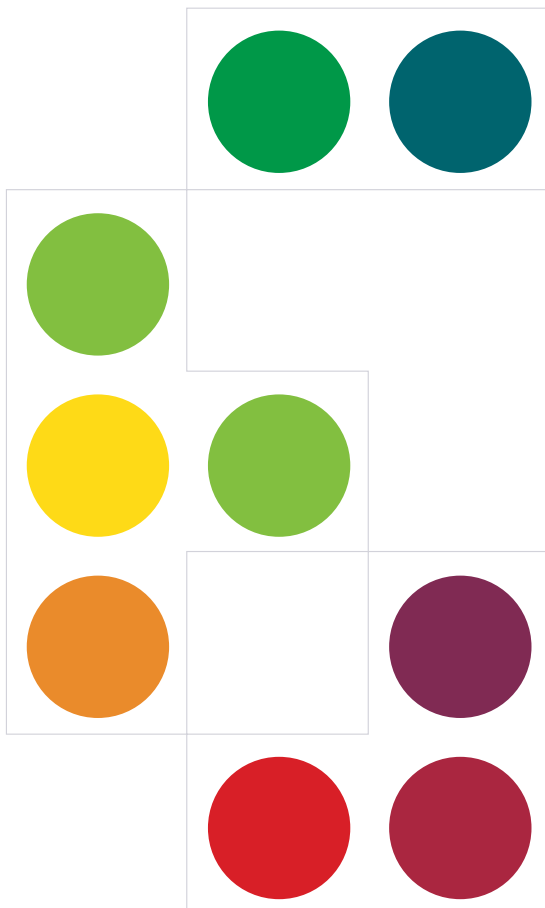


Facet5

⋯ Adverse impact studies



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Introduction

Facet5 was intended to have minimal adverse impact for key groups. Adverse impact can be defined as the situation where one group of people (based on race, gender, ethnicity or similar) produce Facet5 scores that are sufficiently different from others to disadvantage them in a selection situation. It is only of interest in high salience situations such as selection where a decision relating to that person might be made on the basis of a person's Facet5 results. Note that there is a link between the concept of adverse impact and legal statutes. The only groups for which adverse impact needs to be evaluated are those which by law it is illegal to discriminate. In most countries this is limited to gender, race, religion and possibly ethnicity.

Note that this does not mean that you cannot discriminate along these lines providing you can clearly demonstrate a job performance related reason to do so. There are numerous court judgements to clarify this position. For example when selecting Catholic priests it may be reasonable to require them to be Catholic. Given that the Catholic church does not recognise women priests it may also be acceptable to require the person to be male.

It is possible that adverse impact may result from unintentional actions. For example some companies actively recruit from the friends of their existing employees. But this means that they attract people who are similar to their friends. For example if you have a largely Protestant or migrant workforce then using this policy will result in a disproportional number of Protestants or migrants in the applicant group. And this would be discriminatory.

Testing for adverse impact

There is a logistical complexity with capturing data to test for Adverse Impact. It is generally held that it is unacceptable to ask questions that may be seen as discriminatory or may be used in a discriminatory way. It can be done but the questions have to be completely optional.

For example if you wish to capture such demographic data as Gender, Age and Race then this needs to be presented in a completely optional way. This is a particular problem for a global product such as Facet5. Some demographics are easier to apply globally. However race, in particular, can be problematic because of different national classification systems. For example European racial classification is unlikely to include Pacific Islanders while South East Asian countries may be unhappy with the broad 'Asian' label often used.

Therefore Facet5 has never captured such data in a routine way. However we have been able to post code a number of data sets to enable us to test for adverse impact for gender. We also have a number of data sets of different ethnicity to help us to test for that.

Gender differences

As mentioned previously subgroups of the population may differ in their responses to Facet5. If these differences are significant then we need to know the extent and direction of these differences. We have a number of such studies.

UK balanced sample

The first study involved analysis of a highly structured balanced sample from the UK. To do this we identified the cases in the database where the function was known and where there was a sufficient number of both males and females. This was laborious but in the end we identified 12 such job functions which would give us 10 males and 10 females in each function. We calculated the significance of the differences between the two sets of scores on the five main Facet5 factors (we assumed equal variances – no F's were significant so it seems reasonable to make this assumption). The results are shown in the table below:

	Will	Energy	Affection	Control	Emotionality
Male	4.96	5.93	6.37	6.15	4.82
Female	4.58	5.69	6.49	6.16	5.32
T value	1.54	.916	-.483	-.008	-2.14
Significance	.125	.361	.630	.994	.034

This shows that, as with the original sample, the only factor where there is a significant difference is Emotionality. Females scored slightly higher than males (5.32 vs. 4.82) which is in keeping with the original research.

Gender differences by language

In addition to the initial studies which were completed in English, Facet5 exists in many other languages. Part of the translation process was to check for adverse impact due to gender for each of the languages. The results of these are shown below.

Brazilian sample

A comparison of 3478 Brazilian respondents showed the following results. The key statistic is Cohen's D which indicates not only whether there are differences but whether these differences are meaningful.

	Will	Energy	Affection	Control	Emotionality
N – Female	1569	1569	1569	1569	1569
Minimum	19	25	30	31	25
Maximum	71	74	83	85	82
Mean	47.3	52.9	64.4	62.2	52.4
Std. deviation	7.3	7.3	7.4	8.2	9.7
N – Male	1909	1909	1909	1909	1909
Minimum	19	28	33	29	22
Maximum	69	73	90	85	86
Mean	47.4	52.4	64.3	62.2	49.4
Std. deviation	6.8	7.4	8.1	8.2	9.0
Cohen's d	0.01	0.21	0.33	0.07	0.00
Effect size	negligible	negligible	small effect	negligible	negligible

Note that this analysis was based on the raw scores rather than sten scores. This is to avoid losing variance due to the standardisation process. This shows that on four factors, although there were differences, they are deemed to be negligible. However there was a small difference on Emotionality where Brazilian women score slightly higher.

Greek sample

A study of 171 respondents who had completed Facet5 in Greek identified the following differences.

n = 171	Gender	N	Mean	Std. deviation	Sig. diff?
Will	Male	83	47.76	8.79	No
	Female	88	46.08	7.73	
Energy	Male	83	50.57	8.63	No
	Female	87	49.33	7.52	
Affection	Male	83	62.37	8.24	No
	Female	89	61.85	8.13	
Control	Male	83	60.10	10.16	No
	Female	89	60.57	8.39	
Emotionality	Male	84	50.31	9.08	*Yes
	Female	88	54.81	10.07	

* $t=-3.07$, $df=170$, $sig=0.002$ Cohen's $d=3.07$ – medium effect.

Greek speaking women are slightly higher than Greek speaking men on Emotionality but not on the other factors.

Chinese – Mandarin sample

A balanced sample of 233 people completed Facet5 in Mandarin. The sample included almost equal numbers of men and women. The gender differences were as follows:

n = 233	Gender	N	Mean	Std. deviation	Sig. diff?
Will	Male	117	47.08	7.48	No
	Female	116	46.13	7.51	
Energy	Male	117	49.16	7.01	No
	Female	116	49.39	7.88	
Affection	Male	117	64.62	9.39	No
	Female	116	65.60	8.36	
Control	Male	117	61.26	9.00	No
	Female	116	60.48	9.00	
Emotionality	Male	117	50.02	10.52	No
	Female	116	50.88	10.57	

Bulgarian sample

A study of 496 Bulgarian speaking respondents gave the following gender differences.

n = 496	Will	Energy	Affection	Control	Emotionality
N – Male	224	224	224	224	224
Minimum	27	22	31	36	24
Maximum	73	73	86	85	85
Mean	48.46	51.40	59.77	65.54	46.73
Std. deviation	6.82	8.71	9.97	8.68	9.87
N – Female	272	272	272	272	272
Minimum	27	22	31	36	24
Maximum	73	73	86	85	85
Mean	47.81	52.01	61.80	64.58	48.97
Std. deviation	7.35	8.27	8.42	8.65	10.84
Cohen's d	0.09	0.07	0.22	0.11	0.22
Effect size	negligible	negligible	small	negligible	small

This study shows a small difference on both Affection and Emotionality where Bulgarian women score slightly higher. Differences on other scales are negligible.

Indian sample

Approximatley 1400 cases were collected by a global consulting company through their work in India. This gave is a good sample of Facet5 data (all collected in English) which was post coded for gender. The results were as follows:

n = 1416	Will	Energy	Affection	Control	Emotionality
N – Male	1019	1019	1019	1019	1019
Minimum	20	24	31	36	18
Maximum	73	75	90	84	80
Mean	47.20	50.52	66.81	65.27	45.99
Std. deviation	7.18	7.67	7.96	8.03	9.11
N – Female	223	223	223	223	223
Minimum	27	31	47	43	26
Maximum	71	67	83	83	74
Mean	47.74	50.38	65.43	63.53	47.33
Std. deviation	6.96	6.96	7.74	7.45	9.26
Cohen's d	0.08	0.02	0.17	0.22	0.15
Effect size	negligible	negligible	small	small	small

This study shows a small difference on both Affection and Emotionality. Indian women score slightly higher on Emotionality but slightly lower on Affection. Differences on other scales are negligible.

Norwegian sample

A sample of Norwegian data was collected by a number of corporations and consultancies working in Norway. Questionnaires were completed in Norwegian.

n = 1152	Will	Energy	Affection	Control	Emotionality
N – Male	577	577	577	577	577
Minimum	23	30	35	26	22
Maximum	69	71	84	82	68
Mean	48.41	54.21	65.35	57.85	43.40
Std. Deviation	6.63	7.04	8.31	8.92	8.66
N – Female	488	488	488	488	488
Minimum	25	29	39	31	25
Maximum	67	72	86	81	78
Mean	46.45	55.03	67.35	58.38	45.60
Std. Deviation	7.26	6.92	7.25	8.41	9.18
Cohen's d	0.28	0.12	0.26	0.06	0.25
Effect size	small	negligible	small	negligible	small

This study showed that while differences on Energy and Control were negligible, Will, Affection and Emotionality all showed small differences. Norwegian males score slightly higher on Will, lower on Affection and lower on Emotionality. The difference on Emotionality is in keeping with general findings in other countries.

Danish sample

An analysis of 1906 cases of Danish Facet5 data showed the following. Note that 517 of the cases were of unknown gender.

n = 1906	Will	Energy	Affection	Control	Emotionality
N – Male	796	796	796	796	796
Minimum	28	23	22	28	22
Maximum	73	71	86	83	74
Mean	49.20	52.46	63.52	57.14	44.36
Std. Deviation	7.28	8.14	9.81	9.15	9.39
N – Female	593	593	593	593	593
Minimum	23	28	37	22	22
Maximum	70	73	86	78	75
Mean	47.11	52.22	65.80	56.51	45.75
Std. Deviation	8.03	7.31	8.57	9.27	9.87
Cohen's d	0.27	0.03	0.25	0.07	0.14
Effect size	small	negligible	small	negligible	negligible

This result is slightly unusual since it although Danish women still scored slightly higher on Emotionality the difference was negligible. On the other hand they showed small differences in Will (women were lower) and Affection (women were higher).

Gender differences across the sten range

We have long known there is a difference in the average Emotionality scores of men and women. This has been documented previously and is in line with findings from other similar questionnaires. We have recently been asked a simple question:

'What is the percentage of women with high Emotionality?'

Research suggests we would have more women at higher levels of Emotionality and more men at lower levels but we had not actually computed this. This note answers this question.

From a global and multi-lingual research data base of over 100,000 Facet5 profiles that is used for norm development and other research we extracted equal numbers of men and women to give a sample of 60000 for this study. For this research we re-normed the profiles to a common norm based on all cases. This norm is not available for normal use since it blends all languages and countries.

The main statistics for the sample are in the table below.

Gender	n = 60000	Emotionality	Tension	Apprehension
Male	Mean	5.3	5.4	5.2
	Std Dev	1.8	1.9	2.3
Female	Mean	5.8	5.8	5.8
	Std Dev	1.9	2.0	2.4
Total	Mean	5.5	5.6	5.5
	Std. Dev.	1.9	2.0	2.4

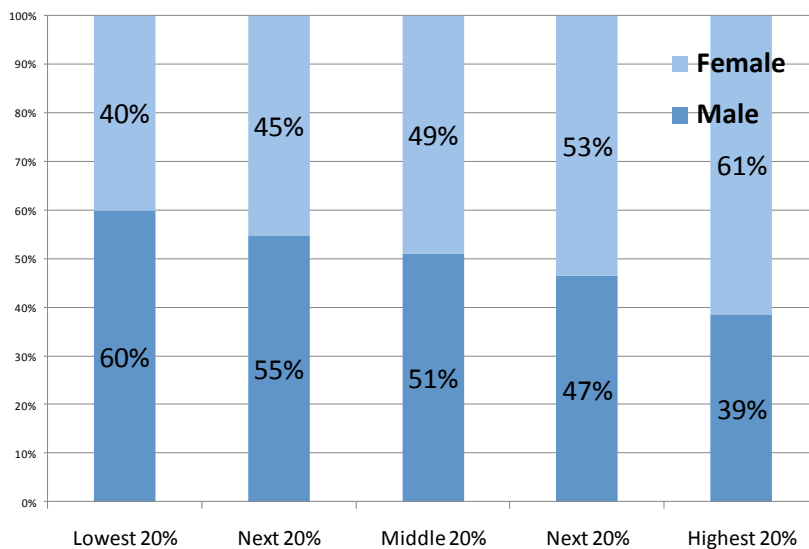
As can be seen the overall mean Sten score is 5.5 and the SD is 1.9 (against a theoretical SD of 2).

The table also shows that women score slightly higher than men on Emotionality (5.3 vs 5.8).

The question was however about the relative proportions at 'high' levels of Emotionality.

'High' is not an absolute term. We advise thinking of scores of over 7 as being 'high' but this is not an absolute. For this analysis we divided the sample into equal 20% bands. We then looked at the proportions of men and women at each band. The results are shown in the chart below:

Emotionality by gender in 20% bands



This shows that although average scores may only be a little higher for all women, this difference changes as the scores move away from the mean. For the middle 20% of Emotionality the difference is 49%:51% which is negligible. At the lowest 20% however men outnumber women 60:40. At the highest 20% the picture is reversed and women outnumber men 61:39%.

The sub-factors are similar suggesting that the differences, apply to both sub-factors almost equally.

Summary

These analyses help to understand the role of opinion and perhaps even prejudice. We frequently hear people asserting that men are certainly higher on Will or that Affection embodies 'female' characteristics. However these studies suggest that these opinions may be due to selective sampling. Experience with Facet5 in a specific environment can easily leave a user with the feeling (and indeed the fact) that there is a consistent pattern appearing in the profiles he/she is seeing. However when the data is looked at more carefully and the effects of pre-selection and function specific differences are ruled out, these differences disappear to a very large degree except in the case of Emotionality.

Is this finding unusual? It is helpful to note that the original 16PF showed significant gender differences on 14 of the 16 factors (only factor B – Intelligence and Q2 – Self-sufficiency showed no difference). In the new 16PF5, 13 of the 16 factors show a gender bias (all except F – Liveliness, Q1 – Openness to change and Q4 – Tension). The OPQ Concept 5 cites significant gender differences on 6 of the 30 scales and the MBTI, while not citing specific studies looking at the significance of gender differences, does produce separate Norm tables for Males and Females.

It is also in keeping with most other research, which shows women to be a little more 'Emotional' than men.

Ethnic differences in Facet5 scores

To test for the effects of adverse impact we selected samples of Facet5 profiles from China and India which were completed by Chinese and Indian nationals in English. We then compared the Facet5 raw scores for these groups with the scores for all people who completed Facet5 in English to see whether they represented impacted sub-groups. The results were as follows:

Chinese adverse impact study

Chinese Adverse impact		Will	Energy	Affection	Control	Emotionality
English speaking Chinese nationals	N	3132	3132	3132	3132	3132
	Minimum	15	22	33	26	18
	Maximum	75	73	90	85	79
	Mean	48.05	51.45	69.24	64.94	47.47
	Std. deviation	7.47	7.25	8.06	8.55	9.54
All English speaking	N	71248	71248	71248	71248	71248
	Minimum	18	19	20	20	18
	Maximum	75	75	90	85	86
	Mean	46.29	51.55	65.74	60.56	46.71
	Std. deviation	7.15	7.91	8.40	9.24	9.64
Differences	Cohen's d	0.25	0.01	0.42	0.47	0.08
	Effect size	small effect	negligible effect	medium effect	medium effect	negligible effect

From this it can be concluded that, if there was a selection process which emphasised high scores on Control or Affection, English speaking Chinese nationals would have a small advantage. If the process valued high Will then Chinese speaking nationals would have a very slight advantage.

Indian adverse impact study

Indian adverse impact		Will	Energy	Affection	Control	Emotionality
English speaking Indian nationals	N	1416	1416	1416	1416	1416
	Minimum	20	24	31	36	18
	Maximum	73	75	90	85	80
	Mean	47.04	50.37	66.67	64.88	46.25
	Std. deviation	7.13	7.59	7.91	7.90	9.20
All English speaking	N	71248	71248	71248	71248	71248
	Minimum	18	19	20	20	18
	Maximum	75	75	90	85	86
	Mean	46.29	51.55	65.74	60.56	46.71
	Std. deviation	7.15	7.91	8.40	9.24	9.64
Differences	Cohen's d	0.1	0.15	0.11	0.47	0.05
	Effect size	negligible effect	small effect	negligible effect	medium effect	negligible effect

This study suggests that English speaking Indian nationals would be at a slight advantage where Control was valued but at a very slight disadvantage where Energy was valued.

Overall these results suggest that the adverse impact on nationals of other countries is small. However in each of those countries we would expect to use national language versions of Facet5 along with local norms.