1.85	4.59	2.13	0.42
Wanted Control (wC)	4.78	1.75	4.65	1.74	0.13
Expressed Affection (eA)	4.15	2.03	4.65	2.15	-0.50
Wanted Affection (wA)	5.25	2.27	5.36	2.10	-0.11

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

³⁵ A positive value indicates that full-time employee mean scores are higher and a negative value indicates that part-time employee mean scores are higher.

Figure 9.8: Employment status differences in scale scores



Chapter 10: Data from the Spanish language questionnaire

Demographic data

The data in this supplement is based on responses from 572 respondents, who completed the Spanish version of the questionnaire over a five-month period between February 2009 and June 2009.

Of these, 400 (70%) were female and 172 (30%) were male. Ages ranged from 18 to 65, with a mean age of 31 years. All the individuals stated that their country of residence was Spain.

The present employment status of the group is summarised in Table 10.1.

Table 10.1: Employment status

Employment status	Number	Percentage
Working full-time	282	49.3%
Working part-time	69	12.1%
Not working for income	98	17.1%
Retired	1	0.2%
Full-time student	58	10.1%
Other	64	11.2%

Scale properties

Descriptive statistics

Table 10.2 below shows the mean and standard deviation for each of the six scales.

Table 10.2: Scale means and standard deviations

Scale	Mean	Std Dev
Expressed Inclusion (eI)	5.15	1.62
Wanted Inclusion (wI)	4.69	2.48
Expressed Control (eC)	4.71	1.91
Wanted Control (wC)	4.96	1.75
Expressed Affection (eA)	4.35	2.39
Wanted Affection (wA)	5.88	2.15

The frequency distributions of the scales are shown in Figures 10.1 to 10.6:

Figure 10.1: Expressed Inclusion (ei) score frequency distribution (n=572)

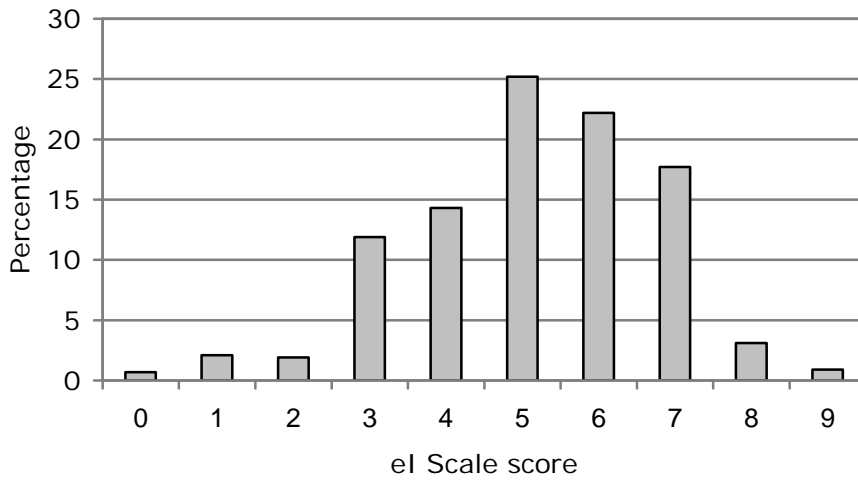


Figure 10.2: Wanted Inclusion (wi) score frequency distribution (n=572)

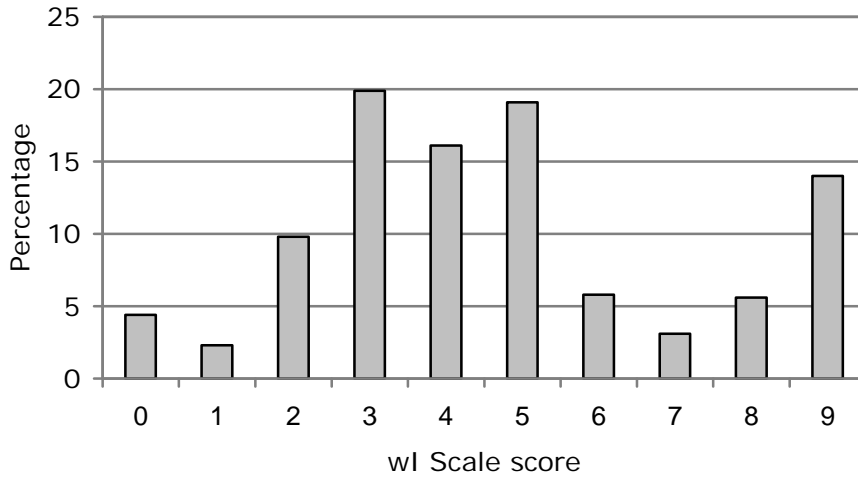


Figure 10.3: Expressed Control (eC) score frequency distribution (n=572)

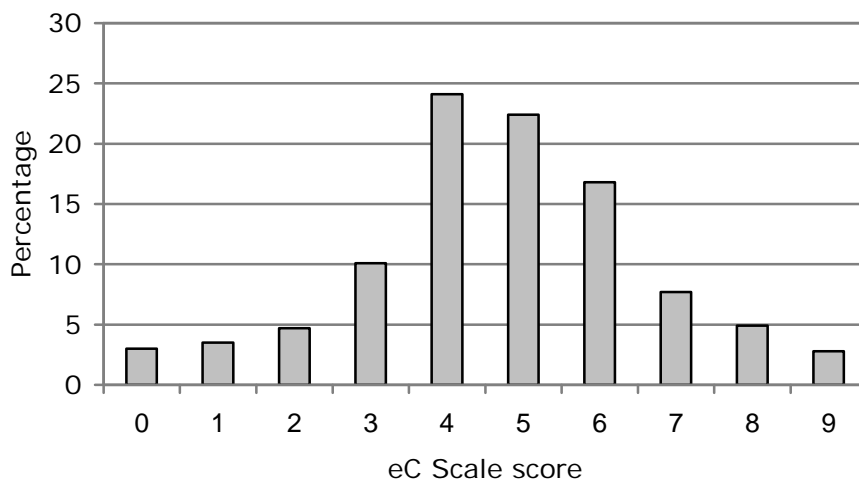


Figure 10.4: Wanted Control (wC) score frequency distribution (n=572)

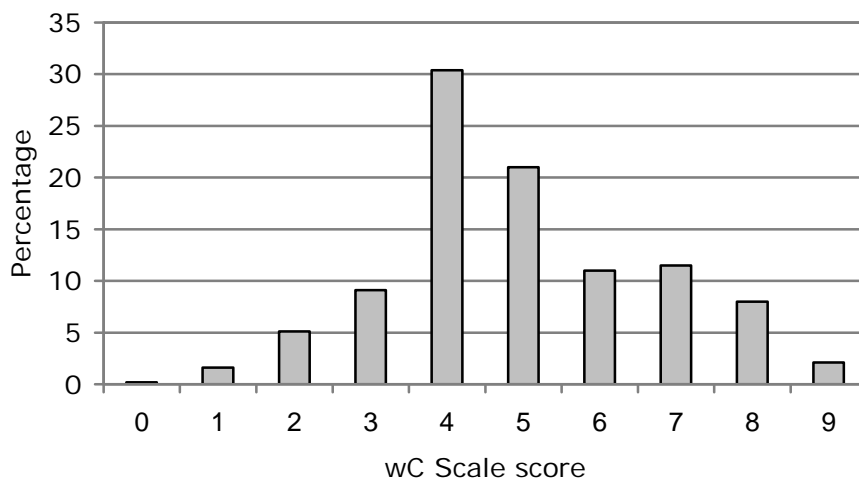


Figure 10.5: Expressed Affection (eA) score frequency distribution (n=572)

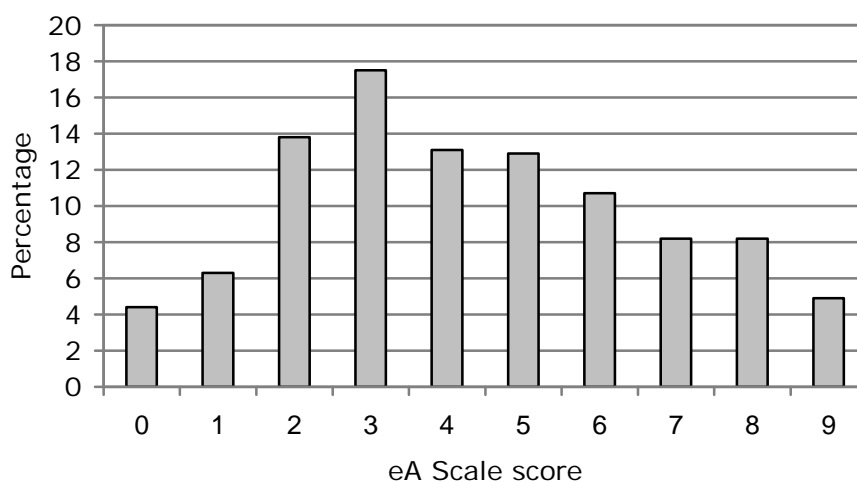
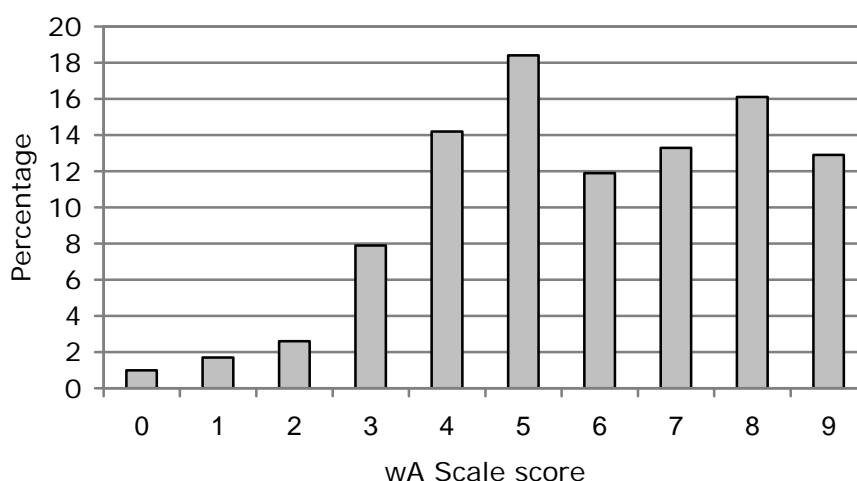


Figure 10.6: Wanted Affection (wA) score frequency distribution (n=572)



Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the Spanish questionnaire are shown in Table 10.3.

Table 10.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha
Expressed Inclusion (eI)	0.87
Wanted Inclusion (wI)	0.96
Expressed Control (eC)	0.93
Wanted Control (wC)	0.87
Expressed Affection (eA)	0.86
Wanted Affection (wA)	0.86

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.³⁶ On this basis, all the dimensions of the questionnaire show good internal consistency reliability.

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 10.4:

Table 10.4: Scale intercorrelations

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.46**					
Expressed Control (eC)	0.19**	0.19**				
Wanted Control (wC)	0.12**	0.05	0.10*			
Expressed Affection (eA)	0.49**	0.45**	0.10*	0.04		
Wanted Affection (wA)	0.28**	0.57**	0.13**	0.08	0.45**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is relatively little correlation.

Group differences

Group differences amongst individuals who completed the Spanish questionnaire were explored on the basis of gender, age and employment status.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 10.5, along with the difference in mean scores. This is represented graphically in Figure 10.7.

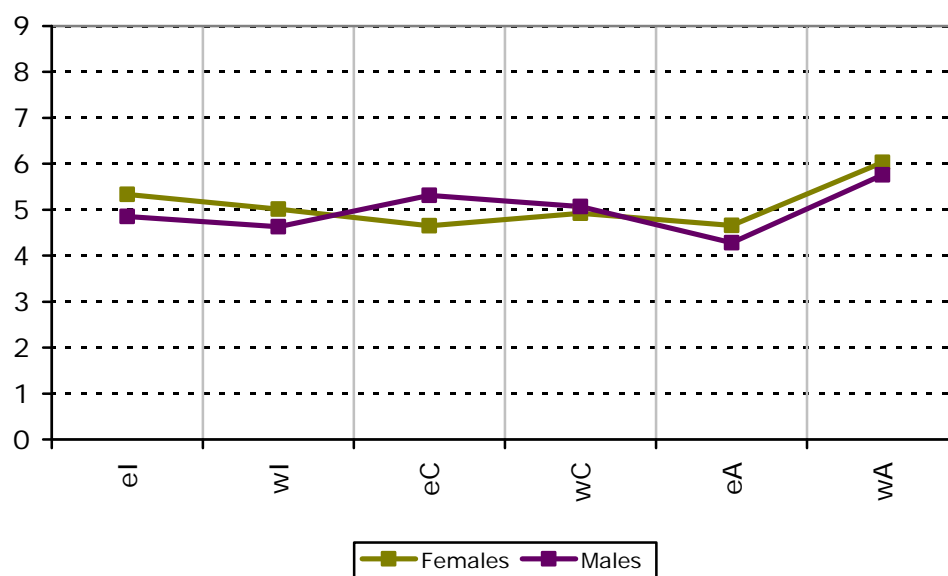
³⁶ For example, see Nunnally (1978) or Kline (2000).

Table 10.5: Gender differences in scale scores

FIRO-B scale	Females (n=400)		Males (n=172)		Difference (F-M) ³⁷
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	5.33	1.55	4.85	1.58	0.48**
Wanted Inclusion (wI)	5.01	2.35	4.63	2.20	0.38
Expressed Control (eC)	4.65	1.72	5.31	1.75	-0.66**
Wanted Control (wC)	4.92	1.69	5.07	1.84	-0.15
Expressed Affection (eA)	4.66	2.24	4.28	2.27	0.38
Wanted Affection (wA)	6.03	2.04	5.76	2.15	0.27

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 10.7: Gender differences in scale scores



Of the six scales, two showed significant differences in mean scores, with females scoring higher on Expressed Inclusion and males scoring higher on Expressed Control.

³⁷ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Age

Correlations between scale scores and age are shown in Table 10.6:

Table 10.6: Gender differences in scale scores

Scale	Correlation with age
Expressed Inclusion (eI)	-0.11**
Wanted Inclusion (wI)	-0.21**
Expressed Control (eC)	0.00
Wanted Control (wC)	-0.00
Expressed Affection (eA)	-0.09*
Wanted Affection (wA)	-0.12**

Significant at: * $p < 0.05$, ** $p < 0.01$

Of the six scales, four showed a significant correlation with age. However, in real terms, all the correlations were quite small with the exception, perhaps, of the one with Wanted Inclusion.

The negative correlations suggest that age is inversely related to scores on all the Inclusion and Affection scales, meaning that younger respondents were more likely to achieve higher Expressed Inclusion, Wanted Inclusion, Expressed Affection and Wanted Affection scores than older respondents.

Employment status

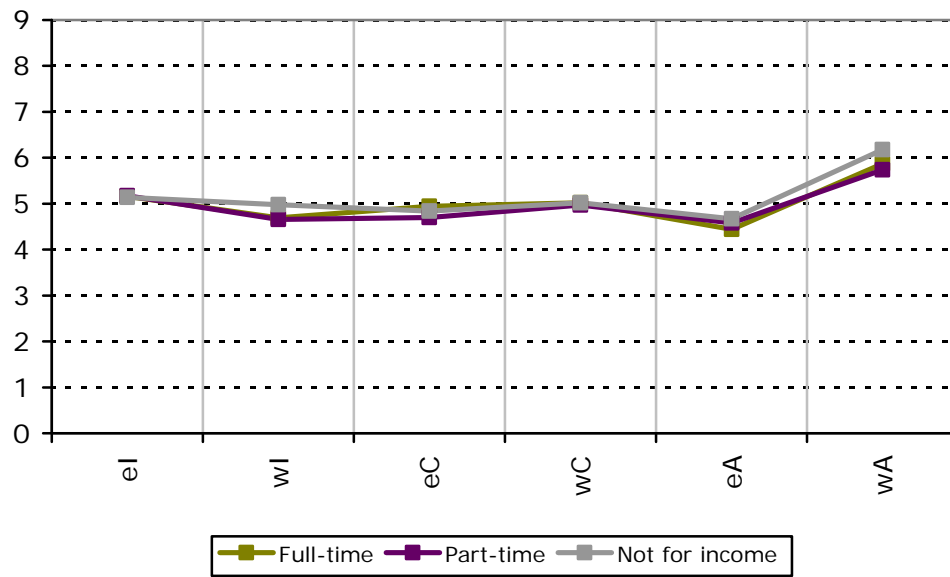
Table 10.7 shows the scale means and standard deviation for full-time workers, part-time workers, and people not working for income. This is represented graphically in Figure 10.8.

No statistically significant differences were found between groups on any of the scales.

Table 10.7: Scale scores by employment status

Scale	Working full-time (n=282)		Working part-time (n=69)		Not working for income (n=98)	
	Mean	SD	Mean	SD	Mean	SD
Expressed Inclusion (eI)	5.16	1.56	5.17	1.78	5.14	1.57
Wanted Inclusion (wI)	4.69	2.28	4.66	2.28	4.98	2.25
Expressed Control (eC)	4.94	1.80	4.70	1.46	4.84	1.80
Wanted Control (wC)	5.02	1.75	4.97	1.62	5.02	1.75
Expressed Affection (eA)	4.44	2.17	4.58	2.42	4.67	2.41
Wanted Affection (wA)	5.87	2.08	5.74	2.21	6.18	2.12

Figure 10.8: Employment status differences in scale scores



Chapter 11: Data from the Swedish language questionnaire

Demographic data

The data in this supplement is based on responses from 487 respondents, who completed the Swedish version of the questionnaire over a two-year period between August 2005 and December 2007.

Of these, 324 (67%) were female and 163 (33%) were male. Ages ranged from 18 to 65, with a mean age of 35 years. All the individuals stated that their country of residence was Sweden.

The present employment status of the group is summarised in Table 11.1

Table 11.1: Employment status

Employment status	Number	Percentage
Working full-time	255	52.4%
Working part-time	64	13.1%
Not working for income	21	4.3%
Retired	6	1.2%
Full-time student	50	10.3%
Other	91	18.7%

Scale properties

Descriptive statistics

Table 11.2 below shows the mean and standard deviation for each of the six scales.

Table 11.2: Scale means and standard deviations

Scale	Mean	Std Dev
Expressed Inclusion (eI)	4.73	1.56
Wanted Inclusion (wI)	3.97	2.07
Expressed Control (eC)	4.99	1.76
Wanted Control (wC)	4.97	1.90
Expressed Affection (eA)	4.95	2.29
Wanted Affection (wA)	6.01	1.86

The frequency distributions of the scales are shown in Figures 11.1 to 11.6:

Figure 11.1: Expressed Inclusion (ei) score frequency distribution (n=486)

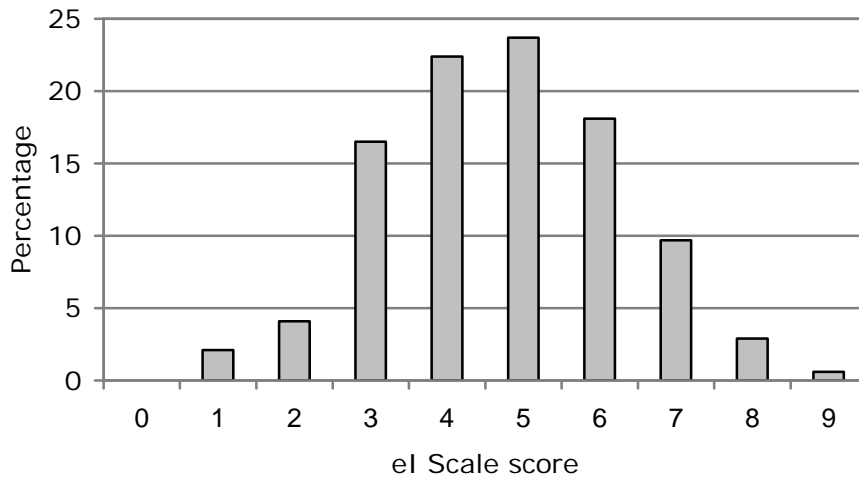


Figure 11.2: Wanted Inclusion (wi) score frequency distribution (n=459)

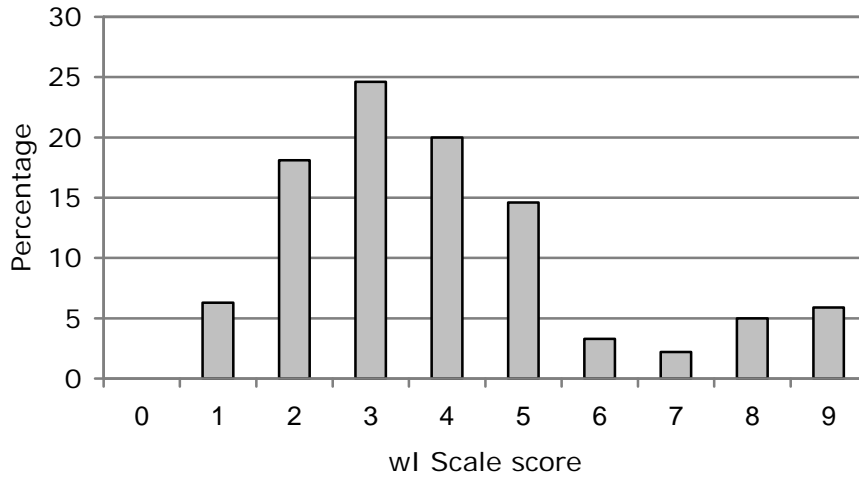


Figure 11.3: Expressed Control (eC) score frequency distribution (n=482)

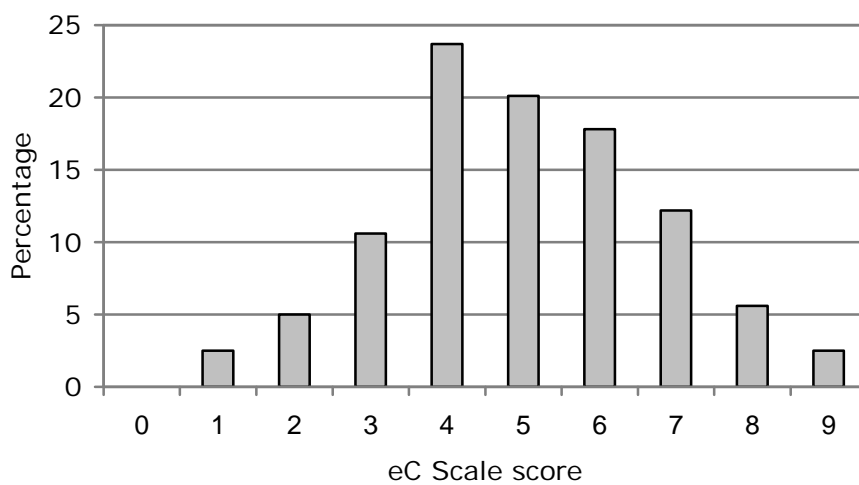


Figure 11.4: Wanted Control (wC) score frequency distribution (n=483)

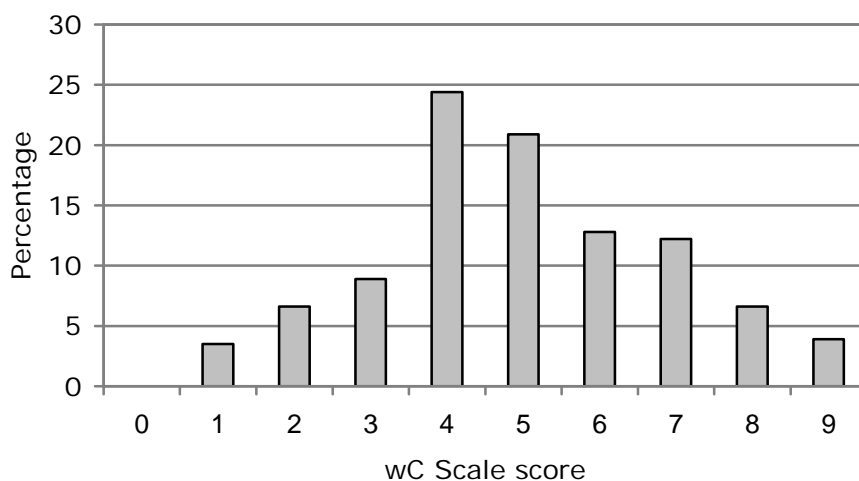


Figure 11.5: Expressed Affection (eA) score frequency distribution (n=484)

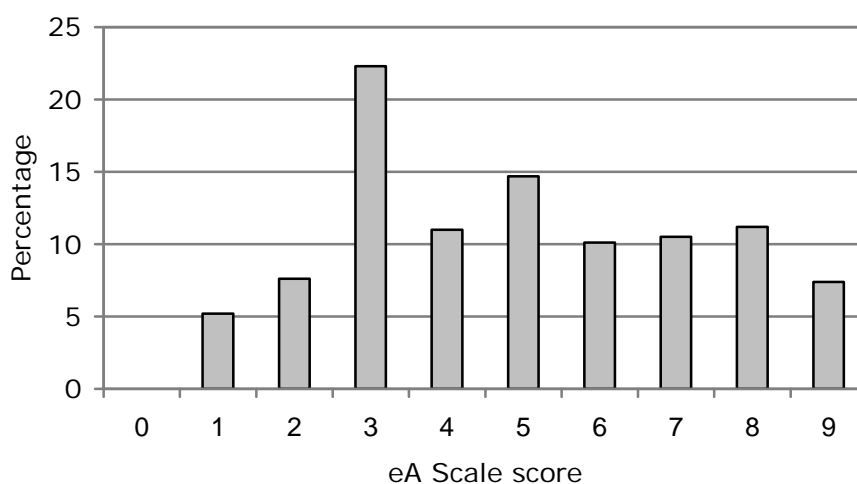
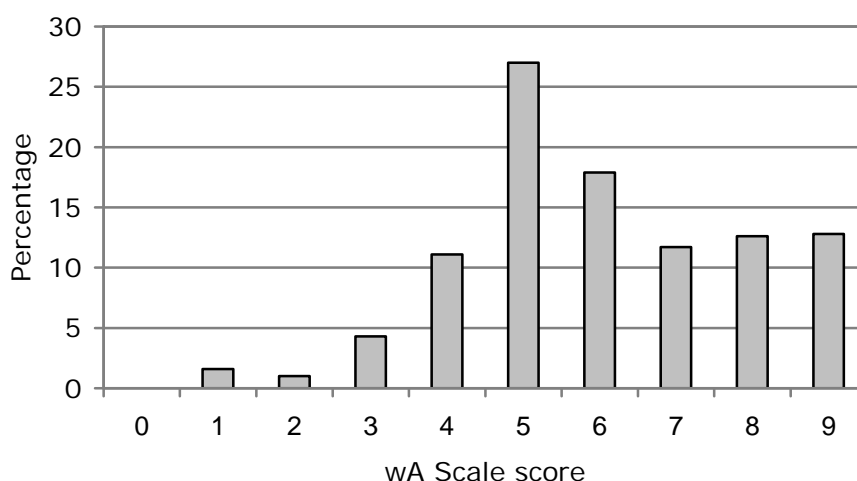


Figure 11.6: Wanted Affection (wA) score frequency distribution (n=486)



Reliability – internal consistency

The reliability of a test or questionnaire relates to how consistent and precise it is. Internal consistency reliability addresses the question of whether all the questions in a scale measure the same construct. A common measure of internal consistency reliability is coefficient alpha (Cronbach, 1951). The alpha coefficients for the Swedish questionnaire are shown in Table 11.3.

Table 11.3: Internal consistency reliability – alpha coefficients

Scale	Coefficient alpha
Expressed Inclusion (eI)	0.83
Wanted Inclusion (wI)	0.95
Expressed Control (eC)	0.92
Wanted Control (wC)	0.92
Expressed Affection (eA)	0.86
Wanted Affection (wA)	0.83

It is generally agreed that internal consistency reliability should achieve a value of at least 0.7 for a test to be considered to be reliable.³⁸ On this basis, all the dimensions of the questionnaire show good internal consistency reliability

Scale intercorrelations

The intercorrelations between the FIRO-B scales are shown in Table 11.4:

Table 11.4: Scale intercorrelations

Scale	eI	wI	eC	wC	eA	wA
Expressed Inclusion (eI)						
Wanted Inclusion (wI)	0.31**					
Expressed Control (eC)	0.11*	0.07				
Wanted Control (wC)	0.12**	0.16**	-0.06			
Expressed Affection (eA)	0.39**	0.31**	0.01	0.00		
Wanted Affection (wA)	0.24**	0.56**	-0.05	0.09	0.50**	

**Significant at $p < 0.01$, *Significant at $p < 0.05$.

There is a significant correlation between Inclusion and Affection, and a significant correlation between the Expressed and Wanted scales of each dimension, with the exception of Expressed and Wanted Control where there is very little correlation.

Group differences

Group differences amongst individuals, who completed the Swedish questionnaire, were explored on the basis of gender, age and employment status.

Gender

The means and standard deviations of the FIRO-B scales are shown separately for males and females in Table 11.5, along with the difference in mean scores. This is represented graphically in Figure 11.7.

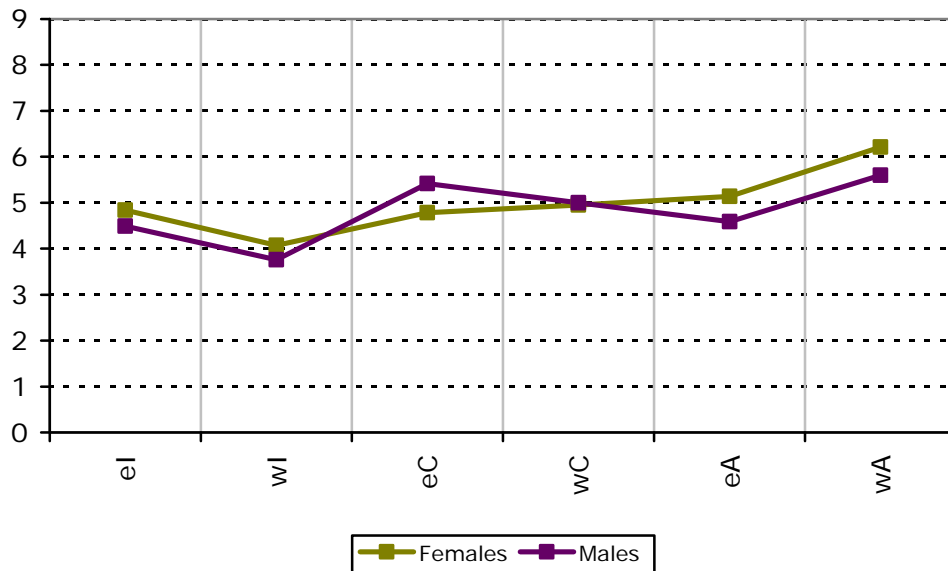
³⁸ For example, see Nunnally (1978) or Kline (2000).

Table 11.5: Gender differences in scale scores

FIRO-B scale	Females (n=324)		Males (n=163)		Difference (F-M) ³⁹
	Mean	SD	Mean	SD	
Expressed Inclusion (eI)	4.84	1.49	4.49	1.68	0.35*
Wanted Inclusion (wI)	4.07	2.09	3.76	2.03	0.31
Expressed Control (eC)	4.78	1.70	5.42	1.79	-0.64**
Wanted Control (wC)	4.95	1.93	5.00	1.85	-0.05
Expressed Affection (eA)	5.14	2.20	4.59	2.42	0.55*
Wanted Affection (wA)	6.21	1.81	5.60	1.89	0.61**

Difference significant at: *p<0.05, **p<0.01 (based on an independent samples t-test).

Figure 11.7: Gender differences in scale scores



Of the six scales, four showed significant differences in mean scores with females scoring higher on Expressed Inclusion, Expressed Affection and Wanted Affection and males scoring higher on Expressed Control.

³⁹ A positive value indicates that female mean scores are higher and a negative value indicates that male mean scores are higher.

Age

Correlations between scale scores and age are shown in Table 11.6:

Table 11.6: Gender differences in scale scores

Scale	Correlation with age
Expressed Inclusion (eI)	-0.11*
Wanted Inclusion (wI)	-0.30**
Expressed Control (eC)	0.02
Wanted Control (wC)	-0.06
Expressed Affection (eA)	-0.19**
Wanted Affection (wA)	-0.28**

Significant at: * $p < 0.05$, ** $p < 0.01$

Of the six scales, four showed a significant correlation with age. However, in real terms, all the correlations were quite small with the exception, perhaps, of the ones with Wanted Inclusion and Wanted Affection.

The negative correlation suggests that age is inversely related to scores on the Wanted Inclusion and Wanted Affection scales, meaning that younger respondents were more likely to achieve higher Wanted Inclusion and Wanted Affection scores than older respondents.

Employment status

Table 11.7 shows the scale means and standard deviation for each employment status category where there are sufficient numbers of people for analysis (50 or more, in this instance, not including the 'Other' category). This is represented graphically in Figure 11.8.

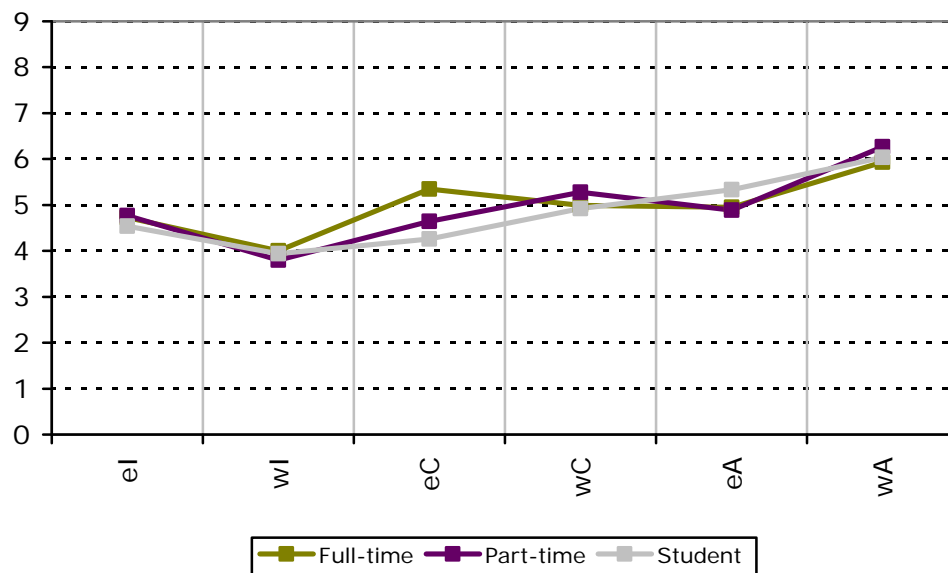
Whilst there are some observable differences across groups on several of the scales, the only statistically significant differences were found between individuals working full-time and those working part-time, and between individuals working full-time and full-time students on the Expressed Control scale. The mean score amongst the working full-time group was significantly higher than amongst the other two groups.⁴⁰ However, these results should be treated with caution due to the relatively small sample sizes for the working part-time and full-time student groups.

⁴⁰ Significant at $p < 0.05$ (based on a one-way analysis of variance).

Table 11.7: Scale scores by employment status

Scale	Working full-time (n=255)		Working part-time (n=64)		Full-time student (n=50)	
	Mean	SD	Mean	SD	Mean	SD
Expressed Inclusion (eI)	4.73	1.48	4.77	1.50	4.54	1.73
Wanted Inclusion (wI)	4.00	2.10	3.80	1.99	3.94	1.99
Expressed Control (eC)	5.35	1.66	4.64	1.95	4.26	1.80
Wanted Control (wC)	4.99	1.83	5.28	2.00	4.92	1.87
Expressed Affection (eA)	4.95	2.24	4.89	2.16	5.33	2.28
Wanted Affection (wA)	5.93	1.92	6.27	1.63	6.04	2.00

Figure 11.8: Employment status differences in scale scores



Chapter 12: Bibliography

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