British Journal of Educational Psychology (2003), 73, 373–393

www.bps.org.uk

Experimental analysis of students' course selection

Elisha Babad* and Arik Tayeb

School of Education, Hebrew University of Jerusalem, Israel

Background. Prior to every term, students must select courses (i.e., academic units of instruction within a degree programme) to determine their study programme. Course selection (CS) is a sequential decision-making (DM) process – students weigh various types of information available about each course. Every decision influences the weighting of considerations for the next. This study is focused on three central dimensions of CS: Learning Value (low or high in being intellectually challenging, interesting and thought-provoking), Lecturer's Style (low or high – exciting, charismatic and humorous versus dry, inflexible, unclear, etc.), and Course Difficulty (easy, moderate or hard).

Aims. (1) To examine students' preferences for each dimension in five choices and in their sequential location (1st to 5th). (2) To trace compromises in dilemma situations after the desirable combinations had already been selected. (3) To investigate differential selection as a function of students' age, gender, and academic standing (average grades).

Sample. Advanced undergraduates in various departments in an Israeli university (*N*=1,007).

Method. In an experimental design, respondents were presented with 12 course descriptions representing 2x2x3 combinations, and asked to select five courses in a sequential order.

Results. The 12 courses were found to be empirically divided into: ideal courses (2), first-degree (4) and second-degree (4) compromises, and rejected courses (2). Students avoided selecting hard courses unless they had no choice. Learning Value was the most preferred dimension, followed closely by Lecturer Style. Correlations showed that older and higher achieving students chose more difficult and high Learning Value courses.

Comments. The discussion centred on the methodological issue of the effectiveness

* *Requests for reprints should be addressed to Professor Elisha Babad, School of Education, Hebrew University of Jerusalem, Mt. Scopus, Jerusalem 91905, Israel (e-mail: elisha@vms.huji.ac.il).*

of an experimental design for the investigation of CS, conceptual issues concerning Course Difficulty in students' selection and evaluation, and applied issues concerning the availability of information about the three investigated dimensions to students in real-life CS.

Prior to every semester, students make a series of interdependent course selection (CS) decisions, choosing the specific academic units (lectures, seminars, labs, etc.) that will comprise their study programme in the next term. These decisions can have more import on students' lives and their future educational and occupational opportunities than they realise at the time, because early decisions can determine later choices and may limit further possibilities. Some of these decisions, in retrospect, often turn out to have been fateful in students' life path, and many of these decisions contribute to determine the nature of their college experience.

Colleges and student bodies invest great efforts in guiding students through the selection process to reach optimal decisions in their specific course choices. These efforts include dissemination of relevant information in various formats and academic advising. Despite the importance of CS to students worldwide and its ecological validity as an arena for investigating commonly occurring decision-making processes, the field has remained rather neglected, especially compared to the abundance of research in the closest conceptual domains, students' ratings of teaching (SRT) and career decision-making (CDM). No integrated conceptualisation and no systematic body of research on CS have emerged thus far, and the existing studies seem rather sporadic and unfocused.

Course selection (CS) as a decision-making (DM) process

In a decision-making process, a prospective course of action must be chosen among alternatives, each related to a particular set of expected outcomes. Criteria, considerations, 'aspects' (in Gati's 1996 terminology) and expected outcomes are compared for the various alternatives. Few alternatives are ever perfect, and decision-makers usually trade off certain utilities for others to reach a satisfying decision. The typical CS process involves a series of sequential, interdependent decisions about several courses (that is, about specific units of instruction in a weekly timetable that will comprise the student's study programme in a given term), where each choice modifies the considerations and the weighting of course characteristics for the next. No wonder, then, that students seek short cuts to reduce the effort and to simplify the CS task (Borgida, 1978; Borgida & Nisbett, 1977; Coleman & McKeachie, 1981; Hendel, 1982; Warton & Cooney, 1997). Sometimes one salient characteristic overshadows all other aspects (a charismatic or witty instructor, an easy grade, filling a hole in the schedule, etc.), and often students ignore the fuller and more valid sources of information, preferring relatively informal (and often unreliable) sources instead. In addition, many students lack a clear and explicit understanding of their priorities and goals. In short, the actual process of CS is quite messy and disorganised for many students. It is therefore appropriate that colleges allow students to make changes in their CS by dropping and adding courses several weeks into each term.

The above description of CS is most appropriate to choices within a discipline area (e.g., choices in 3rd year maths), as opposed to choices across many discipline areas (e.g., choices in the first year of study in generalist degrees), where the diverse contents

and wide multiplicity of disciplines may play a central role in selection. However, in reality, it seems that most course choices are made within relatively narrow disciplines and domains of study, after students have completed their CDM and chosen their department and major field of study. In addition, required courses, where students do not have any degree of freedom in selection, take precedence over selected courses, and they influence subsequent CS.

Two general types of CS considerations

CS considerations can be globally divided into two major groups: (1) Academic considerations, focused on course and instructor characteristics; and (2) Personal/contextual considerations of the selecting student. The first group includes various types of information about academic and instructional aspects of the course, which characterise it and distinguish it from other courses. A variety of course characteristics are included in this group: academic and intellectual quality, mode of teaching and lecturer's personality and expressive style, instructor's accessibility to students, workload difficulty, assignments and readings, exams and grading, and so on. The second group – no less important and meaningful – involves the broader context of student life, manifested in the personal situation and the specific needs and pressures of the individual student at the time of selection: the need to work part-time, the need to attain high grades (perhaps for future admission into advanced programmes), social needs, the pressures of the schedule, and so on.

The first group might be described as generalised academic information, whereas the second group is more idiosyncratic and the considerations vary from student to student. In the CS process prior to each term, these two types of information are mixed, blending into a unique integration which can vary in its success for each student. Research on considerations of the first group can be meaningful for planning institutional policies for disseminating information to increase the 'success' of the CS process for all students. That kind of research cannot readily go into idiosyncratic personal considerations of the second group. The present research is focused on three types of considerations, pertaining to academic quality, instructional quality and workload difficulty. Readers are forewarned that this study was designed in an experimental method, and therefore it examines generalised considerations in a hypothetical choice situation, staying clear of personal considerations and necessities.

Research on CS

The published literature bearing on CS includes studies examining CS patterns as a function of differential student attributes (e.g., Leventhal, Abrami, Perry, & Breen, 1975; Leventhal, Abrami, & Perry, 1976; Martin, 1989; Warton, 1997; Yeung & Marsh, 1997), examination of factors mentioned by students as sources of CS information (e.g., Kerin, Harvey, & Crandall, 1975), and applied programmes to assist students in CS (e.g., Hendel, 1982; Irving, 1990; Lorenz, 1982; Shreve & Wildie, 1992). The few evaluations and follow-up studies of such programmes (Dellar, 1994; Hendel , 1982; Shreve & Wildie, 1992) showed relatively little impact on improving CS quality, and they exposed factors that often hinder the effectiveness of students' CS.

Several experimental studies examined how feedback of SRT data affected CS.

Borgida (1978) and Borgida and Nisbett (1977) found no effects of empirical SRT data on CS compared to vivid, face-to-face information from another student, whereas Coleman and McKeachie (1981), Leventhal *et al.* (1975, 1976) reported substantial effects of SRT feedback. However, the latter studies examined section selection in multi-section courses, a situation in which many important CS factors are missing. In more general terms, Warton and Cooney (1997) suggested that many students do not seek nor access information needed for rational decision-making in CS, and Dellar (1994) concluded that advice offered to students by teachers and peers was often inappropriate and sometimes even detrimental.

Unfortunately, many of the studies on CS in the scientific literature suffered various conceptual and methodological drawbacks:

- Over-concentration on high-school students and first-year university students (freshmen) as representing 'students' at large;
- Focus on multi-section courses, where important elements of CS are absent;
- Examination of 'choices' and 'courses' in general;
- Ignoring the level of choice available for each course, sometimes including required courses (where no real selection is involved);
- Mixing the considerations for selecting 'important' and 'non-important' courses in this sequential decision-making process.

In systematic research on CS, we must separate the focus on the information available to students from the focus on the process of utilisation of the available information in decision-making. With regard to the information, research must delineate the available sources of information and then examine patterns of students' utilisation of that knowledge, investigate the types of information that may facilitate or hinder the effectiveness of the CS process, and conceptualise how types of information and their relative availability would affect actual choices. With regard to the decision-making process, it must be remembered that every choice is a trade-off between expected utilities, and almost every course selected by students actually represents some kind of compromise. More importantly, at every term, the CS process involves a series of sequential decisions, and each decision influences the weighting of considerations for the next decision. Therefore, we are not dealing with a uniform decision-making process repeated several times, but with a flexible mixture of factors, academic and personal considerations, idiosyncratic needs, and expected utilities. In the authors' opinion, some of the published studies neglected to conduct sufficient basic research on the CS process, hastening to conduct applied interventions on the basis of intuitive common sense. Because it seems from the above-mentioned studies that many students conduct their CS in a sloppy and non-systematic manner (and often pay the consequences of their sub-optimal process), it is not sufficient to just make sure that the relevant information is provided and available to students.

Most studies to date focused on self-report testimonials, where students retrospectively described their choices. This kind of research must be supplemented by research that would isolate specific (academic or personal/contextual) factors and test them in a rigorous and systematic manner, alone or in interaction with other factors. Finally, the research must be connected somehow to the existing findings in the two fields that have both conceptual and applied affinity with CS – namely CDM and SRT.

Previous studies in the present research programme

The present research is the third in a series of studies focused on types of information and the decision-making processes in students' CS. A different methodological approach was used in each study. The first study (Babad, Darley, & Kaplowitz, 1999) employed content analysis of a Student Course Guide, and a subsequent correlational analysis examined the associations between types of information available to students, and subsequent end-of-course student evaluations (SRT). The second (Babad, 2001) was a field study, based on retrospective testimonials of students who described their CS deliberations. The present investigation is an experimental study involving selection of hypothetical courses in designated dilemma situations, controlling the types of information available to students and creating dilemmas by particular combinations of factors and considerations.

The first study (Babad *et al.*, 1999) analysed the types of information provided to students about each course in the famous *Princeton Course Guide* (an eagerly-awaited student-written information guidebook providing full information about Princeton University forthcoming courses in an attractive, informal, and palatable style), and examined how they predicted actual students' post-course evaluations (SRT). For each course, the guide provides a description of the instructor's expertise, personality, wit and behavioural style; the major contents and readings in the course; various course characteristics, including workload and reading load, types of assignments and exams; grading leniency; patterns of class participation and instructor-student interaction; contribution of the course to learning and thinking; information about the teaching assistants; and additional informal bits, relevant gossip and criticism. All courses offered at a given semester in the guide were content-analysed and coded into a 9-variable system that included instructor variables, course characteristics, and students' criticism.

The correlational analyses revealed systematic associations between CS types of information and actual post-course SRTs, and particularly a clear developmental trend, where certain kinds of selection considerations progressively replaced other considerations as predictors of SRTs, presumably reflecting students' changing needs. (a) In 100-level courses, SRTs were predicted from course guide descriptions of instructor's humour. (b) In 200-level courses, SRTs were predicted by descriptions of instructor's personality and expressive style. (c) In 300-level courses, lack of criticism was the major predictor of SRT, followed by interesting course and instructor's humour. (d) At 400-level courses, only academic types of CS information predicted SRTs – interesting readings, interesting course, and instructor's knowledge and expertise.

The second study (Babad, 2001) investigated the differential sets of considerations employed by students in selection of 'First' (important) and 'Last' (unimportant) elective courses. ('Elective courses' are either units chosen from a given pool of options, such as two out of eight courses in a given cluster; or courses openly selected from the offerings of an academic department for a given year or level of study. They do not include required courses that must be taken without choice, such as statistics for psychology students.) It was assumed that selection of Last Courses would involve a greater compromise, and students might utilise last choices to satisfy personal needs and/or to make their lives easier and more comfortable. The findings showed that First Courses were selected for their prospective intellectual level, expected quality of teaching, and students' potential learning, whereas Last Courses were selected because they were indeed more comfortable and easy. Thus, these results demonstrated a certain distinction between academic considerations, which seem to have played a

more central role in selection of First Courses, and more personal considerations concerning personal comfort and ease in reaction to the pressures of college life, which seem to have played a more central role in selection of Last Courses. It was also found that students were more satisfied with selection of First Courses than Last Courses. When the respondents were divided into groups of 'satisfied' and 'dissatisfied' students, comparisons of CS considerations indicated that the quality of teaching was the only dimension separating these groups for First and Last Course alike. It was suggested that selection satisfaction and post-course satisfaction (SRT) are distinct phenomena, based on different criteria.

In both 1999 and 2001 studies, the analyses made it possible to formulate a classification of CS factors. In the first study, the content analysis of the course guide descriptions yielded nine variables, all focused directly on the courses and the instructors. In the second study, a longer (22-item) questionnaire was used, adding student considerations (e.g., contribution to future occupation; day, hour and number of credits). Principal components analyses of that questionnaire for First and Last Course yielded six components:

(1) Learning Value (intellectual level, challenge, interesting topic, assignments, etc.);
(2) Good Lecturer (humour, clarity, charisma, rapport with students, etc.);
(3) Easy Course (grades, assignments, attendance, exam format, etc.);
(4) Prerequisite (relating to prior knowledge or leading to other courses);
(5) Comfortable Course (day, hour, number of credits);
(6) Famous Lecturer.

The first three components were selected from the 2001 list and adapted for the present study: Learning Value, Lecturer's Style, and Course Difficulty. Because of the experimental nature of the present study, the number of dimensions to be included had to be limited. To present two levels (low and high) for Learning Value and for Lecturer Style and three levels for Course Difficulty (easy, moderate, and hard), we needed to create 12 hypothetical courses (2x2x3=12). These three components were the most central ones in the 2001 results, and conceptual basis for their selection is presented next.

Overview of the present study, its conceptual basis and design

The present research was planned as an experimental study (within-subject design), where students are required to select five hypothetical courses out of a list of 12 course descriptions in a 2x2x3 design. Babad's (2001) study focused on (first and last) courses that had already been selected, and the respondents' task was to reconstruct retrospectively the considerations that had led to those selections. In the present experimental study, the set of considerations constituted the independent variables, and the decision to select the dependent variable. Each of the 12 course descriptions represented a particular combination of the three factors in the 2x2x3 design. Courses were characterised as yielding high or low learning value; lecturers were described as showing 'high' or 'low quality' instructional style (exciting, charismatic, humorous, etc., versus dry, inflexible, unclear, distant, etc.); and courses were described as easy, moderate, or high in level of difficulty.

Two issues must be addressed to explain the conceptual and methodological

rationale of the present study: (a) What was the purpose of the decision to conduct an experimental study and what unique knowledge was that design expected to contribute? (b) What were the reasons for concentrating on Learning Value, Lecturer's Style and Course Difficulty?

Given that CS is a sequential DM process that is influenced by a wide variety of considerations which are not necessarily consonant with each other, and given that very few selections can be perfect, it follows that students would experience dilemmas in the selection process, and would have to make decisions that would entail certain prices. When self-reported retrospective testimonials are investigated, we know the *outcome* of the process but cannot be sure how exactly the selection had been made. Furthermore, in their self-reports, students describe their selection principles in generalised terms across choices, and often they are not sufficiently informative as to how specific dilemmas were resolved. The experimental research was intended to 'construct' dilemmas in an exacting and planned manner, so that the actual selection behaviour can be carefully followed. The experiment makes it possible to control the investigated dimensions fully, and to minimise the influence of individual differences in personal and idiosyncratic considerations. The experiment focuses on a small number of central dimensions and can be designed to confront students with dilemmas varying in their intensity. Because hypothetical courses and hypothetical selections are involved and no real-life choice (with its potential 'price') is required, respondents are not under any stress of reality circumstances, and can consider and weigh the investigated dimensions in a 'clean' manner.

Because of the hypothetical nature of the experiment, it lacks in ecological validity, as it does not investigate real decisions at the time they are made and it does not include all factors that might influence a given choice. On the other hand it allows for an accurate and exacting examination of very common dilemmas under controlled conditions. We need to know about the interplay of central dimensions in CS over and above specific reality constraints, and the experimental research can provide conclusions about the optimal selections under the best possible conditions. Because the chosen dimensions are so central in any course selection, these sorts of interplay and dilemmas are probably as important and influential when further factors enter the decision-making process in actual selection.

The choice of the specific dimensions for the present study was based on the SRT literature. On the one hand, we relied on dimensions consensually held to be of central importance (learning value and lecturer style), and on the other hand we picked a dimension (workload difficulty) that is currently the focus of intense debate. In the literature on the internal structure of SRT, one extreme view considers student ratings as representing a general instructional skill (d'Apollonia & Abrami, 1997; McKeachie, 1997), whereas the opposite view (Marsh & Roche, 1997) considers SRT as multi-dimensional, representing a number of distinct, distinguishable, and fairly independent factors. The items measuring 'overall course' and 'overall instructor' evaluations may be included in specific factors (Marsh, 1984, reported overall course evaluation as falling within the learning value cluster, and the overall instructor evaluation in the 'enthusiasm' cluster), but they are consensually viewed as representing global summative evaluations of the course and the instructor. These overall evaluations seem to be used most frequently for administrative decisions of promotion, hiring and firing (see, for example, McKeachie, 1997; and the Theall & Franklin, 1990, volume). Even d'Apollonia and Abrami (1997) claimed that 'the general instructional skill was a

composite of three sub-skills: delivering instruction, facilitating interactions, and evaluating student learning' (p. 1198).

Our own analysis of the internal structure of SRT on a sample comparable to the present sample (Babad, Avni-Babad, & Rosenthal, in press) yielded four clusters:

(1) *Academic* (learning value, intellectual quality and challenge, breadth of coverage, contribution of readings, points of view, and overall course evaluation);
(2) *Instructional* (instructor's humour, enthusiasm, clear lectures and examples, and overall instructor evaluation);
(3) *Students* (questioning students and encouraging their participation, interest in students and accessibility to them);
(4) *Difficulty* (course workload and difficulty, and fairness of assignments, exams, and grading).

Thus, it is clear the Learning Value and Lecturer Style are most central dimensions of SRT. Previous research on CS (e.g., Babad *et al*., 1999) also indicated the importance of the academic-intellectual component and the expressive and instructional style of the professor as critical factors affecting students' selections.

The third dimension we chose to vary in this experiment was the controversial dimension of workload difficulty. Greenwald (1997; Greenwald & Gillmore, 1997) discussed the negative relations between course difficulty and student satisfaction, and represented numerous researchers and practitioners in delineating a tacit 'conspiracy' in which easy workload is traded off for higher student evaluations. In contrast, Marsh and Roche (2000) reported a *positive* correlation between workload difficulty and overall SRT, together with a non-linear component, whereby favourable SRTs increase as workload increases to an optimal level, then flatten out or even decline for excessive workload. Marsh and Roche argued that their study debunked the popular myth that SRTs are biased by low workload. Our recent studies on the prediction of student evaluations from brief instances of the non-verbal behaviour of professors (Babad *et al*., in press) contradicted Marsh's position. In that study, workload difficulty was negatively related to the other three SRT clusters and to the overall evaluations.

If workload difficulty plays a role in influencing students' post-course evaluations, it must be far more important in CS deliberations, often probably constituting a critical consideration for selection or non-selection. The existing CS literature reviewed above indicates that students put a high priority on seeking information about course difficulty before making CS decisions. From the findings on considerations for selecting First and Last course (Babad, 2001) it can be hypothesised that the difficulty dimension will gain importance as the selection process progresses. In selection of First courses, the academic and instructional characteristics are probably most important, but later selections involve more compromise, and students' ease and comfort gain importance. Therefore, it was quite clear that the dimension of workload difficulty must be included in this study. Furthermore, we thought that *three* levels of difficulty must be examined (easy, moderately difficult, and hard courses), whereas for Learning Value (LV) and Lecturer Style (LS) two levels (low versus high) seemed sufficient. These decisions led to a 2x2x3 experimental design, with 12 hypothetical courses representing all possible combinations of the three dimensions. (A fourth central dimension, focusing on lecturer-students relations and rapport, could unfortunately not be included. Its inclusion as a fourth factor would have increased the number of combinations to 24, and that might have hindered and clouded the analysis of students' dilemmas.)

The demand to select five courses out of a list of 12 courses seemed quite realistic, and students were expected to experience dilemmas concerning the relative utilities of particular combinations. Each course represented one of the 12 combinations in the 2x2x3 matrix, and it was assumed that one or two courses might represent 'ideal' combinations and would be selected first. Subsequently, the student must consider each combination, weigh its components, and decide which combinations are preferable for the latter choices.

The combinations among the three dimensions and the ensuing dilemmas are quite interesting. For example, if a student cares only about learning value and looks for intellectual challenge and learning gains, six of the 12 courses offer high Learning Value. If all a student cares about is having a good time and enjoying the class, six of the 12 courses offer high Lecturer Style. If all a student wants is to have easy and non-demanding courses, then four of the five choices can be easy courses, and the fifth can be of moderate difficulty. However, if a student is interested in both high Learning Value and high Lecturer Style, then only three courses in the list satisfy this requirement, one easy, one moderate, and one hard course. From these three courses, that student might choose only the first two courses and ignore the third, and would then have to select three additional courses representing other combinations. In terms of data analysis in this design, the accumulation of characteristics of all five selected courses (i.e., total sum of selections) is meaningful, but the location of each choice and the relative importance of each dimension as a function of the order of selection is also significant.

The questionnaire was filled out anonymously by the respondents in this study. However, they were asked to provide information about their age, gender, year of study, and their average grades at the university. This made it possible to also conduct an analysis of individual differences, examining the relationships between these student characteristics and their intensity of preference for Learning Value, Lecturer Style, and levels of Course Difficulty in their five choices.

Method

Participants

Participants were 1,007 advanced undergraduate students at the Hebrew University of Jerusalem. The sample consisted of 280 male and 636 female students (plus 91 students who did not specify their gender) from a variety of departments in the humanities, social sciences and natural sciences. Participants were approached individually or in small groups in various locations, and volunteered to fill out a 5-7 minute anonymous questionnaire.

Questionnaire

The one-page questionnaire was titled 'Course Selection Research'. At the top, participants were informed that this research is focused on how students choose *elective* (not required) courses, in an attempt to understand their decision-making processes. The instructions explained that this was a simulation of CS for the next semester, and respondents would have to choose courses from among 12 course descriptions written by students who took these courses last year. Respondents were

informed that the specific contents of the courses were deliberately omitted, and they should assume that each of the 12 courses was equally interesting and appealing to them in terms of its subject. Respondents were asked to read first all 12 course descriptions, and instructions for the selection task appeared on the bottom of the questionnaire. The descriptions of the 12 courses followed. Each course was described by three sentences, referring to Learning Value (low or high), Lecturer Style (low or high), and level of Course Difficulty (easy, moderate, or hard). (In several initial pilot tests, we tested the wording of the sentences in different combinations for the various courses, to ascertain relative equivalence for each level of each independent variable.) Each course was identified by a 3-digit fictional 'course number'. Two counterbalanced versions of the questionnaires were randomly distributed, with reversed order of presentation of the 12 courses. The course descriptions (somewhat abridged), their characterisation in the 2x2x3 design, and their locations in the counterbalanced questionnaires are presented in Table 1.

After reading all 12 descriptions, respondents were instructed to go through the list again, to choose five preferred courses 'for the next semester', and to write down their selections in a table at the bottom of the page. The instructions emphasised the importance of the order of selection, and therefore the selected courses had to be numbered from 1 (first) to 5 (last), leaving the remaining seven cells of the table blank. At the very bottom of the page, respondents were asked to provide information about their gender, age, year of study, major department(s), and their average grade in their undergraduate studies thus far.

Results

Initial methodological considerations

First, the results of the two counterbalanced questionnaires were compared to determine if order of presentation affected results. All comparisons yielded almost identical results, and therefore the two questionnaires were combined for all subsequent analyses.

We decided to present the results in the simplest descriptive terms. The central analysis focused on the sequential nature of students' decisions, examining what was selected first and what was selected later, in an attempt to reach conclusions about ideal first courses and the types of subsequent compromises made by students in the dilemma situations. A second type of analysis (actually presented first) examined the sum totals of all five decisions combined, ignoring the sequential decisions, to reach conclusions about the overall relative preferences for the three CS dimensions. A third type of analysis focused on individual differences, examining correlations of age, gender, year of study and average grades with overall preference for each of the three CS dimensions.

Overall preferences for Learning Value, Lecturer's Style, and Course Difficulty

To examine the overall preferences of the 1,007 respondents for each CS dimension, the frequencies of selection for each level of the three dimensions, in all five choices combined, were counted and transformed into simple proportions of the possible number of selections. The results are presented in Table 2. The highest preference was

Table 1. Course descriptions and characteristics in the 2x2x3 design, in descending order of eventual selection

Course #	Order In Quest.	Course Description (abridged)	Learning Value (1,2)	Lecturer Style (1,2)	Diffic. Level (1,2,3)
109	10,3	Original material, taught from a new angle, intellectually challenging & interesting course. Lecturer nice, pleasant, smiles, good atmosphere. One of the easiest courses I took.	2	2	1
272	5,8	Charismatic, energetic & confident lecturer. Combination of lectures and readings led to deep understanding. Work required was just right - not too much and not too little.	2	2	2
987	4,9	The lecturer's style was dry and monotonous, but he did challenge us intellectually and evoke thought and learning. You can pass this class with a moderate investment of effort.	2	1	2
181	1,12	Lecturer has world reputation and the lectures proved it. He is open and enthusiastic. Requirements include much reading, comprehensive assignment every fortnight, & 2 exams.	2	2	3
556	9,4	The lectures were exciting & humorous, but lectures-readings combination was not good and hindered learning. Requirements in this class were minimal.	1	2	1
766	11,2	Lectures were dry, pity it was scheduled in mid-afternoon, but nevertheless I learned a whole lot. You can pass this class with a minimal investment of effort.	2	1	1
189	2,11	Lectures and readings were OK, but did not give me new ideas. Lecturer serious, dry & humourless. The course is easy and does not require much work.	1	1	1
269	12,1	Lecturer's style exciting, even a dull topic becomes interesting, but I did not derive much learning. The readings & assignments require very considerable work every week.	1	2	3
126	7,6	Lecturer known & liked, students flock, but frankly the course did not contribute much to my learning. We had to work 2-3 hours every week on the assignments.	1	2	2
901	6,7	Lecturer known as dry & inflexible, therefore low attendance. Lectures were deep & comprehensive, contributed to much learning. Relative to other courses, a lot of work required.	2	1	3
569	3,10	Lecturer was not very open, atmosphere of distance in class. The intellectual level of the course was quite mediocre. Many assignments, a lot of work required in this class.	1	1	3
399	8,5	The lecturer was quite sleepy and slow. Materials learned in a dry and schematic manner and I often failed to really grasp the issues. Workload was average.	1	1	2

Table 2. Proportions of selections of all respondents in all five choices combined, by levels of Learning Value (low vs. high), Lecturer Style (low vs. high), and Course Difficulty Level (easy, moderate, high)

	Learning Value		Lecturer's Style		Course Difficulty Level		
Total Number of Possible Selections	Total *N*=5,035 (5 X 1,007 Respondents)		Total *N*=5,035 (5 X 1,007 Respondents)		Total *N*=4,028 (4 X 1,007 Respondents)		
Level	Low	High	Low	High	Easy	Moderate	Hard
Number of Selections Made	1410	3625	1712	3323	2215	1813	1007
Proportion of Selections	28%	72%	34%	66%	55%	45%	25%*

* For Learning Value and Lecturer Style, six courses were available for selection in each level (low or high). For Course Difficulty, only four courses were available for selection in each level (easy, moderate, or hard), and therefore the total number of possible choices was 4,028 (4 x 1007). Consequently, the proportions of selection for Course Difficulty amount to 125% for all choices of all respondents.

found for high Learning Value – 72% of all choices involved courses described as having high Learning Value, and only 28% of the selected courses were of low Learning Value. Preference for high Lecturer's Style was almost as high – two-thirds of all choices were courses high in evaluation of lecturer style, and only 34% of the choices involved courses with dry, monotonous, inflexible or distant lecturers. Thus, respondents valued very much both Learning Value and Lecturer Style in their CS, with a slight priority of Learning Value over Lecturer Style. For the third dimension, Course Difficulty, the picture in Table 2 was also very clear. Over half (55%) of the possible 4,028 selections were preferences for easy courses, 45% were preferences for moderate difficulty courses, and hard courses were selected only in a quarter of the possible selections. (The responses amounted to 125% because respondents made *five* choices, whereas there were only four courses offered at each level of difficulty.) Thus, respondents showed a strong preference for easy (and moderate difficulty) courses, and a clear dislike for hard courses. Students' avoidance of hard courses accounts for the fact that preference for high Learning Value or high Lecturer Style did not reach the highest potential value (that is, *all* five selections being of high Learning Value or of high Lecturer Style).

Sequential CS: Ideal and rejected courses, and two levels of compromise

Table 3 presents overall selection proportions and selection by order of choice for each of the 12 courses, in descending order, from the most popular to the least popular course. A glance at the column in Table 3 presenting the overall proportions for all five choices combined leads to a rough division of the 12 courses into four categories: 'Ideal courses' (1^{st} and 2^{nd}) at the top, selected by 88-90%; 'Rejected courses' (11^{th} and 12^{th}) at the bottom, selected by 4%; and two levels of compromise between these extremes – more favourable compromises in the 3^{rd} to the 6^{th} course (selected by 48%-64%), and less favourable compromises in the 7^{th} to the 10^{th} course (selected by less than one third of the respondents in any of their five choices).

The first two courses (#109 and #272) were 'ideal' courses in the sense that almost everybody selected them (90% and 88%). They were selected most often as the first (46%+28%=74%) or second (21%+32%=53%) choices. Both courses (characterised as [2-

Table 3. Proportions of selection for all five courses combined and for first, second, third, fourth and fifth course, by 1,007 respondents

Course #	Course Characteristics			Proportion of Selection In All 5 Courses Combined	Proportion of Selection in First to Fifth Course				
	Learning Value (1,2)	Lecturer Style (1,2)	Diffic. Level (1,2,3)	(*N*=1,007 Respondents)	First Course	Second Course	Third Course	Fourth Course	Fifth Course
109	2	2	1	90%	46%	21%	12%	7%	4%
272	2	2	2	88%	28%	32%	12%	10%	6%
987	2	1	2	64%	4%	10%	21%	16%	14%
181	2	2	3	52%	8%	9%	12%	10%	12%
556	1	2	1	49%	4%	9%	12%	12%	13%
766	2	1	1	48%	3%	6%	11%	13%	15%
189	1	1	1	32%	2%	3%	6%	10%	11%
269	1	2	3	28%	3%	4%	5%	7%	9%
126	1	2	2	26%	1%	3%	5%	9%	8%
901	2	1	3	17%	1%	3%	3%	4%	6%
569	1	1	3	4%	0%	0%	1%	1%	2%
399	1	1	2	4%	0%	0%	0%	2%	1%

2-1] and [2-2-2] in the 2x2x3 design) were described as having wonderful and enjoyable instructors, as providing much learning, intellectual challenge and understanding, and as not demanding too much work. Giving these courses a high priority seems very rational – you will have a good time and enjoy class, you will learn a lot, and yet you will not have to exert yourself. Given the overall tendency to avoid hard work (Table 2), these courses must have been really ideal, and it seems strange that a small minority of respondents neglected to select them.

The rejected courses at the bottom (#569 and #399) constituted the 'mirror image' of the ideal courses on the negative side. Indeed very few students selected them (4% each), and never (or almost never) as the first (0%), second (0%) or third (1%) choices. These courses were characterised as [1-1-3] and [1-1-2] in the 2x2x3 design, which means that the lecturers were not very good, the courses did not provide much learning, but nevertheless more (or much) work was demanded. This non-selection seems as rational as the selection of the first two courses at the top of the list.

The more favourable compromises are represented in Table 3 by the 3rd –6th courses (#987, #181, #556, and #766), selected by 64%-48% of the respondents. The characteristics of these four courses in the 2x2x3 design were, respectively: [2-1-2], [2-2-3], [1-2-1], and [2-1-1]. The summary of preferences versus compromises in these

four courses is as follows: students continued to avoid hard courses (selecting two easy courses, one moderate course, and one hard course); they tried to maintain high Learning Value (in three out of the four choices); and compromised on Lecturer Style (choosing two high and two low courses).

In this category of the more favourable compromises, the fourth group (those selecting course #181, characterised as [2x2x3]) is noteworthy. This group represents an interesting deviation for first choice selections (8%, compared to 4% or less for the other choices). The 'compromise' in this case was ideal as far as the academic institution and its learning objectives are concerned: in order to have an academically good course with a good instructor, students were willing to work hard and invest more effort!

The less favourable compromises (7^{th}–10^{th} choices in Table 3) were selected by 32%-17% of the respondents. These courses were characterised in the 2x2x3 design as [1-1-1], [1-2-3], [1-2-2], and [2-1-3], respectively. The summary of preferences versus compromises in this, less popular group of courses, illuminates the nature of the second-level compromises: students now compromised on Learning Value (three of the four courses low and only one high in Learning Value); they continued to compromise on Lecturer Style (two low and two high courses); and were more willing to select hard courses as well, given that they will have either a good instructor or high Learning Value (selecting two hard courses, one moderate course, and one easy course). Still, work avoidance was the salient characteristic: the highest course in this group (# 189, selected by 32% of the respondents, [1-1-1]) was a bad course in terms of Lecturer Style and Learning Value, but it had minimal requirements.

Together, the patterns of the combinations of the three CS dimensions (as represented by the characterisations of the different courses) reinforce the conclusions reached from Table 2 about each dimension separately. On the one hand, students showed preference for high Learning Value and attempted to minimise compromise pertaining to this dimension and, on the other hand, students tried as much as they could to avoid hard and demanding courses. The shifts in the transitions from course to course in Table 3 reflect the two aspects of this process in a gradual way.

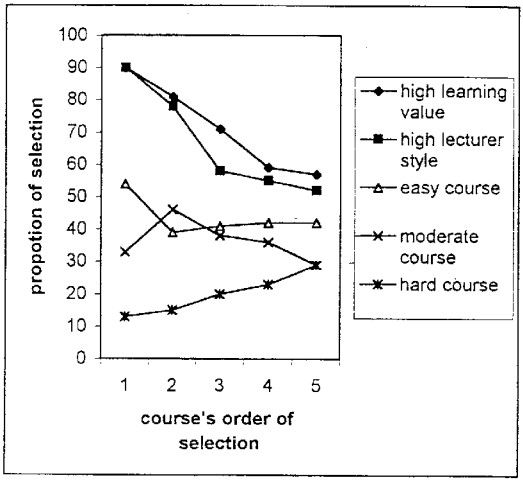

Figure 1. Proportions of selection of first to fifth course for high Learning Value, high Lecturer Style, and for easy, moderate, and hard Course Difficulty

Figure 1 represents these patterns in yet another way. Here, the proportions of selection are presented separately for each of the three CS dimensions as a function of the order of choice. One can see the distinct patterns for high Learning Value, for high Lecturer Style, and for the three levels of Course Difficulty in the transitions from 1st to 5th choices. The figure demonstrates the general preference for easy courses, for high Learning Value, and for high Lecturer Style in the first choice, and the declines (i.e., compromises) in the following choices. The figure also shows the priority of Learning Value over Lecturer Style by the stronger compromise/decline for Lecturer Style. With regard to Course Difficulty, the figure reflects very clearly students' obstinacy in refraining from taking hard courses. The gradual increase in the selection of hard courses from 1st to 5th choice seems to indicate that students might have felt forced to take hard courses because the easy courses were simply of very bad quality.

Individual differences in preferences for Learning Value, Lecturer Style, and Course Difficulty

As mentioned, although the questionnaires were filled out anonymously, students were asked to report their age, gender, field(s) of study and average grades at the university. To conduct a correlational analysis between CS preferences and these characteristics, each respondent's five choices were converted into scores summing their preference for high Learning Value (range 0-5), for high Lecturer Style (0-5), and for more difficult courses (0-4). Correlations of students' age and average self-reported academic grades with the three CS dimensions are presented in Table 4.

Table 4. Pearson correlations between course selection variables (Learning Value, Lecturer's Style, and Course Difficulty) and students' age and average grades

Course Selection Variable	Students' Age	Students' Grades
Learning Value	.092 **	.163 ***
Lecturer's Style	.096 **	.038
Course Difficulty	.069 *	.109 ***

*$p < .05$; **$p < .01$; ***$p < .001$

Five of the six correlations in Table 4 were statistically significant, and the correlations with average grades were highly significant ($p<.001$). Thus, the hypothetical selection process in this experiment was conducted differentially as a function of respondents' age and academic standing, with older students and high achieving students responding differently from younger and lower achieving students. It is granted that these correlations are not very high. However, the statistical significance indicates the existence of a non-random relationship between student characteristics and the patterns of course selection. Given that CS in this experimental situation was hypothetical rather than real, these significant correlations with actual age and academic status lend to the validity of the results.

Older students gave higher preference than younger students to high Learning Value ($r=.092$, $p<.01$) and to high Lecturer Style ($r=.096$, $p<.01$), and selected harder, more difficult courses ($r=.069$, $p<.05$). These correlations are quite low, but their statistical

significance attests to their reliability. The correlations with students' self-reported average grades were also quite interesting: high achieving students showed stronger preference than low achieving students for high Learning Value (r=.163, p<.001) and selected more difficult courses (r=.109, p<.001).

One can make a value judgment and assume that selecting more difficult courses and courses with higher Learning Value represents 'studentship' of higher quality. In that case, the significant (albeit low) correlations gave a certain indication that older students and more highly achieving students demonstrated such higher quality of studentship. These students seem to be willing to work harder and to appreciate more the learning that can be attained at the university.

Results pertaining to students' gender were less clear. As is typical in Israeli undergraduate education, male students in the present sample were older than female students (mean ages of 24.8 and 23.6, respectively). This difference is due to the differential duration of the military service for men and women, plus the fact that more women do not serve in the military at all. (Readers may wonder about the 'old' age of Israeli advanced undergraduates. The fact is that substantial proportions of Israeli youngsters take a long trip to Eastern Asia or South America after their military service and prior to starting their college education. An anonymous reviewer of this paper pointed out that the relatively old ages of the Israeli students in this sample may indicate a problem for generalisation of these findings to 18-20 year-olds in other countries, if a general developmental/maturity factor is involved. Future research may possibly illuminate this possibility.) The t tests comparing preferences of male and female respondents for the three CS dimensions yielded a significant difference only for Course Difficulty, men selecting more difficult courses than women (t=3.22, p<.001). No differences were found for Learning Value and Lecturer Style. However, given the significant correlation between age and selection of harder courses, and given the age difference between the male and female students, it is quite likely that the significant t test for Course Difficulty may not reflect a 'clean' and meaningful 'gender difference', and age might have moderated the gender-related finding.

Analyses of patterns of selection as a function of students' major fields of study were complicated by the fact that most Israeli students have a double major, so that they may belong in two faculties, such as humanities and social sciences, or social and natural sciences. For those respondents who clearly belonged within one domain (humanities, social sciences, behavioural sciences, natural sciences), correlations computed separately for each domain showed no differential patterns. The only finding to mention is that, for the 212 students who were strictly in the humanities, the correlation between average grades and preference for harder courses (r=.24, p<.001) was higher than the correlation reported earlier for the entire sample. Perhaps the major departments in the faculty of humanities differ from their sister departments in the social and natural sciences in offering more elective courses, and therefore in the humanities the association between being a better student and selecting more difficult courses is stronger.

Discussion

The data in this experimental study were examined in various ways, and the results were consistent across all methods. We analysed the totals of all five choices, of every choice alone, and also examined the sequential nature of students' choices. We looked

at each of the three CS dimensions separately, but also scrutinised the specific combinations of the three dimensions represented by each of the 12 courses.

The results showed that in this hypothetical choice situation students chose to avoid hard work, giving strong preference to easy and moderately difficult courses. The results also showed that students gave high importance and were least willing to compromise in their CS to attaining high Learning Value. High Lecturer Style and its resultant enjoyment of the course was also of high importance in selection considerations, with only a slightly lower priority than high Learning Value, and a bit more willingness to compromise on Lecturer Style in dilemma situations.

In line with the previous study (Babad, 2001), the findings illuminated clear differences between first (important) and last (unimportant) choices. Compared to early choices, later choices seem to be influenced by different sorts of considerations. They are dictated – in this experiment and probably in real-life situations as well – by the changing composition and weighting of options after important courses had been selected. The fact that this study involved five sequential choices (unlike the discrete 'first' and 'last' of the previous, 2001 study) made it possible to follow through the sequential process in a continuous way. This enabled us to examine the accumulation of compromises students made when facing the dilemmas caused by the experimental design. Of the 12 courses offered, the first two (most highly selected) were 'ideal courses' in terms of satisfying students' needs (i.e., low workload, high learning, and exciting teaching). The next group of four courses represented easier and more favourable compromises, followed by a second group of four courses representing harder and less favourable compromises. In the first of these two groups, students could maintain their primary criteria and compromise on one dimension only. In the second group, either the main criterion was compromised, and/or two compromises were required. The last two of the 12 courses presented very bad combinations and they were simply ignored.

The correlational analysis illuminated individual differences among students in the intensity of their preferences for the three CS dimensions. Modest but statistically significant correlations indicated that students with higher academic standing in the university (higher grades) demonstrated a stronger preference for high Learning Value and slightly more willingness to select harder courses. Older students showed a stronger preference for high Learning Value, higher Lecturer Style, and for selecting harder courses.

This study was designed as a controlled experiment, and it examined and compared the three CS dimensions in designated dilemmas via hypothetical selections, not influenced by personal reality pressures which usually burden the student (scheduling, time pressures, social needs, previous grades and academic history, various requirements, etc.). But the findings on the associations between age and academic standing (and to a lesser extent, gender) and the CS dimensions related this hypothetical experiment to reality. Indeed these particular findings were not remarkable and involved modest effect magnitudes, but they were statistically significant and consistent. The very existence of an association between actual students' academic standing and the nature of their selection in a hypothetical, virtual choice situation adds to the ecological validity of this research.

What are the limitations of the study? As mentioned earlier, the decision to use an experimental within-subjects design made it possible to control the CS dimensions as independent variables, and to assess accurately how different combinations of CS considerations influence students' order of selection and how they behave in structured

dilemma situations. That kind of precision is not attainable in field studies. However, the courses were hypothetical, many types of institutional information, and certainly personal and contextual considerations involved in real-life selection were missing, and students were not accountable for the real consequences of their decisions. The Learning Value dimension, for example, covered one aspect of the intellectual quality of university courses, but lacked another important aspect of Learning Value, namely, the intensity of the student's interest in the subject matter of the course. Students' personal interest in the content cannot be controlled in an experimental study, and we simply instructed participants to treat all 12 courses as if they were equally interesting and appealing to them in terms of their contents.

Given these limitations, the results must be considered as representing 'ideal' CS under minimal reality constraints. In real life, numerous factors and considerations influence selection, chipping into the important Learning Value and Lecturer Style dimensions. On the other hand, the hypothetical nature of the present situation adds credibility to the findings indicating students' avoidance of hard courses. Not being held accountable for their choices, respondents could have presented themselves in a more positive and socially desirable light by putting on a 'show', how 'bravely' they select hypothetical hard and demanding courses, and yet they avoided the hard courses as much as they could. Thus, the strong and systematic findings on Course Difficulty (plus the weaker correlational findings on academic standing) rule out the possibility of accounting for the results by a social desirability effect. The socially desirable choice behaviour would have been to tackle and be challenged by hard courses rather than avoiding them altogether!

The findings can potentially contribute to the conceptualisation of the dimensions influencing students' CS and subsequent satisfaction (SRT) and the interplay between CS and SRT. The importance and centrality of the Learning Value and Lecturer Style in the SRT literature were discussed earlier. The current findings on these dimensions in initial selection were well in line with the SRT literature, demonstrating their importance in initial selection. This consonance is important to note, even though these findings were not surprising and did not spark new ideas.

The findings on Course Difficulty are more thought-provoking because of their relevance to the current debate on the relations between workload difficulty and other SRT dimensions in the SRT literature. As mentioned earlier, Marsh and Roche (2000) argued strongly for the existence of a positive relation between workload difficulty and other SRT factors, claiming that the linear positive trend is interrupted only in the case of extreme difficulty. They stated that they 'had debunked the popular myth' on the negative relation between workload difficulty and SRT. Our impression is that the 'myth' is very much alive, commonly held by many, if not most, faculty members, who believe that if everything else is held equal, an increase in workload difficulty will cause a reduction in the positivity of their student evaluations. Greenwald (1997; Greenwald & Gillmore, 1997) also disagreed with Marsh and Roche, and in our recent study on 67 courses and close to 2,000 students in Israel in a sample equivalent to the sample of the present study (Babad *et al.*, in press), we found a negative relation between workload difficulty and all other SRT dimensions.

The role of Course Difficulty in CS can illuminate the status of workload difficulty in subsequent SRT, but the relations between course selection and course evaluation have not been investigated as yet. Although positive associations must be expected (that is, students will tend to select courses that they will appreciate and evaluate positively), no one-to-one relationships can be posited. Students may avoid courses that might

nevertheless be highly rated by those enrolling in them, and they may also prefer, for various reasons, to select courses that would not be rated highly. Course Difficulty is a dimension that can be expected to break the smooth association between selection considerations and post-course satisfaction. We found here that students may avoid selecting hard courses that are excellent in terms of Learning Value and Lecturer Style, courses that may well receive high ratings from the students enrolling in them. We also found that students may select easy courses in spite of their deficiencies in intellectual level and/or teaching quality.

If our findings on the avoidance of difficult courses are generalisable beyond the context of the Israeli university (as we believe), these findings would force researchers to reconsider their view about the relation between workload difficulty and SRT, because only a non-random sample of students would evaluate the difficult courses. The population of students filling out SRT questionnaires in elective hard courses would then be non-equivalent to the population filling out questionnaires in elective easy courses, and both groups would differ from the population of students evaluating required, non-elective courses. Such lack of equivalence in student populations might bias and contaminate the research on post-course SRT. Thus, more research on the relations between course selection and course evaluation is needed.

Finally, the applied implications of the present results must be considered. The central issue concerns the status of the three dimensions investigated here in real-life collegiate CS. The present study, as well as previous investigations, commonsense wisdom, and the SRT literature, emphasise the importance of learning value, instructors' expressive style, and course difficulty as critical dimensions of CS. Thus, the emergent questions are to what extent students can gain access to useful information about these dimensions, and what are the sources most likely to provide these types of information. It seems that, in most institutions, formal and credible information about these dimensions is not readily available to students.

The most common institutional source of information, in the form of course descriptions, usually focuses on course content: subject matter, topics and sub-topics, major readings, etc. That can be valuable in allowing students to check how a given course fits their academic interests. However, learning value in the connotation investigated here (i.e., the intellectual level of the course and the quality of learning) cannot really be known from such public information, nor can lecturers' personal characteristics and expressive style be deduced from it. The details about the prospective assignments in course descriptions can give a hint about level of course difficulty, but that information is not sufficiently reliable and might be misleading.

Some institutions make the empirical information of past SRT available to all students. SRT feedback information is far more comprehensive and certainly more reliable, especially if results of *all* items in the SRT questionnaires are made public. However, many institutions are wary and keep SRT information confidential (and this issue has many pros and cons of theoretical, ethical, and practical nature), at best publicising only the identities of the most excellent teachers. In addition, it turns out, from both published studies (e.g., Borgida, 1978; Borgida & Nisbett, 1977; Dellar, 1994; Warton & Cooney, 1997) and from numerous informal sources, that students seem to shy away from making use of empirical-statistical SRT feedback information even when it is made available to them. Students seem to prefer vivid, face-to-face informal gossip from peers and acquaintances, even if it is less credible, less reliable, and partial (in both meanings of the word!).

Because some of the important types of information cannot be disseminated

institutionally through formal channels, student bodies and informal groups in various institutions take it upon themselves to publish student course guides that will provide ample information about learning value, lecturer's style, level of difficulty and other CS dimensions in an attractive, palatable style (see Babad *et al*., 1999). It might be interesting to investigate in future research whether the use of such informal course guides increases students' satisfaction with their CS and decreases course dropping and disappointment.

Future research must thoroughly examine the sources of students' dissatisfaction, focusing on selection versus non-selection during CS periods, and on failures in selection as evidenced by changed courses during drop-and-add periods a few weeks into each term. Examination of dropped courses must include both types of CS considerations discussed earlier: academic considerations focused on course and instructor characteristics and personal/contextual considerations of the selecting student. 'Failure' in selection means that students are dissatisfied with their selection (for whatever reason) and wish to drop these courses altogether. Such future research will have to scrutinise all considerations as they had influenced the initial decision to take the course, and subsequently to identify the exact source(s) of the failed decision. Another direction of more applied research should examine potential interventions intended to make students' CS more effective. Such interventions should deviate from past trends that were focused on the dissemination of more course information, into the decision-making area – developing means of training students to make more effective use of (all types of relevant) information by employing more systematic, rational, and explicit strategies of decision making.

Acknowledgement

The authors thank Yifat Doga for her devoted help and assistance.

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Received 6 December, 2000; revised version received 16 September, 2002