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Students' Concern About Indebtedness: A Rank Based Social Norms Account

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Abstract

This paper describes a new model of students' concern about indebtedness within a rank-based social norms framework. Study 1 found that students hold highly variable beliefs about how much other students will owe at the end of their degree. Students' concern about their own anticipated debt—and their intention of taking on a part-time job during term time—was best predicted not by the size of the anticipated debt, but by how they, often incorrectly, believed their debt ranked amongst that of others. Study 2 manipulated hypothetical debt amounts experimentally and found that the same anticipated debt was rated as 2.5 times more concerning when it ranked as the second highest being considered than when it was the fifth highest. Study 3 demonstrated that the model applies to evaluation of different types of debt (income contingent loans vs. general debt).

Keywords: Students' indebtedness; context effects; attitudes towards debt; Range Frequency Theory; Decision by Sampling; social norms

Introduction

Debt is increasingly becoming an inevitable part of student life in many countries. For example, in the US (Avery and Turner 2012), Canada (Lagerquist 2012) and the UK (DfE 2007) student borrowing has risen sharply in the past 20 years. Although the economic advantages of higher education normally outweigh the debt incurred during a degree, many surveys have revealed the influence of financial strains on students' academic performance and psychological well-being as well as on decision-making regarding university enrolment (e.g., Roberts and Jones 2001; Christie, Munro et al. 2004; Cooke, Barkham et al. 2004; Callender and Jackson 2005; Johnson, Pollard et al. 2008) and career choice after university (e.g., Rothstein and Rouse 2011).

This paper investigates how students appraise debt. Previous research on indebtedness has typically assumed that students, when assessing their own financial situation, make judgments as if considering only their own level of debt (e.g., Davies and Lea 1995; Christie, Munro et al. 2001; Christie and Munro 2003; Cooke, Barkham et al. 2004; Callender and Jackson 2008). This can be labelled an *absolute* approach, which assumes a direct and monotonic relationship between debt and concern about it—the higher the former, the greater the latter.

Here, motivated by cognitive models of judgment and decision-making, we argue instead for a *relative* account: Students are hypothesized to compare their anticipated debt to that of other students. We hypothesize that both (a) contextual information and (b) students' variable and inaccurate beliefs about the levels of debt among students in general will influence their attitudes towards indebtedness.

We begin by briefly describing current models of relative judgment from cognitive psychology. We then highlight the importance of determining which model best predicts

students' attitudes towards indebtedness, because different practical implications follow from different models.

Cognitive Models of Relative Judgment

Several theoretical accounts have been developed to explain the processes underlying comparisons and judgments. We discuss two models of relative judgment that have been developed in psychology and applied in many domains; here we describe each model as it might be applied to debt perception. The first model is Adaptation Level Theory (ALT; Helson 1947). Applied to indebtedness judgments, the ALT approach predicts that people's evaluations of the size of a debt will depend in predictable ways on previously experienced and remembered relevant debt amounts. Individuals are hypothesized to have an internalized "reference" or "typical" debt level derived from current and remembered debt amounts (i.e., an 'adaptation level'). The psychological size of a to-be-evaluated debt will be judged in terms of how it relates to this adaptation level, which is here taken to be simply the mean of relevant previously encountered debt amounts. To the extent that a debt that is being considered is above the adaptation level it will be judged as large, and to the extent that a debt is less than the adaptation level it will be judged to be small. The theory proposes that people continually update their adaptation level, so that new encountered values (e.g., from hearing about new friends' debts) will shift the reference debt level upwards or downwards depending on their size.

A contrasting approach is Range Frequency Theory (RFT; Parducci 1965). According to RFT, what matters is not the mean of comparison debt amounts, but rather (a) how a debt amount relates to the smallest and largest amounts in a comparison context (the *range* principle) and (b) where the particular debt amount ranks within the context (the *rank* principle). The comparison context is assumed to be a small set of other debt amounts, which might be retrieved from memory or might be available in an experimental context when a

judgment about the size of a debt is being made. According to the range principle, a debt will seem large to the extent that it is closer to the highest debt amount in the comparison context than to the lowest debt amount in the comparison context (i.e., the extent to which it is high up the range of debt amounts in the context). According to the rank principle, it will also matter how many smaller and how many larger debts are in the comparison context. These two principles can be formalised as follows.

Assume that the comparison context includes n different debt amounts, arranged in order from smallest to largest $[D_1, D_2, \dots, D_i, \dots, D_n]$. Then, if M_i is the subjective psychological size of D_i (which would relate to, e.g., the concern about debt amount D_i),

$$M_i = wR_i + (1 - w)F_i \quad (1)$$

where R_i is the range value of debt amount D_i :

$$R_i = \frac{D_i - D_1}{D_n - D_1} \quad (2)$$

and F_i is the frequency value, or relative ranked ordinal position i of debt amount D_i in the ordered set:

$$F_i = \frac{i - 1}{n - 1} \quad (3)$$

Thus the evaluation of a debt amount (Equation 1) is determined by both range (Equation 2) and rank (Equation 3) principles, with w being a weighting parameter.

Rank and range principles were observed initially in the domain of psychophysics for judgments of simple stimuli such as the loudness of sounds and brightness of lights (e.g., Parducci, Calfee et al. 1960). They later received considerable experimental support in various cognitive and social domains, influencing for example judgments of income satisfaction (Hagerty 2000; Brown, Gardner et al. 2008), body image (Wedell, Santoyo et al. 2005) and satisfaction with life in general (Smith, Diener et al. 1989; Boyce, Brown et al. 2010). Rank and range principles also characterize attitudes towards the riskiness of alcohol

consumption (Wood, Brown et al. 2012); the effect of income on psychopathology (Wood, Boyce et al. 2012); emotional reactions to events (Wood, Brown et al. 2011); evaluation of pain (Watkinson, Wood et al. 2013) and perception of depression symptom severity (Melrose, Brown et al. 2013), as well as beliefs about the health benefits of physical exercise (Maltby, Wood et al. 2012); personality (Wood, Brown et al. 2012) and moral judgments (Marsh and Parducci 1978).

Retrieved Context and the Rank Principle

An important feature of context-based approaches to debt is that the same actual debt may seem psychologically smaller or larger if the comparison context changes, and hence different individuals may judge the same amount of debt differently if they retrieve different comparison debt amounts. The Decision by Sampling model (DbS; Stewart, Chater et al. 2006) describes the psychological processes underlying rank effects, and places a particular emphasis on the contextual comparison sample retrieved from memory. DbS suggests that evaluations are determined by a series of greater than/larger than comparisons between an amount (such as a debt) under consideration and relevant items recalled from memory at the time the judgment is made. For instance, if a student must evaluate the seriousness of a student debt of £15,000, DbS suggests that she will retrieve from memory other debt amounts she has recently processed (e.g., through discussions about debt with friends). The perceived seriousness of a debt of £15,000 will directly depend on its rank position within this mental sample of debt amounts, which is determined by the number of small and larger debt amounts within the sample.

As a result, different samples retrieved from memory—reflecting differences in students' beliefs about anticipated debt levels in the student population—could lead to different evaluations of the same debt amount. We test this directly in Study 1.

The Range Principle

The range principle as applied to debts states that the perception of a debt's size is partially determined by its distance from the smallest and largest debt amounts in the reference distribution. A consequence of the range principle is that clustering of debt amounts at either the low or high end of a comparison context (i.e., skew) is predicted to affect the mean evaluation of a set of debt amounts. Mean judgments of various quantities in negatively skewed distributions have indeed been found to be higher, even when the distribution means are the same (Parducci 1968). The prediction arises because in negatively skewed distributions most debt amounts cluster near the top end of the distribution and hence will attract relatively high judgments (e.g., high concern) because of the range principle; conversely, in positively skewed distributions most debt amounts are nearer in value to the bottom of the distribution and will attract low judgments (e.g., low concern). Thus a student may believe that a minority of students will owe very little amounts and most will instead owe relatively large amounts; i.e., she would believe the distribution of students' indebtedness to be negatively skewed. In contrast, another student might think that few students will owe large amounts by the time of graduation, while most students will owe relatively low amounts; in this case, the believed distribution of debt would be positively skewed. In Study 2, we test the range principle experimentally.

The Current Studies

The studies reported below tested the predictions of different cognitive models about students' perception of indebtedness. In Study 1, we investigated the nature of the comparisons students make when assessing own financial situation. In Study 2 we tested the range and rank principles experimentally, and examined their influence on perception of indebtedness. Finally, Study 3 investigated whether the same contextual effects are observed for sources of debt which are either income contingent or not.

Study 1

In Study 1, to test whether students' concern about own indebtedness is relative in nature and depends on (possibly inaccurate) beliefs about other students' indebtedness, we asked students to estimate how much debt they think *other students* incur during their degree. Specifically, we elicited from each participant their beliefs about the entire distribution of indebtedness incurred by other students. In this way, we were able to test whether rank position within the believed distribution of students' debt best predict concern about own indebtedness—over and above their own anticipated debt.

Method

Participants

A total of 376 first year undergraduate students (210 females) from two universities in the UK volunteered to take part in this study. Ages ranged from 18 to 51 years ($M = 19.50$, $SD = 2.96$). Students were included in the study if they expected to be in debt at the end of their degree¹, and they were tested during the first two weeks of the academic year 2011/2012. Students were enrolled in a large variety of undergraduate courses. Most students (89.89%) were paying UK/EU fees. The majority of students were of White ethnic origin (64.63%), followed by Indian (6.12%) and Chinese (5.32%) ethnicities.

Design and procedure

Participants filled in a questionnaire individually. The first section included the 11 questions of a subjective probability elicitation task, which aimed to determine participants' beliefs about the distribution of student debt. We refer to the distributions we derived from participants' responses as "inferred distributions". There are different ways to elicit probability distributions (e.g., Manski 2004); here, based on pilot work to establish the easiest method for students, we asked participants to estimate different percentiles points of the distribution (e.g., Melrose, Brown et al. 2013). We used 11 questions phrased as follows: 'How much a student would have to owe, in order to be in more debt than $x\%$ of other

students? (i.e. to rank in the most indebted $y\%$)?', where x had values of [99, 90, 80, 70, 60, 50, 40, 30, 20, 10, and 1] and y had the same values, but in the opposite order. Participants had to answer each of the questions by providing an estimated amount of debt, in British Pounds sterling (at the time of the study, 1 GBP = 1.58 USD; at the time of writing, 1 GBP = 1.60 USD; XE.com 2011). It was expected that, as in previous studies (e.g., Melrose, Brown et al. 2013), some individuals would misunderstand the instructions, by for example assigning low debt values to high percentile points and vice versa, or assigning high debt values to high percentile points and middle values for middle percentiles, only to assign again high debt values for low percentile points. It was therefore decided to exclude participants when the Kendall's τ coefficient between stimuli (i.e. the 11 percentile points) and responses (i.e., participants' estimates for the 11 percentile points) was $< .50$; this led to removal of 46 participants (i.e., 12.23% of the total). Results did not change qualitatively when all participants were included in the analyses.

Next, participants were asked to estimate how much they thought they would owe by the time they graduated ('anticipated debt'). Concern about indebtedness was then measured through two items. Participants expressed their worry about debt by answering the question 'How worried do you think you will be about your debt by the time you graduate?' on a 1 ('Not worried at all') to 7 ('Extremely worried') point scale. They then estimated the difficulty of repaying off the debt by answering the question 'How difficult you think it is going to be to repay your debt by the time you graduate?' on a 1 ('Not at all difficult') to 7 ('Extremely difficult') point scale. Participants were then asked whether they were intending to take a part-time job during term time or not, and to indicate whether they had already a part-time job at the time of testing. We chose to investigate students' intention to take a part-time job as a large proportion of students, in order to alleviate indebtedness and increase disposable income, undertake paid work at some point during term time (e.g., Christie,

Munro et al. 2001). Moreover, considerable evidence points to the negative effects of working during term time on academic performance (e.g., Callender 2008; Johnson, Pollard et al. 2008).

Statistical analyses

In order to compute the rank position of each student within what she believed to be the distribution of student debt, we estimated each student's cumulative distribution function to the answers to the 11 questions aiming at eliciting the belief distribution. The cumulative function described how much other students were believed to owe by the end of their degree. We chose either a lognormal function or a linear function for each participant, depending on which fitted best (the mean of all individuals fits was $R^2 = .91$). This produced an inferred distribution for each participant. We then computed the mean of the inferred distribution ('subjective mean') to permit a test the predictions of ALT. Finally, we computed the relative rank position of each student within her own inferred distribution of debt ('subjective rank').

We used ordinal regression to analyse participants' responses on all the questions based on Likert scale scores. We used logistic regression to predict intention to take a part-time job.

Results and Brief Discussion

As it can be seen from Table 1, students displayed little agreement on the distribution of debt that would be incurred by other students. This is evident from the large variation apparent in the answers to the subjective probability elicitation task. For instance, the interquartile range (*IQR*) of students' estimates of the median percentile ranged from £10,000 to £28,000; in other words, the range of amounts thought to represent the debt that would be owed by 50% of all students was rather wide. At the same time, great variability was observed also in estimates of the 10th (*IQR* = [2,000, 14,000]) and 90th percentiles (*IQR* = [19,750, 45,000]), meaning that there was also little agreement about what represented a

small (i.e. the estimated debt for the least indebted 10% of students) and a large expected debt (i.e. the debt estimated for the 10% most indebted students).

INSERT TABLE 1 HERE

The rank-based predictions arising from the large variation in beliefs about other students' debt can be exemplified as follows. Figure 1 shows the best-fit cumulative density functions for beliefs about university students debt for participants 19 (top panel) and 78 (bottom panel). Although participant 19 expected to owe more by the time of graduation (anticipated debt = £20,000) than did participant 78 (anticipated debt = £15,000), participant 19 believed that 35% of students would owe more than she would herself, whereas participant 78 thought that she would rank in the most indebted 20% of students; as predicted, participant 19 reported lower concern about debt than participant 78.

INSERT FIGURE 1 HERE

Predicting Students' Concern about Indebtedness

We ran regression analyses to predict students' concern about indebtedness. We pitted against each other predictors capturing the rank principle (e.g., Stewart, Chater et al. 2006; 'subjective rank'), ALT (Helson 1947; 'subjective mean'), and an absolute approach (i.e., the more one owes, the more concerned one will be; 'anticipated debt'). The latter two variables were logarithmically transformed.

In addition, we entered in the analyses three additional critical variables: (a) fees, indicating whether students were paying UK/EU fees or overseas fees (1=UK/EU, 2=Overseas), as the latter are considerably higher and therefore can impact both concern

about debt and beliefs about other students' debt; (b) gender (1=Male, 2=Females), as previous research has showed that females generally worry more about debt (Kettley, Whitehead et al. 2008; e.g., Haultain, Kemp et al. 2010); and (c) age, as older students tend to worry less about debt (Davies and Lea 1995).

Table 2 shows that the results were consistent with a relative account of students' perception of indebtedness. Subjective rank significantly predicted (a) how worried a student would feel about her own debt and (b) the estimated difficulty of paying it off. No support was observed for the absolute approach or ALT, as neither anticipated debt nor subjective mean predicted either outcome.² Anticipated debt initially correlated with students' worry about indebtedness ($\rho = .146, p = .008$) and anticipated difficulty in paying off debt ($\rho = .188, p < .001$). However, as anticipated debt did not independently predict student's concern when entered in a regression analysis, results suggest that this variable was acting as a proxy for rank.

INSERT TABLE 2 HERE

Predicting Intention to Take a Part-Time Job during Term Time

Finally, we investigated which factors significantly predict students' intention to take a part-time job during term time (see Table 3); this was coded as a binary variable (0 = not planning to take a part-time job, 1 = planning to do so), as we excluded from this analysis the 44 participants who said they already had a part-time job at the time of testing.³

INSERT TABLE 3 HERE

As predicted, relative rank position significantly predicted intention to take a part-time job; those whose rank was close to 1 (i.e., those who thought they would owe more than almost all the other students) were almost 5 times more likely to be willing to work during term time than those whose rank was close to 0. No support for ALT or for the absolute approach to students' indebtedness was observed—as again anticipated debt and subjective mean debt did not enter as significant predictors.⁴

In summary, rather than comparing their own expected indebtedness level to some internalised standard (e.g., the adaptation level), or to simply considering their own anticipated debt irrespective of that of others, students based their evaluations about indebtedness on where they thought their debt would rank within the student population.

Study 2

In Study 1 we observed an association between the ranked position of a debt within a comparison context and concern about the debt. In Study 2 we experimentally manipulated the rank position of a given person's level of debt relative to other amounts viewed at the same time. Students were asked to imagine they would owe different amounts of money by the time they graduated. We manipulated the distribution of debt amounts in each context in order to test the predictions of rank and range principles. Students' worry about debt was assessed via different scenarios to increase the generalizability of the results.

Method

Participants

A total of 240 participants (145 females) took part in this study. Participants, who volunteered to take part in the study and were not paid, were a convenience sample of students from a university in the UK and they were tested in the first term (of three) of the academic year 2011/2012. As in Study 1, participants had to be currently in debt in order to be eligible⁵. Participants' ages ranged from 18 to 36 ($M = 20.43$, $SD = 2.19$); they were

predominantly of White ethnicity (71.25%), with Indian ethnicity being the 2nd most represented (10.42%). A minority of participants were international students paying overseas fees (13.75%). Sixty participants were randomly allocated to each of the four distribution types.

Design and procedure

Participants were handed a 3-page booklet; on each page, one of three different question scenarios was presented. For each scenario, students were asked to imagine they would owe 11 different amounts of money by the time they graduated. For question 1 ('concern'), students were told that each of the amounts represented a different amount owed by the time of graduation (from all sources together); for each, participants had to rate the level of concern they would experience if they owed that amount, on a 1 ('not at all concerned') to 4 ('extremely concerned') point scale. For question 2 ('difficulty'), participants had to rate the difficulty of repaying each of the debt amounts, on a 1 ('not at all difficult') to 4 ('extremely difficult') point scale. Finally, for question 3 ('job'), participants had to state how likely they would be to take a less pleasant but more highly paid job so to pay off each debt amount, on a 1 ('not at all likely') to 4 ('extremely likely') point scale. As in Study 1, we removed from the analyses data from participants who responded erratically (16.67% of the total). Participants were excluded if either (a) the Kendall's τ coefficient between stimuli and responses was $< .50$ or (b) the response range for their ratings within each question scenario was < 1.00 ; the latter criterion was added in order to exclude from the analyses those participants who provided the same rating regardless of the debt amount under consideration. Results do not change qualitatively when all participants were included in the analyses.

Testing the Rank Principle

To test the rank and range principles, the distribution of 11 amounts of hypothetical debt was manipulated between subjects (see Table 4). The comparison between unimodal and bimodal distributions will allow us to test the effects of the rank principle. The debt amounts in these two distributions are different, with the exception of five amounts which are presented in both distributions (the five 'common points'). In both distributions, the smallest (£1,000; common point 1), the mean (£19,000; common point 3) and the largest amount (£37,000; common point 5) were the same; these amounts have also the same rank position within the distribution (rank = 1, 6, and 11, respectively), hence no differences in participants' responses are predicted by either the absolute or the relative accounts. The second common point is £11,000; in the unimodal distribution, £11,000 ranks as the 2nd lowest (i.e. rank = 2)—while it ranks as the 5th in the bimodal distribution (rank = 5). If rank determines students' evaluations of indebtedness, the concern due to owing £11,000 by graduation should be higher in the bimodal distribution than in the unimodal distribution, although the absolute debt is the same in both cases. Also, as £11,000 has the same distance from the distribution's mean (i.e. it is £8,000 lower) in both distributions, any difference in concern for £11,000 cannot be readily explained by ALT (Helson 1947). Conversely, £27,000 (common point 4) ranks lower in the bimodal distribution (rank = 7) than in the unimodal distribution of debt (rank = 10)—hence we expect it to be associated with higher levels of concern in the unimodal distribution.

INSERT TABLE 4 HERE

Testing the Range Principle

We tested the range principle by comparing students' average concern about the negatively skewed distribution to the average concern for the positively skewed distribution.

The mean debt is the same for both distributions (£25,818); thus, no differences should be expected according to either the absolute approach or ALT. However, in the negatively skewed distribution the debt values cluster around the upper limit of the distribution and hence will attract higher ratings of worry compared to the positively skewed distribution, where most debt amounts are instead nearer to the lower limit of the distribution. As the total rank position of the 11 debt amounts is the same in both distributions, any overall difference in concern between the two distributions can be attributed to the range principle.

Question scenario (concern, difficulty and job) was manipulated within-subjects. The presentation order of the scenarios was counterbalanced across participants through a Latin square design. The order in which the 11 amounts were presented to each participant was manipulated between-subjects and counterbalanced across question scenarios; in the ascending order condition the first of the amounts presented was the smallest, while the opposite was true for the descending order condition. As none of the presentation order entered significantly in the analyses reported below, data were collapsed across all presentation orders.⁶

Results and Brief Discussion

Rank effects

We first compared participants' responses for all three questions in the unimodal and bimodal distributions. Figure 2 presents participants' responses for the five common debt amounts.

For the 1st, 3rd and 5th common points participants' responses were very similar across the two groups for all the questions. This result was expected as each amount covered the same rank position within each distribution type. In line with the rank principle, common point 2 was rated higher (e.g., it elicited more concern) in the bimodal distribution—where it ranked as 5th lowest—than in the unimodal distribution, where it ranked 2nd lowest.

Conversely, common point 4 attracted higher responses in the unimodal distribution (rank = 10) than in the bimodal distribution (rank = 7). This pattern of results was the same for all three question types.

A 5 (within: common point) \times 3 (within: question) \times 2 (between: distribution) mixed ANOVA confirmed these observations. There was a significant main effect of point, as higher amount of debts elicited greater concern, higher predicted difficulty of repaying the debt, and higher likelihood of taking an unpleasant job because of debt, $F(4, 296) = 658.14, p < .001, \eta_p^2 = .90$. There was also the predicted interaction between distribution and comparison point, $F(4, 296) = 19.28, p < .001, \eta_p^2 = .21$, suggesting that the effects of increasing debt amounts on concern depended on each amount's relative rank position. This interaction is graphed in Figure 2; the 95% confidence intervals for a group that do not bound the mean of the other group indicate statistically significant difference—hence, as expected, participants' ratings of the 2nd and 4th common points significantly differed, whereas the ratings of the 1st, 3rd and 5th common points did not. This effect of rank position of the debt amount over and above its absolute value did not differ across the three question scenarios, as the 3-way interaction effect was not significant, $F(8, 592) = 1.59, p = .126$.

INSERT FIGURE 2 HERE

Range effects

Table 5 presents the overall scores (the responses' average for all the 11 amounts) for both the negatively and positively skewed conditions, separately for each question type. In line with the range principle, the average responses were higher in the negatively skewed distribution—the differences being of large effect size (Cohen 1969).

INSERT TABLE 5 HERE

A 2 (between: distribution) \times 3 (within: question) mixed ANOVA revealed a significant main effect of distribution, $F(1, 95) = 20.19, p < .001, \eta_p^2 = .18$. As predicted, participants reported higher responses in the negatively skewed distribution compared to the positively skewed distribution. There was also a main effect of question, $F(2, 190) = 50.57, p < .001, \eta_p^2 = .35$; question 3 ('job') received significantly lower responses than the other two questions and question 2 ('difficulty') attracted lower responses than question 1 ('concern'). However, the interaction distribution \times question was not significant, $F(2, 190) < 1$, confirming that the large effect of distribution skew did not differ across the three scenarios.

These results support the hypothesis that students perceive indebtedness in relative terms. When asked to imagine how worried they would be if they owed specific amounts of money by the time they graduate, students' responses were best predicted by the rank and range principles (Parducci 1965). Other holistic features of the context (e.g., debt average) did not play a role, thus no empirical support was observed for alternative theories (e.g., ALT).

Study 3

In this study we investigated whether contextual effects occur across different components of student debt. In the UK—as from the academic year 1998-1999—those who take a student loan to cover tuition fees benefit from an income contingent repayment scheme: Former students do not repay the loan unless and until their income exceeds a specific amount. Income contingent loans (ICLs) thus represent a specific form of debt that may attracts different or reduced concerns, as they allow students to smooth consumption over their lifecycle and protect them against economic hardship and even bankruptcy, which compromises their capacity to borrow in the future (Barr 1989; Chapman 2006). Thus, Study

3 was a replication of Study 2 where we instructed students to consider the to-be-assessed amounts as either due to ICLs, or not (non-ICL debt).

Method

Participants

A total of 84 participants (48 females) volunteered to take part in this study. Participants' ages ranged from 18 to 50 ($M = 21.99$, $SD = 3.87$) and they were predominantly of either Chinese (40.48%) or White ethnicity (38.10%). Participants were tested in the third term of the academic year 2012/2013. Roughly the same number of participants was paying overseas (51.19%) and home/EU fees (48.81%). Twenty-one participants were allocated to each of the four distribution types.

Design and procedure

Materials and procedure were the same as in Study 2, the only difference concerning the framing of the debt scenarios; students were told whether the amounts of debt referred to ICL or non-ICL debt. For the former, students were told that the 11 amounts referred to debt due to income contingent loans (ICL); they were also told that ICL are loans that students take out to cover tuition fees, but that do not need to be repaid unless and until, after the completion of a degree, a specific level of income is exceeded. In the non-ICL condition students were told to consider the 11 amounts as any debt accrued (e.g., by building up credit card debt or an overdraft on a current account) other than income contingent debt.

The order in which the three question scenarios ('concern', 'difficulty' and 'job') were framed as either ICL or non-ICL debt was manipulated between-subjects, with 44 participants being presented with the three questions as referring to non-ICL debt first, while the remaining 40 were allocated to the ICL-first condition. As in the previous studies, we removed from the analyses data from participants (17.86% of the total) if either (a) the Kendall's τ coefficient between stimuli and responses was $< .50$ or (b) the response range for

their ratings within each question scenario was < 1.00 . Results do not change qualitatively when all participants were included in the analyses.

As in Study 2, the presentation order of question scenarios ('concern', 'difficulty' and 'job') and amounts of debt (i.e., ascending vs. ascending) were counterbalanced between-subjects through a Latin square design. As none of the presentation order variables entered significantly—either as main or as interaction effects— data were collapsed across all presentation orders in the analyses reported below.⁷

Results and Brief Discussion

Rank effects

We first compared participants' responses for all three questions in the unimodal and bimodal distributions. Figure 3 presents participants' responses for the five common debt amounts in each scenario, separately for each debt type. As in Study 2, no differences were observed for the 1st, 3rd and 5th common points, while ratings for the 2nd and 4th points differed between distributions as predicted by the rank principle. This pattern was the same across scenarios and debt types.

A 5 (within: common point) \times 3 (within: question) \times 2 (between: distribution) \times 2 (within: debt type) mixed ANOVA confirmed these observations. The only significant effects were (a) the main effect of point, $F(4, 124) = 407.82, p < .001, \eta_p^2 = .93$, as higher amount of debts elicited greater concern, higher predicted difficulty of repaying the debt, and higher likelihood of taking an unpleasant job because of debt; (b) the main effect of question, $F(2, 62) = 6.04, p = .005, \eta_p^2 = .16$, as question 1 ('concern') attracted higher ratings than questions 2 ('difficulty') and 3 ('job'); (c) the main effect of debt, $F(1, 31) = 15.17, p < .001, \eta_p^2 = .33$, as, overall, non-ICL debt attracted higher ratings for the three question scenarios; and (d) the predicted interaction between distribution and comparison point, $F(4, 124) = 19.83, p < .001, \eta_p^2 = .39$, suggesting that the effects of increasing debt amounts on concern

depended on each amount's relative rank position as in Study 2. Most importantly, this effect of rank position of the debt amount over and above its absolute value did not differ depending on debt type—as the 3-way interaction distribution by point by debt was not significant, $F(4, 124) = 2.18, p = .150$ —nor dependent on question scenario, as the 3-way interaction distribution by point by question was not significant either, $F(8, 248) = 1.13, p = .343$. Figure 3 shows how the same interaction effect between distribution and point was observed across debt types and question scenarios. Further, the 4-way interaction was not significant, $F(8, 248) = 1.70, p = .201$.

INSERT FIGURE 3 HERE

Range effects

Figure 4 presents the overall scores (the average response for all 11 amounts) for both the negatively and positively skewed conditions, depending on debt type and separately for each question type. In line with the range principle, the average responses were higher in the negatively skewed distribution, this being true across question scenarios and debt types.

INSERT FIGURE 4 HERE

A 2 (between: distribution) \times 3 (within: question) \times 2 (within: debt type) mixed ANOVA confirmed the above observations. The significant main effect of distribution, $F(1, 34) = 9.59, p = .004, \eta_p^2 = .22$, indicated that, as predicted, participants' responses were higher in the negatively skewed distribution than in the positively skewed distribution. Most importantly, the effect of skew on ratings was observed regardless of question type, $F(2, 68) = 1.36, p = .264$, and debt type, $F(1, 34) < 1$. The 3-way interaction was not significant either,

$F(2, 68) = 2.25, p = .121$. Both the main effects of debt, $F(1, 34) = 17.69, p < .001, \eta_p^2 = .34$, and question, $F(2, 68) = 4.52, p = .014, \eta_p^2 = .12$, were also noted: as for the previous analysis on rank effects, non-ICL debt attracted higher ratings for the three question scenarios and question 1 attracted higher ratings than questions 2 and 3. Overall, the results corroborated the findings of Study 2 as students' responses were best predicted by rank and range principles regardless of whether or not the debt under consideration was income contingent.

General Discussion

The results of the present three studies support a relative account of students' perception of indebtedness. The results of Study 1 showed that students' perception of (and worry associated with) their own expected debt depends on where they believe their debt will rank within the student population. The rank principle also predicted students' willingness to take a part-time job during term-time to increase income and ease debt. Strikingly, anticipated personal debt alone did not *independently* determine any of these psychological dimensions. Study 2 showed that students' worry about debt is highly context-dependent, as the information available in the decision-making context determined participants' concern about debt. Finally, Study 3 showed that contextual information influences students' evaluation regardless of debt repayment modality: Although the income-contingent portion of debt attracted predictably lower concern (see also Higgins and Withers 2009), its appraisal was vulnerable to the same context effects that were observed for the standard component of student debt. Thus, although the present survey was run in the UK where ICL schemes are in place (as in Australia) and student debt is on the rise, we suggest that students in other countries (e.g., the US where debt is predominantly non-ICL) are likely vulnerable to the same contextual effects.

The effect of contextual information on students' evaluations of debt was substantive. For instance, the effect of contextual skew in Study 2 averaged at $d = 0.89$ (Cohen 1969). In

Study 3, although we observed an effect of debt type whereby ICL debt attracted lower concern than non-ICL debt, the effect size ($d = 0.71$) was half that of the effect of rank ($d = 1.50$, averaged across comparisons). Importantly, the latter was rather similar for both debt types ($d = 1.54$ and $d = 1.46$ for the ICL and non-ICL scenarios, respectively). Finally, in Study 1 we observed that students who believed that they would owe more than almost all other students (i.e., their subjective rank approached 1) were almost 5 times more likely to plan to take on a part-time job than those whose rank was near 0. In comparison, in the same analysis the effect of gender was rather smaller: Female students were just over 50% more likely to plan to work during term time than male students.

It is important to understand how the variable and inaccurate beliefs about students' indebtedness observed in Study 1 enter into students' financial decision-making both (a) prior to enrolment to university (e.g., whether to apply for it or not, and where to apply to; Callender and Jackson 2005) and (b) during the completion of the degree (e.g., whether to take a part-time job during term time; Ford, Bosworth et al. 1995). We will consider each scenario in turn.

As perception of anticipated amounts of debt can affect the decision whether or not to apply to higher education, it is important to establish the cognitive processes responsible for students' perception of indebtedness. For instance, the rank principle might influence how students decide whether or not to apply to higher education. Two students might both expect to owe approximately £20,000 by graduation. However, student A thinks that 70% of students will end up owing less than £20,000, while student B believes that 70% of students will owe £20,000 or more. If the association between concern and indebtedness is context-independent, as is typically assumed, worry levels should be the same for both students, as they both expect to owe £20,000 by graduation. On the other hand, the rank principle instead

predicts that student A—who thinks that only 30% of students will owe more than her—will be more concerned than student B, who thinks that only 30% will owe less than she will.

When relating students' concern about indebtedness to the strategies they implement to overcome them, an interesting relationship between rank effects and intention to take a part-time job was observed. Students' attitude towards taking a part-time job was very much influenced by rank effects—rather than by absolute or average debt-related effects. Providing information about average student debt (for a recent intervention on energy consumption based on this principle see Schultz, Nolan et al. 2007) might not effectively influence students' decision-making, for instance deterring them to take a part-time job when doing so might be financially unwarranted. Rank-relevant information (e.g., percentiles) will provide information which is more aligned with students' reasoning about debt: A student who predicts she will owe £15,000 by graduation, and who erroneously thinks that 90% of other students will owe less, might be less tempted to work during term time once she is informed about the correct rates of students' indebtedness.

Students' beliefs about debt may also shed light on influence of social class and socio-economic status on both attitudes towards indebtedness and fear of debt (Christie, Munro et al. 2001; Callender and Jackson 2005). Students from low income families report higher repayment difficulties, even after having controlled for income and debt (Callender and Jackson 2008). Students from poorer backgrounds (or who receive less generous contributions from their parents) might overestimate their rank position within students' distribution of debts. If so, they might for that reason display greater fear of debt and might be deterred from applying to university. Indeed in Australia, although ICLs have increased enrolment rates to higher education, they have not significantly altered the socio-economic composition of university students (e.g., Chapman 2006); even if ICLs are associated with more advantageous conditions than typical debt, students from lower socio-economic

backgrounds are no more likely to enrol in university than prior to the introduction of ICLs. Our relative account of student indebtedness suggests why this might be the case, as it argues that students' biased beliefs shape their attitudes towards debt. Thus, perceived benefits of income contingent repayments might be watered down by biased beliefs about the distribution of student debt.

The present results have also broader implications for the debate on students' financial literacy and debt perception. Students have been often shown to rely on relatively poor knowledge of financial products and economic concepts (e.g., Chen and Volpe 1998; Lusardi and Tufano 2009; Lusardi and Mitchell 2011). Clear associations are often observed between low financial literacy and poor financial decision-making, which often lead to higher costs for borrowing and higher financial strain (e.g., Norvilitis, Merwin et al. 2006; Lusardi and Tufano 2009), although students seem unaware of their level of financial knowledge (Lusardi and Mitchell 2011). Here, we show that students' financial illiteracy might display itself in two further ways. First, students' choices might be driven also by relatively inaccurate and variable beliefs about the general levels of indebtedness, which as we have shown are taken into account when considering their own financial situation. Second, students were shown to be heavily influenced in their evaluations by contextual information that was present at the time a judgment was prompted. The reliance on contextual information indicates that students might not have stable beliefs about financial dynamics, and thus may struggle to select the financial products that would best fit their situation. As we have not directly measured financial literacy, we cannot make a specific contribution to the recent debate into which student groups might be more at risk of low finance literacy (e.g., females and international students; Chen and Volpe 1998; Lusardi and Mitchell 2011; Boyland and Warren 2013). Future research could directly investigate whether financial literacy mediates the contextual effects observed here on the perception of debt.

Finally, one potential implication is that an increase in tuition fees might not put off students from applying to university as much as it is feared. The Easterlin paradox (Easterlin 1974) illustrates this argument. Easterlin showed that, despite an increase in nations' GDP over the recent decades, average subjective well-being within nations did not increase by much (if at all) over the same period. One account of this paradox is that of relative comparison, whereby well-being is not related to the individual's wealth, but rather by her wealth rank within the social context (e.g., Boyce, Brown et al. 2010). As wealth increases for everybody—although at different rates—people's average relative rank position in the income distribution does not change. This phenomenon is related to the distinction between absolute versus relative economic mobility and it is object of current debates on perceived social mobility (e.g., Causa and Johansson 2010). Extrapolating to the case of fee rises, one could predict that in the long term higher fees may not greatly deter students to apply to university, as their concern about indebtedness is relative in nature rather than being determined by anticipated debt alone.

This paper is the first to show that students' concern about indebtedness is relative in nature. Students worry about debt, but when they do so they consider the financial situation of other students as well—and they are more influenced by the outcome of these social comparisons than by their own financial prospect as if considered in isolation.

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Footnotes

1. By including in the present study those students who indicated that they anticipated no debt at the end of the degree we would have artificially inflated the relationship between debt and concern about it: If a student expects to owe £0 at the end of his/her degree, s/he won't worry about it at all. This will reduce overall variability in the data without adding any useful information
2. The same results were observed when (a) the non-logarithmically transformed data was analysed, as only subjective rank and gender were significant predictors, and (b) when more flexible regression equations were used. For the latter, for instance, if the interaction term between anticipated debt and gender was entered into the analyses—thus allowing for debt levels effects to vary by gender—rank was still a significant predictor for both worry, $B = 1.33$, $Wald = 6.16$, $p = .013$, and difficulty to repay, $B = 1.78$, $Wald = 11.01$, $p < .001$, while anticipated debt was not, $B = 1.01$, $Wald = 1.82$, $p = .177$ and $B = 0.62$, $Wald = 0.58$, $p = .447$, respectively. The same pattern was observed when we allowed instead the term fees to interact, as rank was still a significant predictor for both dependent variables, $B = 1.32$, $Wald = 5.98$, $p = .017$ and $B = 1.72$, $Wald = 10.16$, $p < .001$, while anticipated debt was not, $B = 0.33$, $Wald = 0.16$, $p = .690$ and $B = 1.12$, $Wald = 1.84$, $p = .175$. Also, subjective mean did not enter as a significant predictor in any of these additional analyses (all $ps > .748$)
3. We repeated this analysis by including the 44 students who had already a part-time job at the time of testing; intention towards taking a part-time job was coded as 0 = not planning to work during term-time and 1 = either working already or planning to take a job. The results from the logistic regression confirmed that only subjective rank was a significant predictor, while the effect of gender again approached significance

4. The same results were observed when the non-logarithmically transformed data was analysed, as subjective rank was the only significant predictor and the effect of gender again approached significance
5. We again collected data only from students who anticipate some debt at the end of their degree, as it is mostly those students who engage in financial considerations about debt and its impact on their lives, and thus represent the most informative sample for the current research purposes
6. The same results were observed regardless of gender and fees
7. As in Study 2, data were collapsed also across gender and fees as neither variable impacted on the results

Table 1. Debt estimates provided in the subjective probability elicitation task for low, medium and high percentile points (in GBP)

Percentile points	<i>M</i>	<i>SD</i>	IQR		Range	
			<i>LL</i>	<i>UL</i>	<i>LL</i>	<i>UL</i>
10 th percentile	9,265	8,133	2,000	14,000	0	32,000
50 th percentile	19,742	12,040	10,000	28,000	45	55,000
90 th percentile	36,901	44,565	19,750	45,000	70	550,000

Note: *IQR* = Interquartile Range; *LL* = lower limit; *UL* = upper limit.

Table 2. Regression coefficients from the analyses of Study 1

	Estimate	SE	Wald	<i>P</i>
<i>Worry</i>				
Subjective rank	1.31	0.54	5.96	.015*
Log(Anticipated debt)	0.51	0.40	1.57	.210
Log(Subjective mean)	0.08	0.49	0.03	.863
Fees	0.61	0.36	2.87	.090
Age	-0.04	0.03	1.56	.211
Gender	1.21	0.21	33.03	<.001***
<i>Difficulty of repaying the debt</i>				
Subjective rank	1.79	0.54	11.12	<.001***
Log(Anticipated debt)	0.39	0.40	0.94	.332
Log(Subjective mean)	0.16	0.49	0.10	.749
Fees	-0.21	0.36	0.34	.560
Age	-0.02	0.03	0.33	.566
Gender	0.61	0.20	9.29	.002**

Note: * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

Table 3. Predicting intention to take a part-time job during term time (Study 1)

	B	SE	Wald	<i>P</i>	Exp(B)
Subjective rank	1.60	0.71	5.06	.025*	4.97
Log(Anticipated debt)	-0.24	0.51	0.23	.634	0.79
Log(Subjective mean)	0.36	0.65	0.30	.584	1.43
Fees	0.42	0.47	0.80	.371	1.52
Age	-0.04	0.04	0.84	.359	0.96
Gender	0.44	0.25	2.91	.088	1.55

Note: * significant at 5% level

Table 4. Amounts (in thousands of GBP) used in the 4 different distribution conditions in Study 2.

	<i>Rank</i>										
	1	2	3	4	5	6	7	8	9	10	11
<i>Distribution</i>											
Unimodal	<u>1</u>	<u>11</u>	13	15	17	<u>19</u>	21	23	25	<u>27</u>	<u>37</u>
Bimodal	<u>1</u>	3	5	8	<u>11</u>	<u>19</u>	<u>27</u>	30	33	35	<u>37</u>
Negative skew	1	13	19	23	27	29	31	33	35	36	37
Positive Skew	15	16	17	19	21	23	25	29	33	39	51

Note: Underlined amounts represent the five common points for the comparison between unimodal and bimodal distributions

Table 5. Mean participants' responses as a function of question type and distribution skew
(Study 2)

Question	Distribution				
	Negative Skew		Positive Skew		<i>D</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Concern	3.17	0.51	2.56	0.58	1.12
Difficulty	2.93	0.69	2.52	0.49	0.69
Unpleasant job	2.60	0.71	2.06	0.56	0.85

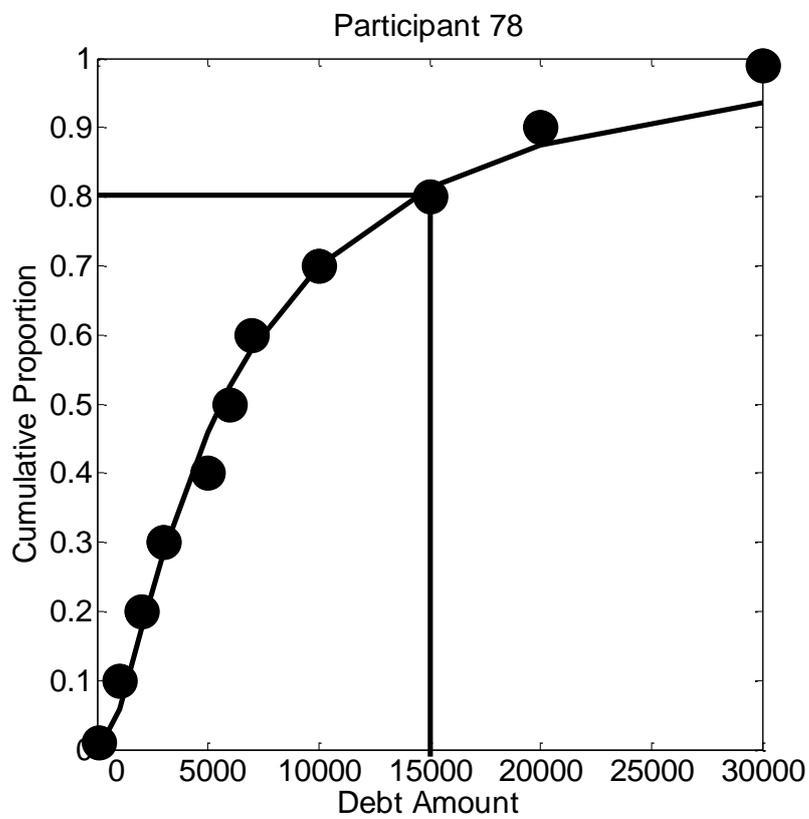
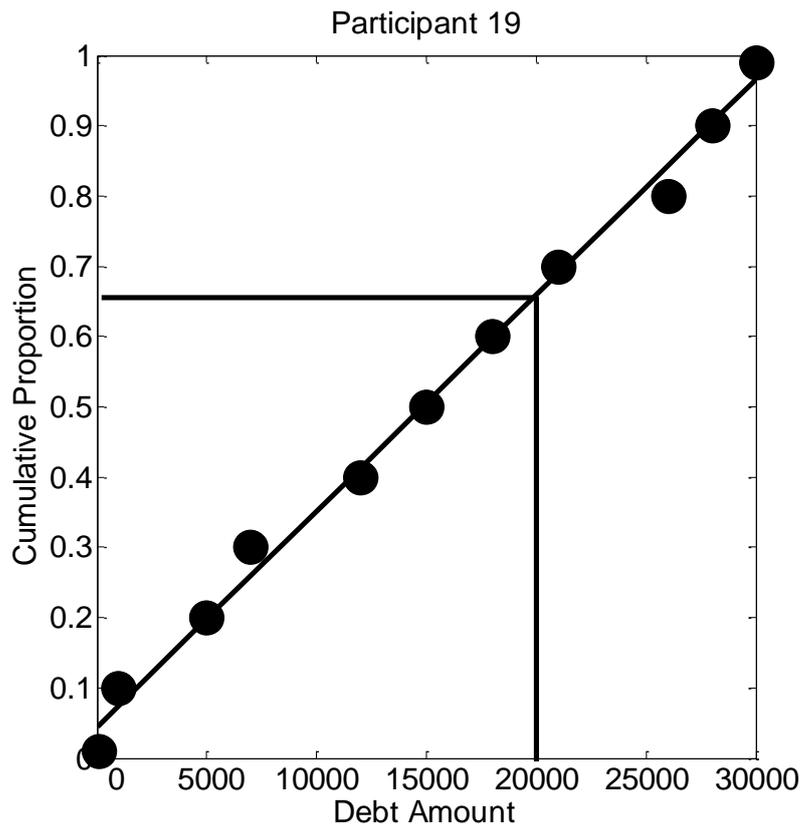
Figure Captions

Figure 1. The cumulative distribution (filled circles) along with a best-fit cumulative density function (solid lines) elicited from participants 19 (top panel) and 78 (bottom panel). Vertical lines indicate own debt, while the horizontal line represents the inferred rank position

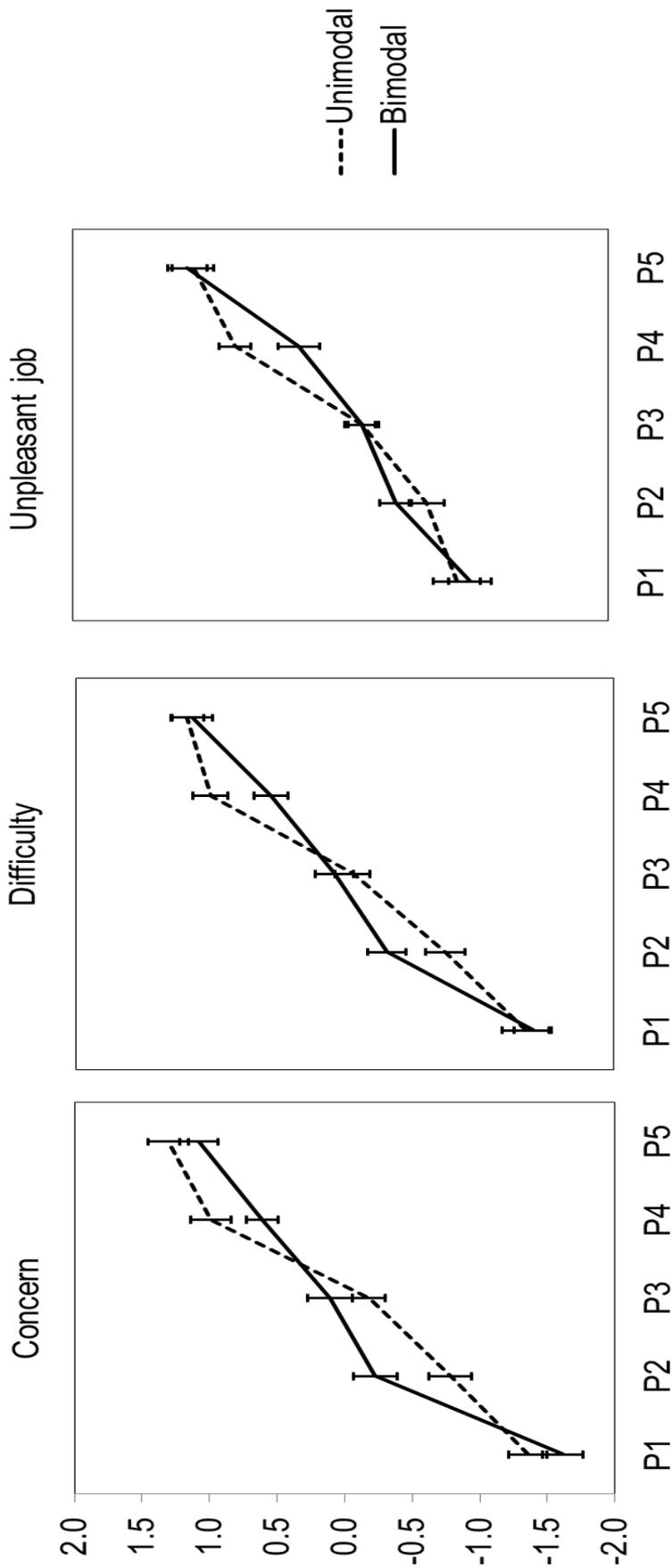
Figure 2. Interactions between distribution type and common points (P1 to P5) for the three questions (Study 2). To limit the individual differences in scale use, mean deviations on a participant-by-participant basis are plotted instead of actual ratings. Error bars represent 95% confidence intervals.

Figure 3. Interactions between distribution type and common points (P1 to P5) for the three questions for ICL (top panels) and non-ICL debt (bottom panels) in Study 3. Ratings indicate mean deviations on a participant-by-participant basis. Error bars represent 95% confidence intervals.

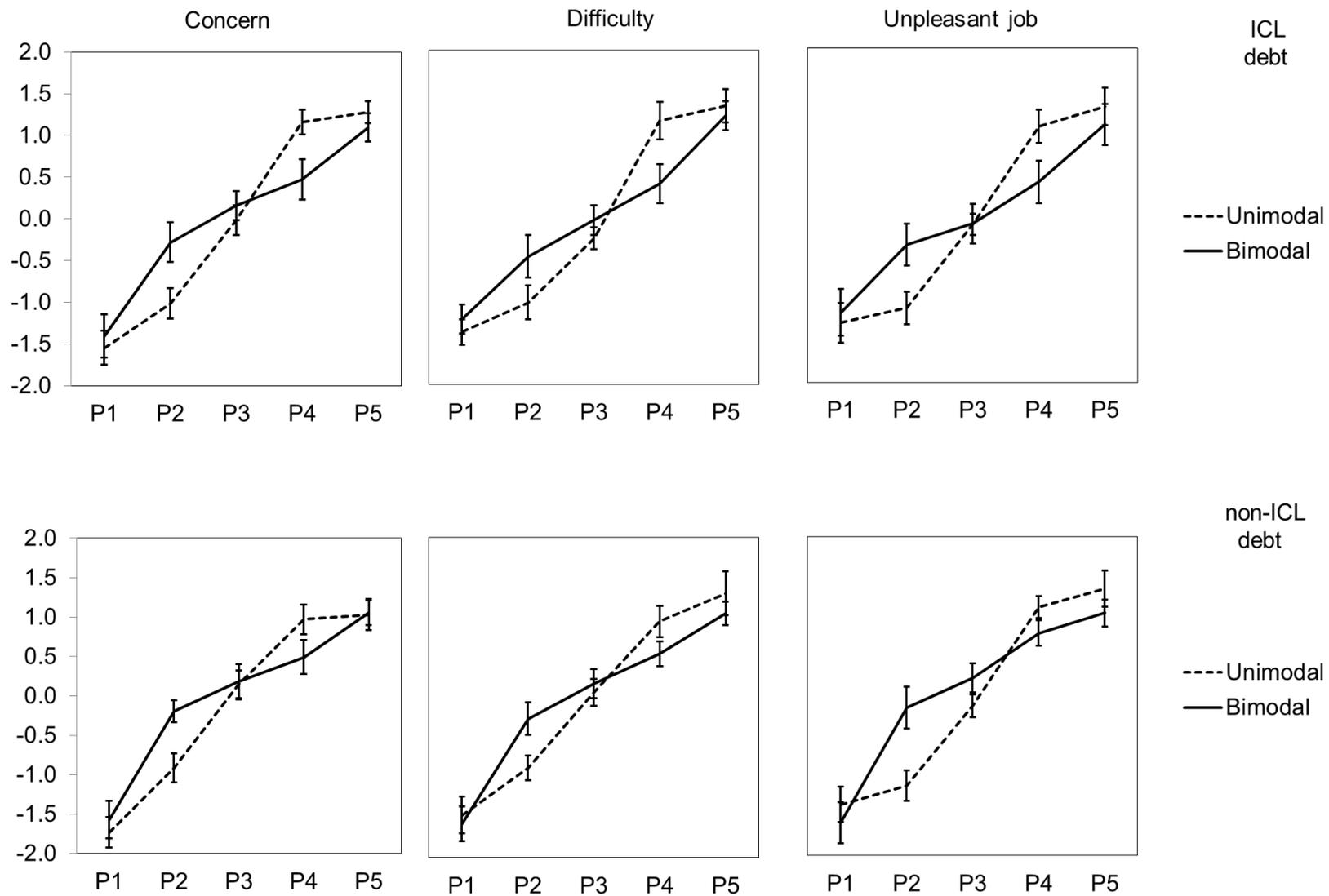
Figure 4. Mean participants' responses as a function of question type, depending on distribution skew and debt type (Study 3). Error bars represent 95% confidence intervals.



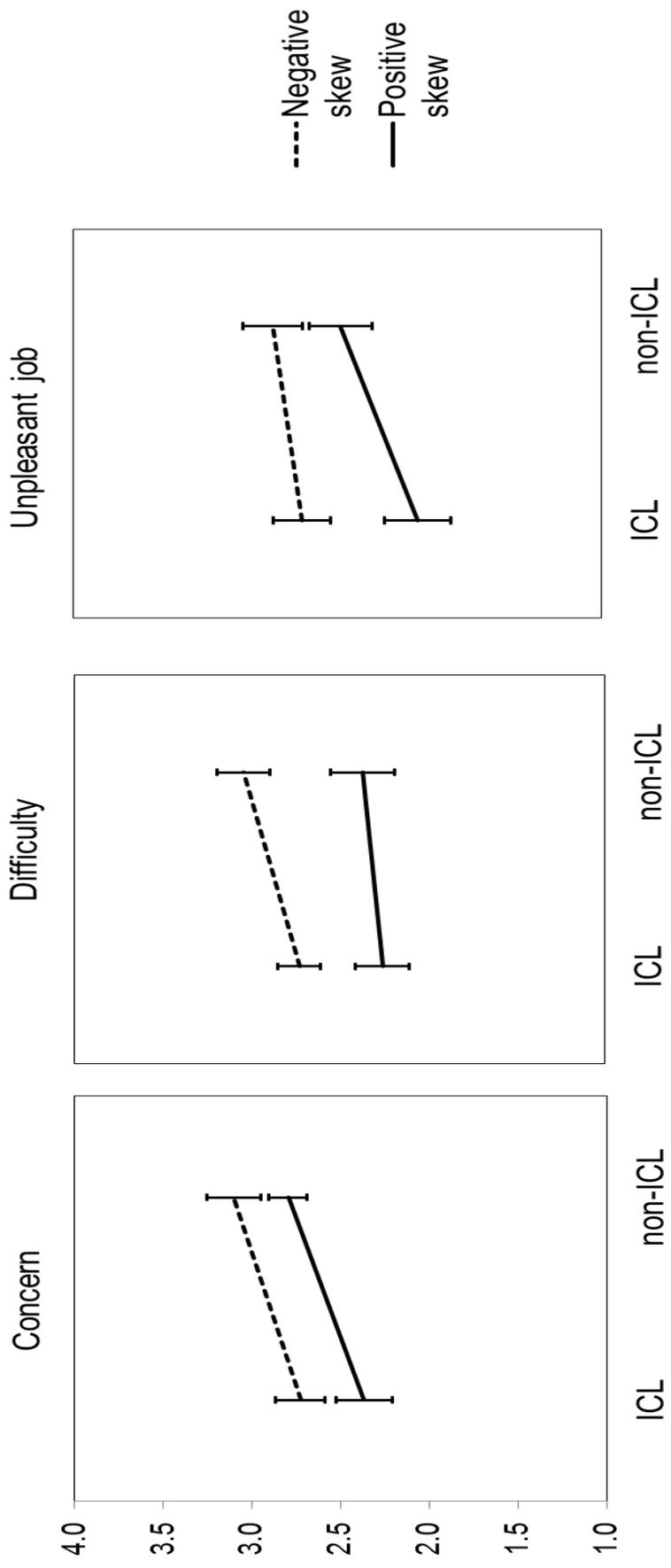
(Figure 1)



(Figure 2)



(Figure 3)



(Figure 4)