Behavioral Dynamics in Transitions from College to the Workforce*

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Abstract

We study the effect of major changes over the life-cycle on the economic decision making of college students by examining their transition from college to the labor market. We follow students in a Colombian university longitudinally and compare those in their last semester in college (i.e. those who are searching for jobs) to students in previous semesters (i.e. those who are involved in day-to-day college life) across three main stages: job search, receiving and accepting a job offer, and receiving a paycheck. Conditional random assignment is achieved based on quarter of birth as slightly older students are more likely to be on the job market. By matching students on the job-market to lower year students, we use a difference-in-differences set up to show that receiving a job-offer alone has a significant effect on experimentally-measured economic decision-making tasks despite this being an expected outcome of graduating from this university. This does not reflect an easing of liquidity constraints because students have not yet received any paychecks. Relative to comparison students, those who receive a job offer become less present biased, perceive less liquidity constraints, start saving more and donate more to others. Importantly, they also report feeling less frustrated, depressed, worried and tired than students in the comparison group which suggests a psychological effect associated with the resolution of uncertainty despite attaining a job being an expected outcome. However, consistent with their added responsibilities by the time they earn a salary, they have increased household expenditures and a lot of these effects at the job offer stage dissipate by the time they receive their first paycheck. We find evidence that performance in cognitive tasks becomes differentially worse for students who transitioned to the labor market which suggests a greater cognitive load associated with becoming independent and earning money.

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1 Introduction

If individuals make decisions differently along the different phases of the life cycle, and in particular, if they engage in counterproductive decision-making in some of those phases, there may be room for policies to help them avoid costly mistakes. This motivates the literature studying how risk, time and social preferences measured through experimental games and survey measures change over time or in response to macroeconomic or idiosyncratic shocks (see Chuang & Schechter, 2015, for a survey). Even though economic models take preferences as given, there may be variation associated with age, cognitive ability and other individual characteristics (Benjamin et al., 2013), or with changes in the environment people face (Malmendier & Nagel, 2011; Nguyen, 2011; Beauchamp et al., 2012; Krupka & Stephens, 2013).

This paper studies the transition from being a student to working full-time and how decision-making, performance in cognitive tests, and self-reported feelings about one's financial situation and phychological measures change along this transition. Even though this is an important transition in the lives of many people, the changes it involves have not been sufficiently studied in the economics literature.[1] Economic theory predicts that students' behavior should not change when transitioning from being a student to a working person because they should incorporate all future income streams into their decisions before graduating and are, therefore, expected to dissave in order to smooth their life-time consumption. Empirical tests of the permanent income hypothesis (PIH), however, show that it fails when analyzing income shocks from tax refunds (Shapiro & Slemrod, 1995) and from receipt of income (Stephens, 2003). Even though we are not directly testing the PIH in this paper, these findings provide evidence that people do not completely smooth consumption and may also change behavior in settings like ours. In fact, the uncertainty around the specifics of a job, rather than whether they will get one or not are important enough to affect decision making, but this remains an understudied aspect of uncertainty.

A unique feature of our study is being able to measure the effect of receiving a job offer, before being paid. While in college, students cannot completely smooth their consumption in the presence of liquidity constraints, they also face uncertainty about what kind of job they will get and their starting salary. In our sample, at baseline, only 6 percent of students

[1] Gustman and Stafford (1972) study consumption changes among graduate students

have a credit card with a limit larger than US$1,000, and 10 percent have loans of US$5,000 or more. What is surprising in this context is that despite these credit and liquidity constraints, it is the mere resolution about the details of a future job that are sufficient to cause real changes in behavior.

To measure changes in decision making, we compare experimentally-measured economic decision-making tasks for students on the job market versus students in lower years across three main stages: job search (baseline), receiving and accepting a job offer, and receiving the first paycheck. We compare the second and third stages to the first to provide evidence on changes in decision making along these two important stages of the transition to the labor market. Our identification strategy uses the fact that students on the job market are likely to be slightly older than those who are not for reasons that are unrelated to their performance on economic decision making tasks. We hypothesize that the conditional random assignment into quarter of birth results in a student being in the last semester or the comparison group. Our experimental measures include risk aversion (Eckel & Grossman, 2002; T. Tanaka, Camerer, & Nguyen, 2010), time preferences (Andreoni & Sprenger, 2012), ambiguity aversion (Y. Tanaka et al., 2014), cognitive measures (IQ test, cognitive reflection test, numerical Stroop task, Flanker task), and social preferences (dictator and ultimatum games). We also measure perceived financial situation and emotions through survey questions.

Our sample consists of students in a prestigious university in Colombia who are very likely to experience the college-to-labor-market transition, as their chances of finding a job soon after graduation are high. Specifically, we compare students in their last semester in college (i.e. those who are searching for jobs) to similar students in previous semesters (i.e. those who are involved in day-to-day college life). We pick comparison students to closely match the gender, major-choice and economic background of last-semester students to most accurately mimic what would have happened to last-semester students had they not finished college. With this comparison group, we perform a difference-in-differences (DID) analyses of risk, time and social preferences, performance in cognitive tests, perceived financial situation, and psychological factors. We also provide evidence of the stability of these outcomes across time from within-person analyses.

We find significant effects on decision making both in the after-offer and after-paycheck

stages among last-semester students who transition to the labor market. What is striking is the strong series of effects observed when these students merely receive a job offer - they become less present-biased, perceive less hardship in raising funds for emergencies, become more altruistic and scale up both their spending in rent and groceries and their savings. This demonstrates how important resolving uncertainty around the details of an otherwise almost guaranteed event can be in affecting decision making.

This study also highlights how crucial self-reported emotion measurements can be. Students report feeling less tired, frustrated, depressed and worried when they receive their job offers. In fact, not controlling for these phychological factors can lead to erroneous conclusions about some of their economic decision making behavior. For instance, last-semester students appear to become less risk averse when they get a job offer, but this effect disappears after controlling for these psychological factors. The results on time preferences, on the other hand remain quite robust to controlling for these variables.

The fact that we observe these results demonstrates how the behavior of these students while in university, where they live quite frugally, is not only constrained by liquidity and credit constraints. This is evidence that uncertainty about the future is important in determining behavior. Once these students receive a paycheck, their behavior further changes. They perform worse on cognitive tasks relative to students in the comparison group. After being paid, these students might have to undertake greater responsibilities and may have more variables to consider, causing a greater cognitive load (Mullainathan & Shafir, 2013). Indeed, the share of their monthly income spent on groceries and savings goes up as early as the job offer stage lending credence to their added responsibilities. The feelings of less worry, tiredness, depression and frustration as well as the observed changes in preferences dissipate by the time they start getting paid.

We contribute to the literature studying changes in decision making along the life cycle and to the literature studying the stability of preferences by highlighting the implications of uncertainty and psychological factors in experimentally-elicited preferences. Experimental measures of risk, time and social preferences are used extensively in experimental economics and are increasingly being added to large-scale national surveys. Hence, it is important to understand how factors, internal and external to individuals, can affect their behavior in these tasks. Moreover, if measures of preferences elicited in the lab relate to behavior in real

life, our findings suggest that when people resolve uncertainty about big life-cycle events, they are in a better position to make important decisions given that they would care more about the future, are more generous and are in a better psychological state. In the particular context that we study, after receiving a job offer is usually when people choose health and pension plans. A policy implication of this study is that major decisions such as the details of such plans may be best dealt with right after receiving a job offer. This is the period we identify as when people are most forward thinking, report less worry and tiredness and are most altruistic.

Our study compares favorably to other papers in the literature in terms of sample size, breadth of measures analyzed, and low attrition that is not systematically correlated with covariates or outcomes at baseline. Furthermore, the characteristics of our sample guarantee a large degree of homogeneity in terms of baseline cognition and education level. Because in this study we try to have individuals as similar as possible at baseline, this element constitutes an advantage over other studies because it is less likely that results are driven by correlation between cognitive ability and choices in the tasks (Benjamin, Brown, & Shapiro, 2013; Choi, Kariv, Müller, & Silverman, 2014).

The rest of this paper is organized as follows: Section 2 presents the background of our setting and the research design. Section 3 presents details about data collection and the experimental measures we use. Section 4 discusses the difference-in-differences results. Section 5 concludes.

2 Background and research design

We study one of the most important transitions in life, i.e. from college to the labor market and how economic decision making changes along this period. Our setting involves students at a large public university in Colombia recruited primarily from the Engineering Deparment. In general, students from this university and engineering students specifically have very good prospects in the Colombian labor market given the academic quality and prestige of the university they attend.

A unique feature of this university is that admissions are solely determined by an admissions exam. About 40,000 to 60,000 applicants take the entrance exam every semester

for admission to the Bogota Campus. The number of slots varies every semester but is usually around 2,000. Hence, the university admits the students who are at the very top of the admission score distribution. The admissions process guarantees that we will have students with similar cognitive ability so, our results will presumably not be affected by big differences in cognition or level of education. Indeed, this assumption bears out in the data where we observe parallel trends in the cognitive performance of last-semester students and their counterparts in lower years.

We use the fact that students in their last semester of college will experience a series of changes in their transition from college to the labor market. First, they will receive job offers that, once accepted, will resolve the uncertainty they may have regarding when and what kind of job they will secure and how much they will be paid. Second, once they start in the new job, they will receive a salary which will help them them ease their liquidity constraint. To construct an appropriate comparison group to have a benchmark to analyze the changes observed for students transitioning to the labor market, we use the fact that students in earlier semesters are very similar to last-semester students. Besides age and variables that are naturally different when one is farther along in college, we expect that students about to graduate and in other semesters are similar in most observable and unobservable characteristics. Our group of comparison students is selected to closely match the last-semester students on gender, major and economic background. In section 3 we provide evidence of similarities in characteristics we collected. Hence, we divide students in two groups: those who are about to graduate and will experience the transition within the next semester, and those who will remain in college for the duration of the study. We differentiate between the two groups by calling them "last-semester students" and "comparison", respectively and find balance across the groups on all of the relevant characteristics.

A particular feature of this context is that, in general, students cannot perfectly smooth consumption by taking loans that will help them keep their standard of living constant before and after graduating from college. In our sample, only 6 percent of students have credit cards with a credit limit above $1,000 (the equivalent of about 1.5 times the expected salary in their first job after graduation) and about 10 percent have loans over $5,000 at baseline.

The different stages in the research design are summarized in Table 1. By observing behavior from the second and third stages relative to the first we provide evidence on how

our outcomes of interest change across these important stages of the college to labor-market transition. Even though stage 2 is associated with the resolution of uncertainty, and stage 3 with easing of the liquidity constraint on economic decision-making, there may be other changes as students gradually become more independent.

Table 1: Summary of research design

	Round 1 **Job search**	Round 2 **After job offer**	Round 3 **After pay**
Last-semester students	Send resumes, job interviews	Receive and accept offer	Cash on hand
Other students	Normal student life		
Timeline	April - May, 2016	October, 2016	December, 2016

The relevant timeline for our design is as follows. The two semesters in the academic year go from February to May and August to November. Graduation ceremonies take place in March and August. About half of our participants are in their last semester of college in the February to May semester and hence graduate in August. Students in their last semester of college typically work on a thesis, do an internship which may turn into a contract job after graduation or already have a job in an area related to their major. If they have already secured a job, the expectation is that their salary will increase when they graduate. Simultaneaously, they may look for other college-graduate jobs.

3 Data and experimental tasks

We collected data from five waves of surveys taking place at the recruitment stage and at three points in time according to Table 1: (i) Sign-up survey; (ii) Two surveys at baseline (during the last semester before graduation of last-semester students); (ii) One survey approximately after receiving and accepting a job offer[2]; (iii) One survey approximately after

[2]Notice that the timing of this survey does not coincide with graduation in August. Because all surveys were conducted either well before or well after graduation, we do not think that our results are driven by

starting in the new job and receiving at least one paycheck. Participants responded to all surveys online on roughly the same dates between April, and December, 2016. All surveys except the sign-up questionnaire contained the same tasks, although in cognitive tests we varied the questions or worded them differently every time to reduce the role of memory in answering these questions. For other tasks, remembering would be harder because each task involved many choices.

3.1 Recruitment

The Engineering College at this university agreed to send an email inviting engineering students to participate in a research study about economic decision making. Students signed up in April, 2016 using an online form with questions about demographics, major, current semester in the major, GPA, tuition, socio-economic measures at the household level, whether they work, and perceived probability of finding a job between April and October, 2016 for those who plan to graduate in August. Students in undergraduate as well as master's programs were allowed to sign up.

Among students in their last semester and in other semesters, 767 signed up to participate in the study. Since we wanted similar numbers of last-semester students and students in other semesters to maximize power, we selected students in lower semesters to equal the number of students in their last semester who signed up. We did so by stratifying on gender, major, and tuition above or below the median.[3] Our number of observations at baseline is 363 of which 178 (or 49.1 percent of) students were in their last semester of college.

3.2 Tasks and incentives

Our online surveys contained of three types of questions: economic decision making tasks, cognitive tests, social preferences, and questionnaires about socioeconomic situation, consumption of durable goods, debt, stress, and salary expectations. In addition, we ask last-semester students about job offer and paycheck dates.

We measure economic decision making in terms of risk aversion, time preferences, ambiguity aversion, and inconsistencies in risk lotteries and time preference choices. We elicit

the excitement associated with graduation.

[3]The median tuition per semester in our sample is COP 600,000 which is equivalent to around US$200.

risk aversion using the Eckel and Grossman (2002) measure (see example in Appendix A). This method consists of presenting six different gambles varying the expected return, the standard deviation, and the implied CRRA range. Subjects are instructed to select one of the gambles to play. Each gamble has a 50 percent probability of receiving a low payoff and 50 percent probability of receiving a high payoff, except the first one in which both payoffs are the same. If this task is selected for payment at the end of the survey, the gamble they choose will actually be played. The expected payoff in gambles 1 to 5 increases linearly with risk. For gambles 5 and 6, the expected payoff is the same but the risk is bigger in gamble 6 as reflected by the higher standard deviation. Risk-averse subjects are expected to choose gambles with a lower standard deviation, while risk neutral subjects should choose the gamble with higher expected return (gamble 5) and risk-seeking subjects should choose gamble 6 (Charness, Gneezy, & Imas, 2013).

To analyze risk choices we use the risk lotteries from T. Tanaka et al. (2010). This method is intended to capture Prospect Theory parameters through a series of three lotteries which are much more complex than the Eckel and Grossman (2002) measure.[4] The lotteries consist of a given number of rows and two columns designated A and B. In each row, columns A and B contain two values each that represent payoffs and their probabilities appear at the top of the table. For each row subjects have to choose whether they prefer column A or B. They are explained that if this task is randomly chosen for payment at the end of the survey, one of the rows will be chosen at random, and the amount they will win will depend on the probability stated at the top of the column. The lotteries are designed such that, a risk neutral person will choose column A up to row 6 and column B starting in row 7 (see appendix B). This is because the expected payoff of choosing column A is higher for rows 1 to 6 and higher for column B in rows 7 to 14. Ideally, subjects will switch columns only once but it has been found that if monotonic switching is not enforced, subjects often switch multiple times especially in populations with low education (T. Tanaka et al., 2010). Hence, most papers using this method only ask for the row in which the subject would switch. Because we want to study inconsistencies in choices, we do not enforce monotonic switching but rather ask for choices in every row. We are interested in seeing whether making mistakes (switching back and forth from Column A to Column B) changes across the three stages differentially for those who will find jobs while we control for learning or understanding the task better

[4]The lotteries elicit the three Prospect Theory parameters: risk aversion, loss aversion, and non-linear probability weighting. Prospect Theory provides a different and more general characterization of risk preferences than Expected Utility Theory.

with the performance of the group of students in the comparison group.

Ambiguity aversion, the preference for known risks relative to unknown risks (Ellsberg, 1961; Camerer & Weber, 1992), is another measure of economic decision making that we analyze. To implement this measure we use a task based on Y. Tanaka et al. (2014) in which subjects must choose between a gamble whose outcome objective probabilities are known relative to one in which they are unknown. In practice, participants are presented with a series of comparisons as in appendix C. In each of 9 choices, they see two urns filled with 24 blue and red balls and are instructed that they will receive the monetary reward associated to the urn the choose to play if a red ball is drawn from that urn. In urn A (left-hand side), there are always 12 red and 12 blue balls completely visible to participants and the payment in case of drawing a red ball from that urn is 20,000 pesos (about US$7) in each of the 9 choices. Urn B (right-hand side) is partially covered so that it is impossible to know the mix of red and blue balls, hence urn B is the ambiguous urn. The occluder covers 1/4, 1/2 and 3/4 of the urn depending on the choice. In the first three choices, the value of urn A and B is the same (20,000 pesos) but in subsequent choices, the value of urn B increases to 30,000 (in choices 4-6) and to 40,000 pesos (in choices 7-9) if a red ball is randomly selected. To analyze ambiguity aversion we create a variable counting the number of times the students choose the ambiguous urn from a total of 9.

Time preferences is an important dimension of economic decision making that we measure in this study by adapting the elicitation task presented in (Andreoni & Sprenger, 2012). The idea of the task is that subjects are given a pre-specified monetary amount and are required to allocate it between two dates: earlier and later (see appendix D). A difference between our implementation of the task relative to (Andreoni & Sprenger, 2012) is that the allocations are not continuous but discretized to increase in 1,000 pesos (about 33 dollar cents) intervals. Participants are instructed to allocate 50,000 pesos (about US$17) between two dates separated between each other by 4 or 9 weeks. The earliest payment they could receive is one week from the date they respond the survey because participants were responding the surveys online and that made it impossible to pay them the same day they finished it. The trade-offs they face are between weeks 1 and 5, 1 and 9, 5 and 9, and 5 and 13. For each of these trade-offs, they made 4 decisions with varying interest rates if money is allocated to the later date (1, 10, 50, and 100 percent interest rates). When they choose a value in the earlier date, the amount to be received in the later date was automatically calculated in the "later"

column including interest. In total, in each round they made 16 choices allocating money to earlier and later dates. We analyze the monetary values assigned to early dates in each of the four time comparisons. The first decision we study is the number of non-monotonic decisions made by a student. Non-monotonocity in this case refers to allocating an increasing amount of money to an earlier period as the interest rate for the later period payout goes up. We also examine the "impatience" of students by examining how many times out of the 16 choices students allocate the entire 50,000 pesos to the sooner period. We also study a measure of present-biasedness by examining at each of the four interest rate levels, what the probability is of assigning a greater amount of money to week 1 vs. week 5 for a delay of 4 weeks and 8 weeks respectively. These probabilities are then weighted proportional to the interest rates in order to derive a percentage of "present-biasedness".

In terms of cognition, the bandwidth theory proposed by Mullainathan, Shafir and coauthors implies that scarcity (of time or resources) affects cognitive functioning which may compromise decision making (Shah et al., 2012; Mani et al., 2013; Mullainathan & Shafir, 2013). To measure different dimensions of cognition we use tasks such as a Raven's matrices-type IQ test, the Cognitive Reflection Test (CRT), the Flanker's test, and the numerical Stroop test.

The IQ test is a version of the Raven's test in which a pattern must be completed by the participant by choosing one of the choices given. This test provides a non-verbal measure of fluid intelligence which, as discussed in Mani et al. (2013), proxies the capacity to solve problems without prior knowledge. There were 9 questions in total and a time limit of 3 minutes to solve them. The test is difficult enough that very few people are able to correctly answer all questions in 3 minutes. Upon completion of the 3 minutes, participants were automatically directed to the next task. The same questions were given in Baseline 1 and after the job offer, and in Baseline 2 and after their first paycheck so the participants did not see the questions in at least 5 months.

The Numerical Stroop Test requires the subject to enter the number of digits displayed to them without getting distracted by the digit itself. For example if they see "3 3" they must respond "2" which is the number of objects displayed and not "3" which is the number that may come first to mind. This test has been used by Mani et al. (2013) and Carvalho et al. (2016) as a measure of cognitive control which is related to inhibitting innapropriate

responses and selecting the appropriate information for processing. Because our surveys are taken online, our version of the Numerical Stroop Task involves using the keyboard to select the correct number of objects displayed out of 45 in total in 30 seconds. Participants receive 1,000 pesos for each correct answer if this task is selected for payment at the end of the survey.

In the Flanker Test subjects see a sequence of five arrows pointing to the left or to the right. They have to press the arrow in the keyboard that corresponds to the direction that the middle arrow in the sequence is poining to. This test measures the ability to ignore distracting information and supress inappropiriate responses. Again they have 30 seconds to correctly respond as many questions as possible.

The last cognitive measure we study is the Cognitive Reflection Test (CRT). This test measures the ability to supress incorrect intuitive and spontaneous answers to give the reflective correct answer (Frederick, 2005). The test usually consists of 3 questions (see appendix E) but we add three more from Sinayev and Peters (2015) or change the wording of the original three questions so that it is harder for participants to recognize them from previous rounds.

Finally, for social preferences we use the dictator and ultimatum games. By introducing these games, we were interested in seeing whether altruistic behavior changes across the different stages. In the dictator game, participants were told that they will receive 20,000 pesos for sure. Then, they had to choose whether to give part of their allocation to another randomly chosen student participating in the study. If this task would be chosen for payment, the allocation chosen by the student would be implemented. A second question of this game changes the recipient of the gift from a randomly chosen student to a foundation that helps kids in need in Bogota. In the ultimatum game, the setup is the same except that now the subject proposes an allocation to the recipient student which can be rejected or accepted by the recipient.[5]

The order in which tasks appeared to participants was random although they always came before the questionnaire about psychological and stress measures, expenditures, salary expectations, and relevant dates of job offer and paycheck. No feedback about performance

[5]The response from the recipient in this game was actually not implemented because participants were not responding the survey simultaneously. In practice, whatever amount the participant donated was assigned to a randomly chosen student.

after each survey was given to participants. At the end of the survey, one of the tasks was selected for payment. The computer followed the instructions that participants read in the instructions in order to select the amount of the prize. In each survey excluding the recruitment survey, prizes ranged from the equivalent of US$7 to US$57. The mean prize across all three rounds of surveys was $30.

3.3 Summary statistics

As mentioned previously, at baseline, we expect that last-semester students do not differ substantially from students who will not experience the changes along the transition to the labor market except in variables such as age and degree of independence. Table 2 presents the means of variables collected at sign-up and the p-values of the differences between the two groups. We see that last-semester students are older, more likely to be employed at the time of the survey (during their last semester of college), to have accumulated more experience from part- and full-time jobs and internships, and less likely that their parents pay for most of their expenses. Importantly, they do not differ from comparison group students across other demographic or academic characteristics.

To construct our difference-in-differences, we collected information from students over a total three rounds. From the two surveys in the baseline period (round 1), we are able to establish parallel trends for most of our outcome variables. In the section showing the difference-in-differences results we include the two rounds of data collection to check for parellel trends. We only see one variable (inconsistencies in risk aversion) to have an interaction coefficient in the diff-in-diff regression in the baseline periods that is statistically significant. Hence, given that virtually all variables exhibit parallel trends in the period before the changes associated with the transition to the labor market take place, the difference-in-differences analysis is a valid method to analyze our data.

Round 2 and Round 3 were timed in such a way as to capture as many students as possible who met the criteria for these rounds, namely to have received a job offer by Round 2, and to have started working by Round 3. However, there is no uniform way in which all students get jobs at the same time, and so while a majority of the last-semester students fulfilled the criteria, not all of them did. In order to interpret our results using a difference-in-differences strategy in which to compare their Round 2 or Round 3 behavior to baseline, we made various modifications to the observations in Round 2 and Round 3.

Table 2: Differences in baseline characteristics

Variable	**Comparison**	**Last-sem. students**	**Obs**	**p-value difference**
Poor (tuition<median)	0.54	0.59	363	0.29
Female	0.26	0.25	363	0.79
Age	22.98	25.07	352	0.00
Tuition	6.71	6.26	363	0.42
Undergraduate	0.87	0.88	363	0.73
Semester	6.20	10.42	355	0.00
GPA	3.80	3.81	356	0.70
Poor (SISBEN=1,2,3)	0.36	0.38	363	0.70
Residential stratum	2.85	2.93	362	0.34
Employed	0.43	0.65	363	0.00
Expected first salary (pesos)	2,046,757	1,957,584	363	0.33
Expected salary in 5 years (pesos)	4,508,649	4,819,663	363	0.19
No. semesters working full time	0.32	0.52	363	0.07
No. semesters working part time	1.97	2.84	363	0.00
No. semesters internship	0.09	0.53	363	0.00
How hard to find job after graduation	2.83	2.57	363	0.01
Parents in different hh	0.05	0.07	363	0.33
Parents pay most expenses	0.72	0.57	363	0.00

By Round 2, all of the last-semester students had job offers, but some of them had also started working. This increases the probability that they had already been paid, and therefore, if we wanted to quantify the effect of resolving their uncertainty with a job offer, before they had been paid, the students who had already started working may bias the results. For instance, we had 142 last-semester students in Round 2 originally and they all reported having received a job offer. Out of these, 46 students report having started working and thefore, get transferred to Round 3. Then in Round 3, we check if every student reports having received at least one paycheck, if they have not yet received one, they are moved from Round 3 to Round 2 - in this case, 12 students from Round 3 were moved to Round 2. Therefore, the students who remained in Round 2 were those who explicitly reported having

a job offer and not working, or working and not having received a paycheck. The students who remained in Round 3 were those who reported at least one paycheck in the previous few months. By making this adjustment, we can now interpret the effect of Round 2 as being the effect of having a job, and therefore having one's uncertainty about the job being resolved. The effect of Round 3 would be capturing the easing of the liquidity constraint because these students would now be paid a salary, among other changes associated with starting a new job. Further details of the effect of these adjustments can be found in Table 3.

Table 3: Adjustments reflecting after offer and after paycheck stages

No. of Students	Original Observations				Observations after Adjustment			
	Round 1		Round 2	Round 3	Round 1		Round 2	Round 3
	Wave 1	Wave 2			Wave 1	Wave 2		
Total	365	363	304	285	365	363	258	273
Last semester	179	178	142	128	179	178	96	116
Job offer	-	-	142	-	-	-	96	-
Working	-	-	-	128	-	-	-	116

3.4 Attrition

Any longitudinal study involves some degree of attrition. In this section we assess the extent of attrition across different rounds and whether it can be predicted from baseline covariates or baseline outcomes. If attrition happened differentially for students with certain characteristics, some of our results in the next section could be driven by selection into staying in the sample.

For the baseline, surveys 1 and 2, we collected data from 363 participants. The aggregate attrition rate after receiving a job offer is 16.7 percent and after receiving the first paycheck, it is 21.5 percent. Effective attrition, after making the adjustments in the definition of stages discussed in the previous section, is 28.9 percent for the after offer period (Round 2) and 24.8 percent for the after paycheck period (Round 3). We consider these rates to be excep-

tionally low among longitudinal studies. For the econometric analyses we use the sample that contains students who answered all surveys (XX students).

As expected, attrition is higher among last-semester students who eventally graduate and find jobs. Further, students who stay in the sample are more likely to be undergraduates although the statistical significance of this variable dissapears when adjusting for multiple inference testing. The evidence shows that attrition is not related to baseline covariates except for the variable indicating whether the student is a last-semester student.

Because comparison group students are more likely to respond to all surveys, we examine whether outcomes measured at baseline are related to staying in the sample for the comparison and last-semester students separately. Tables 9 and 10 show the attrition test results. The dependent variable in the two tables is an indicator equal to one if the student responds all surveys. We regress that indicator on all the variables in the rows. Given the large number of regressors, we split these regressions in two tables. Appendix Table 9 shows the risk, time and social preferences outcomes at baseline. Similarly, Appendix Table 10 shows cognitive tests, perceptions on personal finances and psychological measures. The three columns of results correspond to one of three samples (all, comparison group, and last-semester students). For statistical significance, we report the usual tests without adjusting for multiple hypothesis testing (stars) and the tests adjusting for the Benjamini-Hochberg method within column (daggers).

Column 1 of Table 9 shows that students who remain in the sample are more likely to make non-monotonic switches in the risk lottery and less likely to be present-biased than students who leave the sample. Only the result for the significant correlation in inconsistencies in risk choices survives the multiple testing adjustment. Moreover, it is clear that this significant relationship is driven by last-semester students as can be seen in column 3. In Table 10 we do not see any significant differences in the baseline outcomes between those who stay and those who attrit (Columns 1 to 3).

Overall, we find that last-semester students are more likely to attrit. Students who remain in the sample are more likely to make inconsistent choices in the risk lottery and, to some extent, to be less present biased. However, these correlations with baseline characteristics are not crucial in the statistical sense.

4 Difference-in-Differences Results

In order to examine whether the economic and social preferences, cognitive performance and survey responses of these students change along the transition from college to the labor market, we employ a difference-in-differences (DID) strategy. The two main periods of interest are Round 2, when last-semester students receive a job offer, and Round 3, when they finally start working and receive at least one paycheck. An important contribution of this paper is to separate these two periods in order to understand whether there are any changes in behavior along the transtition and whether the changes in decision making accompany a mere resolution of uncertainty after getting a job offer or whether there needs to be a real increase in their incomes. In order to tease out these various changes, we run the following regression specification:

$$\begin{aligned} y_{it} = {} & \alpha_1 \text{Baseline } 1 + \alpha_2 \text{Baseline } 2 + \alpha_3 \text{After offer} + \alpha_4 \text{After paycheck} + \beta_1 \text{Baseline } 1 \times \text{Last sem.} \\ & + \beta_2 \text{Baseline } 2 \times \text{Last sem.} + \beta_3 \text{After offer} \times \text{Last sem.} + \beta_4 \text{After paycheck} \times \text{Last sem.} \quad (1) \end{aligned}$$

In the above specification, the dependent variables include risk-aversion, time preferences, social preferences, cognitive performance, personal finances and emotions. We collect four measurements of these variables so the index t goes from 1 to 4. On the right hand side, the first four independent variables represent the indicator variables for the 4 periods under study here: the two baseline rounds, after offer and after paycheck as described above. The last four terms represent the interaction terms between the last-semester dummy, in this case a dummy for whether a student is in his or her final semester, and these four periods. Note that this regression specification does not include a constant and therefore the first four coefficients (α_1, α_2, α_3, α_4) may be interpreted as the average values of the outcomes in each of the rounds for lower year students (the comparison group). The coefficients β_1, β_2, β_3 and β_4 similarly represent the differential effect of being a last-semester student. The average value of an outcome for a last semester student in the after offer stage, for instance, may then be interpreted as $(\alpha_3 + \beta_3)$. The standard errors are clustered at individual level.

Our main hypothesis was that even though these students attend one of the most pretigious universities in Colombia, they still have considerable uncertainty about when and where they will get their jobs. This uncertainty may be enough to affect their decision making behavior, in addition to when they receive their first paycheck and resolve a potential liquidity constraint.

4.1 Risk and Ambiguity Preferences

We measure risk aversion using the Eckel and Grossman (2002) task. Extreme risk aversion is defined as an indicator variable for when the student picks the first three gambles. The ambiguity aversion variable counts the number of times the ambiguous urn is chosen out of nine possible choices between the visible and the ambiguous urn. For details on the tasks ot the definition of the variables see Section 3.

Table 4 demonstrates that when uncertainty regarding the labor market is resolved and students who previously were in their final semester receive a job offer, there is a decrease in extreme risk-aversion (first column) among all students, but significantly more so for students who receive a job offer. Therefore students who have their job uncertainty resolved appear to have a higher propensity to pick riskier gambles than lower year students by about 12.2 percentage points. It is worth pointing out that the majority of students were risk averse at baseline with about 70 percent of students choosing one of the three least risky gambles to play. There is a significant reduction in risk aversion among all students by job offer stage in which the proportion of risk-averse subjects is reduced to about 50 percent and 38 percent among comparison group and last-semester students, respectively.

However, in column 2, we run the same regression but with controls for psychological measures, specifically: self-reported measures of how tired, frustrated, worried, depressed and happy the students were, and how much enjoyment they took in life. With the controls in place, the after-offer result for last-semester students being differentially less risk averse than their counterparts in lower years vanishes. Additionally, extreme risk aversion falls by a far greater magnitude from baseline to the after offer stage and the after paycheck stage for all students, ranging from 78 percent in the first baseline to 26 percent after receiving a paycheck. This underlines the importance of sujective measures of wellbeing and emotions in economic decision making. Therefore controlling for such measures is crucial to understanding how economic decision making changes over time, and not including them gives rise to the risk of errors in measuring trends in such decisions.

The ambiguity aversion results show that at baseline students chose the ambiguous urn very few times (less than 4 times on average) independent of their last-semester or compar-

Table 4: DID results: Risk and ambiguity preferences

	(1) **Extremely risk averse: first 3 gambles**	(2) **Extremely risk averse: first 3 gambles**	(3) **Lower: more ambiguity averse**	(4) **Lower: more ambiguity averse**
Baseline 1 * Comparison	0.696***	0.778***	3.793***	3.533***
	(0.0341)	(0.0674)	(0.142)	(0.310)
Baseline 2 * Comparison	0.707***	0.846***	3.740***	3.438***
	(0.0337)	(0.0674)	(0.150)	(0.307)
After offer * Comparison	0.500***	0.201***	4.226***	3.704***
	(0.0370)	(0.0528)	(0.152)	(0.323)
After paycheck * Comparison	0.424***	0.261***	4.377***	4.552***
	(0.0366)	(0.0579)	(0.154)	(0.414)
Baseline 1 * Last sem.	-0.0103	-0.0143	0.138	0.181
	(0.0488)	(0.0489)	(0.203)	(0.202)
Baseline 2 * Last sem.	-0.0548	-0.0690	0.0516	0.0236
	(0.0492)	(0.0492)	(0.226)	(0.225)
After offer * Last sem.	-0.122**†	-0.0287	-0.0634	-0.00240
	(0.0545)	(0.0552)	(0.264)	(0.269)
After paycheck * Last sem.	0.0457	0.0155	-0.147	-0.168
	(0.0593)	(0.0624)	(0.247)	(0.249)
Observations	1,355	1,355	1,232	1,232
R-squared	0.600	0.626	0.801	0.807
Emotion controls	NO	YES	NO	YES

Standard errors clustered at the individual level in parentheses.
*** p<0.01, **p<0.05, * p<0.1
Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1

ison group status. These preferences remain remarkably stable over time, with there being a slight trend towards less ambiguity aversion with every period. We observe no differential impact of being a last-semester student in any period. Controlling for emotional measurements does not change these results.

Because we are analyzing multiple outcomes simultaneously, we conduct a multiple inference test to study the effects of the resolution of job uncertainty, and of receiving a paycheck on the risk and ambiguity outcomes jointly (separately for each regression specification),

following the Benjamini-Hochberg procedure to determine the false discovery rates. This procedure recalculates the p-values of coefficients of interest, and the new significance levels are denoted by the † symbol. We find that the risk aversion result in column 1 holds up to this multiple inference test at 10% significant level. However, in column 2, with the emotion controls, we do not find any differential effect of receiving a job offer on the last-semester students. We may conclude that these self-reported emotional measurements do affect experimentally-elicited risk decisions. We also examine inconsistencies in risk choice, calculated by counting the number of times subjects switch between option A and B (see description in Section 3). However, we do not consider these results because we do not observe parallel trends in the baseline measures and attritions seems to be correlated with this variable, and therefore cannot make conclusions about subsequent results (Table 11 in the Appendix).

4.2 Time Preferences

We look at three main measures calculated from a task following a similar format to Andreoni and Sprenger (2012). In this task, we ask subjects to allocate money (50,000 pesos or $17) between two periods. These include between week 1 and 5, week 1 and 9, week 5 and 9 and week 5 and 13. If they allocate money to the later date, they receive interest of 1%, 10%, 50% and 100% for each of the above four intertemporal decisions, totalling 16 intertemporal choices to be made in each round.

From Table 5, out of a possible 12 non-monotonic decisions, on average, at the first baseline students just make 2.26 of these inconsistent decisions and there is no differential effect of being a last-semester student. In the second baseline round, however, there appears to be a differential effect on making non-monotonic choices for last-semester students, violating the parallel trends assumption (at the 10 percent level) in this case.

Our measure of "impatience", which counts the number of times a student allocates the full endowment to the earlier period does not demonstrate any additional effect for last-semester students, On average, all students appear to become slightly more impatient over time, with them making around 2.6 "impatient" choices in the first baseline and going up to almost 5 out of 16 by Round 3 (when last-semester students receive their first paycheck). On controlling for emotional measurement, this range widens, but once again, there is no

Table 5: DID results: Time preferences

	(1) **No. of non-monotonic choices**	(2) **No. of non-monotonic choices**	(3) **No. of times subj. allocates full amt. for sooner period**	(4) **No. of times subj. allocates full amt. for sooner period**	(5) **% present biasedness (weighted by interest rate)**	(6) **% present biasedness (weighted by interest rate)**
Baseline 1 * Comparison	2.258***	2.577***	2.577***	2.188***	30.07***	36.91***
	(0.239)	(0.528)	(0.247)	(0.522)	(2.889)	(6.150)
Baseline 2 * Comparison	2.088***	2.069***	3.434***	3.617***	28.81***	32.38***
	(0.241)	(0.457)	(0.281)	(0.596)	(2.688)	(5.558)
After offer * Comparison	1.515***	1.659***	4.571***	4.748***	34.18***	33.07***
	(0.225)	(0.482)	(0.315)	(0.698)	(3.074)	(6.611)
After paycheck * Comparison	1.344***	1.216***	4.487***	6.284***	29.10***	41.48***
	(0.224)	(0.405)	(0.330)	(0.732)	(3.061)	(7.253)
Baseline 1 * Last sem.	0.0468	0.0320	0.254	0.272	-1.274	-1.820
	(0.359)	(0.368)	(0.356)	(0.359)	(4.064)	(4.110)
Baseline 2 * Last sem.	-0.622*	-0.678**	0.623	0.516	0.502	-0.0710
	(0.317)	(0.319)	(0.410)	(0.413)	(3.805)	(3.779)
After offer * Last sem.	-0.452	-0.518	-0.549	-0.560	-10.07**†	-12.38**†
	(0.328)	(0.363)	(0.509)	(0.514)	(4.610)	(4.787)
After paycheck * Last sem.	-0.414	-0.478	0.320	0.249	5.229	3.994
	(0.302)	(0.325)	(0.495)	(0.493)	(4.806)	(4.774)
Observations	1,243	1,243	1,243	1,243	1,243	1,243
R-squared	0.264	0.272	0.508	0.520	0.480	0.492
Emotion controls	NO	YES	NO	YES	NO	YES

Standard errors clustered at the individual level in parentheses.
*** p<0.01, **p<0.05, * p<0.1
Multiple Inference: ††† p_m<0.01, †† p_m<0.05, † p_m<0.1

additional effect of being a last-semester student. Finally, we also examine a measure of present-biasedness, where we enumerate the instances where a subject allocated a greater amount to the sooner period when the sooner period was a week from now versus 5 weeks from now for the same delay length until the later period, i.e., week 1 vs. week 5 and week 5 vs. week 9. This is then weighted by the interest rate for the later period payoff in each row of the price list to end up with a percentage of present bias. Here, we find that last-semester students are differentially less present biased that their counterparts after receiving a job offer in Round 2, by about 10 percentage points. In fact, this result becomes even stronger

when controlling for emotional measurements, with the gap widening to 12 percentage points. This demonstrates that time preferences may be less swayed by these emotions compared to risk decisions. A multiple inference test following the Benjamini-Hochberg procedure combining all three time preference measures reiterates that for present-biasedness, there is a definite effect from resolving job uncertainty for last-semester students. To contextualize this result, Carvalho et al. (2016) find that before payday, poor individuals in the US are more present biased when making choices about monetary rewards. We observe the opposite behavior when individuals have not received income yet but face less uncertainty regarding their future income and outcome of their college education investment.

4.3 Self-Perceptions of Financial Status

We do find significant effects of receiving a job offer on the self-reported financial health of last-semester students. In Table 6 we show the result of regressions on outcomes such as whether it is hard to come up with money for an emergency, whether it is hard to cover next week's expenses with the money they have today and whether they are stressed about personal finances. In the first two cases, receiving a job offer has a significant and positive effect for last-semester students. To elaborate, they report finding it hard to come up with money or it being hard to cover expenses less frequently than the baseline, and when compared to students in lower years. Therefore, in terms of perception of own wealth, there appears to be a clearly positive effect of merely receiving a job offer, without having yet been paid. There is no significant differential effect for last-semester students after receivng a paycheck, which is telling of the immense effect that the resolution of uncertainty alone has on perception of one's coping ability.

The results for the self-reported measure on it being hard to come up with money in an emergency holds up to the regression specification with the emotional controls - i.e. last-semester students less frequently report this in Round 2 after receiving a job offer. Indeed, after controlling for these emotions, there is an additional effect for last-semester students after receiving their paycheck as well. What is important to note with this specification however, is that all students, on average, report it being less hard to come up with money in an emergency over the 4 rounds, but we do observe differential effects for last-semester students. This, once again, underlines that controlling for such emotions when studying perceptions of financial status are important because they can affect not only economic decision

Table 6: DID results: Financial status

	(1) **Hard to come up with money**	(2) **Hard to come up with money**	(3) **Hard to cover expenses**	(4) **Hard to cover expenses**	(5) **Stress level - personal finances**	(6) **Stress level - personal finances**
Baseline 1 * Comparison	0.592***	0.602***	0.234***	0.184***	0.391***	0.371***
	(0.0364)	(0.0771)	(0.0313)	(0.0632)	(0.0361)	(0.0753)
Baseline 2 * Comparison	0.663***	0.568***	0.196***	0.257***	0.326***	0.236***
	(0.0350)	(0.0745)	(0.0294)	(0.0616)	(0.0347)	(0.0676)
After offer * Comparison	0.571***	0.253***	0.245***	0.0984**	0.337***	0.107**
	(0.0366)	(0.0464)	(0.0318)	(0.0385)	(0.0350)	(0.0444)
After paycheck * Comparison	0.543***	0.312***	0.212***	0.209***	0.337***	0.159***
	(0.0369)	(0.0566)	(0.0302)	(0.0484)	(0.0350)	(0.0480)
Baseline 1 * Last sem.	-0.0531	-0.0469	-0.0539	-0.0476	0.0357	0.0429
	(0.0522)	(0.0516)	(0.0426)	(0.0412)	(0.0519)	(0.0505)
Baseline 2 * Last sem.	-0.124**	-0.0993*	0.00660	0.0164	0.0672	0.0905*
	(0.0513)	(0.0516)	(0.0421)	(0.0414)	(0.0505)	(0.0495)
After offer * Last sem.	-0.253***†††	-0.139***††	-0.103**††	-0.0355	-0.0599	0.0399
	(0.0531)	(0.0511)	(0.0429)	(0.0444)	(0.0509)	(0.0492)
After paycheck * Last sem.	-0.0913	-0.155***††	-0.0120	-0.0263	0.0804	0.0167
	(0.0594)	(0.0589)	(0.0481)	(0.0503)	(0.0579)	(0.0564)
Observations	1,355	1,355	1,355	1,355	1,355	1,355
R-squared	0.553	0.595	0.207	0.275	0.368	0.438
Emotion controls	NO	YES	NO	YES	NO	YES

Standard errors clustered at the individual level in parentheses.
*** p<0.01, **p<0.05, * p<0.1
Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1

making measures but subjective assessment of financial health.

Once again, on running a multiple inference test for these three financial health measures, the differential effect for last-semester students after their job offer persists at 1 and 5 percent significance levels in their perception of it being hard to come up with money in an emergency and it being hard to cover expenses (only for the regression specification without emotional measurement controls) respectively. The significant and different effect at after paycheck stage from column 2 also persists after the multiple inference test.

4.4 Expenditures

One reason that last-semester students and comparison students do not differ in their reporting of how hard it is to cover expenses, despite last-semester students perceiving it being less hard to come up with money in an emergency, may be due to their increased expenditures after receiving a job offer. Table 7 backs up the above pattern by demonstrating that the fraction of these job market students' monthly income spent on rent, groceries and savings goes up significantly in Round 2 when last semester students receive a job offer. Particularly their expenditures on groceries and savings remain differentially higher than lower year students in both regression specifications (with and without emotion controls.) In fact, after calculating the false discovery rates for the multiple inference test of how Round 2 affects these three expenditures, the results for groceries and savings remain highly significant. What is interesting here is that before having been paid in their jobs, these students already scaled up their expenditures in anticipation of receiving a paycheck.

There is also a differential but smaller effect of receiving a paycheck on last-semester students with their shares of expenditures on rent, groceries and savings being higher in Round 3 after paycheck - but this is more expected given their rise in income.

4.5 Psychological Measures

The controls that we include in our second regression specification quite often strongly affect our results regarding last-semester students, particularly in the case of risk aversion. There are some important patterns within these emotion measures as well. Last-semester students who receive a job offer report being differentially less tired, worried, depressed and frustrated. Further results are presented in Appendix table 13. What is clear is that while last-semester students report being less worried or tired in Round 2 after resultion of job uncertainty, by Round 3 after receiving a paycheck, these effects disappear, that is there is not difference in psychological measures between last-semester and comparison. Part of this may be related to the additional responsibilities they have to take care of, given their additional expenditures after resolving job uncertainty in Round 2 and after being paid in Round 3 (Table 7).

Table 7: DID results: Spending behavior

	(1)	(2)	(3)	(4)	(5)	(6)
	Share of monthly inc. spent on rent	**Share of monthly inc. spent on rent**	**Share of monthly inc. spent on groceries**	**Share of monthly inc. spent on groceries**	**Share of monthly inc. spent on savings**	**Share of monthly inc. spent on savings**
Baseline 2 * Comparison	9.388***	13.09***	6.546***	8.487***	12.84***	10.13***
	(1.334)	(2.968)	(0.733)	(1.713)	(1.228)	(2.403)
After offer * Comparison	11***	18.70***	7.856***	8.916***	11.34***	8.049***
	(1.568)	(3.848)	(0.879)	(1.712)	(1.143)	(2.826)
After paycheck * Comparison	10.46***	9.254***	8.168***	10.18***	12.14***	14.21***
	(1.545)	(3.292)	(0.835)	(1.981)	(1.147)	(2.958)
Baseline 2 * Last sem.	3.324	2.602	2.928**	2.687**	1.322	1.469
	(2.049)	(2.023)	(1.133)	(1.152)	(1.884)	(1.879)
After offer * Last sem.	4.234*†	3.083	3.059**††	2.715**†	6.014***††	5.728**††
	(2.495)	(2.518)	(1.378)	(1.377)	(2.195)	(2.256)
After paycheck * Last sem.	4.594*†	4.474*	2.650**†	2.606**	3.030	3.552*†
	(2.414)	(2.497)	(1.230)	(1.259)	(1.926)	(1.880)
Observations	884	884	884	884	884	884
R-squared	0.280	0.296	0.412	0.422	0.405	0.431
Emotion controls	NO	YES	NO	YES	NO	YES

Standard errors clustered at the individual level in parentheses.
*** p<0.01, **p<0.05, * p<0.1
Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1

4.6 Cognitive Performance

Corroborating the above pattern of reports of being less tired, depressed and worred dissipating by Round 3, we have further evidence that in Round 3, after receiving their paycheck there are increased responsibilities. We study changes in cognitive performance by looking at how students perform in tasks such as the Raven's Matrices and a Cognitive Reflection Test - CRT (Table 8); Flanker test and a Stroop test (Table 14 in the Appendix). These increased responsibilities may be contributing to an increasing cognitive load and we find that in after receiving a paycheck, last-semester students perform differentially worse than lower year students in the cognitive reflection tasks as well the Raven's Matrices. In fact, these results hold up even in the multiple inference test where we examine the hypothesis

that receiving a paycheck significantly affects the four cognitive tasks jointly.

Specifically, the performance of the lower year students stays approximately stable across time in the cognitive reflections tasks. Their performance in the Raven's Matrices task does improve over time and this may be attributable to learning effects. They respond 3.5 questions (column 4 in Table 8) correct on average at baseline, and lower year students improve their score by almost 3, while last-semester students lag slightly behind at a score of 6 in after receiving a paycheck. This is consistent with the additional responsibilities and changes associated with starting a new job. It is possible that these changes impose a cognitive load on last-semester students and impairs their performance in these cognitive tasks.

Table 8: DID results: Cognitive performance

	(1) **CRT: both questions**	(2) **CRT: both questions**	(3) **Raven's Matrices**	(4) **Raven's Matrices**
Baseline 1 * Comparison	1.142***	1.130***	4.038***	3.503***
	(0.0612)	(0.135)	(0.118)	(0.254)
Baseline 2 * Comparison	1.317***	1.256***	6.408***	6.050***
	(0.0548)	(0.115)	(0.110)	(0.242)
After offer * Comparison	1.188***	1.273***	5.154***	5.020***
	(0.0577)	(0.134)	(0.137)	(0.340)
After paycheck * Comparison	1.445***	1.324***	6.538***	6.447***
	(0.0595)	(0.134)	(0.116)	(0.265)
Baseline 1 * Last sem.	-0.119	-0.106	0.0919	0.117
	(0.0856)	(0.0863)	(0.171)	(0.174)
Baseline 2 * Last sem.	0.0107	0.0139	-0.00988	0.00265
	(0.0791)	(0.0805)	(0.154)	(0.156)
After offer * Last sem.	-0.0811	-0.0900	0.140	0.145
	(0.0991)	(0.101)	(0.229)	(0.237)
After paycheck * Last sem.	-0.210**††	-0.218**††	-0.512***††	-0.515***††
	(0.0937)	(0.0947)	(0.190)	(0.188)
Observations	1,243	1,243	1,249	1,249
R-squared	0.722	0.725	0.925	0.926
Emotion controls	NO	YES	NO	YES

Standard errors clustered at the individual level in parentheses.
*** p<0.01, **p<0.05, * p<0.1
Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1

4.7 Social Preferences

Another hypothesis we started out with was that at Round 2 and Round 3, when job uncertainty is resolved and students start working at their first jobs, in dictator and ultimatum games, they may allocate more to others. From table 12, we find that their generosity towards other individuals and charity foundation after job uncertainty is resolved is indeed higher compared to lower year students. Furthermore, we find that this differential pattern persists even after controlling for emotions in the case of allocating money to another student in a dictator game and allocating money to another student in an ultimatum game (columns 2 and 6 in table 12 in the Appendix). On average, students allocate a far higher share to a foundation than a student in a dictator game, donating almost 61 percent of their endowment to a foundation versus 30 percent to a student in a dictator game (specification with emotion controls). What is puzzling under this specification is that both lower year and last-semester students scale up their donations to other parties in all three games. This is at odds with previous findings by Matthey and Regner (2013) that individuals who have participated in more experiments donate less money. One can hypothesize why last-semester students may donate more after receiving a job offer, but it is unclear why comparison students would also scale up at Round 2 (after last semester students receive a job offer) (columns 2, 4 and 6 in table 12 in the Appendix).

These results help us conclude that this life transition from college to working life is quite crucial in the way it affects the choices and decisions made by these subjects. An important takeaway from this analysis is the role played by emotions such as worry and tiredness in making economic decisions such as risk choices. What is interesting is that the resolution of job uncertainty alone is sufficient enough to affect time and social preferences. Their spending behavior also changes significantly in response to an expected wealth increase. Given that they are at a top university, and there is a reasonable guarantee of getting a good job, these large effects are important and provide an avenue for further research.

5 Conclusion

This paper documents the changes in decision making that occur as a result of a major life transition - specifically transitioning from being a college student to a working member of society. When students join college, particularly if it is a prestigious school like the one from which we draw our participants in this study, it may be reasonable to assume that students

have certain expectations of finding a job and having financial security. Therefore, similar to the Permanent Income Hypothesis' predictions for consumption, one may not expect to see changes in decision making behavior for risk preferences, time preferences, cognitive performance and other related tasks and decisions. However, our hypothesis was that even though students in such universities are somewhat assured of finding good jobs, there is considerable uncertainty of the specificities of the job, such as the when it will come and how much it will pay. These uncertainties may be large enough to cause changes in decision making merely in response to receiving a job offer, even before being paid for the first time.

In fact, our results bear out this hypothesis quite conclusively. We use a difference-in-differences strategy to study the effect on decision making of first transitioning from a being a (last-semester) college student to receiving a job offer, and then the effect receiving a paycheck. We employ the fact that students about to experience the transition are similar to students in lower years in many dimensions. Therefore, comparing last-semester students to students in lower years (pursuing similar major, having a similar gender distribution and having similar tuition levels) provides us with a reasonable research design. By having lower year students in the comparison group answer the same questions as the last-semester students at roughly the same times, we can effectively compare the their answers across rounds to determine differential trends among these final semester students. Of course, because we are unable to randomly assign the status of being a last semester student, we cannot make strong causal claims about the results. But the patterns we observe are strongly suggestive of the effects that transition to the job market can have on decision making behavior measured through experimental tasks.

We find that there is indeed a change in time preferences, perceptions of financial health and feelings about being tired and worried as a result of merely receiving a job offer. The finding that last-semester students become differencially less present-biased solely in response to a job offer demonstrates what a strong effect the resolution of this job uncertainty can have. These students report it now being less harder to come up with money for an emergency and it being less hard to cover expenses even though they have not been paid in their new jobs just yet. This contradicts the perception that students at a good college would have no uncertainty about getting a job since without any change in their earnings, their perception of their status changes significantly. Furthermore, these students report that they are less worried, tired, depressed and frustrated when they receive their job offer. While this is not

surprising, what is striking is the large effect these emotions have in their decision making during the transition. Without accounting for these feelings, students appear to become less risk-averse on receiving their job offer. However, once we control for these emotions, these results vanish. In other cases, the effect of the transition is made stronger, like in the case of becoming less present-biased when the job uncertainty is resolved. Often when studying decision making behavior, such self-reported measures are not taken into account and this could be affecting the interpretation of results.

After receiving at least one paycheck from their new jobs, all the positive effects on perception of financial status we observed in the after job offer period dissipate and are no longer significant. There are no longer significant results on present-biasedness. Furthermore, these students also perform differentially worse on the cognitive reflection task and the Raven's Matrices-type cognitive tests. Finally, after receiving a paycheck, students report being more frustrated, worried and tired. These results are consistent with the hypothesis that after actually receiving some income, these students have to take on many more responsibilities relating to becoming more independent. They may also have to take care of other family members, adding to their stress levels and generating a decrease in the bandwidth available to solve problems (Mullainathan & Shafir, 2013).

It appears that the resolution of uncertainty regarding the details of their job is the crucial factor that induces changes in the decision making of students who transition to the labor market. Their perceptions of their financial health also change positively. However, after starting to work and being paid, there may be greater cognitive load that comes with having a lot more responsibilities that lead to changes in cognitive performance and feelings of worry and tiredness.

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A Risk lottery based on Eckel and Grossman (2002)

Row no.	**Column A** (if heads comes out)	**Column B** (if tails comes out)
1	28,000 pesos	28,000 pesos
2	24,000 pesos	36,000 pesos
3	20,000 pesos	44,000 pesos
4	16,000 pesos	52,000 pesos
5	12,000 pesos	60,000 pesos
6	2,000 pesos	70,000 pesos

B Risk lotteries based on Tanaka, Camerer and Nguyen (2010)

	Column A		Column B		Exp. payoff diff.
Row no.	**If 1 to 3 comes out**	**If 4 to 10 comes out**	**If 1 comes out**	**If 2 to 10 comes out**	(A - B)
1	4,000 pesos	1,000 pesos	6,800 pesos	500 pesos	770 pesos
2	4,000 pesos	1,000 pesos	7,500 pesos	500 pesos	700 pesos
3	4,000 pesos	1,000 pesos	8,300 pesos	500 pesos	620 pesos
4	4,000 pesos	1,000 pesos	9,300 pesos	500 pesos	520 pesos
5	4,000 pesos	1,000 pesos	10,600 pesos	500 pesos	390 pesos
6	4,000 pesos	1,000 pesos	12,500 pesos	500 pesos	200 pesos
7	4,000 pesos	1,000 pesos	15,000 pesos	500 pesos	-50 pesos
8	4,000 pesos	1,000 pesos	18500 pesos	500 pesos	-400 pesos
9	4,000 pesos	1,000 pesos	22,000 pesos	500 pesos	-750 pesos
10	4,000 pesos	1,000 pesos	30,000 pesos	500 pesos	-1,550 pesos
11	4,000 pesos	1,000 pesos	40,000 pesos	500 pesos	-2,550 pesos
12	4,000 pesos	1,000 pesos	60,000 pesos	500 pesos	-4,550 pesos
13	4,000 pesos	1,000 pesos	100,000 pesos	500 pesos	-8,550 pesos
14	4,000 pesos	1,000 pesos	170,000 pesos	500 pesos	-15,550 pesos

C Ambiguity aversion based on Tanaka et al. (2014)

D Time preferences based on Andreoni and Sprenger (2012)

	EARLIER		LATER	
Allocate	☐	to be received next week AND	☐	to be received in five weeks with a 1% interest
Allocate	☐	to be received next week AND	☐	to be received in five weeks with a 10% interest
Allocate	☐	to be received next week AND	☐	to be received in five weeks with a 50% interest
Allocate	☐	to be received next week AND	☐	to be received in five weeks with a 100% interest
Allocate	☐	to be received next week AND	☐	to be received in nine weeks with a 1% interest
Allocate	☐	to be received next week AND	☐	to be received in nine weeks with a 10% interest
Allocate	☐	to be received next week AND	☐	to be received in nine weeks with a 50% interest
Allocate	☐	to be received next week AND	☐	to be received in nine weeks with a 100% interest

E Cognitive Reflection Test (CRT)

The questions that were asked in Spanish are a translation or adaptation of the following questions:

- A bat and a ball cost $1.10 total. The bat costs $1.00 more than the ball. How much does the ball cost? (Intuitive error: 10; correct: 5)
- If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? (Intuitive error: 100; correct: 5).
- In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? (Intuitive error: 24; correct: 47)

- Jerry received both the 15th highest and the 15th lowest mark in the class. How many students are in the class? (Intuitive error: 15, 30; correct: 29)
- A man buys a pig for $60, sells it for $70, buys it back for $80, and sells it finally for $90. How much has he made? (Intuitive error: 10; correct: 20)
- Simon decided to invest $8,000 in the stock market one day early in 2008. Six months after he invested, on July 17, the stocks he had purchased were down 50%. Fortunately for Simon, from July 17 to October 17, the stocks he had purchased went up 75%. At this point Simon has (a) broken even in the stock market, (b) is ahead of where he began, (c) has lost money. (Intuitive error: b; correct: c).

F Attrition

Table 9: Tests for sample attrition (Part 1)

	Levels in Baseline 2			**Change from Baseline 1 to 2**		
	All	Comparison	Last-sem. Students	All	Comparison	Last-sem. Students
Risk averse	0.095	0.049	-0.005	0.006	-0.042	-0.242**
	(0.086)	(0.094)	(0.131)	(0.075)	(0.088)	(0.110)
CRRA	-0.033	-0.021	-0.020	-0.015	-0.028	0.007
	(0.024)	(0.026)	(0.038)	(0.020)	(0.021)	(0.030)
Inconsistent risk lottery	0.205***†††	-0.001	0.388***††	0.017	-0.069	0.092
	(0.065)	(0.085)	(0.109)	(0.066)	(0.059)	(0.103)
Ambiguity averse	0.030	0.075	0.033	-0.031	0.023	-0.023
	(0.052)	(0.057)	(0.087)	(0.051)	(0.052)	(0.081)
Present biased	-0.002**	-0.002	-0.001	-0.002***	-0.002**	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Impatient	-0.003	-0.002	0.006	-0.005	-0.011	0.003
	(0.008)	(0.011)	(0.011)	(0.010)	(0.014)	(0.012)
Non-monotonic choices	0.022**	0.008	0.026	0.014	0.001	0.005
	(0.009)	(0.010)	(0.017)	(0.009)	(0.014)	(0.013)
Fraction to student - dictator	-0.027	0.049	0.131	-0.056	0.186	-0.077
	(0.134)	(0.158)	(0.181)	(0.142)	(0.201)	(0.204)
Fraction to foundation - dictator	-0.110	-0.128	-0.192	-0.097	-0.422***††	0.159
	(0.097)	(0.120)	(0.136)	(0.129)	(0.137)	(0.173)
Fraction to student - ultimatum	0.090	0.157	-0.046	0.144	0.359	-0.052
	(0.175)	(0.253)	(0.235)	(0.169)	(0.247)	(0.242)
Constant	0.651***††	0.812***	0.533	0.583***††	0.827***††	0.306***††
	(0.198)	(0.251)	(0.337)	(0.047)	(0.062)	(0.071)
N	352	178	171	317	157	157

Notes: Standard errors clustered at the individual level in parentheses
*** p<0.01, **p<0.05, * p<0.1
Multiple testing: ††† p<0.01, †† p<0.05, † p<0.1

Table 10: Tests for sample attrition (Part 2)

	Levels in Baseline 2			**Change from Baseline 1 to 2**		
	All	Comparison	Last-sem. Students	All	Comparison	Last-sem. Students
IQ test (Raven's)	0.012	0.001	0.026	0.035***	0.020	0.052**
	(0.018)	(0.019)	(0.027)	(0.013)	(0.015)	(0.021)
CRT test	0.008	-0.024	-0.017	-0.023	-0.005	0.008
	(0.041)	(0.045)	(0.059)	(0.031)	(0.034)	(0.053)
Stroop test	-0.001	0.002	0.004	0.004	-0.003	0.011**
	(0.005)	(0.004)	(0.009)	(0.004)	(0.004)	(0.006)
Flanker test	-0.003	0.000	-0.006	-0.004	-0.000	-0.008**
	(0.003)	(0.005)	(0.006)	(0.003)	(0.003)	(0.004)
Hard to come up with money	-0.008	-0.018	-0.117	0.022	-0.039	0.025
	(0.056)	(0.066)	(0.085)	(0.065)	(0.069)	(0.108)
Hard to cover expenses	-0.020	0.064	0.027	-0.040	0.089	-0.097
	(0.074)	(0.085)	(0.108)	(0.064)	(0.072)	(0.103)
Insatisfied HH finances	-0.026	0.002	0.001	-0.035	0.040	-0.050
	(0.066)	(0.068)	(0.097)	(0.058)	(0.059)	(0.089)
Stressed personal finances	-0.033	0.047	-0.071	0.025	0.002	-0.035
	(0.064)	(0.079)	(0.095)	(0.059)	(0.049)	(0.090)
Inconsistent in the value of money	-0.031	-0.031	-0.048	-0.007	-0.039	-0.089
	(0.055)	(0.065)	(0.096)	(0.060)	(0.066)	(0.102)
Happy	0.117*	0.087	0.131	0.094	0.042	0.229***
	(0.071)	(0.092)	(0.101)	(0.058)	(0.067)	(0.086)
Frustrated	0.028	-0.054	0.035	0.017	-0.023	0.089
	(0.070)	(0.073)	(0.133)	(0.054)	(0.057)	(0.085)
Depressed	-0.032	-0.063	0.015	-0.041	-0.110*	-0.044
	(0.074)	(0.082)	(0.144)	(0.057)	(0.058)	(0.097)
Worried	0.005	-0.039	-0.021	-0.011	0.023	-0.086
	(0.061)	(0.071)	(0.088)	(0.050)	(0.055)	(0.075)
Enjoying myself	-0.109*	-0.022	-0.215**	-0.126**	-0.013	-0.182**
	(0.066)	(0.084)	(0.089)	(0.052)	(0.068)	(0.076)
Tired	0.017	-0.001	-0.013	-0.029	0.024	-0.071
	(0.058)	(0.066)	(0.084)	(0.050)	(0.052)	(0.074)
Constant	0.651***††	0.812***††	0.533	0.583***††	0.827***††	0.306***††
	(0.198)	(0.251)	(0.337)	(0.047)	(0.062)	(0.071)
N	352	178	171	317	157	157

Notes: Standard errors clustered at the individual level in parentheses
*** p<0.01, **p<0.05, * p<0.1
Multiple testing: ††† p<0.01, †† p<0.05, † p<0.1

G Other difference-in-differences results

Table 11: DID results: More risk measures

	(3)	(4)	(5)	(6)
	Risk averse	**Risk averse**	**Fraction making inconsistent risk choices**	**Fraction making inconsistent risk choices**
Baseline 1 * Comparison	0.832***	0.897***	0.261***	0.223***
	(0.0277)	(0.0500)	(0.0325)	(0.0635)
Baseline 2 * Comparison	0.837***	0.925***	0.190***	0.235***
	(0.0273)	(0.0553)	(0.0290)	(0.0586)
After offer * Comparison	0.598***	0.216***	0.136***	0.0774**
	(0.0363)	(0.0518)	(0.0254)	(0.0311)
After paycheck * Comparison	0.554***	0.327***	0.0924***	0.0533*
	(0.0368)	(0.0592)	(0.0214)	(0.0277)
Baseline 1 * Last sem.	0.0112	0.00759	-0.0305	-0.0249
	(0.0390)	(0.0389)	(0.0454)	(0.0452)
Baseline 2 * Last sem.	-0.0841**	-0.0945**	-0.0779**	-0.0805**
	(0.0424)	(0.0432)	(0.0375)	(0.0381)
After offer * Last sem.	-0.132**	-0.0139	-0.0615*	-0.0531
	(0.0549)	(0.0526)	(0.0333)	(0.0365)
After paycheck * Last sem.	0.0891	0.0531	-0.0141	-0.0238
	(0.0580)	(0.0598)	(0.0330)	(0.0339)
Observations	1,355	1,355	1,355	1,355
R-squared	0.725	0.752	0.181	0.195
Emotion controls	NO	YES	NO	YES

Robust standard errors in parentheses

*** p<0.01, **p<0.05, * p<0.1

Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1

Table 12: DID results: Social preferences

	(1) **Fraction to student - dictator**	(2) **Fraction to student - dictator**	(3) **Fraction to foundation - dictator**	(4) **Fraction to foundation - dictator**	(5) **Fraction to student - ultimatum**	(6) **Fraction to student - ultimatum**
Baseline 1 * Comparison	0.331***	0.299***	0.553***	0.608***	0.438***	0.417***
	(0.0179)	(0.0352)	(0.0232)	(0.0478)	(0.0136)	(0.0268)
Baseline 2 * Comparison	0.279***	0.323***	0.477***	0.491***	0.423***	0.474***
	(0.0175)	(0.0384)	(0.0235)	(0.0492)	(0.0139)	(0.0302)
After offer * Comparison	0.343***	0.716***	0.468***	0.778***	0.464***	0.792***
	(0.0261)	(0.0373)	(0.0282)	(0.0394)	(0.0220)	(0.0307)
After paycheck * Comparison	0.340***	0.604***	0.477***	0.612***	0.467***	0.680***
	(0.0270)	(0.0514)	(0.0287)	(0.0536)	(0.0241)	(0.0431)
Baseline 1 * Last sem.	0.0362	0.0358	-0.0314	-0.0374	0.0249	0.0262
	(0.0255)	(0.0257)	(0.0339)	(0.0340)	(0.0189)	(0.0188)
Baseline 2 * Last sem.	0.0569**	0.0552**	-0.0162	-0.0141	0.0258	0.0204
	(0.0260)	(0.0267)	(0.0336)	(0.0340)	(0.0202)	(0.0205)
After offer * Last sem.	0.209***†††	0.0924***††	0.132***†††	0.0359	0.149***†††	0.0505*
	(0.0416)	(0.0351)	(0.0426)	(0.0391)	(0.0355)	(0.0304)
After paycheck * Last sem.	-0.0988***	-0.0524	-0.0852**	-0.0543	-0.0957***	-0.0631**
	(0.0368)	(0.0361)	(0.0432)	(0.0445)	(0.0319)	(0.0314)
Observations	1,355	1,355	1,355	1,355	1,355	1,355
R-squared	0.588	0.669	0.673	0.702	0.779	0.826
Emotion controls	NO	YES	NO	YES	NO	YES

Robust standard errors in parentheses

*** p<0.01, **p<0.05, * p<0.1

Multiple Inference: ††† p_m<0.01, †† p_m<0.05, † p_m<0.1

Table 13: DID results: Psychological measures

	(1) **Frustration**	(2) **Depression**	(3) **Worry**	(4) **Enjoyment**	(5) **Tired**
Baseline 1 * Comparison	0.196***	0.141***	0.402***	0.511***	0.598***
	(0.0294)	(0.0258)	(0.0363)	(0.0370)	(0.0363)
Baseline 2 * Comparison	0.337***	0.239***	0.538***	0.484***	0.603***
	(0.0350)	(0.0316)	(0.0369)	(0.0370)	(0.0362)
After offer * Comparison	0.283***	0.239***	0.424***	0.446***	0.435***
	(0.0333)	(0.0316)	(0.0366)	(0.0368)	(0.0367)
After paycheck * Comparison	0.239***	0.201***	0.266***	0.543***	0.223***
	(0.0316)	(0.0297)	(0.0327)	(0.0369)	(0.0308)
Baseline 1 * Last sem.	-0.0159	0.0160	-0.0707	-0.0727	-0.0585
	(0.0412)	(0.0376)	(0.0507)	(0.0526)	(0.0522)
Baseline 2 * Last sem.	-0.0785	-0.0256	-0.128**	0.0500	-0.0976*
	(0.0481)	(0.0441)	(0.0523)	(0.0527)	(0.0522)
After offer * Last sem.	-0.147***†††	-0.151***†††	-0.201***†††	-0.0808	-0.232***†††
	(0.0437)	(0.0393)	(0.0502)	(0.0541)	(0.0495)
After paycheck * Last sem.	0.0652	0.0163	0.108*	0.0217	0.116**
	(0.0534)	(0.0487)	(0.0559)	(0.0593)	(0.0540)
Observations	1,355	1,355	1,355	1,355	1,355
R-squared	0.257	0.201	0.398	0.492	0.491
Emotion controls	NO	NO	NO	NO	NO

Robust standard errors in parentheses

*** p<0.01, **p<0.05, * p<0.1

Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1

Table 14: DID results: Cognitive performance - Additional tasks

	(1)	(2)	(3)	(4)
	Stroop Test	**Stroop Test**	**Flanker Test**	**Flanker Test**
Baseline 1 * Comparison	16.84***	14.75***	28.45***	27.95***
	(0.463)	(1.053)	(0.735)	(1.478)
Baseline 2 * Comparison	17.84***	16.77***	30.58***	28.69***
	(0.451)	(0.976)	(0.646)	(1.191)
After offer * Comparison	18.24***	16.94***	29.67***	29.96***
	(0.485)	(1.060)	(0.767)	(1.772)
After paycheck * Comparison	19.78***	18.26***	31.69***	29.90***
	(0.433)	(0.695)	(0.699)	(1.404)
Baseline 1 * Last sem.	-0.399	-0.259	-0.708	-0.638
	(0.714)	(0.726)	(1.046)	(1.056)
Baseline 2 * Last sem.	0.530	0.752	-0.856	-0.538
	(0.609)	(0.614)	(0.886)	(0.895)
After offer * Last sem.	0.314	0.460	0.847	1.011
	(0.842)	(0.824)	(1.327)	(1.418)
After paycheck * Last sem.	-0.183	-0.199	-0.397	-0.244
	(0.629)	(0.635)	(1.067)	(1.085)
Observations	1,228	1,228	1,229	1,229
R-squared	0.901	0.904	0.914	0.915
Emotion controls	NO	YES	NO	YES

Robust standard errors in parentheses

*** p<0.01, **p<0.05, * p<0.1

Multiple Inference: † † † p_m<0.01, †† p_m<0.05, † p_m<0.1