Moral consequences of becoming unemployed

Abigail Barr[a,1], Luis Miller[b], and Paloma Ubeda[b]

[a]School of Economics, University of Nottingham, University Park, Nottingham NG7 2RD, United Kingdom; and [b]School of Economics and Business, University of the Basque Country, 48015 Bilbao, Spain

Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and approved March 7, 2016 (received for review November 2, 2015)

We test the conjecture that becoming unemployed erodes the extent to which a person acknowledges earned entitlement. We use behavioral experiments to generate incentive-compatible measures of individuals' tendencies to acknowledge earned entitlement and incorporate these experiments in a two-stage study. In the first stage, participants' acknowledgment of earned entitlement was measured by engaging them in the behavioral experiments, and their individual employment status and other relevant socioeconomic characteristics were recorded. In the second stage, a year later, the process was repeated using the same instruments. The combination of the experimentally generated data and the longitudinal design allows us to investigate our conjecture using a difference-in-difference approach, while ruling out the pure self-interest confound. We report evidence consistent with a large, negative effect of becoming unemployed on the acknowledgment of earned entitlement.

economic experiments | longitudinal data | distributive justice | redistribution | unemployment

Understanding how becoming unemployed affects people's reasoning is important. Unemployment and the poverty it engenders is associated with depression, anxiety, stress, low subjective well-being and self-esteem, heightened aversion to risk, and a greater tendency to discount the future within the individual (1–7), and higher rates of suicide, murder, and alcohol-related death across countries (8, 9). We investigate a different kind of effect, a moral consequence of unemployment that, alongside unemployment's effects on mental health, could explain why people are disengaging from the labor market (10). We test the conjecture that becoming unemployed erodes the extent to which a person acknowledges earned entitlement, i.e., acknowledges an individual's right to keep, consume, or dispose of that which was gained through his or her own effort or endeavor. This right and its acknowledgment underpins labor market functioning and guides taxation and government-spending policy worldwide (11).

Survey-based studies find a positive association between low economic status and stated preferences for redistributive taxation and spending (12–16). However, although these survey-based results are consistent with our conjecture, they are also consistent with pure self-interest; purely self-interested individuals would state a preference for minimal or no redistribution when they are relatively well-off as this would minimize their tax burden, but would shift to favoring redistribution on becoming relatively poor owing to job loss (17).

We used behavioral experiments to generate incentive-compatible measures of individuals' tendencies to acknowledge earned entitlement that cannot be driven by pure self-interest (18). We incorporated these experiments into an unusual two-stage study. In the first stage, participants' acknowledgment of earned entitlement was measured by engaging them in the behavioral experiments, and their individual employment status and other relevant socioeconomic characteristics were recorded. In the second stage, a year later, the process was repeated using the same instruments. We use the resulting data to investigate whether losing a job or becoming unemployed on leaving full-time education causes individuals to acknowledge earned entitlement less. Then, using a variety of methods, we exclude the possibility that our findings are driven by changes across time in self-interest, i.e., in the weight applied to own payoff, health status, fatalism, and laziness.

Including those in full-time education and those who transition from full-time education to unemployment in the analysis is useful for four reasons. First, it links our study to the extensive experimental literature on acknowledgment of earned entitlement by students (19–25). Second, it allows us to investigate whether transitioning from preparation for the labor market to unemployment has a similar moral effect to transitioning from participation in the labor market to unemployment. Third, although the transition from employment to unemployment is highly likely to be associated with a decline in income, the transition from education to unemployment is not. In addition, this being the case, a comparison of the effects of the transitions is informative about mechanism. Finally, the likelihood of transitioning from education to unemployment is increasing and is, thus, of particular interest.

The results reported below pertain to a sample of 151 individuals for whom we have both year 1 and year 2 data points. This sample is composed of four subsamples (Fig. 1*A*): those who were employed in both years; those who transitioned from employment to unemployment; those who were full-time students in both years; and those who transitioned from full-time education to unemployment. We exploit the transitions into unemployment using difference-in-difference and triple-difference methods to estimate the causal effect of interest.

Participants' acknowledgment of earned entitlement was measured using a four person distributive justice game ("DJ game") (*SI Appendix*, section 8). In this game, each participant is initially endowed with a positive sum of money, initial endowments vary across the four participants, each knows the initial endowment of

Significance

Unemployment has devastating effects on people's economic and social circumstances. Its negative effects on mental health and subjective well-being are also well documented. However, until now, there has been no quantitative evaluation of the moral consequences of unemployment. Here, using behavioral experiments and an unusual subject engagement strategy, we present evidence that becoming unemployed erodes the extent to which a person acknowledges earned entitlement, i.e., acknowledges an individual's right to that gained through his or her own effort or endeavor. This finding has important implications for the way we should think about economic and political systems. It indicates that, in addition to a causal link running from preferences to outcomes, there exists a feedback loop from outcomes to preferences that needs to be taken into account when considering system dynamics.

Author contributions: A.B., L.M., and P.U. designed research, performed research, contributed new analytic tools, analyzed data, and wrote the paper.

The authors declare no conflict of interest.

This article is a PNAS Direct Submission.

Freely available online through the PNAS open access option.

[1]To whom correspondence should be addressed. Email: abigail.barr@nottingham.ac.uk.

This article contains supporting information online at www.pnas.org/lookup/suppl/doi:10.1073/pnas.1521250113/-/DCSupplemental.

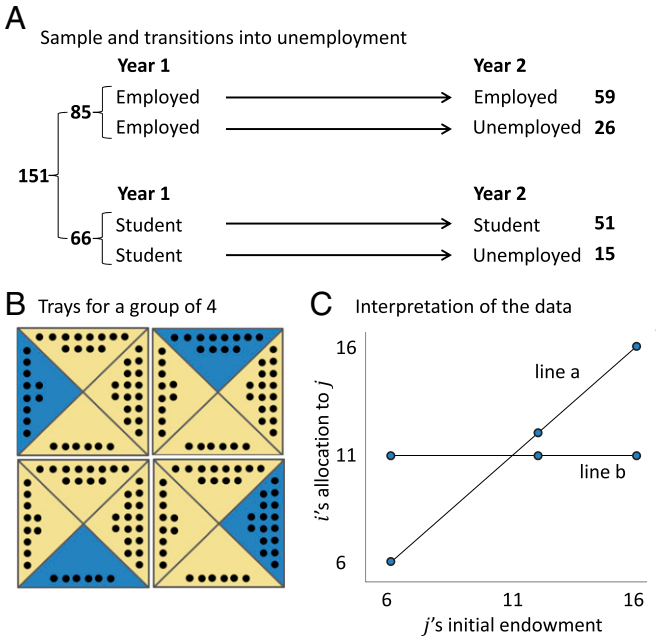

Fig. 1. Research design. *A* presents the sample design, subsample sizes, and descriptions. *B* presents diagrams of the trays given to the four members of a group in the behavioral experiment. The blue quadrant of each tray contains the tray-receiving participant's own initial endowment in the form of counters. The other three quadrants contain the initial endowments of the others in the tray-receiving participant's group. *C* presents a graphical aid to understanding how the data from the experiment should be interpreted: if the relationship between *j*'s initial endowment and *i*'s allocation to *j* has a slope of 1 (line a), it implies full conditioning of allocations on initial endowments; a slope of zero (line b) implies no such conditioning and indicates that *i* redistributed across the *j*s in his or her group such that their final allocations were equal.

each of the four participants, and each is free to make final allocations to the four, subject to the constraint that the sum of the allocations must equal the sum of the initial endowments. Once all of the participants have made their allocation decisions, the decisions of one, randomly selected, determine the final payoffs. To play the game, each participant receives a tray divided into four quadrants (Fig. 1*B*). One of the quadrants is colored blue and contains the participant's own initial endowment in the form of counters. The other three quadrants contain the initial endowments of the others in the participant's group. The participants are then free to move the counters between quadrants.

Before the DJ game, the participants engaged in a real-effort task. In two-thirds of the sessions, their performance ranking in that task determined their initial endowments. Below, we use the term "earned treatment" when referring to these sessions and "random treatment" when referring to the other sessions, in which the initial endowments were randomly assigned. The distribution of initial endowments was constant across treatments; within each set of four participants, one was initially endowed with €16, one with €12, one with €10, and one with €6. In each year, participants played the game once, making their decisions in private and without knowing the identity of the other three members of their group (*SI Appendix*, section 8). Each participant played under the same treatment in both years.

Our analysis focuses on whether, how, and to what extent the allocation made by participant *i* to participant *j* in the DJ game is conditioned upon *j*'s initial endowment. Assuming linearity (*SI Appendix*, section 5), the conditioning of *i*'s allocation to *j* on *j*'s initial endowment is fully captured by the slope of the relationship between the two, i.e., by the effect of a one unit change in *j*'s initial endowment on *i*'s allocation to *j* (Fig. 1*C*). If, for a given participant-type subsample, the slope of this relationship is significantly greater in the earned treatment compared with the random treatment, it indicates that participants of that type acknowledge earned entitlement. In the example represented in Fig. 1*C*, the participant follows either a strict proportional (line a) or a strict egalitarian (line b) rule. When the former rule is applied to discretionary variables (earned treatment) and the latter to exogenous variables (random treatment), the resulting moral principle has been termed the accountability principle (19, 20). Our analytical objective is to establish whether and how the cross-treatment difference in slopes changes on becoming unemployed.

In previous studies involving similar tasks (18–25), students and employed individuals in developed countries acknowledged earned entitlement. In contrast, unemployed individuals tended not to acknowledge earned entitlement (18). If becoming unemployed causes individuals to acknowledge earned entitlement less or not at all, in the DJ game, we should observe the following: (*i*) participants not or minimally conditioning allocations on initial endowments in the random treatment, regardless of the year and their employment status; (*ii*) participants significantly conditioning allocations on initial endowments in the earned treatment in year 1, regardless of whether they subsequently became unemployed; (*iii*) participants who stayed employed or in full-time education also significantly conditioning allocations on initial endowments in the earned treatment in year 2; and (*iv*) participants who became unemployed either ceasing to condition or reducing the extent to which they condition allocations on initial endowments in the earned treatment in year 2.

Results

Fig. 2 presents the results. The figure is made up of three panels, each containing two directly comparable bar charts. The heights of the bars indicate the estimated mean within participant-year slopes for various defined subsamples. In each panel, the upper chart pertains to the earned treatment, the lower chart to the random treatment. In each chart, the left-hand pair of bars pertains to year 1, and the right-hand pair to year 2. In Fig. 2*A*, the graphed slopes are derived from the regression in column *i* of Table 1. Each graphed slope is the sum of between one and all eight of the estimated coefficients presented in the table (*SI Appendix*, section 4). The green bars pertain to participants who were either employed or in full-time education in both years, and the orange bars to participants who became unemployed in year 2 having been either employed or in full-time education in year 1. Fig. 2 *B* and *C* present the same analysis as Fig. 2*A*, but conducted separately for the subsamples of participants who were employed in year 1 (Fig. 2*B*) and those who were in full-time education in year 1 (Fig. 2*C*) (*SI Appendix*, Table S6).

The relatively short bars in the lower chart in each panel indicate that participants did not or only minimally conditioned allocations upon initial endowments in the random treatment, regardless of the year and their employment status. A slope of zero is consistent with both pure selfishness and the application of the strict egalitarian rule. However, purely selfish individuals would allocate zero to all others and, under the random treatment, only 10% of the allocations to others were zero and the mean allocation to others was 18% of the sum of initial endowments (*SI Appendix*, Table S5).

The bars in the upper charts in each panel indicate that, in year 1, under the earned treatment both those who stayed employed or in full-time education and those who subsequently became unemployed conditioned their allocations to others on those others' initial endowments. In contrast, in year 2, under the earned treatment, a difference emerges between participants who stayed employed or in full-time education and those who became unemployed: the former, who retained their employment

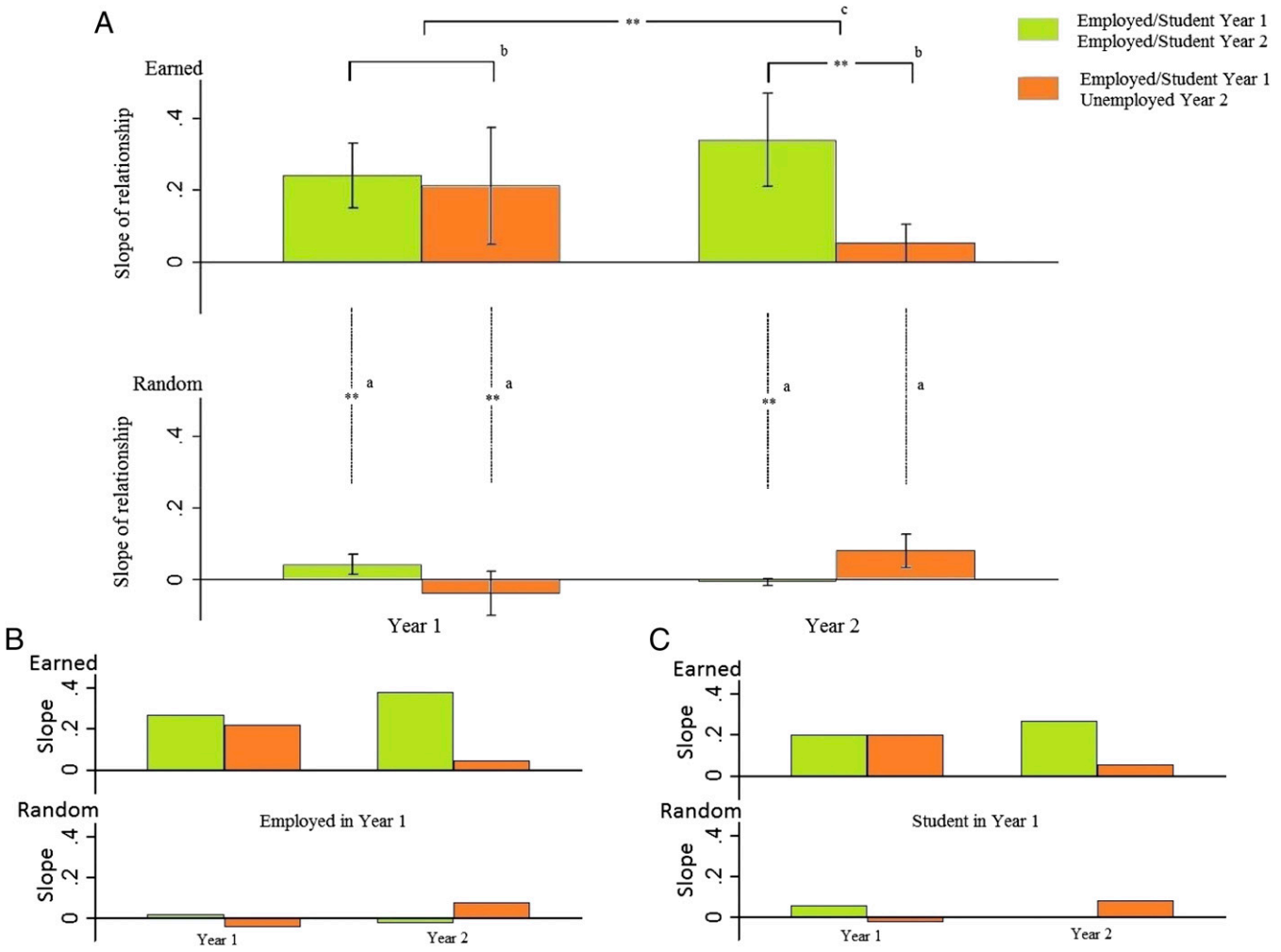

Fig. 2. The effect of becoming unemployed on the acknowledgment of earned entitlement. The slope estimates graphed as vertical bars in *A* are derived from the regression model presented in column *i* of Table 1 (below). The slope estimates graphed in *B* and *C* are derived from similar models focusing on allocations made by those who were employed in year 1 and those who were in full-time education in year 1, respectively (*SI Appendix*, section 4). The allocator-year fixed effects control for individual differences in partial selfishness and marginal within individual changes in partial selfishness over time. In *A*, the whiskers indicate 95% confidence intervals and the results of various linear restriction tests are also presented. (a) For each subject subsample in each year, the significance of the difference in slopes between the earned and random treatments is reported (vertical dotted lines). (b) Lower horizontal bars indicate significance of the differences in cross-treatment differences (diff-in-diffs) between those who stayed employed or in full-time education and those who became unemployed within each year. (c) Upper horizontal bar indicates significance of the difference in those diff-in-diffs (triple-diff) between year 1 and year 2. **Significance at 1%.

status, continued to condition their allocations upon initial endowments, whereas the latter, who became unemployed, did not.

A Chow test indicates that the slopes graphed in *B* and *C* are statistically indistinguishable (*P* value of 0.516) (*SI Appendix*, Table S6). That becoming unemployed has a similar effect on those previously in employment and those previously in full-time education suggests that the effect is owing not to a decline in income but to something intrinsic to the state of being unemployed.

Given the Chow test result, for the remainder of this section, we will focus on the pooled analysis in *A*. According to this analysis, in year 1, the slope of the relationship between earned initial endowments and final allocations was 0.24 for those who remained employed or in full-time education and 0.21 for those who subsequently became unemployed. Both of these slopes are significantly different from zero (values of $P < 0.001$ and 0.014, respectively) and significantly different from the corresponding slope under the random treatment (value of $P < 0.001$ and 0.007, respectively). In year 2, for those who remained in employment or full-time education, the slope of the relationship between earned initial endowments and final allocations was 0.34 and significantly different from both zero (value of $P < 0.001$) and the corresponding slope under the random treatment (*P* value < 0.001). However, for those who became unemployed, the slope was only 0.05 and only weakly significantly different from zero (value of $P < 0.056$) and, most notably, not significantly different from the corresponding slope under the random treatment (*P* value of 0.412).

These results are consistent with acknowledgment of earned entitlement by all in year 1, but only by those who remained employed or in full-time education in year 2. Difference-in-difference tests indicate that, although the allocating behavior of those who did and did not become unemployed was statistically indistinguishable in year 1 (*P* value 0.121), it was significantly different in year 2 (value of $P < 0.001$). Finally, we turn to our direct estimate of the effect of becoming unemployed on acknowledgment of earned entitlement, i.e., the triple difference between experimental treatments, time periods, and those who did and did not become unemployed. In column *i* of Table 1, the

Table 1. Regression analysis of the effect of becoming unemployed on the acknowledgment of earned entitlement

	Dependent variable = *i*'s allocation to *j*			
	(*i*)	(*ii*)	(*iii*)	(*iv*)
Control =	—	Health	Internal LoC	Performance
y_j	0.043**	0.013	0.073	0.049**
	(0.014)	(0.076)	(0.044)	(0.011)
y_j * *E*	0.198**	−0.197	−0.035	0.193**
	(0.049)	(0.144)	(0.124)	(0.048)
y_j * *U*	−0.081*	−0.080	−0.082*	−0.094*
	(0.039)	(0.040)	(0.040)	(0.036)
y_j * *E* * *U*	0.051	0.045	0.039	0.064
	(0.112)	(0.110)	(0.106)	(0.111)
Y2 * y_j	−0.050**	$4.5e^{-4}$	−0.096	−0.052**
	(0.015)	(0.102)	(0.062)	(0.012)
Y2 * y_j * *E*	0.148	0.913**	0.453*	0.104
	(0.082)	(0.245)	(0.210)	(0.075)
Y2 * y_j * *U*	0.168**	0.168**	0.170**	0.185**
	(0.046)	(0.047)	(0.047)	(0.046)
Y2 * y_j * *E* * *U*	−0.427**	−0.436**	−0.406**	−0.431**
	(0.135)	(0.131)	(0.131)	(0.131)
y_j * Control		0.001	−0.004	0.033**
		(0.003)	(0.005)	(0.011)
y_j * *E* * Control		0.016*	0.033*	−0.041
		(0.006)	(0.016)	(0.048)
Y2 * y_j * Control		−0.002	0.006	−0.046**
		(0.004)	(0.008)	(0.017)
Y2 * y_j * *E* * Control		−0.031**	−0.043	0.164*
		(0.009)	(0.026)	(0.065)
Constant	0.188**	0.188**	0.187**	0.188**
	$(8.6e^{-5})$	$(9.0e^{-5})$	$(1.1e^{-4})$	$(4.2e^{-4})$
Mean of control by year and subsample				
Year 1, *U* = 0		24.218	7.218	0.011
Year 1, *U* = 1		24.976	7.489	0.033
Year 2, *U* = 0		24.627	6.991	0.354
Year 2, *U* = 1		24.268	7.195	0.396
Observations	906	906	906	906
Participants	151	151	151	151
Clusters	61	61	61	61

Notes: Sample includes allocations made to others by participants who were employed or in full-time education in year 1; there are six observations per participant, three pertaining to the year 1 DJ game, and three pertaining to the year 2 DJ game; participant-year fixed effects, a_{it}, included in all models; *j*'s initial endowment (y_j) = *j*'s initial endowment expressed as a proportion of the 44 tokens in the game; Earned (*E*) = 1 if *i* made allocations under the earned treatment, = 0 if *i* made allocations under the random treatment; Became Unemployed (*U*) = 1 if *i* became unemployed between year 1 and year 2; = 0 if *i* remained employed or in full-time education; *Y2* = 1 if allocation made in year 2; = 0 if allocation made in year 1; "Health" ranges from 0 (severe health problems and psychological distress) to 36 (good health); "Internal LoC" ranges from 0 (fully believing your future depends upon luck or fate) to 13 (fully believing you are responsible for your own success or failure); "Performance," number of pots processed in the real-effort task by *i* minus mean number of pots processed in real-effort task undertaken by *i* (filling or emptying) divide by SD in pots processed in that task; Mann–Whitney rank sum and *t* tests indicate that controls do not vary across subsamples, performance increased between years; SEs clustered at the session level; **significant at 1%; *significant at 5%.

coefficient on $Y2{*}y_j{*}E{*}U$ is the triple-diff estimator of the effect of becoming unemployed on acknowledgment of earned entitlement. The estimated coefficient is significantly different from zero (*P* value of 0.002), negative, and indicates a reduction in the difference in the slope of the relationship between the earned and random treatment that is specific to those who became unemployed.

This reduction in slope difference is consistent with a cessation in acknowledgment of earned entitlement. However, before we can conclude that becoming unemployed erodes the extent to which a person acknowledges earned entitlement, we have to rule out the possibility that the reduction in slope difference among those who become unemployed is owing to them becoming either purely selfish or more but still only partially selfish. In the analysis above, we controlled for variations in partial selfishness both within and across participant types and within participants across years to a degree by including allocator-year fixed effects. However, if those who become unemployed also become considerably more selfish, they would allocate considerably more to themselves regardless of treatment. This would reduce the amount to be allocated to the others and, thus, constrain the extent to which they could differentiate allocations across others. In the extreme, if they become purely selfish they would take everything for themselves regardless of treatment and, thereby, reduce the slope of the relationship to zero in both treatments.

Of the 151 participants whose allocations to others enter the analysis, only seven (five employed in year 1, three of whom became unemployed in year 2, and two students in year 1, both of whom became unemployed in year 2) became purely selfish in year 2. These seven were evenly distributed across treatments and excluding their allocations to others from the analysis does not change the results (*SI Appendix*, section 6).

If those who become unemployed become considerably more selfish, it would manifest as a differentially large increase between years 1 and 2 in the allocations they made to themselves. A linear regression analysis of allocations to self provides no evidence of such a differentially large increase, and this null finding is robust to the inclusion of own initial endowment, treatment, and the interaction between the two as controls (*SI Appendix*, section 6).

We did not randomize becoming unemployed, so we need to consider the possibility that becoming unemployed and ceasing to acknowledge earned entitlement are both driven by a change in a third variable. A decline in health could cause job loss, a transition from education into unemployment and a shift toward egalitarian notions of distributive justice. So too could any other experience that causes an individual to become more fatalistic or lazy. We do not have data pertaining to such other experiences. However, we do have proxies for fatalism and laziness. In Table 1, we investigate the robustness of our main finding to the inclusion in the analysis of an index measure for (self-reported) health (26), a standard measure of internal locus of control (27), the inverse of fatalism, and a measure of the allocating participants' performance in the real-effort task, which would be systematically reduced by an increase in laziness. For these robustness checks to be valid, not only the control but also its interactions with others' initial endowments, the experimental treatment and the year must be included. In Table 1, we do this for one control at a time. Including all three controls and corresponding interaction terms at the same time, yields similar results (*SI Appendix*, Table S10).

The slopes graphed in Fig. 2*A* are derived from the regression in column *i* of Table 1. In that regression, the coefficient of −0.427 on $Y2{*}y_j{*}E{*}U$ is the triple-diff estimator of the effect of becoming unemployed on acknowledgment of earned entitlement. Columns *ii* and *iii* reveal that health and fatalism do affect the extent to which an individual acknowledges earned entitlement; note, for example, the insignificance of the coefficients on $y_j{*}E$ and the positive and significant coefficients on $y_j{*}E{*}Control$. Column *iv* reveals that those who performed better in the real-effort task acknowledged unearned entitlement marginally more in year 1 and marginally less in year 2 and acknowledged earned entitlement considerably more in year 2. However, the inclusion of each of these controls in the analysis resulted in only very marginal changes

in the estimated coefficient on $Y2{*}y_j{*}E{*}U$, which remains negative, large, and highly significant across all models.

This analysis does not rule out the possibility that becoming unemployed and ceasing to acknowledge earned entitlement are both driven by a change in a third variable. However, it does indicate that, although three highly likely candidates for such a variable do impact on acknowledgment of entitlement, earned or otherwise, none are the cause of our main finding. Indeed, although each of the three candidates has a large and significant impact on acknowledgment of entitlement, this impact appears to be almost entirely orthogonal to the large and significant eroding effect of becoming unemployed on acknowledgment of earned entitlement.

Discussion

Economists have traditionally assumed that preferences, including moral concerns, are exogenously given (28). Under this assumption, changes in behavior follow from changes in constraints, i.e., prices, information and technologies, and both individual- and system-level outcomes can be predicted with relative ease. However, the validity of this assumption has long been questioned; in the mid-19th century, Karl Marx famously wrote that "[it] is not the consciousness of men that determines their being, but on the contrary it is their social being that determines their consciousness" (29). More recently, a growing body of evidence has emerged, indicating that preferences are indeed endogenous, systematically varying across societies, and changing following changes in institutions and various other aspects of context (30, 31). The study presented here contributes to this body of evidence. Specifically, it shows that a change in one important dimension of an individual's context—whether they are employed or not—directly affects the extent to which they acknowledge earned entitlement, a key moral value underpinning market-driven societies. Note that this finding identifies a feedback loop (7) running from an outcome to a dimension of individual preferences that is instrumental in determining that outcome. Thus, our result raises challenges for theory and suggests potentially important avenues for future empirical research.

The finding that becoming unemployed erodes individual acknowledgment of earned entitlement can be explained with reference to dissonance reduction (19, 32). On becoming unemployed, individuals who previously adhered to the value of earned entitlement let go of that value instead of either: enduring a decline in material well-being; or receiving resources to which they do not feel entitled and enduring the psychological effects of the resulting dissonance. In turn, the finding may help to explain why, especially following the financial crisis of 2008, young people are disengaging from the labor market (10); on becoming unemployed, individuals let go of the value of earned entitlement and, thereby, let go of one of the motivations for finding a new job.

The extent to which individuals believe that earned entitlement should be acknowledged has potential implications for the way they vote, how willing they are to pay their taxes, and whether and how they engage in the process of production. In addition, this being the case, the finding has potentially important and far-reaching policy implications. However, here, the need for further research looms large. This is because the significance of the finding for the dynamics of societies and the ideal policy response depend on how and how readily the effect is or can be reversed. Through further research, we need to establish whether unemployed individuals have to reacquire the value of earned entitlement before effectively reengaging with the labor market. Then, assuming they do, we need to investigate how this process occurs and whether and how different interventions enable the process.

Methods

Participants. We conducted the study in Spain, the country with the third highest unemployment rate in the Organization for Economic Cooperation and Development (OECD). We focused on two cities, Bilbao and Cordoba, where the unemployment rates were high (about 15%) and extremely high (above 30%), respectively. The first stage of the study took place in April to June 2013 (year 1) and the second stage a year later (year 2). In 2013, 18 experimental sessions were conducted in Cordoba (12 earned and 6 random) and 16 in Bilbao (10 earned and 6 random). Thirty-one sessions involved 16 participants and three sessions involved 12 participants, leading to a total of 532 participants in year 1. In year 2, 16 sessions in Cordoba (9 earned and 7 random) and 13 in Bilbao (8 earned and 5 random) were conducted. Sixteen sessions involved 16 participants, and 13 sessions involved 12 participants, leading to a total of 412 participants in year 2. The attrition rate between year 1 and year 2 was 48%, and 275 people participated in both years. This paper focuses on the 151 participants who were either employed or students in both years or employed or students in year 1 and unemployed in year 2. According to the year 1 sociodemographic and behavioral data, year 1 participants who did and did not return to take part in year 2 are statistically indistinguishable (*SI Appendix*, section 2).

Behavioral Tasks. The specific design and presentation of both the four-person DJ game and the real-effort task reflected our intention to involve people from all walks of life in the experiment. Both were manual, highly visual, and required neither literacy nor much in the way of numeracy or analytical ability (*SI Appendix*, section 8).

The DJ game was undertaken using specially designed and manufactured trays. Each participant received a tray. Each tray was divided into four quadrants, each quadrant relating to a participant. The tray-receiving participant's own quadrant was blue and located at the side of the tray closest to the participant when the tray was placed on a desk in front of him or her. Each quadrant contained a number of counters indicating the initial endowment of the corresponding participant. Each counter was worth €1. The participants were invited to rearrange the counters across the quadrants as they saw fit, while being instructed not to remove any of the counters from the tray.

The real-effort task involved sorting yellow and blue gravel into various containers for 7 min. There were two versions of the task. In one, participants were given a box of mixed yellow and blue gravel and a tray full of small plastic pots. They had to put seven pieces of blue gravel and seven pieces of yellow gravel in each small pot. In the other, participants received a tray full of small plastic pots, each containing a mixture of blue and yellow gravel, and two larger containers and were asked to empty the small pots and sort the gravel by color, putting the blue gravel in one of the larger containers and the yellow gravel in the other. Note that the filling task can be viewed as preparation for the emptying task and vice versa. This enabled us to tell the participants in each session that they were helping us sort out some materials that would be used in subsequent sessions. Thus, we encouraged the participants to view their efforts as genuinely productive. In the earned treatment, at several points throughout the sessions, the participants were told and reminded about the association between pots filled (or emptied) and initial endowments in the DJ game (*SI Appendix*, section 8).

Analysis. The analytical objective is to establish whether, how, and to what extent the allocation made by *i* to *j* in the DJ game is conditioned upon *j*'s initial endowment and whether, how, and to what extent this conditioning varies depending on the following: whether that initial endowment is earned or a windfall; whether the employment status of *i* is stable or changing over time; and the time period in which the allocation is made, i.e., before or after the status change in the event that such a change takes place.

To this end, we estimated the following linear regression model:

$$x_{ijt} = \alpha_{11} y_{jt} + \alpha_{12}(y_{jt} * E_i) + \alpha_{13}(y_{jt} * U_i) + \alpha_{14}(y_{jt} * E_i * U_i) + \alpha_{21}(Y2_t * y_{jt}) + \alpha_{22}(Y2_t * y_{jt} * E_i) + \alpha_{23}(Y2_t * y_{jt} * U_i) + \alpha_{24}(Y2_t * y_{jt} * E_i * U_i) + a_{it} + \varepsilon_{ijt},$$

where x_{ijt} is the allocation made by *i* to *j* in time period *t*; y_{jt} is *j*'s initial endowment in time period *t*; $E_i = 1$ if *i* played the DJ game under the earned treatment, and 0 if *i* played the DJ game under the random treatment (each participant played under the same treatment in both time periods); $U_i = 1$ if *i* became unemployed between year 1 and year 2, and 0 if *i* was in employment or full-time education in both year 1 and year 2; $Y2_t = 1$ if the allocation was made in year 2, and 0 if the allocation was made in year 1; α_{11}, α_{12}, α_{13}, α_{14}, α_{21}, α_{22}, α_{23}, and α_{24} are the coefficients to be estimated; a_{it} are allocator-year fixed effects; and ε_{ijt} are allocation-specific idiosyncratic errors. The allocator-year fixed effects, a_{it}, in this specification are crucial. They ensure that the other parameters

isolate the within–allocator-year relationship between allocations to others and those others' initial endowments and differences in that relationship across subject types, treatments and time periods. In this specification, the effect of becoming unemployed on acknowledgment of earned entitlement is a triple difference. Specifically, it is the difference in the change over time in the random-earned treatment effect on the slope of the allocation–initial-endowment relationship between those who became unemployed and those who did not, i.e., it is α_{24}.

The estimation is presented in Table 1, column *i*. The slopes graphed in Fig. 2*A* are derived from that estimation. The slopes graphed in Fig. 2 *B* and *C* are derived from similar estimations based on the subsamples of allocations made to others by those who were employed or in full-time education in year 1, respectively.

SI Appendix accompanies the paper. This study was approved by the University of the Basque Country Research Ethics Committee. All participants provided informed consent.

ACKNOWLEDGMENTS. We thank F. Aguiar, R. Cubitt, S. Gaechter, L. Gangadharan, P. Maitra, J. Schulz, and O. Weisel for valuable comments. S. Demel provided excellent research assistance. A.B. acknowledges support from the Economic and Social Research Council via the Network for Integrated Behavioural Sciences (Award ES/K002201/1). L.M. and P.U. acknowledge support from the Spanish Ministry of Economy and Competitiveness (Grant ECO2012-30626) and the Basque Government (Research Group IT-783-13).

1. Hollander AC, Bruce D, Ekberg J, Burström B, Ekblad S (2013) Hospitalisation for depressive disorder following unemployment—differentials by gender and immigrant status: A population-based cohort study in Sweden. *J Epidemiol Community Health* 67(10):875–881.
2. Paul KI, Moser K (2009) Unemployment impairs mental health: Meta-analyses. *J Vocat Behav* 74(3):264–282.
3. Jefferis BJ, et al. (2011) Associations between unemployment and major depressive disorder: Evidence from an international, prospective study (the predict cohort). *Soc Sci Med* 73(11):1627–1634.
4. Arnetz BB, et al. (1991) Neuroendocrine and immunologic effects of unemployment and job insecurity. *Psychother Psychosom* 55(2-4):76–80.
5. Mendolia S (2014) The impact of husband's job loss on partners' mental health. *Rev Econ Househ* 12(2):277–294.
6. Clark AE, Oswald AJ (1994) Unhappiness and unemployment. *Econ J* 104(424):648–659.
7. Haushofer J, Fehr E (2014) On the psychology of poverty. *Science* 344(6186):862–867.
8. Stuckler D, Basu S, Suhrcke M, Coutts A, McKee M (2009) The public health effect of economic crises and alternative policy responses in Europe: An empirical analysis. *Lancet* 374(9686):315–323.
9. Nordt C, Warnke I, Seifritz E, Kawohl W (2015) Modelling suicide and unemployment: A longitudinal analysis covering 63 countries, 2000–11. *Lancet Psychiatry* 2(3):239–245.
10. Eurofound (2012) NEETs—Young people not in employment, education or training: Characteristics, costs and policy responses in Europe (Publications Office of the European Union, Luxembourg).
11. Miller D (1992) Distributive justice: What the people think. *Ethics* 102(3):555–593.
12. Alesina A, La Ferrara E (2005) Preferences for redistribution in the land of opportunities. *J Public Econ* 89(5-6):897–931.
13. Alesina A, Giuliano P (2010) *Handbook for Social Economics*, eds Bisin A, Benhabib J (North-Holland, Amsterdam).
14. Pittau MG, Massari R, Zelli R (2013) Hierarchical modelling of disparities in preferences for redistribution. *Oxf Bull Econ Stat* 75(4):556–584.
15. Giuliano P, Spilimbergo A (2014) Growing up in a recession. *Rev Econ Stud* 81(2): 787–817.
16. Margalit Y (2013) Explaining social policy preferences: Evidence from the Great Recession. *Am Polit Sci Rev* 107(1):80–103.
17. Durante R, Putterman L, van der Weele J (2014) Preferences for redistribution and perception of fairness: An experimental study. *J Eur Econ Assoc* 12(4):1059–1086.
18. Barr A, Burns J, Miller L, Shaw I (2015) Economic status and acknowledgement of earned entitlement. *J Econ Behav Organ* 118:55–68.
19. Konow J (2000) Fair shares: Accountability and cognitive dissonance in allocation decisions. *Am Econ Rev* 90(4):1072–1091.
20. Konow J (2003) Which is the fairest one of all? A positive analysis of justice theories. *J Econ Lit* XLI(4):1188–1239.
21. Frohlich N, Oppenheimer J, Kurki A (2004) Modeling other-regarding preferences and an experimental test. *Public Choice* 119(1-2):91–117.
22. Cappelen AW, Hole AD, Sorensen EO, Tungodden B (2007) The pluralism of fairness ideals: An experimental approach. *Am Econ Rev* 97(3):818–827.
23. Erkal N, Gangadharan L, Nikiforakis N (2011) Relative earnings and giving in a real-effort experiment. *Am Econ Rev* 101(7):3330–3348.
24. Cappelen AW, Konow J, Sorensen EO, Tungodden B (2013) Just luck: An experimental study of risk taking and fairness. *Am Econ Rev* 103(4):1398–1413.
25. Cappelen AW, et al. (2014) Equity theory and fair inequality: A neuroeconomic study. *Proc Natl Acad Sci USA* 111(43):15368–15372.
26. Golberg D, Williams P (1988) A User's Guide to the General Health Questionnaire (NFER-Nelson, Windsor, UK).
27. Rotter JB (1966) Generalized expectancies for internal versus external control of reinforcement. *Psychol Monogr* 80(1):1–28.
28. Stigler GJ, Becker GS (1977) The gustibus non est disputandum. *Am Econ Rev* 67(2): 76–90.
29. Marx K (1904) *A Contribution to the Critique of Political Economy* (Kerr, Chicago).
30. Bowles S (1998) Endogenous preferences. *J Econ Lit* XXXVI(1):75–111.
31. Fehr E, Hoff K (2011) Introduction: Tastes, castes and culture: The influence of society on preferences. *Econ J* 121(556):396–412.
32. Festinger L (1957) *A Theory of Cognitive Dissonance* (Stanford Univ Press, Stanford).