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The Academic Value of Internships: Benefits Across Disciplines and Student Backgrounds

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Highlights

- Effect sizes for student internships on subsequent academic performance are estimated
- Estimates control for prior performance, gender and ethnicity and include several student cohorts
- Positive effects are found across a large number of subjects and disciplines
- Independent of student characteristics chances for top class degrees are doubled with an internship

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Abstract

While student benefits from internship experience have been frequently documented in research, the emphasis has been on internship effects on employment and career indicators. This work is concerned with effects on academic outcomes and focuses on the robustness of such effects across academic disciplines as well as for different achievement levels of students, student gender, and ethnicity. We present findings from a longitudinal sample (n > 15,000) that covers an extensive range of subjects and disciplines for large Undergraduate cohorts. Main effects and interactions for student background characteristics were investigated showing stable academic benefits for advantaged and disadvantaged students. Further, using ordinal logistic multi-level modelling, we explored the impact on the probability of attaining a higher degree classification for different student scenarios, thus illustrating the practical significance of these internship effects. Effects are less likely to stem from maturation or self-selection. Findings are therefore discussed against a background of motivational approaches suitable to integrate both direct and indirect paths from internship experience to academic outcomes to career indicators.

Keywords: Internship, academic performance, student achievement, ordinal logistic regression, placement

The Academic Value of Internships: Benefits Across Disciplines and Student Backgrounds

Internships as voluntary, temporary work placements, often undertaken by students at the university and college levels, have been hailed as win-win situations for both employers and internees (Coco, 2000). Employers do not have to commit to actual employment, and internees can further their (future) career. Clearly, internships feature prominently when it comes to the employability of graduates from higher education (e.g., Gault, Redington, & Schlager, 2000), and in recent years universities across the Western world have increasingly acknowledged the importance of career-furthering measures (Bridgstock, 2009; Smith, McKnight, & Naylor, 2000). Yet, the exact benefits of internships, and how these are brought about, remain a matter of ongoing debate (Narayan, Olk, & Fukami, 2010). The present work aims to add to this debate by focusing on the academic value of internships and their direct effects on study outcomes.

There is little doubt that internships can have a direct and positive effect on a number of career indicators, at least under the right circumstances (for recent reviews, see Knouse & Fontenot, 2008; Narayan et al., 2010). Studies specifically relating to business education and training have shown that, compared to no such experience, internships are associated with greater perceived attractiveness of job applicants to recruiters (Taylor, 1988), with graduates obtaining a job more quickly and more easily (Knouse, Tanner, & Harris, 1999), and with higher salary levels as well as increased job satisfaction (Gault et al., 2000).

In contrast, less emphasis has been put on internship outcomes within higher education. In a recent synthesis of the existing literature, Narayan et al. (2010) have drawn up an integrative model of internship effectiveness, which addresses academic preparedness as an antecedent variable, but omits any academic benefits from student outcomes. This is supplemented by students' own perceptions, who have been shown to attribute substantial social and career-related value to internships, but no academic value that would feed back into

their studies (Cannon & Arnold, 1998; Cook, Parker, & Pettijohn, 2004). Empirical studies conducted in educational contexts so far suggest, however, that an internship experience directly impacts on final grades and degree classes (Gomez, Lush, & Clements, 2004; Mandilaras, 2004; Mansfield, 2011; Rawlings, White, & Stephens, 2005; Reddy & Moores, 2006).

The first aim of the current work, therefore, is to integrate effects and processes that relate to higher education with literature on organizational settings and career development concerns.[1] The second aim is to empirically demonstrate such educational effects. In doing so, our study will go beyond prior research through an in-depth investigation of student demographics, variation across academic disciplines and controls for self-selection.

For a thorough investigation of the internship-university link, a number of student demographics are considered that are well known to be associated with study outcomes, namely gender, ethnicity and scholastic aptitude. Some studies (e.g., Gomez et al., 2004) have controlled for some of these factors in order to obtain a good estimate of effect size. In the present work, we are more concerned with interactions between internship experience and background characteristics in order to estimate internship effects for different student groups. This can then indicate, for example, whether internships are more or less effective for students from disadvantaged backgrounds. Another area of inquiry concerns the stability of effects across different academic disciplines. Studies so far have thrown a spotlight on individual degree courses (Gomez et al., 2004; Mandilaras, 2004; Mansfield, 2011; Rawlings et al., 2005; Reddy & Moores, 2006), and most studies concerned with career indicators have been conducted within business schools (Narayan et al., 2010). These findings, however, cannot capture the full variation in terms of gender composition, ethnic diversity and scholastic aptitude to be found within a full-scale university, let alone the variation in standards and learning climates on different courses. Lastly, we are concerned with the problem of self-selection. Where research has focused on optional internships, clear a priori differences have

been documented between students with and without internship experience. As in all field settings, this weakens any argument that assigns a causal role to internships in raising academic performance.

In the following, we will elaborate on these points by discussing, firstly, the current status of internships in higher education and, secondly, the factors that need to be considered for documenting a general, positive effect of internships on academic outcomes. We will then go on to present findings from a large, longitudinal student sample, spanning a broad range of academic subjects to reliably estimate an internship effect while controlling for past academic achievements and student demographics.

Internships and Higher Education

It is to be expected that internships will increasingly turn into a core interest for the higher education sector. In recent years, non-academic graduate attributes such as career management skills have become more attractive for universities to sport, mostly in order to meet the demands of prospective employers (Bridgstock, 2009). A number of internationally important university rankings, such as the *Financial Times University Ranking* in the US and *The Times Good University Guide* in the UK, include indicators of postgraduate career success (Clarke, 2007). All of this increased interest, then, is driven by an employability agenda. If internships have a direct causal effect on career indicators, universities are well advised to invest in internships alongside traditional, academic teaching and training.

But what about effects on academic achievement? Anecdotal evidence suggests that excellent students come with excellent references, including internship experience. Past research has shown that brighter students, those with better grades, are more likely to get into an internship (Knouse et al., 1999; Knouse & Fontenot, 2008; Taylor, 1988). We find the opposite causal direction, however, to be of much higher practical relevance. Improved academic performance owing to internships could have a substantial indirect effect on students' value on the job market, given that study outcomes are routinely treated as central

predictors of employment (see Smith et al., 2000). Roth and Clarke (1998), in their meta-analysis, found an overall correlation of .20 between academic performance (grades) and starting salary, as well as correlations from .20 to .30 between grades and current salary. Further benefits of increased academic performance include a reduction in stress and improved adjustment to new life circumstances (Chemers, Hu, & Garcia, 2001). Our theoretical understanding, then, distinguishes between two causal paths from internships to career indicators, one direct and one indirect by means of influencing academic performance.[2] This helps to further highlight the importance of investigating links between internships and academic outcomes.

So far, studies that have included information on both internships and study outcomes have been struggling with resolving the inherent confound between the two variables (Gault et al., 2000; Knouse et al., 1999; Taylor, 1988), in part due to the level of rigour in the statistical analyses. Although several studies have hinted at academic benefits to date (Gomez et al., 2004; Mandilaras, 2004; Mansfield, 2011; Rawlings et al., 2005; Reddy & Moores, 2006), there is little stringent evidence for a causal link between internships and study outcomes. Most convincingly so far, Gomez and colleagues (2004) found a relationship between internships in the second year of an undergraduate bioscience degree course and final marks in the third year while controlling for pre-university qualifications, prior academic achievements, and gender. On a percentage scale, the net effect of an internship experience amounted to an increase of 4 percentage points in final marks. With these findings, however, there is still room for substantial student self-selection since the authors report on a UK degree system that normally allows students to choose between a degree course with or without internship, even after they have commenced their studies (Little & Harvey, 2006). A similar criticism applies to other research in the field. We believe this can be overcome by, first of all, looking at a range of degree courses and comparing effects not only for corresponding courses with and without internships, but also for courses that never provide an

internship option and those where internship is integral to the course (and therefore, in some sense, compulsory).

Student Background Characteristics and Internship Effects

Closely related to the issue of self-selection, as discussed above, is the question of student background characteristics: Would we expect internships to be equally effective for different categories of students? A prominent factor in this context is ethnicity. It is a well-established finding that in Western, mixed-ethnic societies, most non-white students, and in particular Blacks, show lower academic achievements (Cohen, Garcia, Apfel, & Master, 2006; Kao & Thompson, 2003; Nora & Cabrera, 1996; Arroyo & Zigler, 1995). Without going here into any details concerning the underlying reasons for this minority disadvantage, it is important to note that Whites are also more likely to take up an internship than Blacks (Knouse et al., 1999), thus potentially furthering the gap. This is particularly troublesome in those academic disciplines where internships are far from the norm and require more student initiative in terms of set up.

Another factor that has received considerable attention in the literature on academic outcomes and graduate careers is gender. While research on gender and academic achievement was historically concerned with an academic disadvantage for female students (Rudd, 1984), more recent studies have moved away from a uniformly negative view on female educational attainment (McNabb, Pal, & Sloane, 2002), with some reporting an overall reversal of this gender gap (Buchmann & DiPrete, 2006). Females tend to show both higher study motivation and higher study outcomes (e.g., Harackiewicz, Barron, Tauer, & Elliot, 2002), with the exception of science subjects and related disciplines (Mellanby, Martin, & O'Doherty, 2010; Steele 1997). Studies on internships have mostly used gender as a control variable (Gomez et al., 2004; Rawlings et al., 2005), but Mansfield (2011) reported a reduced benefit from internships for female students as compared to males. This emphasises the importance of further investigating interactions between internships and gender.

Finally, the level of academic aptitude needs to be taken into account. As stated before, brighter students are more likely to gain access to internships (Knouse et al., 1999). This means that studies on internships run the risk of focusing on elite support while neglecting lower achievers. As with some other background characteristics, studies documenting an internship effect on academic outcomes have routinely controlled for prior achievement. An exploration of internship effects at different levels of academic achievement, however, is still missing. In sum, we propose that taking into account central student characteristics, ethnicity, gender, and academic aptitude, both as control variables and potential moderators of internship effects will further increase the relevance of findings in current debates in the higher education sector.

General and Stable Internship Effects?

Having discussed the relevance of an internship effect on academic achievement and the main variables investigated in this study, we briefly address factors that speak for and against a general effectiveness of internship. At first, the generality of effects may well be questioned on the grounds of the potentially moderating role of student characteristics identified so far. On the other hand, small-scale studies so far have found support for internship effects in disciplines as varied as economics (Mandilaras, 2004), bioscience (Gomez et al., 2004), surveying (Mansfield, 2011), information systems (Rawlings et al., 2005), and psychology (Reddy & Moores, 2006). Of course, all these benefits could stem from general maturation in students (Devlin, 1996). However, given that academic achievement is multi-factorial (e.g., being influenced by prior knowledge, intelligence, social support and external pressures), we find it more fruitful to speculate on overarching motivational processes. Although this work is not directly concerned with student motivation, the consideration of motivational constructs helps to formulate the expectation that internship effects will be robust across different academic disciplines and at the same time will show some variability for different types of students.

Internship effects on motivational factors in relation to careers are well documented. Internships have been shown to lead to a higher fit between business students' instrumental values and job characteristics (Pedro, 1984), to a greater crystallization of a vocational self-concept (Brooks, Cornelius, Greenfield, & Joseph, 1995; Taylor, 1988), and to improve the cushioning of a graduate's reality shock (Cook et al., 2004; Taylor, 1988). These findings point to processes independent of specific academic fields and suggest that, overall, internships may be related to changes in intrinsic motivation (Deci, Vallerand, Pelletier, & Ryan, 1991) as well as social-cognitive processes leading to increased self-efficacy and interest (Lent, Brown, & Hackett, 1994) and higher-level career aspirations (Nauta, Epperson, & Kahn, 1998). Based on these speculations, we expected to find positive internship effects on academic outcomes, and for these to hold across disciplines. At the same time, research on perceived barriers (Luzzo & McWhirter, 2001) indicates that such effects may vary across student background characteristics, with particular reference to ethnic minority status and being female, due to group-specific anticipation of inhibiting factors on the way to educational and career goals. A systematic comparison of internship effects across different sub-groups in the student population, something which has not been undertaken so far, is therefore essential.

Research aims

In the following, we present findings from a large longitudinal data set on internships and academic achievements covering the years from 2001 to 2008 for all completed undergraduate student cohorts at one of the largest universities in the UK. Internships were all integrated with degree courses and took place during an additional year sandwiched in between year two and year three of a three years B.A. or B.Sc. degree (hence the commonly known label 'sandwich placement' in the UK). Internship duration typically falls in between eight and eleven months, depending on university policy.

These data enabled us to pursue several research aims that go well beyond what existing studies could address so far. Firstly, controlling for prior academic achievement, we wanted to estimate the magnitude, if any, of a general internship effect and to test for the stability of such an effect across a broad range of academic disciplines. Secondly, we wanted to compare effects for important subgroups within the student population: for males and females, for different ethnic backgrounds, and at different levels of academic aptitude. Thirdly, our aim was to provide a control for self-selection of students. Although it is impossible in most field settings to rule out self-selection biases completely, our data allowed for a comparison of voluntary and mandatory internships in various ways. Corresponding degree courses with and without an internship could be juxtaposed, as well as courses that never provide an internship option and courses that only exist with an integrated internship.

In a further step, we attempted to maximize the practical relevance of our analyses by comparing different ways of scaling academic outcomes, namely degree mark and degree class. Within the English-speaking world, there are a number of approaches to grading and awarding a particular level of outcome to a student's degree (Sadler, 2005). In the UK, a degree mark is often awarded as a grade point average with a value range from 0 to 100. Specific ranges on this scale represent different degree classes (see Yorke, Barnett, Evanson, Haines, Jenkins, Knight, et al., 2004, for the particulars in matching class to mark). For both academic and career purposes, degree class solely carries importance, and in recent years strong concerns in the UK have been raised regarding mounting pressures on students to obtain the top-most classes in order to gain access to qualified employment (Burgess Group, 2007). The Higher Education Statistics Agency (HESA) publishes data on student achievement on the basis of degree class only (HESA, 2012).

Method

Participants

Data were obtained from the central administration of a UK university with one of the largest undergraduate populations in the country on all undergraduate student entries spanning the years from 2001 to 2009. In order to be included in the analyses, all entries had to meet the following criteria:

(a) They had to refer to a completed undergraduate degree course, either 3 years full-time study without internship, or 4 years with an internship during the 3rd year of study. According to university regulations, internships could last from 36 to 52 weeks with an expected typical duration of 44 weeks. They should not indicate shorter or integrated internships, and they should take place in a professional setting external to the university. Organisations of all sizes in the industrial, charitable, public and service sectors were eligible to offer internships. Internships were facilitated by the university, but the final responsibility of securing an internship rested with the student. This means that, for each degree course, internships were not normally supplied by one or few external organisations, but were linked to a large and varied range of organisations and professions.

(b) They had to allow for consistent mapping of students and internships to a specific course. This did not hold in a small proportion of cases where students had changed courses during this period.

(d) In case of internships, only those students who had also completed their internship were considered. A small number of students were excluded for this reason (n = 65).

The above criteria resulted in a sample of 15,732 complete student entries covering five cohorts (having commenced studies in 2001-2005). All further information is provided for this select set of students only. Students were on average 19.4 years old (SD = 3.2) at the start of their studies. Females were in a slight majority (52.7%), and a large majority (81.5%) were classed as having a “white” ethnic background. Internships were completed by 4,024 (25.6%) of all students.

A summary of student numbers, gender ratio, ethnicity ratio, and internship ratio by subject area is provided in Table 1.

Measures

In addition to gender (male/female), ethnicity (white/non-white) and internship (yes/no), the following variables were available and used in the analyses:

Course affiliation. In order to model variation explained at the course, rather than student, level, course affiliation was included as a categorical variable. Students were distributed over a total of 186 degree courses spanning almost the full range of higher education subjects. The Joint Academic Coding System used by the Higher Education Council for England (HEFCE, 2010) showed entries for 16 out of 19 categories, ranging in student frequency from 210 to 3,243. The three categories that were not represented were Medicine and Dentistry (though other subjects related to medicine are represented), Technologies (which does not cover subjects classed as engineering, which are represented), and Non-European Languages. Accumulated course sizes over all student cohorts ranged from 1 to 1,488 with a mean size of 85 (*SD* = 153.61, *Median* = 24).

Choice. To indicate whether students could effectively choose between academically equivalent 3-year and 4-year courses, a dichotomous variable was computed, coded as 0 for no choice and 1 for choice. Out of the 186 courses, 35 existed in both the 3-year version without internship and the 4-year version with internship. 44 came with mandatory internships (i.e., they were not offered in any other way by the university). 107 did not include an internship and existed only in the 3-year version.

Prior achievement. Prior academic achievement was measured as the average of year 1 and 2 marks, $r(8,876) = .67$, 95% CI [.66, .68]. This index could potentially range from 0 to 100 (with higher values indicating better achievement).

Final marks. As with prior achievement, final marks could potentially range from 0 to 100 (with higher values indicating better final achievement).

Degree class. Arguably more important than the final mark is the degree classification, which was coded as an ordinal variable. In the UK, degree outcomes are usually grouped into five categories: "Fail/Other" (indicating no honours degree classification according to the regulations of the awarding body), and "Third class", "Second, class, lower division", "Second, class, upper division" and "First class" honours degrees (the latter indicating a degree with distinction, commonly achieved with an overall mark of 70% or higher). The honours degree classifications are usually abbreviated to "Third", "2:2", "2:1" and "First". It should be noted that regulations for accumulating credit, awarding grades or marks, and criteria for determining classifications vary considerably between awarding bodies.

Data-analytical procedures

Multiple regression models of varying complexity were used to predict final marks and degree class from internship experience while controlling for other student characteristics. Given the nested data structure, students within degree courses, multilevel modelling (see, e.g., Snijders & Bosker, 2012) was the method of choice, and particular emphasis was given to two-level models in which variation at the course level, rather than the student level, is explicitly modelled and controlled for. All regression models were computed in R (R Development Core Team, 2012) using the lme4 package (Bates, Maechler, & Bolker, 2012) for models involving final marks and the ordinal package (Christensen, 2012) for models involving degree class.

Results

After the preliminary analyses, we will first focus on a comparison between traditional single-level regression models that disregard course affiliation and two-level multilevel models that consider course-level variability. We then proceed to investigate the practical significance of an internship effect by looking at the probabilities for attaining a final degree

class in different student scenarios. Lastly, the stability of internship effects is examined across courses that do or do not give choice over internships to students.

Preliminary analyses

The mean for prior achievement was M = 57.1 (SD = 6.7), indicative of a 2:2 class. Mean marks improved from year 2 to the final year with a mean of 58.6 (SD = 8.3), also indicative of a 2:2. This difference was statistically significant, M = 1.59, 95% CI [1.41, 1.77]. Overall degree classification showed 1.7% in the Fail/Other class, 7.6% with a Third, 43.6% with a 2:2, 41.3% with a 2:1 and 5.8% with a First.

Bivariate correlations between internship, final marks, prior achievement, gender and ethnicity are presented in Table 2. As one would expect, a significant relationship between final marks and prior achievement was found: $r(15{,}730) = .62$; 95% CI [.61, .63]. In contrast, all correlations involving internship were relatively modest, none exceeding a magnitude of .14.

Comparing models with and without course-level variability

A comparison of single-level models (i.e., disregarding variability at the level of study courses) and two-level multilevel models (including such variability as a random effect) showed distinct differences. First, final year mark was regressed on prior achievement, gender, ethnicity, internship and all two-way interactions involving internship using the standard multiple regression approach (with prior achievement centred). In this model, all effects, with the exception of the internship x ethnicity interaction, emerged as statistically significant. A summary is provided in Table 3. Undertaking an internship led to an average increase of 2.7 percentage points in final year marks. Interactions with gender and with prior achievement indicated that this effect was reduced for female students and lower for higher achieving students. The same set of predictor variables was used in a two-level model that included course-level variability as a random effect (see Table 3).[3] A model comparison showed that 9.3% of the total variance in final year marks was located at the course level.

According to a likelihood ratio test course-level effects were highly significant: $\chi^2 = 723.10$ ($df = 1$), $p < .001$. In contrast to the single-level model, the influence of gender was markedly reduced ($b = 0.38$ vs. 1.26). While prior achievement, $b = 0.766$, 95% *CI* [0.750, 0.789], gender, $b = 0.381$, 95% *CI* [0.129, 0.678], and ethnicity, $b = 1.251$, 95% *CI* [0.922, 1.538], remained significant predictors with similar effects, there was no interaction between internship and gender. Undertaking an internship led to an average increase of 3.4 percentage points in final year marks, $b= 3.409$, 95% *CI* [2.725, 3.968], and this effect decreased as prior achievement increased, $b = -0.151$, 95% *CI* [-0.188, -0.117]. In sum, internships had a positive and reliable effect on final year marks. The multi-level approach showed that this was independent of gender and held over a large range of academic courses.

A similar pattern emerged when the odds of attaining a particular degree class were predicted in a series of ordinal logistic regressions. In a single-level model containing prior achievement, gender, ethnicity, internship and all two-way interactions involving internship, all predictors were significant with the exception of the ethnicity x internship interaction. A summary is provided in Table 4. A positive coefficient for internship ($b = 0.349$) indicated that undertaking an internship increased the odds of attaining a higher degree classification. In addition, as indicated by the interactions, this internship effect was reduced for female students and lower for higher achieving students. Including course level variation as a random effect in a two-level model again changed the overall picture (see Table 4). Although there is no established way of partitioning the variance for ordinal multilevel models, a likelihood ratio test confirmed that course-level effects, again, were highly significant: $\chi^2 = 882.46$ ($df = 1$), $p < .001$. Compared to the single-level model, the internship effect was substantially stronger: $b = 0.744$, 95% *CI* [0.538, 0.950] vs. 0.349 in the single-level model. As before, this effect decreased as prior achievement increased, $b = -0.029$, 95% *CI* [-0.041, -0.016]. However, in direct contrast to the single level model, the effect was now increased for female students, $b = 0.245$, 95% *CI* [0.080, 0.402], whereas gender itself was no longer significant. In

addition, prior achievement, $b = 0.266$, 95% *CI* [0.258, 0.274], and ethnicity, $b = 0.337$, 95% *CI* [0.232, 0.441], both remained significant predictors in this model. A detailed interpretation of coefficients will be provided in the next section. Here, it can be stated that internships substantially increased students' chances of improving their degree classification, over a large range of academic courses.

In order to investigate further the striking differences between single- and two-level models in terms of gender-related effects, we focussed on gender ratio at the course-level in a number of follow-up analyses. It is a well-known fact that academic subjects differ widely in gender composition, and the two-level models automatically control for these differences. For each student in the data set, the corresponding gender ratio at the course level was computed. Gender ratio had a mean of $M = 0.527$ (in favour of being female) with a standard deviation of $SD = 0.266$, indicating substantial variation in the data. If course-level effects involving gender are indeed driven by gender ratio, then controlling for ratio in the single-level models should yield effects that are more in line with those obtained in the two-level models. This is exactly what we found. Adding gender ratio and the internship x ratio interaction to the single-level model predicting final year marks changed the gender coefficient from $b = 1.256$ to $b = 0.399$ (0.381 in the two-level model) and the gender x internship interaction from $b = -0.916$ to $b = 0.458$ (0.295 in the two-level model). Similarly, for the prediction of degree class, adding gender ratio and the internship x ratio interaction to the single-level model changed the gender coefficient from $b = 0.311$ to $b = 0.024$ (0.019 in the two-level model) and the gender x internship interaction from $b = -0.172$ to $b = 0.282$ (0.245 in the two-level model).

Investigating internship effects across student scenarios

Given that interactions between internship and both prior achievement and gender were obtained, the two-level models were used to chart predictions of final marks and final degree class for different student scenarios. Internship effects were investigated for male and

female students separately and, further, for students with average prior achievement and for students below and above the average (defined here as one standard deviation below and above the mean). Taking into account the significant role of ethnicity, this illustration is presented for male, non-white students and for female, white students, the two groups with lowest and highest academic achievements, respectively. Put differently, internship effects are shown for an extreme group comparison.

Internship effects on mean final marks across student scenarios are summarised in Figure 1. Figure 1 displays the mean with two-tiered error bars (Baguley, 2012). The outer tier (thin lines) depicts a conventional 95% CI for each mean. The inner tier (thick lines) is adjusted so that error bars that do not overlap are significantly different with approximately 95% confidence. In spite of the interaction effects obtained, the effect of internship is evident across gender and ethnicity. It is more pronounced for students at below average performance, but remains statistically significant for students with above average performance as indicated by the clear lack of overlap for the inner tier error bars. (Note that performance levels were determined using the distributions of prior academic achievement within male, non-white students and within female, white students to avoid confounding with any internship effect).

In the case of degree class, similar comparisons of student scenarios were made, but now the probability distributions with and without internship are presented. Figure 2 summarises these comparisons. Again, performance levels were determined using the distributions of prior academic achievement within student groups. As with mean final marks, the internship effect is substantial across all scenarios. While the probabilities of obtaining a third class degree or of failing are always reduced with an internship, the probabilities of obtaining an upper second (2:1) or first class degree are always increased. Generally, the probability of first class degrees was low in these scenarios, which is not surprising given that in the whole sample, above average performance was defined as one *SD* above the mean (an overall mark of 57.08 + 6.66 = 63.74). In other words, our academically able group were

performing at the low 2:1 level in the first two years of studying. Even so, internships can increase the odds of attaining a first class degree substantially. As can be seen from Table 5, the odds increased by a factor of 2 or greater post-internships for most scenarios.

Effects of choice and maturation

We also tested for effects of choice over undertaking an internship. In other words, differences between courses with mandatory internships, those with optional internships and those with no internships were investigated. This amounts to a test of self-selection effects because it includes a direct comparison of 3-year and 4-year courses of the same kind. Adding choice and the interaction between choice and internship to the two-level model predicting final marks as specified in Table 3 did not substantially affect the reported effects, and neither choice nor the corresponding interaction were significant. The same was found for the two-level model predicting degree class as specified in Table 4. Adding choice and the choice x internship interaction to this model did not substantially affect the reported effects, and neither choice nor the corresponding interaction were statistically significant. To sum up, not only did internships show reliable positive effects on academic outcomes over a range of courses, these effects were also unaffected by the degree of choice that students had over taking up or not taking up an internship.

Finally, the data allow for a tentative analysis of the effects of maturation. For this, a small sub-set of students was identified (n = 186) on a language degree course, located within the Humanities, who had undertaken a study placement at another university instead of a work placement.[4] Put differently, these students had completed a regular degree course within four years with one year away from their main study environment. We compared this sub-set with all students on three-year degree courses within the Humanities, recreating all analyses for final marks and degree class as outlined in Tables 3 and 4 with a sample size of n = 2652. For all models, and in contrast to previous internship effects, placement students showed significantly lower outcomes than non-placed students. Coefficients for study placement were

b = -3.94 (p < .05) for the two-level model predicting final marks and b = -1.53 (p < .05) for the two-level model predicting degree class.

Discussion

Internships have been hailed as powerful career boosters, and, indeed, researchers have generally found positive associations between internships and career-relevant variables. Our findings show that internships also have a crucial effect on subsequent academic outcomes. These effects hold controlling for prior academic achievement, and they hold for both advantaged and disadvantaged students. This work goes beyond previously published research by investigating the moderating role of student characteristics across a large range of academic subjects and by addressing questions of student self-selection. In dealing with these issues on an unprecedented scale and with data-analytical techniques that take adequate account of the nested data structure, it is hoped that the present study can contribute substantially to current debates in the higher education sector and to a more thorough understanding of the benefits that internships provide. In the following, we will discuss our findings in detail and then address wider issues in relation to our study.

First, the positive internship effects on academic outcomes, obtained here with a longitudinal data set spanning all courses from a higher education institution with a large and varied undergraduate student population, were surprisingly robust. Nearly identical patterns were obtained from using final year mark and degree classification as outcome variables. While the effect found for final year mark, an average increase of 3.3 percentage points, may look small, the effect for degree classification shows that this change in marks is mirrored by substantially higher probabilities for achieving top degree classes, and substantially lower probabilities for incurring a low degree class. This demonstrates the practical relevance of going on a placement in terms of immediate academic benefits.

Second, taking course-level variability into account led to markedly different patterns of findings when compared to single-level models. In particular, internship effects were

stronger in all two-level models, and the role of gender as a variable changed substantially. Not only were direct effects for gender reduced in two-level models (to non-significance in the case of degree classification), the interaction between gender and internship changed from being significant and negative to non-significant for final year mark, and then to significant and positive for degree classification. These changes show that course-level variability should always be taken into account, and they imply a note of caution regarding prior research that has focused on single degree courses. Effects obtained for a particular degree or subject may not generalise easily to other degrees or subjects. We can therefore assume, in line with the two-level models, that being female indicates a higher final year mark although it has no direct relation to final degree class. Still, for the latter outcome variable, female students seem to benefit more from undertaking an internship than male students. The most promising candidate to explain the sensitivity of gender effects to the inclusion of course-level variability, according to our results, is the variation in gender composition across subjects.

Third, prior achievement had a positive effect on academic outcomes in all models, and the higher prior achievement, the more internship effects were reduced. Being classed as a white student also had a positive effect on academic outcomes, regardless of undertaking an internship. This, together with the effects found for gender, raises the question of who is most likely to benefit from an internship and whether positive effects will be completely offset for some students. Explorations of different student scenarios showed that in spite of some variability, a positive effect for internships was maintained for all combinations of gender, ethnicity and level of prior academic achievement. Moreover, the odds of achieving a first class degree were most increased for students performing at an average or below average level. Correlations between gender, ethnicity and internship experience were generally weak ($< .2$), which suggests that the scenarios we explored are realistic and frequently occurred in the sample. For instance, being male and non-white did not drastically reduce the likelihood of undertaking an internship. In addition, the relationship between levels of prior achievement

and undertaking an internship, although significant, was again weak. This finding, although supportive of previous research (Knouse et al., 1999; Knouse & Fontenot, 2008; Taylor, 1988), indicates that internships were not only undertaken by brighter students, but by students at all levels of academic achievement.

Fourth, and related to the issue of academic aptitude discussed above, our findings show that self-selection plays a secondary role at best. Our comparison of degree courses with mandatory and optional internships showed no differences in terms of an internship effect. Of course, it is impossible to rule out self-selection effects entirely. Students' choice to enrol on a particular course with or without mandatory internship may be influenced by wider career goals, school grades, levels of confidence and so forth. In the same manner, students may have to decide prior to enrolment whether they wish to join a 3-year version without or a 4-year version with internship. Still, whatever the modalities of particular courses, our analyses demonstrate that across courses and disciplines the benefits of an internship are persistent.

Similar to arguments surrounding self-selection, findings do not suggest that internship effects are a product of mere maturation. On the contrary, students who spent a year studying in a different place before completing their degree showed less favourable outcomes compared to students in the same university segment who did not undertake such a study placement. This discrepancy could be due partly to different marking standards on a particular degree course; there is only one course with study placements in the data. At the same time, the discrepancy could also point towards student difficulties with fitting back in after they have been exposed to an entirely different set of standards at another university. At the very least, our analyses raise important questions regarding the facilitation or inhibition of student progress by means of a sandwich year. They also make an explanation of internship effects based on maturation less likely.

Some issues remain that must be left to future research. We are well aware that any wider claim to generality of effects is compromised by the fact that we looked at only one

university and one basic format for internships. The decentralised management of internships within the institution and the range of teaching and learning methods, from practice-based to abstract instruction, to be found across academic subjects give us confidence that future research will essentially confirm our findings for the comparatively long internships that we investigated. The question remains, though, whether shorter internships would be equally effective, and, more generally, what constitutes an optimal duration. If equal benefits, academic and otherwise, could be reaped from internships that do not require the expansion of a three-year into a four-year degree course, this would be of immediate relevance for general study design and the format of courses that higher education institutions want to put on offer. If, on the other hand, year-long internships prove to be superior, a case can be made for different types of study support for degree courses with and without internships. Our findings essentially state that course without internship carry an academic disadvantage. In order to determine the right kind of study support, more needs to be known about the changes in students brought about by internships.

Our study was not designed to test hypotheses regarding the underlying psychological processes that drive internship effects. As we noted in the beginning, motivational factors can provide a rationale for effects that occur across different academic subjects. In particular, the formation of overarching career goals feeding back into academic studies and a shift towards intrinsic motivation are promising candidates. If future research can indeed assign a central role to these factors, would we then expect the same benefits from fostering goals and intrinsic motives without internships? Or are the underlying processes such that a non-academic environment is needed for optimal outcomes? At the same time, we did not find reduced effects for disadvantaged students, an expectation suggested by the motivatonal literature on perceived barriers (Luzzo & McWhirter, 2001). It may be that internships provide immersive experiences that simply outweigh such barriers. Clearly, linking the

academic outcomes of internships to motivational constructs is a task that still needs to be done.

Conclusions

We see the academic value of internships as an indirect path to career indicators and as such, the present work carries some important messages for higher education institutions and for those advising students on their career plans. 1) Internships typically come with benefits, and all students across all subject areas are likely to reap these benefits. 2) There is, on the whole, surprisingly little variation between advantaged and disadvantaged student groups. Encouraging weaker students to take up an internship is no wasted effort. 3) When evaluating the effectiveness of internships, institutions are well advised to consider course-level variability, in particular gender ratio. 4) Ironically, academic benefits may be due to aspects of the non-academic environment in which internships happen. Mere maturation (e.g., studying for an additional year in a different academic environment) did not lead to the same positve outcomes in our sample. 5) Given this pattern of findings, institutions should consider whether degree courses without internships carry specific disadvantages, and if so, how these could be addressed through specific study support.

References

Arroyo, C.G., & Zigler, E. (1995). Racial identity, academic achievement, and the psychological well-being of economically disadvantaged adolescents. *Journal of Personality and Social Psychology, 69*, 903-914. doi: 10.1037/0022-3514.69.5.903

Baguley, T. (2012). Calculating and graphing within-subject confidence intervals for ANOVA. *Behavior Research Methods, 44*, 158–75. doi:10.3758/s13428-011-0123-7

Bates, D., Maechler, M., & Bolker, B. (2012). *lme4: Linear mixed-effects models using S4 classes*. Available at: http://CRAN.R-project.org/package=lme4 [accessed 01-04-12]

Bridgstock, R. (2009). The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher Education Research & Development, 28*, 31-44. doi: 10.1080/07294360802444347

Brooks, L., Cornelius, A., Greenfield, E., & Joseph, R. (1995). The relation of career-related work or internship experiences on the career development of college seniors. *Journal of Vocational Behavior, 46*, 332-349. doi: 10.1006/jvbe.1995.1024

Buchmann, C., & DiPrete, T.A. (2006). The Growing Female Advantage in College Completion: The Role of Family Background and Academic Achievement. *American Sociological Review, 71*, 515-541. doi: 10.1177/000312240607100401

Burgess Group (2007). *Beyond the honours degree classification: Burgess Group final report*. London: Universities UK.

Cannon, J.A., & Arnold, M.J. (1998). Student expectations of collegiate internship programs in business: A 10-year update. *Journal of Education for Business, 73*, 202-205. doi: 10.1080/08832329809601630

Chemers, M.M., Hu, L., & Garcia, B.F. (2001). Academic self-efficacy and first-year college student performance and adjustment. *Journal of Educational Psychology, 93*, 55-64. doi: 10.1037/0022-0663.93.1.55

Christensen, R.H.B. (2012). *ordinal: Regression Models for Ordinal Data*. Available at: http://www.cran.r-project.org/package=ordinal/ [accessed 01-04-12]

Clarke, M. (2007). The impact of higher education rankings on student access, choice, and opportunity. In Institute for Higher Education (Ed.), *College and university ranking systems: Global perspectives and American challenges*. Washington, DC: Institute for Higher Education Policy.

Coco, M. (2000). Internships: A try before you buy arrangement. *SAM Advanced Management Journal, 65*, 41-47.

Cohen, G.L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science, 313*, 1307-1310. doi: 10.1126/science.1128317

Cook, S.J., Parker, R.S., & Pettijohn, C.E. (2004). The perceptions of interns: A longitudinal case study. *Journal of Education for Business, 79*, 179-185.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational psychologist, 26*, 325-346.

Devlin, M. (1996). Older and wiser?: A comparison of the learning and study strategies of mature age and younger teacher education students. *Higher Education Research and Development, 15*, 51-60. doi: 10.1080/0729436960150104

Gault, J., Redington, J., & Schlager, T. (2000). Undergraduate business internships and career success: Are they related? *Journal of Marketing Education, 22*, 45-53. doi: 10.1177/0273475300221006

Gomez, S., Lush, D., & Clements, M. (2004). Work placements enhance the academic performance of bioscience undergraduates. *Journal of Vocational Education and Training, 56*, 373-385. doi: 10.1080/13636820400200260

Hadfield, J. D. (2010). MCMC Methods for Multi-Response Generalized Linear Mixed Models: The MCMCglmm R Package. *Journal of Statistical Software, 33*, 1-22. Available at: http://www.jstatsoft.org/v33/i02/ [accessed 03-11-13]

Harackiewicz, J.M., Barron, K.E., Tauer, J.M., & Elliot, A.J. (2002). Predicting success in college: A longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology, 94*, 562-575. doi: 10.1037/0022-0663.94.3.562

HESA [Higher Education Statistics Agency] (2012). *Statistics – Students and qualifiers at UK HE institutions*. Available at: http://www.hesa.ac.uk/content/view/1897/239/ [accessed 01-04-12]

Kao, G., & Thompson, J.S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology, 29*, 417-442. doi: 10.1146/annurev.soc.29.010202.100019

Knouse, S.B., & Fontenot, G. (2008). Benefits of the business college internship: A research review. *Journal of Employment Counseling, 45*, 61-66. doi: 10.1002/j.2161-1920.2008.tb00045.x

Knouse, S.B., Tanner, J.T., & Harris, E.W. (1999). The Relation of College Internships, College Performance, and Subsequent Job Opportunity. *Journal of Employment Counseling, 36*, 35-43. doi: 10.1002/j.2161-1920.1999.tb01007.x

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*, 79-122. doi: 10.1006/jvbe.1994.1027

Little, B., & Harvey, L. (2006). *Learning through work placements and beyond*. Sheffield, UK: Centre for Research and Evaluation, Sheffield-Hallam University.

Luzzo, D. A., & McWhirter, E. H. (2001). Sex and ethnic differences in the perception of educational and career-related barriers and levels of coping efficacy. *Journal of Counseling & Development, 79*(1), 61-67. doi: 10.1002/j.1556-6676.2001.tb01944.x

Mandilaras, A. (2004). Industrial placement and degree performance: Evidence from a British higher institution. *International Review of Economics Education, 3,* 39-51.

Mansfield, R. (2011). The effect of placement experience upon final-year results for surveying degree programmes. *Studies in Higher Education, 36,* 939-952. doi: 10.1080/03075079.2010.486073

McNabb, R., Pal, S. & Sloane, P. (2002). Gender differences in educational attainment: the case of university students in England and Wales. *Economica, 69,* 481–503. doi: 10.1111/1468-0335.00295

Mellanby, J., Martin, M., & O'Doherty, J. (2010). The 'gender gap' in final examination results at Oxford University. *British Journal of Psychology, 91,* 377-390. doi: 10.1348/000712600161880

Nauta, M. M., Epperson, D. L., & Kahn, J. H. (1998). A multiple-groups analysis of predictors of higher level career aspirations among women in mathematics, science, and engineering majors. *Journal of Counseling Psychology, 45,* 483-496. doi: 10.1037/0022-0167.45.4.483

Narayanan, V.K., Olk, P.M., & Fukami, C.V. (2010). Determinants of internship effectiveness: An exploratory model. *Academy of Management Learning & Education, 9,* 61-80.

Nora, A., & Cabrera, A.F. (1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. *The Journal of Higher Education, 67,* 119-148.

Pedro, J.D. (1984). Induction into the workplace: The impact of internships. *Journal of Vocational Behavior, 25,* 80-95.

R Development Core Team (2012). *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing.

Rawlings, P., White, P., & Stephens, R. (2005). Practice-based learning in information systems: The advantages for students. *Journal of Information Systems Education, 16*, 455-465.

Reddy, P., & Moores, E. (2006). Measuring the benefits of a psychology placement year. *Assessment & Evaluation in Higher Education, 31*, 551-567. doi: 10.1080/02602930600679555

Roth, P.L., & Clarke, R.L. (1998). Meta-analyzing the relation between grades and salary. *Journal of Vocational Behavior, 53*, 386-400. doi: 10.1006/jvbe.1997.1621

Rudd, E. (1984). A comparison between the results achieved by women and men studying for first degrees in British universities. *Studies in Higher Education*, 9, 47–57.

Sadler, D.R. (2005). Interpretations of criteria-based assessment and grading in higher education. *Assessment & Evaluation in Higher Education, 30*, 175-194. doi: 10.1080/0260293042000264262

Smith, J., McKnight, A., & Naylor, R. (2000). Graduate employability: Policy and performance in higher education in the UK. *The Economic Journal, 110*, 382-411. doi: 10.1111/1468-0297.00546

Snijders, T.A., & Bosker, R.J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling (2nd ed.)*. London: Sage.

Steele, C.M. (1997). A Threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613-629. doi: 10.1037/0003-066X.52.6.613

Taylor, M.S. (1988). Effects of college internships on individual participants. *Journal of Applied Psychology, 73*, 393-401. doi: 10.1037/0021-9010.73.3.393

Yorke, M., Barnett, G., Evanson, P., Haines, C., Jenkins, D.Knight, P., et al. (2004). Some effects of the award algorithm on honours degree classifications in the UK higher

education. *Assessment & Evaluation in Higher Education, 29*, 401-413. doi: 10.1080/02602930310001689000

Footnotes

[1] In light of the relevant literature, there is a tendency toward the term ‘internship’ in the US, in contrast to, for example, the UK and Australia where ‘placement’ is more commonly used. Further, internship is more accepted than placement in the areas of organizational behaviour and management. For our purposes, we will adopt the term internship throughout this work.

[2] Further, as already stated, academic performance also facilitates access to internships, but in the interest of clarity, we are not concerned with bi-directional causality at this stage. Later analyses include a crucial comparison of compulsory versus voluntary internships and thus provide a check on the assumptions implicit in this simplified model.

[3]Confidence intervals for the two-level modelling of final marks are HPD derived confidence intervals obtained with Markov chain Monte Carlo methods using MCMCglmm (Hadfield, 2010).

[4]These 186 students, not being on regular internships as defined here, were not included among the internship students in the main analyses.

Table 1

Summary of Student Numbers, Gender Ratio, Ethnicity Ratio, and Internship Ratio by Subject Area

Subject area	*n*	female	non-white	internship	degree format		
					FT only	SW only	FT/SW
Creative arts & design	3243	.54	.18	.30	.46	.12	.34
Business & administrative studies	2410	.46	.18	.20	.66	.06	.25
Social studies	2139	.57	.17	.22	.60	.09	.27
Biological sciences	1156	.49	.18	.27	.52	.12	.32
Law	986	.61	.21	.23	.60	.10	.26
Education	974	.46	.22	.24	.56	.11	.27
Architecture, building & planning	832	.63	.17	.29	.52	.12	.32
Mass communication & documentation	706	.51	.20	.17	.68	.08	.20
Mathematical & Computer sciences	701	.54	.17	.23	.63	.08	.26
Combined	643	.55	.17	.23	.58	.07	.29
Physical sciences	479	.49	.28	.54	.14	.29	.47
Linguistics, classics & related subjects	304	.52	.19	.27	.48	.11	.33
Historical and philosophical studies	261	.48	.19	.26	.54	.09	.32
Engineering	243	.59	.15	.16	.78	.07	.07
Veterinary sciences, agriculture & related subjects	235	.41	.22	.44	.24	.18	.50
Subjects allied to medicine	210	.52	.17	.34	.46	.13	.38
European languages, literature & related subjects	210	.43	.16	.22	.62	.09	.25

Note. All figures other than *n*s represent proportions. Subject areas are defined by the Joint Academic Coding System common to the UK. FT: full-time. SW: sandwich/with internship. Degree format excludes students not classifiable due to degree changes while studying.

Table 2

Bivariate Correlations

	1	2	3	4	5
1 – Final mark	-	.62	.12	.13	.18
2 – Prior achievement		-	.10	.11	.19
3 – Internship			-	-.14	-.01†
4 – Gender				-	-.02*
5 – Ethnicity					-

Note. Unless indicated otherwise, all coefficients are significant at $p < .01$. *: $p < .05$. †: *n.s.*

Table 3

Summary of Regression Models Predicting Final Year Marks

	Single-level model (R^2 = .380***)			Two-level model		
	b	*SE*(*b*)	95% *CI*	*b*	*SE*(*b*)	95% *CI*
Intercept	56.192***	0.163	55.872, 56.512	55.987***	0.252	55.505, 56.473
Prior Achievement	0.758***	0.010	0.739, 0.777	0.766***	0.010	0.750, 0.789
Gender	1.256***	0.124	1.013, 1.499	0.381**	0.137	0.129, 0.678
Ethnicity	1.619***	0.161	1.304, 1.934	1.251***	0.162	0.922, 1.538
Internship	2.681***	0.309	2.076, 3.287	3.409***	0.322	2.725, 3.968
I x PA	-0.168***	0.018	-0.203, -0.132	-0.151***	0.018	-0.188, -0.117
I x G	-0.916***	0.247	-1.401, -0.431	0.295	0.263	-0.259, 0.780
I x E	-0.183	0.314	-0.798, 0.433	0.204	0.310	-0.326, 0.839

Note. The two-level model treats students as nested within degree courses. I: Internship. PA: Prior Achievement. G: Gender. E: Ethnicity. ***: $p < .001$. **: $p < .01$.

Table 4

Summary of Ordinal Logistic Regression Models Predicting Degree Classification

	Single-level model			Two-level model		
	b	*SE(b)*	*95% CI*	*b*	*SE(b)*	*95% CI*
$Threshold_{fail\|third}$	-4.676***	0.081	-4.835, -4.517	-4.895***	0.106	-5.102, -4.688
$Threshold_{third\|2.2}$	-2.610***	0.057	-2.722, -2.498	-2.735***	0.088	-2.908, -2.563
$Threshold_{2.2\|2.1}$	0.772***	0.053	0.668, 0.876	0.863***	0.085	0.696, 1.031
$Threshold_{2.1\|first}$	4.445***	0.066	4.316, 4.574	4.703***	0.095	4.516, 4.890
Prior Achievement	0.252***	0.004	0.245, 0.259	0.266***	0.004	0.258, 0.274
Gender	0.311***	0.039	0.236, 0.387	0.019	0.031	-0.043, 0.080
Ethnicity	0.463***	0.050	0.365, 0.561	0.337***	0.053	0.232, 0.441
Internship	0.349***	0.095	0.163, 0.535	0.744***	0.105	0.538, 0.950
I x PA	-0.033***	0.006	-0.045, -0.022	-0.029***	0.006	-0.041, -0.016
I x G	-0.172*	0.076	-0.322, -0.022	0.245**	0.080	0.089, 0.402
I x E	0.025	0.097	-0.165, 0.214	0.158	0.102	-0.042, 0.358

Note. The two-level model treats students as nested within degree courses. I: Internship. PA: Prior Achievement. G: Gender. E: Ethnicity. ‘fail’, ‘third’, ‘2.2’, ‘2.1’, and ‘first’ refer to UK degree classifications. ***: $p < .001$. **: $p < .01$.

Table 5

Summary of Change in Odds for Attaining a First Class Degree Depending on Internship Experience and Prior Achievement (Below Average, Average or Above Average)

	Male, non-white			Female, white		
	Internship		Δ odds	Internship		Δ odds
	No	Yes		No	Yes	
Below average	.001	.002	× 2.8	.004	.014	× 3.6
Average	.004	.009	× 2.3	.018	.054	× 2.9
Above average	.023	.043	× 1.9	.083	.187	× 2.3

Note. Figures under internship refer to the probability of attaining a first class degree. Below average is defined as 1 *SD* below group mean (males or females) and above average as 1 *SD* above group mean for prior achievement.

Figure Captions

Figure 1. Internship Effects on Final Year Marks for Select Student Scenarios. Outer Tier Error Bars (Thin Lines) Depict Conventional 95% CIs. Inner Tier Error Bars (Thick Lines) Depict Adjusted CIs With Non-Overlap Indicating Statistically Significant Differences.

Figure 2. Internship Effects on the Predicted Probability of Attaining a Particular Degree Classification for Select Student Scenarios. Solid Lines (to the Right) Indicate Internship Experience, Broken Lines (to the Left) Indicate No Internship.

Figure 1

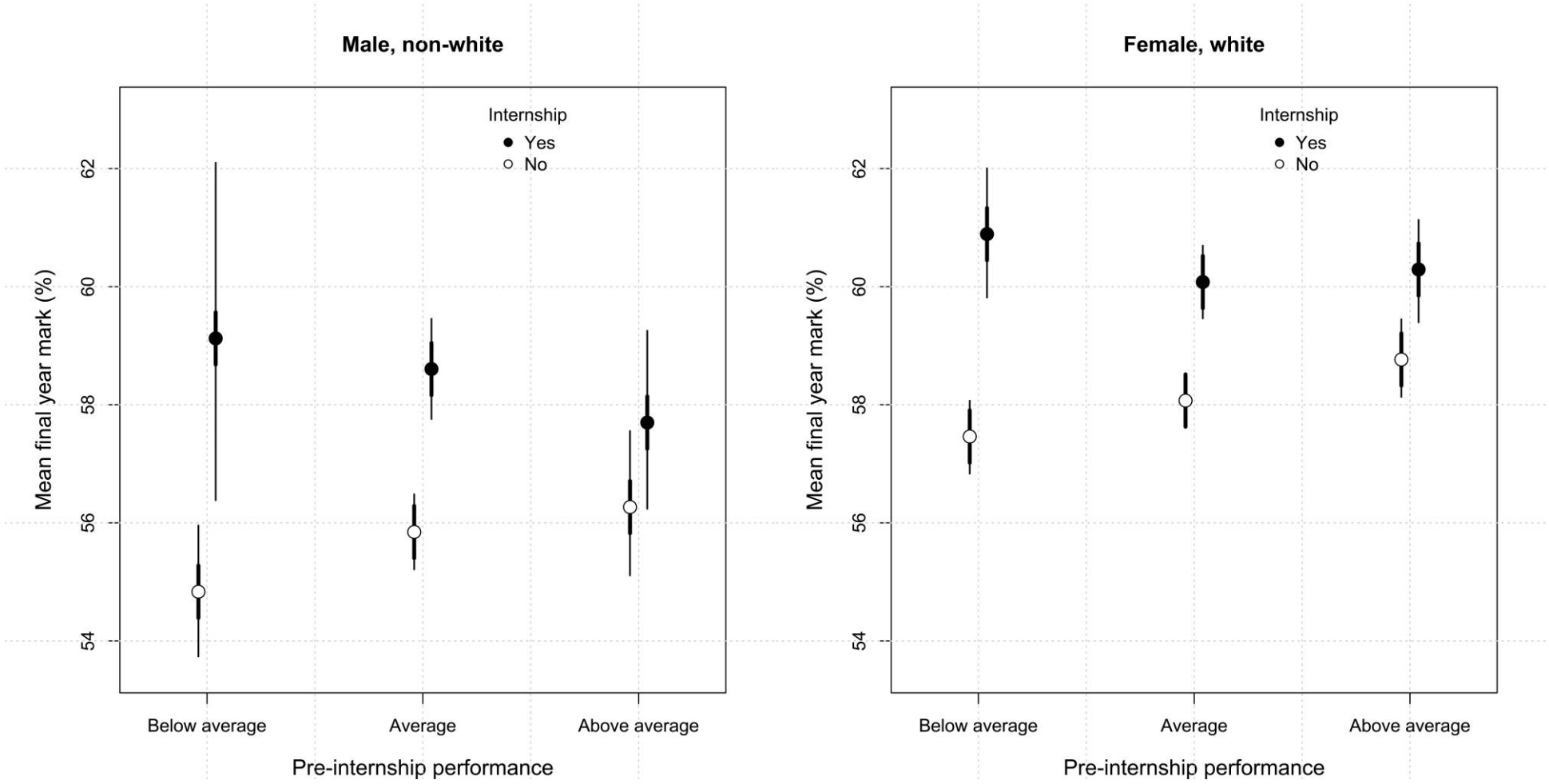
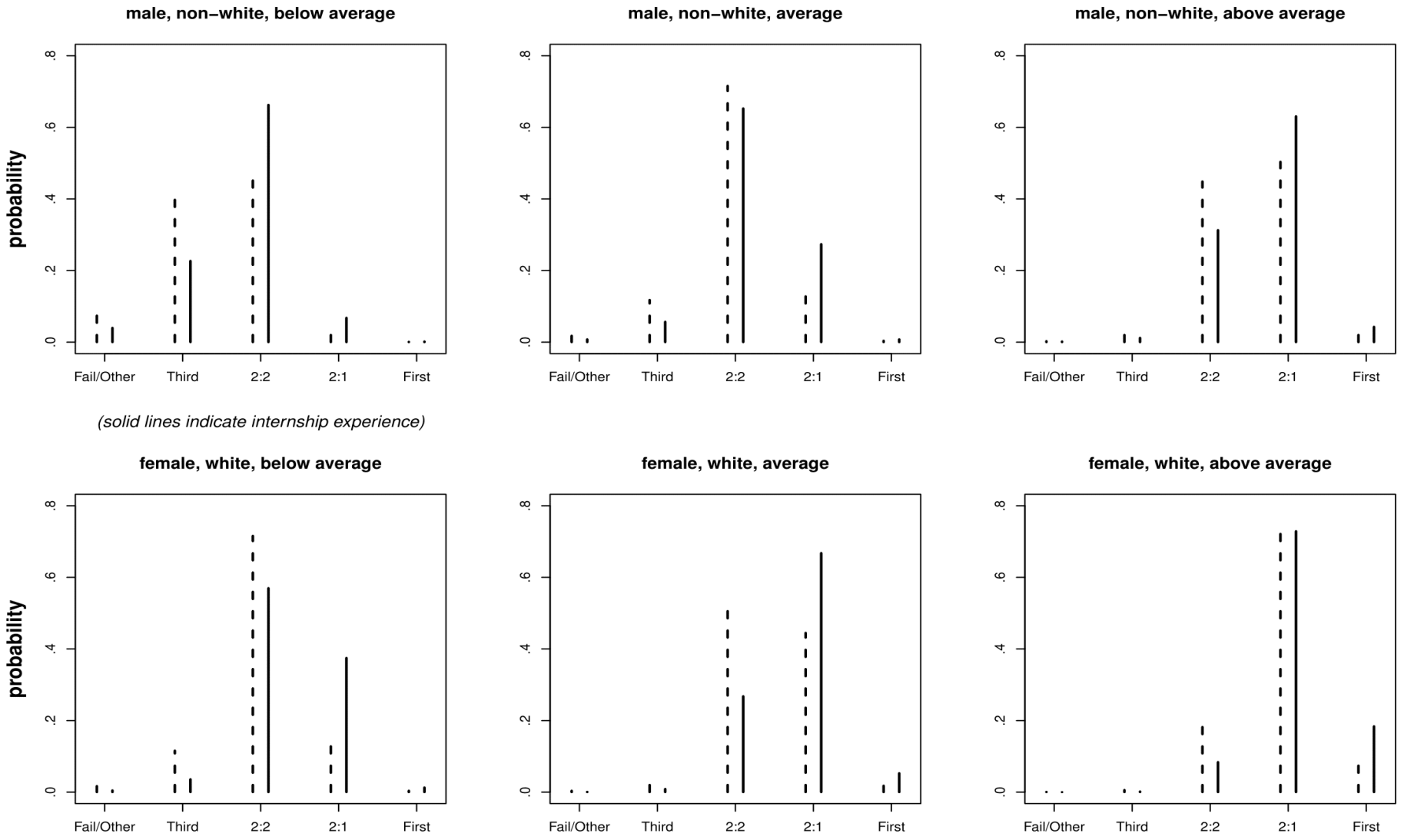

Male, non-white
Female, white
Internship
Yes
No
Mean final year mark (%)
54
56
58
60
62
Below average
Average
Above average
Pre-internship performance

Figure 2



(solid lines indicate internship experience)

(solid lines indicate internship experience)