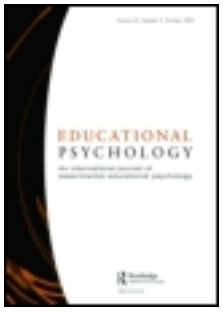

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Soft skills in higher education: importance and improvement ratings as a function of individual differences and academic performance

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Soft skills in higher education: importance and improvement ratings as a function of individual differences and academic performance

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Three UK studies on the relationship between a purpose-built instrument to assess the importance and development of 15 'soft skills' are reported. *Study 1* ($N = 444$) identified strong latent components underlying these soft skills, such that differences *between-skills* were over-shadowed by differences *between-students*. Importance and improving ratings on these skills predicted academic performance and accounted for the effects of personality on academic performance. *Study 2* replicated the structure of the soft skills inventory and associations with academic performance in a larger sample ($N = 1309$). Examination of mean differences across faculties (humanities, life sciences, hard sciences) revealed higher soft skills ratings in 'softer' courses. *Study 3* ($N = 87$) incorporated an IQ measure, which was found to be negatively related to importance ratings on soft skills. Results highlight the cohesive structure of beliefs concerning various non-academic skills and their significant links to educationally relevant individual differences. Theoretical, methodological and applied implications are considered.

Keywords: soft skills; generic skills; transferrable skills; personality; academic performance

Over the past decade, politicians, educational researchers and practitioners alike have emphasised the importance of fostering a set of non-academic attributes, such as the 'ability' to cooperate, communicate and solve problems, often referred to as generic or soft skills[1] in higher education (Bennet, Dunne, & Carré, 1999; Stephenson & Yorke, 1998). Unlike academic or disciplinary knowledge, which is subject-based, content-specific and formally assessed, soft skills comprise a range of competencies that are independent of, albeit often developed by, formal curricula and rarely assessed explicitly. Thus, soft skills are often defined in terms of 'those skills, abilities, and personal attributes that can be used within the wide range of working environments that graduates operate in throughout their lives' (Fraser, 2001, p. 1).

Although different institutions and government reports have identified slightly different sets of attributes, there is growing acceptance for idea that soft skills may

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help students to accomplish not only academic but also occupational goals after graduating (Bennet et al., 1999; Kember, Leung, & Rosa, 2007). Yet employer surveys have long reflected discontent with the extent to which these skills are fostered in higher education (Harvey, Moon, & Gheall, 1997). For example, Boud (1990) pointed out that 'there is often a gap between what we require of students in assessment tasks and what occurs in the world of work' (p. 101). A clear example is that of oral communicational skills, which are highly rated in the industry but rarely fostered or assessed at university (Leveson, 2000).

In the UK (see Drew, 1998 for an early review), 'vocational' or 'work-related' skills have been a topic of debate since the 1960s. However, academics refuse to acknowledge their importance, seeing them as a distraction from other academic priorities, in particular research. Likewise, students reportedly characterise their learning environments in terms of formal/disciplinary subjects rather than soft skills development.

Assessing the validity of soft skills: conceptual and methodological limitations

How useful are soft skills? Scholars and practitioners have highlighted the difficulties of addressing this question, primarily for two reasons. Firstly, the 'catalogue' of soft skills has varied widely from one study or intervention to another and included a wide range of attributes. Secondly, many of these attributes can only be assessed subjectively, that is there are no objective tests for, say, interpersonal and management skills. Moreover, several of the attributes that constitute soft skills taxonomies refer to dispositional traits that may change very little during the years of higher education and are known to affect academic grades (Chamorro-Premuzic & Furnham, 2005, 2006a).

As noted, researchers and practitioners have not only used different labels to refer to soft skills but also included a wide range of attributes, ranging from operational skills to interpersonal competence. Thus, the validity of these competencies for predicting different educational and occupational outcomes depends on the particular skill being examined, as well as on specific settings. Different soft skills are also indicative of quite different patterns of malleability, that is the degree to which individual levels of these skills can change over time, especially as a consequence of formal education and training. Trait-like constructs, such as emotional intelligence (see Petrides & Furnham, 2001), drive and motivation, may be more influenced by personality than by teaching or academic training (Chamorro-Premuzic, 2007; Costa & McCrae, 1992).

However, integrative soft skills taxonomies have highlighted similarities among different lists and even provided subcategories for classifying them. Bennett et al. (1999) surveyed academic and student terms, and identified four major categories underlying soft skills, namely management of self, information, others and tasks. Similarly, Gallivan, Truex, and Kvasny (2004) identified six commonly sought soft skills in the USA, namely communication, interpersonal, leadership, organisation, self-motivation and creativity, and estimated these attributes to account for approximately 26% of the skills mentioned in online job advertisements. Recently, Job Outlook's 2006 Survey of 250 employers (cf. Beard, Schwieger, & Surendran, 2007) listed 13 main 'skills sought by employers'(e.g. communication, analytical, teamwork, interpersonal and organisational skills, as well as motivation, flexibility and detail orientation).

Goldsmiths soft skills project: framework, taxonomy and goals

Based on the above-listed attributes and categories and taking into account the key aims of Goldsmiths' 2006/2007 Review Of Assessment, which, among other goals, attempted to examine the impact of current and future assessment strategies on the development of soft skills, we designed a self-report inventory to assess perceptions of the importance and the development of 15 capacities, namely *self-management*, *communicational*, *interpersonal*, *team-working skills*, the *ability to work under pressure*, *imagination/creativity, critical thinking*, *willingness to learn*, *attention to detail*, *taking responsibility, planning and organising skills, insight*, *maturity*, *professionalism* and *emotional intelligence*. Thus, in three reported studies, we will examine the structure of students' beliefs concerning the importance and development of soft skills in relation to academic and occupational success, as well as their associations with broad individual difference factors (personality traits and cognitive ability).

Soft skills and academic performance and occupational success

Most scholars believe that soft skills *should* be related to academic performance (Barrie, 2006, p. 225). Thus, soft skills would be a necessary precursor to content-based learning of academic knowledge (Barrie, 2006). Although special courses aimed at fostering specific soft skills have been examined (Medlin, Graves, & McGowan, 2003; Oliver & McLoughlin, 2001), meta-analytic evidence suggests that soft skills courses are not very effective for university students (Hattie, Biggs, & Purdie, 1996). Instead, a better alternative seems to be to foster these abilities through the study of formal disciplines and academic knowledge. Thus, 'the more common approach has been through the belief that the development of [soft skills] should be embedded within the learning about the discipline' (Kember et al., 2007, p. 611).

Soft skills and individual differences

How well students may benefit from opportunities to develop their soft skills may partly depend on their actual competencies (see Crebert, Bates, Bell, Patrick, & Cragnolini, 2004). Given the dispositional nature of some of these attributes, we will investigate their relationship to individual differences (intelligence and personality). Furthermore, because personality (neuroticism, extraversion and conscientiousness) and cognitive ability (IQ, *g* [general intelligence factor]) (see Chamorro-Premuzic & Furnham, 2005 for a review) have been systematically related to academic performance, as well as occupational performance (Chamorro-Premuzic, 2007), it is necessary to show that any effects of soft skills on academic performance are not accounted for by individual difference factors. Moreover, recent studies (Chamorro-Premuzic & Furnham, 2006b; Spinath, Spinath, Harlaar, & Plomin, 2006) showed that self-assessed intelligence is significantly related to academic performance. Thus, the link between soft skills and self-assessed intelligence will also be examined.

Softs skills and academic assessment methods

Gibbs (1992) argued that students' learning is affected by the way they are assessed (see also Furnham & Chamorro-Premuzic, 2005). Likewise, Biggs' (1996) theory of

constructive alignment posited that both instruction *and* assessment ought to be adjusted in order to impact on students' learning. Moreover, one of the goals of assessment is to increase the congruency between what students need to learn for university and what employers expect from them after graduating (Boud, 1995), stimulating students to develop work-relevant skills (Gulikers, Bastiaens, Kirschner, & Kester, 2006). Thus, the present study will also examine the link between preferences for different university assessment methods and soft skills.

Soft skills across disciplines

Finally, this paper will also assess how importance and improvement ratings of soft skills differ across disciplines. Previous research (Barrie, 2006; Pascarella & Terenzini, 1991) has highlighted differences in soft skills perceptions with curricula. Accordingly, we expect that soft skills will be rated differently by students from 'soft' degrees (i.e. humanities and social sciences) and 'hard' degrees (i.e. exact and natural sciences). In particular, academics of the former group are expected to attribute more importance and to be more self-conscious about their own improvement in soft skills than students of the later group.

Study 1

This study attempted to test the relationship between soft skills, self-assessed intelligence, personality traits and preferences for different academic assessment methods. The following hypotheses were stated:

- H1: Importance and improvement ratings on soft skills will be positively correlated with academic performance, such that students who believe that soft skills are useful to excel in academic assessment and maximise their career opportunities. In addition, those who believe their courses are enabling them to improve on their skills will all be more likely to have higher academic performance.
- H2: Soft skills will also be significantly and positively related to self-assessed intelligence, conscientiousness, extraversion, openness and agreeableness.
- H3: The relationship between soft skills and academic performance will hold significant even after controlling for the personality correlates of academic success.
- H4: Hypotheses H1 and H3 will also be tested using a single-item measure of 'degree engagement'. We expect that soft skills will be associated with degree engagement and that this association is largely independent of the effects of personality and self-assessed intelligence on degree engagement.

Sample

In all, 444 (69.7% female) undergraduate and post-graduate students from UK universities participated in the study in exchange for book vouchers. Age ranged from 17 to 71 years (M = 24.56 years; SD = 8.32 years). Participants aged ±2SD from the mean were checked on all measures but represented no statistical outliers and were thus retained for further analyses.

Measures

Academic performance

Students rated their academic performance on a six-point scale, that is 'fail', 'pass', 'third', '2–2', '2–1' and 'first'. In the UK, these represent the typical grading categories and have an equivalent, ordinal, 100-point scale (though different grading systems are used in different programmes and universities).

Self-assessed intelligence

Self-assessed intelligence was assessed through an 18-item questionnaire which requires participants to rate their different abilities, for example spatial, mathematical, social, etc., on a standardised bell curve (Chamorro-Premuzic & Furnham, 2006b). In the present study, the internal reliability was coefficient alpha = .91, whilst the mean score was $M = 107.01$ (SD = 12.36). Based on principal component analysis (PCA), a single component underlying the self-assessed intelligence scale was identified and computed via calculation of the arithmetic mean (see Chamorro-Premuzic & Furnham, 2005, for a review of studies adopting similar methods).

Personality traits

Personality traits were assessed through an abbreviated version of the 'neuroticism–extraversion–openness five factor inventory' (Costa & McCrae, 1992). This 15-item scale (three items per factor), five-point Likert-type scale (Furnham, & McManus, 2004; Furnham, McManus, & Scott, 2003), assesses the five major personality dimensions: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness.

Goldsmiths soft skills inventory

This is a seven-point Likert-type scale (ranging from 1 = 'not at all' to 7 = 'extremely useful'). Respondents were asked to rate whether they believed that each of the 15 attributes (e.g. self-management skills, team-working, etc.) could help them obtain a first class degree (outstanding academic achievement), a desirable job after graduating and how much their degree was helping them to improve on each of these skills. A total score was obtained for each section of the Goldsmiths soft skills inventory by collapsing the items and computing the mean score.

Degree engagement

Participants were asked to give an overall engagement rating in regards to their degree. The single question ('In all, how inspiring do you find your degree?') was responded on a seven-point Likert-type scale (ranging from 7 = 'definitely inspiring' to 1 = 'definitely not inspiring') and computed independently.

Preference for assessment methods inventory

A self-report scale was used to assess participants' preferences for six different assessment modalities (see Chamorro-Premuzic, Furnham, Dissou, & Haeven, 2005),

namely multiple choice exams, essay-type exams, final year dissertation, continuous assessment, group work (one mark for everybody in the group) and group work (individual marks according to each student's contribution). Based on a PCA, which revealed a two-factor scale structure, the first three modalities were collapsed under one composite labelled 'exams', whilst the last three were aggregated in a second factor labelled 'coursework'.

Results

First, PCA and internal reliability were computed for each of the soft skills scales. A single underlying factor and high internal consistencies were observed in all scales (outstanding academic achievement – eigenvalue = 6.73, coefficient alpha = .90, explained variance = 44.91%; desirable job after graduating – eingenvalue = 8.17, coefficient alpha = .92, explained variance = 54.51%; improving skills – eigenvalue = 7.34, coefficient alpha = .92, explained variance = 48.96%).

Next, descriptive statistics and bivariate correlations were computed (Table 1). Supporting H1, academic performance significantly correlated with outstanding academic achievement, desirable job after graduating and improving skills. Significant correlations between personality traits and soft skills were also observed (partially supporting H2 as the relation between self-assessed intelligence and soft skills was lower than expected). To date, outstanding academic achievement significantly correlated with conscientiousness, desirable job after graduating correlated with agreeableness and with conscientiousness, and improving skills correlated with extraversion, agreeableness and conscientiousness.

Two series of hierarchical regressions were performed (see Table 2). Firstly, self-assessed intelligence (Step 1), personality (Step 2), soft skills (Step 3) and academic assessment preferences (Step 4) were added as predictors of academic performance. The results showed self-assessed intelligence, conscientiousness and outstanding academic achievement as significant predictors. A second series of hierarchical regressions was then performed to test whether academic performance (Step 1), personality (Step 2), soft skills (Step 3) and preference for assessment methods (Step 4) significantly predicted degree engagement. Academic performance was only a significant predictor in the first model. In the third model, soft skills increased the explained variance by 9% and desirable job after graduating and improving skills were significant predictors (supporting H4). In the final model, exams was revealed as a significant predictor. With regards to personality traits, only conscientiousness remained significant across the four models.

Path analysis (Arbuckle, 2003) was used to examine whether soft skills (outstanding academic achievement) worked as mediators between conscientiousness and academic performance (Sobel's test $Z = 2.40$; $p = 0.01$). The model was not tested for desirable job after graduating and improving skills as the regression showed no significant links between these factors and academic performance. Although the power of the model was low (see the parsimony goodness-of-fit index, PGFI), the other indices supported the hypothesised relation among the variables: $\chi^2(2) = 4.668$, $p = .09$; CFI = .86 (comparison fit index; values around .90 indicate very good fit); PGFI = .19 (optimal coefficient around .50; RMSEA = .05 (the root-mean-square error of approximation; values of .08 or .06 or bellow indicating reasonable fit).

Multi-group analyses were then performed in order to test whether the model was invariant across male ($n = 195$) and female ($n = 295$) participants (see Figure 1). A

Table 1. Study 1 – descriptive statistics and bivariate correlations.

	M	SD	2	3	4	5	6	7	8	9	10	11	12	13
1. Academic performance	66.67	18.41	.12*	−.06	.07	.02	.01	.12*	.20**	.12**	.12*	−.01	−.01	.11*
2. Self-assessed intelligence	107.01	12.36		−11*	.07	16**	.08	.01	−.04	−.03	−.01	−.01	.11	.15**
3. Neuroticism	9.0	2.61			.01	−.06	−13**	−14**	.01	.04	−.01	−.05	−14**	−20**
4. Extraversion	10.42	2.01				.10*	.10*	.04	06	.05	.11*	.18**	.20**	.13**
5. Openness	11.69	2.35					14**	.02	−.02	−.03	−.01	−.05	.22**	.16*
6. Agreeableness	12.33	1.96						16**	07	.10*	.14**	.10*	.04	.07
7. Conscientiousness	10.83	2.27							.14**	.12**	.11**	.05	.09*	.24**
8. Outstanding academic achievement	4.80	1.16								.62**	.59**	.09*	−.01	.16**
9. Desirable job	5.29	1.17									.60**	.07	−.08	.02
10. Improving skills	4.44	1.22										.11*	−.01	.28**
11. Coursework	12.21	4.29											−.05	.08
12. Exams	16.85	4.42												.25**
13. Degree engagement	5.50	1.36												

*$p < .05$; **$p < .01$.
Note: $N = 420$.

Table 2. Study 1 – multiple step regression analysis.

Step	Variable	Beta	*t*	*R*	ΔR^2	*F*
Significant predictors of academic performance						
1.	Self-assessed intelligence	.12	2.46**	.12	.01	6.09**
2.	Self-assessed intelligence	.11	2.24*	.18	.02	2.46**
	Conscientiousness	.11	2.34*			
3.	Self-assessed intelligence	.12	2.47**	.26	.05	3.52**
	Outstanding academic achievement	.19	3.06**			
4.	Self-assessed intelligence	.12	2.54**	.27	.05	3.09**
	Conscientiousness	.09	1.93*			
	Outstanding academic achievement	.20	3.08**			
Significant predictors of Degree Engagement						
1.	Academic performance	.11	2.28**	.11	.01	5.21**
2.	Openness	.13	2.91**	.35	.11	9.89**
	Neuroticism	–.16	3.56**			
	Extraversion	.10	2.26*			
	Conscientiousness	.20	4.32**			
3.	Openness	.13	3.11**	.47	.20	13.09**
	Neuroticism	–.16	3.63**			
	Conscientiousness	.19	4.29**			
	Desirable job	–.26	4.31**			
	Improving skills	.36	6.15**			
4.	Neuroticism	–.13	3.06**	.50	.23	12.38
	Conscientiousness	.17	3.94			
	Desirable job	–.24	4.02			
	Improving skills	.35	6.14**			
	Exams	.17	3.77**			

*$p < .05$; **$p < .01$.

baseline was tested for each group in order to confirm that the model fits the data well. For the female sample, the fit indicators were $\chi^2(2) = 2.290$, $p = .31$, CFI = .96, PGFI = .19, RMSEA = .02. For the male sample, the indicators were $\chi^2(2) = 3.238$, $p = .19$, CFI = .84, PGFI = .19, RMSEA = .07.

When testing for the multi-group comparison, support for the hypothesised model was found in the unconstrained model $\chi^2(4) = 5.536$, $p = .23$, CFI = .91, PGFI = .19, RMSEA = .03, so as in the constrained model $\chi^2(8) = 8.920$, $p = .34$, CFI = .94, PGFI = .39, RMSEA = .01. The difference between both models was not significant, indicating good support for the invariant structure of the model across genders $\chi^2(4) = 8.920–5.536 = 3.384$, $p = .50$.

Discussion

Study 1 set out to explore the structure of the Goldsmiths soft skills inventory as well as to explore the associations between these soft skills-related beliefs and individual differences in personality, self-assessed intelligence and academic performance. Despite the wide range of attributes covered by the Goldsmiths soft skills inventory,

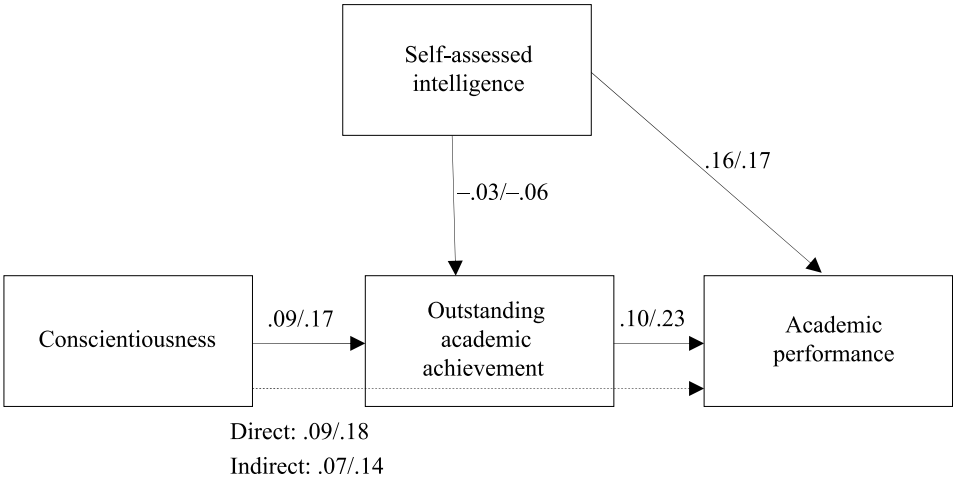

Figure 1. Outstanding academic achievement as a mediator between conscientiousness and academic performance taking into account the independent effects of self-assessed intelligence. Notes: Coefficients on the left relate to results of the female sample, whilst coefficients on the right refer to findings in the male sample. The dashed line represents a path that was originally significant (significant direct effects), but no longer so when the mediator was included in the model (non-significant indirect effect).

PCA identified a clear single-factor solution underlying the three versions of the inventory (outstanding academic achievement, desirable job after graduating and improving skills), indicating that rating differences *between participants* were much stronger than those *within participants/between items*. People consistently rated all of the 15 attributes as more or less important for both outstanding academic achievement and desirable job after graduating and thought they were improving equally on each of these attributes. Thus, it is conceptually appropriate to group these attributes under one common label, such as 'soft skills'.

Correlations between the overall composites of the Goldsmiths soft skills inventory and individual difference factors were generally modest, showing that students' beliefs on the importance of these attributes and the degree to which they improved on them were largely independent from personality, self-assessed intelligence and academic performance. Yet, some significant associations were found, whereby the extent to which soft skills were considered important for outstanding academic achievement and desirable job after graduating and the degree to which students felt they were improving on these skills were all linked to higher academic performance. On the other hand, individual differences in conscientiousness were linked to all soft skills scales, whilst the improving skills scale also correlated with extraversion and agreeableness. When academic performance was regressed onto soft skills and individual differences (as well as preferences for different assessment methods), only 5% of the variance was explained. This is remarkably low compared to recent studies on individual differences and academic performance (Chamorro-Premuzic & Furnham, 2003a, 2003b, 2005; see O'Connor & Paunonen, 2007 for a recent meta-analysis). Two factors may explain the low effect size of the results. Firstly, academic performance was obtained via student self-reports rather than university records, which means misreporting may have occurred, though the survey was anonymous and students had no reason to 'fake good'. Secondly, there was a clear restriction of range

in academic performance grades such that 55.7% of the students obtained a 2:2 or 2:1 degree. This may have underestimated the true association between academic achievement and the examined predictors.

Soft skills – in particular, ratings of outstanding academic achievement – were nevertheless found to be the most significant predictors in the regression and had incremental validity over personality traits. Thus, the belief that soft skills were useful to do well in exams was linked to higher exam grades, even after personality factors were accounted for. Moreover, when soft skills were tested as mediators of conscientiousness and academic performance, the effect of this personality trait on exam grades was no longer significant. Thus, for both males and females, when accounting for the effects of soft skills on academic performance, conscientiousness was not linked to higher grades.

When soft skills and personality traits were examined as predictors of degree engagement, results showed that students' level of degree engagement was significantly predicted by soft skills – especially how much they thought they were improving on these attributes – even after controlling for established individual difference factors. Given that degree engagement is an important goal of academic degrees and higher education institution, the importance of the association between enjoyment ratings and soft skills development found in the present study cannot be overemphasised. Thus, fostering soft skills may considerably promote student engagement with their studies and courses.

Despite limitations (e.g. the use of self-reports and the single-wave nature of the study), the results have exploratory value in that they highlight the 'global' component underlying perceptions of soft skills, that is their importance for educational and occupational settings, as well as how they develop. Furthermore, to our knowledge, no previous study has looked at the extent to which importance ratings of soft skills are linked to academic performance when controlling for dispositional factors. Clearly, the importance attributed to the non-academic attributes examined via the Goldsmiths soft skills inventory was positively associated with academic performance. Whether this association is a function of the latter causing the former (such that high-achieving students tend to value soft skills more) or vice versa (the case of valuing soft skills leading to higher academic performance) is of secondary importance provided that indeed importance ratings are linked to soft skills development.

In Study 2, we attempted to replicate the structure of the Goldsmiths soft skills inventory, using a larger sample of students and examine mean differences across subjects and levels of academic performance.

Study 2

Sample

Participants were 1307 (70.8% female) undergraduate and postgraduate students from UK universities. Age ranged from 17 to 70 years *(M* = 24.49; SD = 7.43). As in Study 1, data were checked for outliers, but no cases were removed.

Measures

Academic performance

Academic performance was operationalised in terms of students' final grade as in Study 1. In order to perform analysis of variance – unlike in Study 1 – data were

aggregrated in three groups: A (A First), B (B 2–1), C and under (C 2–2, D Third, E Pass and F Fail). 22.6% of the participants fell into the first category, 64.8% in the second and 12.6% in the third.

Soft skills

As in Study 1. In this study, reliability coefficients were outstanding academic achievement – coefficient alpha = .90, desirable job after graduating – coefficient alpha = .92, improving skills – coefficient alpha = .92. Details of the factor analyses are reported in the 'Results' section.

Degree engagement

As in Study 1.

Preference for assessment methods inventory

As in Study 1.

Results

Confirmatory factor analysis with AMOS 5.0 (Arbuckle, 2003) was performed in order to replicate the factor structure of the Goldsmiths soft skills inventory scales found in Study 1. The initial model for each of the three soft skills was run with the 15 items as observed variables and the higher factor (outstanding academic achievement/desirable job after graduating/improving skills) as the latent variable. Although the analysis revealed an adequate model fit, the indexes were weaker than expected. Inspection of inter-item correlations revealed the importance of including these paths in the models. Thus, errors of inter-item correlations over $r = .52$ were allowed to correlate. The analyses were rerun and areas of misfit with low correlation coefficients were identified. Modifications were done until adequate fit was achieved (see Figures 2–4). For outstanding academic achievement, the chi-square goodness-of-fit test was significant: $\chi^2(75) = 777.516$, $p < .001$, but other indexes indicated that the model was well fitting, CFI = .92, PGFI = .57, RMSEA = .08. For desirable job after graduating, the model was also well fitting: $\chi^2(79) = 431.658$, $p < .001$, CFI = .96, PGFI = .62, RMSEA = .05. For improving skills, the indices were: $\chi^2(76) = 394.973$, $p < .001$, CFI = .96, PGFI = .60, RMSEA = .05 revealing a good fit as well.

Next, descriptive statistics and bivariate correlations were computed for all variables (see Table 3). The significant correlations between the final grade and outstanding academic achievement, desirable job after graduating and improving skills support the relationship between academic performance and soft skills and replicates the results from Study 1. According to initial predictions, academic performance was also significantly correlated with assessment method preferences – exams and with degree engagement. Additionally, partial correlations were performed and revealed no sex effects on the soft skills and academic performance relationship.

Analyses of variance were performed to test for significant soft skills differences in academic performance (see Table 4). Participants with final grades C and under had lower scores on outstanding academic achievement, desirable job after graduating and

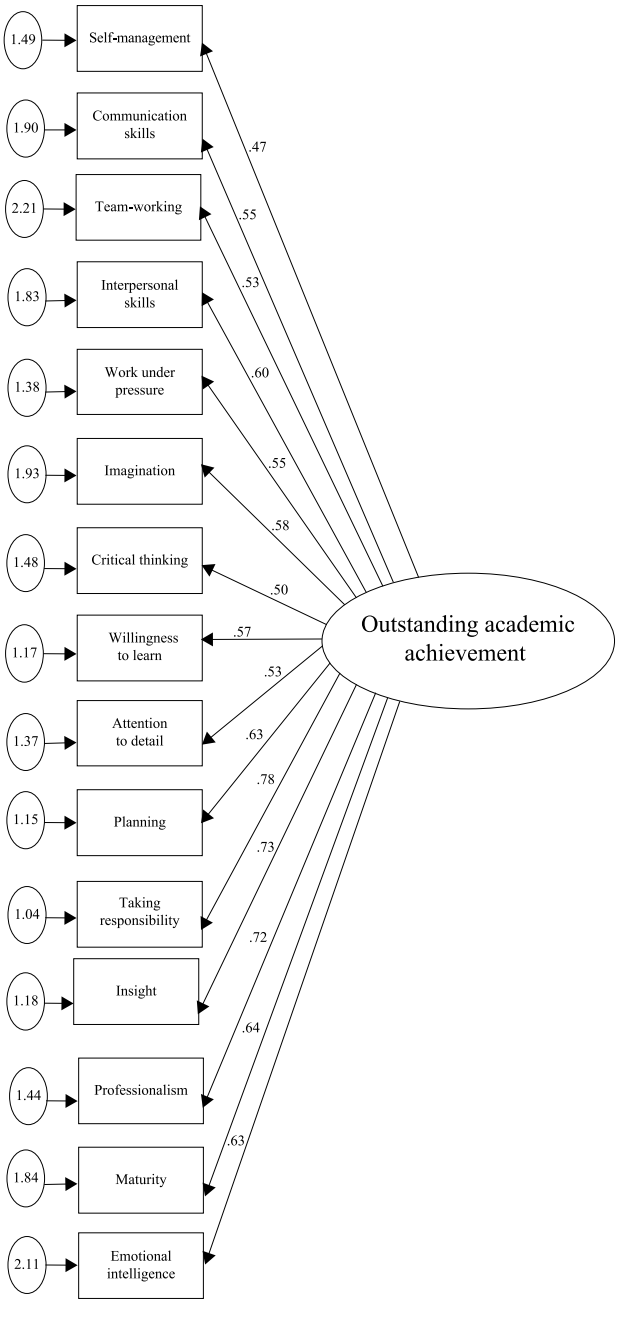

Figure 2. Confirmatory factor analysis of the Goldsmiths soft skills inventory having outstanding academic achievement as the latent trait.

improving skills (effect sizes ranged from d = .31 to .43). However, there were no significant group differences between Grades A and B.

As in Study 1, hierarchical regressions were carried out to test the predictors of academic performance and degree engagement (see Table 5). In the first series, soft

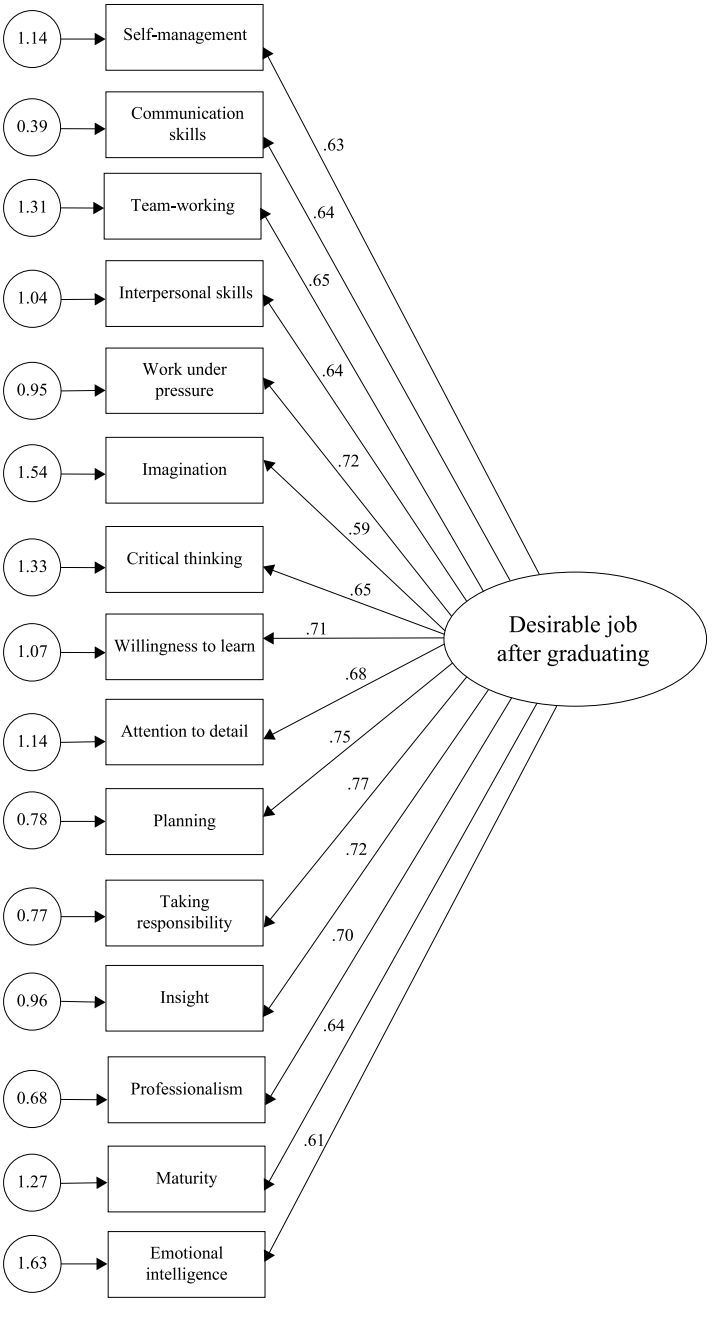

Figure 3. Confirmatory factor analysis of the Goldsmiths soft skills inventory having desirable job after graduating as the latent trait.

skills (Step 1) and preference for assessment method (Step 2) were added as predictors of academic performance. The results showed outstanding academic achievement, desirable job after graduating and exams as the strongest predictors. In the second series, academic performance (Step 1), soft skills (Step 2) and preference for

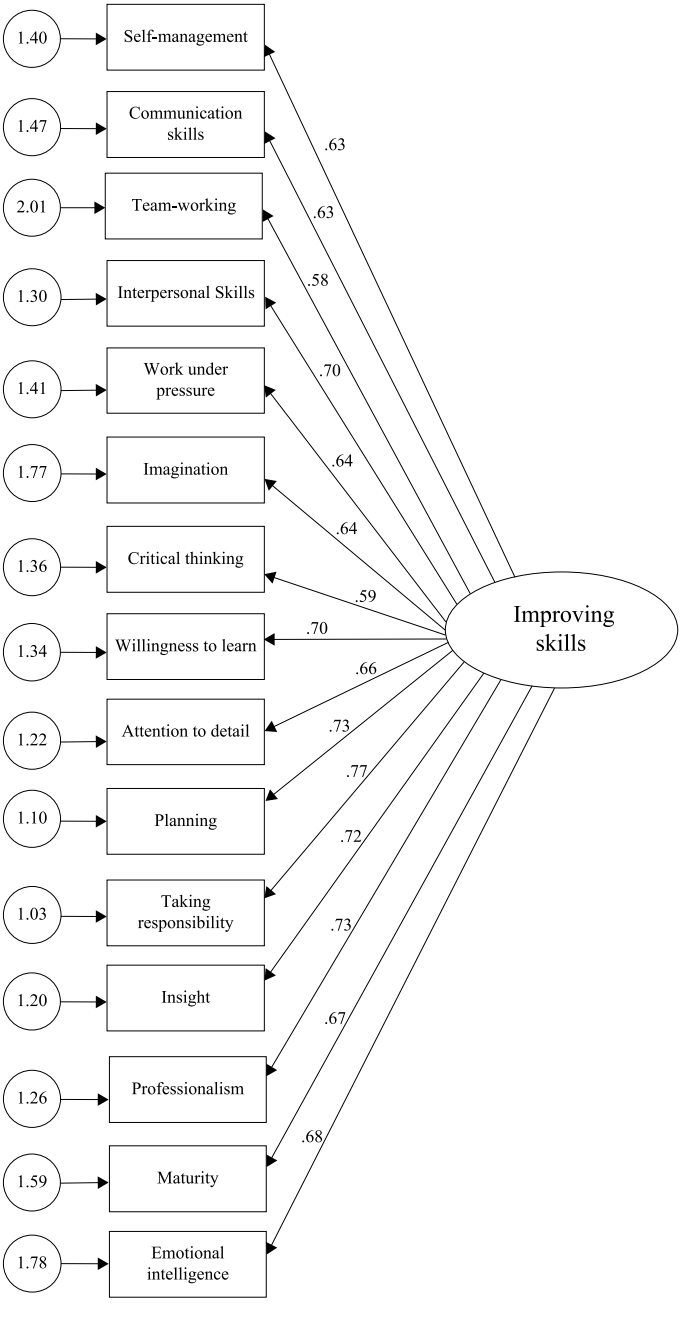

Figure 4. Confirmatory factor analysis of the Goldsmiths soft skills inventory having improving skills as the latent trait.

assessment method (Step 3) were tested as predictors of degree engagement. All variables were significant to the model; however, when preference for assessment methods were added in Step 3, the explained variance increased was not significant (1%).

Table 3. Study 2 – bivariate correlations among all measures.

	M	SD	Alpha	2	3	4	5	6	7
1. Academic performance	1.90	0.5		.18*	.11**	.12**	.06*	.01	.13**
2. Outstanding academic achievement	5.20	1.03	.90		.67**	.60**	.14**	.21**	.24**
3. Desirable job	5.54	1.00	.92			.56**	.12**	.15**	.12**
4. Improving skills	4.95	1.13	.92				.16**	.23**	.35**
5. Exams	4.51	1.02						.05*	.12**
6. Coursework	4.33	1.39							.13**
7. Degree engagement	5.50	1.33							

*$p < .05$; **$p < .01$.

Table 4. Study 2 – differences in soft skills among academic performance groups.

	Final grade			
	A First $n = 292$ *M* (SD)	B 2-1 $n = 839$ *M* (SD)	C and under $n = 163$ *M* (SD)	ANOVA df (2, 1291) *F*
Outstanding academic achievement	5.37^{a} (.93)	5.23^{ab} (.96)	4.83^{c} (1.36)	14.84**
Desirable job	5.60^{a} (1.06)	5.54^{ab} (.89)	5.32^{c} (1.30)	5.45**
Improving skills	5.04^{a} (1.15)	4.93^{ab} (1.06)	4.58^{c} (1.34)	11.81**

**$p < .01$.
Note: Means with differing supercripts within rows are significantly different at $p < .05$.

Analyses of variance (see Table 6) were subsequently performed to examine soft skills differences across subject areas. Significant differences were observed in all soft skills (effect size ranged from $d = .30$ to .43). Humanities students had significantly higher scores than exact and science students and biological students on outstanding academic achievement and improving skills. For desirable job after graduating, humanities students had significantly higher scores than biological students.

Discussion

The first aim of this study was to replicate the structure of the Goldsmiths soft skills inventory found in Study 1. Using confirmatory factor analysis, a latent factor was indeed replicated for each of the versions of the inventory. Despite the semantic differences among the different attributes included in the questionnaire, again, the two sets of importance ratings, as well as the improvement ratings, were found to vary quite systematically, such that ratings on any of these attributes would be a robust predictor of ratings on the others.

Also in line with Study 1, outstanding academic achievement ratings were linked to increased academic performance, especially those in the lower academic performance group differed significantly from the two higher groups (A and B). This

Table 5. Study 2 – multiple step regression analysis.

Step	Variable	Beta	*t*	*R*	ΔR^2	*F*
Significant predictors of academic performance						
1.	Outstanding academic achievement	−.20	5.01**	.18	.02	9.97**
	Desirable job	.08	2.26*			
2.	Outstanding academic achievement	−.21	5.20	.18	.03	8.73**
	Desirable job	.09	2.39**			
	Exams	−.05	2.05*			
	Coursework	.08	3.07			
Significant predictors of degree engagement						
1.	Academic performance	.13	4.61**	.13	.01	21.26**
2.	Academic performance	.08	3.04**	.39	.15	56.27**
	Outstanding academic achievement	.11	3.41**			
	Desirable job	−.18	5.02			
	Improving skills	.37	11.03**			
3.	Academic performance	.08	3.00**	.40	.16	40.45**
	Outstanding academic achievement	.11	3.04**			
	Desirable job	−.18	5.00**			
	Improving skills	.35	10.40**			
	Exams	.09	3.36**			
	Coursework	.05	1.95*			

*$p < .05$; **$p < .01$.

Table 6. Study 2 – differences in soft skills among academic performance groups.

	Knowledge area			
	Humanities/social sciences *n* = 635 *M* (SD)	Science and engineering *n* = 138 *M* (SD)	Biological/life sciences *n* = 129 *M* (SD)	ANOVA df (2, 899) *F*
Outstanding academic achievement	5.17[a] (.99)	4.82[b] (1.22)	4.74[bc] (1.27)	12.54**
Desirable job	5.54[a] (.98)	5.30[ab] (1.20)	5.24[bc] (1.18)	6.23**
Improving skills	4.89[a] (1.13)	4.50[b] (1.30)	4.59[bc] (1.19)	8.47**

**$p < .01$.
Note: Means with differing supercripts within rows are significantly different at $p < .05$.

association held consistent across sexes. Interestingly, preferences for coursework were positively related to perceived levels of improvement of soft skills, which were also correlated with degree engagement, as in Study 1.

Differences in soft skills ratings across university programmes revealed that 'harder subjects' (sciences) were consistently linked to lower importance and improving skills ratings, whilst the opposite pattern was observed for 'softer subjects' (humanities).

Study 3

This study incorporates a measure of cognitive ability to examine whether different levels of ability are associated with differences in soft skills ratings. As in Study 1, personality and preference for assessment methods' factors were also incorporated.

Sample

Participants were 87 undergraduate students from UK universities. Age ranged from 18 to 34 years (M = 22.40; SD = 3.30).

Measures

Soft skills

The same as in Studies 1 and 2, though only the outstanding academic achievement and desirable job after graduating versions were included for time limitations. A total score was obtained for both soft skills via collapsing all the items and computing the mean score.

IQ

IQ scores were obtained from the Alice-Heim 5 test AH5 (Part 1) (Heim, 1968). This is a timed (20 min) measure of verbal and spatial ability, designed for highly intelligent samples (notably university students). Scores were converted into the standardised IQ scale according to the manual and the mean was M = 14.16 (SD = 3.97).

Ten-item personality inventory (TIPI)

Each of the items is composed by two descriptors, and the participants are asked to describe themselves on a seven-point scale ranging from 1 (disagree strongly) to 7 (agree strongly) (see Gosling, Rentfrow, & Swann, 2003, for evidence of validity).

Preference for assessment methods inventory

As in Studies 1 and 2

Results

Table 7 reports the descriptive statistics and bivariate correlations for all measures. Soft skills significantly correlated with extraversion, agreeableness and conscientiousness, IQ and academic assessment preferences: exams and coursework.

Hierarchical regression analysis was performed to test the validity of the significant correlates of soft skills as its predictors. The first model [$F(3, 80) = 6.62$, $p < .01$] included only personality traits, which accounted for 17% of the variance. The strongest predictors were extraversion ($\beta = .26$, $t = 2.64$, $p < .01$) and conscientiousness ($\beta = .26$, $t = 2.62$, $p < .01$), followed by agreeableness ($\beta = .19$, $t = 1.97$, $p < .05$). When IQ was added as a predictor [$F(4, 79) = 6.61$, $p < .01$], the explained variance increased by 4% and together with extraversion ($\beta = .23$, $t = 2.40$, $p < .01$), it was the strongest predictor ($\beta = –23$, $t = 2.30$, $p < .01$). Conscientiousness remained a

Table 7. Study 3 – descriptive statistics and bivariate correlations.

	M	SD	2	3	4	5	6	7	8	9	10
1. Soft skills	5.73	.72	–.33**	25*	.22*	28**	.02	.18	.09	–.21*	.24*
2. IQ	115.05	13.98		–.08	–.09	–.12	.06	.04	.01	.19	–.06
3. Extraversion	5.04	1.45			–.07	.12	.09	.25*	28**	.05	.18
4. Agreeableness	4.48	1.06				.10	.17	.04	–.02	.14	.14
5. Conscientiousness	4.38	1.60					.12	–.07	.09	–.24*	40**
6. Neuroticism	4.04	1.45						–.05	40**	.19	.13
7. Openness	5.75	1.05							.20	.08	–.10
8. CSE	30.27	5.19								.04	.10
9. Exams	4.07	2.60									–.21
10. Coursework	4.45	1.38									

*$p < .05$; **$p < .01$.
Note: $N = 87$; CSE = core self evaluation.

significant predictor in the model ($\beta = .22$, $t = 2.19$, $p < .05$), but agreeableness did not. In the third model [$F(6, 77) = 4.98$, $p < .01$], when preference for assessment methods' factors were added, the explained variance increased by only 1% and the new entered variables were not significant predictors.

Discussion

This study set out to explore the relationships among the Goldsmiths soft skills inventory, personality, IQ and the PAMI (Preference for Assessment Methods Inventory). Accordingly, it attempted to replicate the associations found in Study 1 and to investigate links between the inventory and cognitive ability.

Given the relatively small sample size and the high inter-correlation between outstanding academic achievement and desirable job after graduating, the two factors were averaged in a single measure. Correlations between the total soft skills factor and personality (extraversion, conscientiousness and agreeableness) replicated the findings from Study 1. Although correlation coefficients were higher in this study than in Study 1, sample size differences between the two studies may account for this discrepancy, as well as, to a lesser extent, the fact that two different personality inventories were employed.

Interestingly, IQ was negatively associated with soft skills ratings, such that individuals with higher cognitive ability were less likely to believe that soft skills were important for outstanding academic achievement or desirable job after graduating. Given the non-academic nature of the majority of the attributes listed by the Goldsmiths soft skills inventory (the exception being critical thinking), it is not totally surprising that IQ was negatively related to importance ratings of soft skills. This is consistent with the idea that lower ability students may use soft skills to compensate for their poorer analytic/reasoning skills, just as conscientious students are more likely to use soft skills to improve their academic performance (Chamorro-Premuzic & Furnham, 2006b). Likewise, the Goldsmiths soft skills inventory taped into several conscientiousness-related aspects (e.g. willingness to learn, self-management skills, attention to detail). Although attitudes towards exams and coursework were associated with soft skills ratings, once personality and IQ

were controlled for, preference for assessment methods' factors had negligible links with soft skills ratings.

General discussion

The three studies reported in this paper have shown that perceptions of the importance and development of soft skills are consistent across a wide range of non-academic attributes; though mean levels of importance and development ratings vary clearly across domains of formal education. In some cases, these attributes arguably refer to overlapping constructs (e.g. self-management skills and interpersonal skills). However, the fact that Goldsmiths soft skills inventory are mostly referred to different psychological concepts (e.g. critical thinking and attention to detail) suggests that the homogeneity of the ratings may reflect true common variance on the importance and extent to which these variables are simultaneously developed. For instance, emotional intelligence and attention to detail quite clearly refer to different aspects of students' behaviours, but students who think one is important are also likely to value the other and vice versa.

An alternative interpretation for the high similarity of ratings across different attributes (as evidenced by the PCA and confirmatory factor analysis) is that respondents were either 'positive' or 'negative' in their ratings in general, meaning the pattern of findings reflects a response bias rather than accurate reporting on the development or perceived importance of these attributes. Although this possibility cannot be discarded, were it true, it would have probably caused high correlations between the soft skills ratings and agreeableness, as the latter is a known predictor of positive bias in attitudinal surveys (Chamorro-Premuzic, 2007). Moreover, all participants volunteered to take part in these studies so they may be expected to provide more positive ratings than the average student. This makes response biases more likely, but their effects on the homogeneity of responses across attributes unlikely, as the opposite (differences between students being larger than between attributes) would have been found.

What significance does the identified structure of the Goldsmiths soft skills inventory have? Theoretically, it warrants interpretations of this set of attributes as 'soft skills' or any label that highlights their similarities in terms of being non-academic or generic. This interpretation is consistent with the modest correlations between soft skills and academic performance ratings. However, soft skills seem to play a clear role in regards to degree engagement, which are of educational and occupational interest per se. One of the roles of higher education is arguably to promote enthusiasm and motivation to learn, and engagement with academic subject matters is likely to impact on occupational choices, as well as higher self-efficacy.

From an applied point of view, practitioners should be aware of the concrete possibility that improvements on any of these skills are probably indicative of improvements on any other skills, and the same applies to importance ratings. For example, knowing that students think teamwork is important for outstanding academic achievement may indicate that they also believe emotional intelligence is important for this outcome. Moreover, there are important implications for occupational psychology as the present results have highlighted the importance of equipping students with the relevant non-academic skills to pursue their work-related career goals. Thus, students seem aware of the need to develop soft skills in order to enhance their work prospects. Accordingly, one can only hope that the gap between academically fostered and occupationally desired skills is indeed reduced (Beard et al., 2007; Green, 1990).

Note

1. Given the large number of overlapping terms (e.g. graduate or personal graduate attributes/competencies/capabilities, core/transferable skills, key skills, lifelong learning skills and non-content-related skills), for simplicity, we use soft skills throughout this paper, though we acknowledge that these concepts are not always interchangeable (Clanchy & Ballard, 1995). Thus, Robins and Webster (1999, p. 14) noted that soft skills can include 'just about anything outside the knowledge content and disciplinary orientations of subject areas'.

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