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Peer effects in financial decision-making☆

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ABSTRACT

Peer effects might play an important role in complex financial decisions because many consumers lack experience with them and the costs of thinking through such decisions can be very high. We study peer effects in retirement savings, life insurance purchase, and two charitable giving programs in a military setting with plausibly exogenous assignment of individuals to social groups. Peers, defined broadly as social groups which may include members of different ranks, appear to play an important role in the charitable giving programs, but not in the other outcomes. We assess a number of potential reasons for the disparate findings and provide suggestive evidence that the observability of individuals' choices is key.

1. Introduction

Individuals' financial decisions have been the focus of recent U.S. policy efforts from the establishment of the Consumer Financial Protection Bureau to widespread financial education programs (U.S. Government Accountability Office, 2012). This seems natural since many financial decisions are complicated — uncertainty about future earnings, social norms, and the complexity of financial instruments are only a few factors that complicate these decisions. Given research linking cognitive ability and experience to financial mistakes (Agarwal et al., 2009; Bertrand and Morse, 2011; Agarwal and Mazumder, 2013) and the high costs of thinking through many financial decisions (Madrian and Shea, 2001), individuals may turn to their peers for help with these choices. Among workers with employer-provided retirement funds, 25% report discussing how to use the funds with peers (Employee Benefit Research Institute, 2008). Fourteen percent of federal employees enrolled in the Thrift Savings Plan (the federal government's version of a 401(k)) indicate that peers are a top factor in their investment decisions (Thrift Savings Plan, 2013). A striking 78% of millennials state that they base their financial habits on those of their social group (American Institute of CPAs, 2013). Although survey and anecdotal evidence suggest peers are important, well-identified studies have produced mixed results on peers' impacts in other settings (Sacerdote, 2001; Lyle, 2007; Mas and Moretti, 2009; Guryan et al., 2009).

We use the exogenous assignment of new U.S. Army soldiers to military units to study whether social groups matter for young, moderately educated individuals' financial decisions. Because the Army assigns soldiers based on strategic needs, newly trained soldiers have no say into which units they are transferred. Since these unit members work and live together, soldiers are effectively randomized to different social groups. Although military units are comprised of soldiers of different ranks, throughout the paper we use the term peer effects to refer to any effects of unit members on each other whether they are of equal or different ranks.

Despite this exogenous assignment, there are additional well-known challenges to estimating the causal effects of peers (Manski, 1993). First, it is difficult to quantify the extent to which the group

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affects the individual because the individual's behavior can influence the group's choices. A common approach to deal with this "reflection problem" is to estimate the impact of a group's predetermined characteristics on a person's outcome. For example, Sacerdote (2001) and Lyle (2007) study the effects of college roommates on each other's academic performance by regressing an individual's outcome on her own pre-determined ability (measured by her S.A.T. score) and her randomly assigned roommate's predetermined ability. For financial decisions, this approach would require data on measures such as how pro-social, financially literate, or forward looking a person's social group is, but these characteristics are very difficult to quantify.

Building on the standard model of peer effects, we show that in the absence of data on such a characteristic, a social group's past choice can serve as an index for all measured and unmeasured social group characteristics that affect an individual's current choice. Using the unit members' past behavior as the treatment also prevents contemporaneous shocks from biasing the estimated impacts, a second major concern highlighted in Manski (1993). Our derivation suggests that past work that has used previous choices when estimating peer effects underestimates the impact of peers (e.g. Eisenberg et al., 2014). Intuitively, previous choices reflect not only the full set of characteristics, but also the common shock experienced in the past. Because common shocks are unobserved, the estimated coefficient on peers' past choices picks up their impacts as well.

Our initial specification regresses a soldier's financial decision twelve months after arrival at her new unit on the unit's mean financial decision from the month before the soldier arrived.[1] Although this specification overcomes the reflection problem and biases due to contemporaneous common shocks, it is affected by the bias described previously. We circumvent this concern by instrumenting for peers' behavior with peers' choices at their previous units, separate and apart from the current unit used in our main analyses. Given exogenous assignment to units, common shocks across peers' current and past unit are uncorrelated and so the instrument likely satisfies the exclusion restriction.

We study the impacts of peers on four financial decisions: charitable giving to the Army Emergency Relief (AER) and to the Combined Federal Campaign (CFC), retirement savings with the Thrift Savings Plan (TSP), and life insurance purchases via Servicemembers Group Life Insurance (SGLI). We estimate substantial impacts of peers in the AER, slightly smaller impacts in the CFC, and no effects for the TSP or SGLI.[2]

One potential reason for the disparate findings is that soldiers' AER and CFC decisions are observable to others while their SGLI and TSP choices are not. Both the AER and the CFC have annual promotional campaigns that create environments in which unit members are likely to have conversations about whether they have participated. Even without these conversations, individuals' giving may be easy to observe since donations are collected in public settings. Neither the retirement savings nor the life insurance programs have similar campaigns and soldiers make their decisions in private at their local military finance office. Economic theories of peer effects rely on this observability (e.g. Banerjee, 1992; Kandel and Lazear, 1992; Ellison and Fudenberg, 1993; Bernheim, 1994; Ellison and Fudenberg, 1995; Bénabou and Tirole, 2006) and recent empirical studies of other choices suggest it is an important prerequisite for peer effects (Bandiera et al., 2005; Mas and Moretti, 2009; Bursztyn and Jensen, 2015).

To assess the importance of observability in our context, we exploit the timing of the AER campaign. Donations to the AER are far more observable during and after the campaign than they are in the months leading up to it. We find that peer effects operate exclusively during and after the annual campaign, when peers' choices are or have been observed.[3] This finding seems especially relevant given that government and consumer groups advocate incorporating peer effects into financial wellness programs.[4]

Alternatively, there might simply be something different about charitable giving that makes peers' choices more important than they are for retirement savings and life insurance. We address three possibilities: that charitable giving is a pro-social or other-regarding choice while the other programs are not, differences in the institutional choice architecture surrounding these decisions, and that social effects are less likely to overcome preferences than information deficits. Although we present suggestive evidence against these possibilities, we cannot definitively rule them out.

Our research makes two primary contributions to the literature on peer effects. First, our results provide evidence on peer effects in financial decisions that comes from a manipulation of social groups rather than information.[5] Field experiments have shown that providing information to some individuals affects their peers' savings decisions (Duflo and Saez, 2003; Beshears et al., 2015), purchases of financial assets (Bursztyn et al., 2014), purchases of insurance (Cai et al., 2015), and charitable donations (Frey and Meier, 2004; Shang and Croson, 2009). While these experiments are extremely informative about potential mechanisms, they do not directly estimate naturally occurring, or organic, peer effects at work since the researchers are directly manipulating the environment. Even if individuals act on the information as a result of the experiment, they may not do so in their daily lives because absent the researchers' intervention, information is often costly to obtain. Our estimates complement this line of literature by identifying social effects arising from a naturally occurring change in social groups rather than external information. And second, our simple model suggests that regressing an individual's decision on her peers' past choices will lead to a negatively biased estimate of peers' impacts.

An important caveat to our findings is that it is not clear how well they generalize to other populations. Although there is clearly selection into the armed services, our soldiers' charitable giving and retirement savings patterns closely mirror those of young workers. In addition, the campaigns we study are widespread in both the public sector and private market firms.

[1] One of our outcomes is measured in the January after the soldier arrives in the new unit because that is the first month in which a soldier's participation in the program is reflected.

[2] In particular, we estimate that a one standard deviation increase in peers' participation rates in the AER, CFC, TSP, and SGLI lead to 9, 6, −0.5, and −0.6 percentage point increases in a soldier's participation rate respectively.

[3] Unfortunately, we are not able to conduct the same analysis with the CFC since individuals are only able to donate during the annual campaign.

[4] The Consumer Financial Protection Bureau identifies leveraging peer networks as a best practice for workplace financial wellness programs (Consumer Financial Protection Bureau, 2014). The President's National Research Symposium on Financial Literacy and Education made it a top priority to understand the impact of social factors (specifically highlighting peer effects) on financial attitudes and behaviors (Department of the Treasury, 2008). The President's 2013 Advisory Council on Financial Capability encourages social group discussions as complements to workplace financial education (Department of the Treasury, 2013). Internationally, UN programs designed to provide financial assistance and World Bank reports assert the importance of social group effects in these domains (Hopkins and Ata Cisse, 2015; World Bank, 2015).

[5] Earlier empirical work estimates positive, and often large, correlations between individual and peers' decisions in stock market choices (Hong et al., 2004; Hong et al., 2005; Ivković and Weisbenner, 2007), charitable giving (Wu et al., 2004), and corporate governance decisions (Davis and Greve, 1997). Some studies have leveraged natural experiments to estimate plausibly causal impacts of peers on financial decisions for specific populations: retirement savings of individuals at a university (Duflo and Saez, 2002), charitable giving through an online platform in the U.K. (Smith et al., 2014), charitable giving to a university (Meer, 2011), and Harvard MBA graduates' business decisions (Shue, 2013).

The rest of this article proceeds as follows. Section 2 provides background on the Army, its soldiers, and our four financial outcomes. Section 3 provides evidence that supports the plausibly exogenous assignment of soldiers to units. We develop a model to show that a group's past behavior can be interpreted as an index of all relevant group characteristics and to motivate our empirical specification in Section 4. Section 5 discusses our empirical strategy and regression specification. Section 6 presents our main estimates of social effects and Section 7 presents extensions. Section 8 discusses the results and concludes.

2. Background

Enlisted members of the active duty Army, commonly referred to as "soldiers," begin their service with approximately 10 weeks of basic training followed by 2–52 weeks of Advanced Individual Training (AIT) where they learn the specific skills related to their job, known as their primary military occupational specialty. These jobs vary from infantryman to helicopter crewman to supply clerk to intelligence analyst. Upon completion of their AIT, soldiers are relocated to join an operational unit of the Army in the United States or abroad (e.g., Korea or Germany). This includes routine service at their post, field training exercises, and deployments to serve in missions from peacekeeping to disaster relief to combat. In each case, soldiers work and live in close proximity with members of their unit for an extended period of time.

As a matter of policy, the Department of Defense and its military Services assign military personnel to locations and units based on organizational requirements, known here as the "needs of the Army."[6] In practice, the Army defines its "needs" by a combination of occupational specialty (e.g. infantry soldiers or intelligence analysts) and rank (e.g. Private or Sergeant); the Army might need a Private who is an Infantryman or a Sergeant who is a Combat Engineer. Although the Army's assignment process is not random, within some combinations of job and rank, soldiers are seen as interchangeable. This is particularly true of newer soldiers in traditional combat units (e.g., Infantry and Armor Brigade Combat teams). These units do not have any authority or ability to screen and select particular soldiers. The assignments are made by separate personnel at the Army, and then post, level who are charged with satisfying the unit "needs" based on occupational and rank needs. Even if these personnel did have some authority to screen or individually select, they do not have information on new soldiers' past AER, CFC, TSP, or SGLI choices nor do they complete phone or email interviews in which a particular soldier's characteristics might be learned. In addition, for new soldiers who have just finished their training, there are no "performance" measures for the soldiers that are visible to the personnel who make the assignments, only the soldier's job and rank.

To circumvent potential selection of individuals to peer groups, we restrict our analysis to male soldiers who have just completed their AIT training and are assigned to traditional combat units.[7] Since these new enlistees have no say in their post or unit of assignment, their social groups should be as good as randomly assigned. Below, we conduct balance tests and a falsification exercise to formally test that the soldiers in our sample appear to be randomly assigned to these units. These restrictions also mean we are analyzing social effects in more homogenous group settings.

Military units provide a convenient setting to study social effects given their standardized and separate operations. On Army posts, a unit lives and works together, and does so apart from the other units. Most Army members' interactions occur with individuals in their own unit based on the co-location of their offices, motor pools and other facilities. They begin their day together, typically with physical training, they share the same daily work tasks and they often spend their evening and weekend leisure times together. This is especially true for the junior enlisted soldiers that we analyze in our sample, as they are usually required to live in the unit barracks, most eat meals at the unit dining facility since their food is subsidized, and they socialize with their unit members based on their common work schedules and limited transportation options.[8] The mean number of soldiers in our sample units is 134 (s.d. = 55), approximately a typical Army company.[9]

The role of the unit in establishing social groups has been documented for decades. Moskos (1971, p.66) highlights the critical role of the company (what we call a unit),

> "Though every soldier is an integral part of the tremendously large organization that is the United States Army, his social horizon is largely circumscribed … at the level of the company.… It is within the confines of his company that the soldier's personal associations are formed, and within which he is fed, housed, and issued equipment. Moreover, much of the soldier's everyday service life is directly affected by policy issuing from the Orderly Room …. It is also at the company level-under Article 15 of the Uniformed Code of Military Justice-that punishment is meted out for minor offenses …. In brief, the Army company is not only the arena for primary group relationships, but it is also the unit in which the functions of work, administration, residence, and legal controls are conterminously carried out."

To analyze the social effects in financial-decision-making, we use Army administrative data covering active duty enlisted service members serving from 2005 to 2013. Taken together, the Army's unique assignment process and our detailed longitudinal data linking individuals and units enable us to study a group of individuals with a near experimental assignment of social groups with varying financial environments. Previous economic research has exploited these quasi-experimental assignments to study the causal effects of: pollution (Lleras-Muney, 2010), access to payday lending (Carrell and Zinman, 2014; Carter and Skimmyhorn, forthcoming) and parental absences (Lyle, 2006; Angrist and Johnson, 2000) but have not had the rich administrative data at the unit level that we use in this paper. To our knowledge, Lyle and Smith (2014), who study mentor effects among Army officers, are the only other researchers to exploit this unique setting with its quasi-experimental assignment process and detailed data on individuals and their social groups.

The administrative data we use in this paper contain information on an individual's age, race, education level, Armed Forces Qualification Test (AFQT) score, marital status, military occupation, rank, post and unit. We combine these data elements with administrative outcome data to perform our analyses at the individual level. We evaluate social effects with respect to four different financial outcomes: two charitable giving decisions, a defined contribution retirement saving decision and a term life insurance decision, as these were the only financial outcomes

[6] See for example, Department of Defense Directive 1315.07 "Military Personnel Assignments" and U.S. Army Regulation 600-14 "Enlisted Assignments and Utilization management."

[7] We omit females from the main analysis because they were not randomly assigned to all types of units during our sample. In particular, women were ineligible for infantry and armor jobs, and the Army did not assign women to infantry or armor units at that time. In addition, women make up only 7% of our sample. In Appendix A, we present our primary analyses using both male and female soldiers. These results are extremely similar to those presented in the main text.

[8] Our sample consists of junior enlisted members (Private through Sergeant). Junior enlisted soldiers who are not married are required to live in government-owned housing (U.S. Government Accountability Office, 2014). Married soldiers (22% of our sample) can live with their spouses, on or off base. Our main results are very similar when married soldiers are excluded.

[9] The unit levels we exploit are the lowest levels observed in the military administrative data.

Table 1
Summary statistics.

	Mean	Standard deviation
Panel A: Soldiers' outcomes		
AER	0.238	0.426
CFC	0.360	0.480
TSP	0.224	0.417
SGLI	0.865	0.342
Panel B: Unit participation rates in programs (treatment)		
AER	0.213	0.192
CFC	0.424	0.236
TSP	0.180	0.104
SGLI	0.968	0.157
Panel C: Soldiers' demographics (covariates)		
White	0.703	0.457
High school degree	0.851	0.356
College degree or more	0.049	0.215
Age	22.324	4.096
AFQT score	58.922	19.325
Married	0.223	0.416

Note. DOD data. The data are for male soldiers in traditional combat units who were transferred to their first unit between 2003 and 2012. AER is Army Emergency Relief; CFC is Combined Federal Campaign charities; TSP is Thrift Savings program; SGLI is Servicemembers Group Life Insurance. Panel A presents means and standard deviations of outcomes for soldiers in our sample twelve months after arrival at the new unit. Panel B presents participation rates for the units the soldiers were transferred to in the month prior to the soldier's arrival. Panel C presents soldiers' demographic information.

available in the data. We provide summary statistics for the sample in Table 1.

We have two outcomes related to charitable giving. The first measures individual donations to Army Emergency Relief (AER), a private non-profit organization dedicated to helping soldiers and their families with financial challenges, primarily through no-interest loans, grants, and scholarships.[10] Army Regulation (AR) 930-4 covers policies, procedures and responsibilities for the administration of AER relief, the annual AER fundraising campaign, the role of commanders and campaign staff in the program, the permitted and prohibited fund-raising methods, the publicity methods, and the requirement for voluntary contributions (Department of the Army, 2008).[11] The regulation effectively standardizes the fundraising environment (information and interactions) across military units and mitigates the likelihood that our observed effects are driven by differential types of fundraising campaigns. The annual campaign at the unit level increases the salience of the program, but also exposes unit members to unit norms and to other individual participation decisions. Unit leaders direct the fundraising effort and often distribute and collect donation forms at public, unit-level formations. While unit members' specific donation amounts are unlikely to be known, the completion and submission of donation forms is generally witnessed and will be what we term "observable" in the remainder of the paper.[12] We observe all monthly AER contributions made via direct deposit from an individual's military pay. Although we do not observe their donations in cash or via credit card on the AER website, these latter methods of giving account for a very small fraction of dollars donated and a minority of donations.[13] The mean individual AER participation rate in our sample is 24% and the mean unit participation rate is 21%. The mean unit donation is $1.46 per individual per month.

The second outcome measures individual donations to the Combined Federal Campaign (CFC). The CFC is the world's largest annual workplace charity campaign, managed by the Office of Personnel Management (OPM) for all federal government agencies (including the Army), and it enables millions of employees to donate to one or more of thousands of charities of their choosing.[14] For the Army, AR 600-29 "defines policy, procedures, and responsibilities pertaining to all aspects of fund-raising in support of the annual Combined Federal Campaign, including which fund-raising practices are specifically permitted and which are prohibited (Department of the Army, 2010).[15] As with the AER, this regulation generates a common campaign experience in the workplace, with unit campaign leads, group formations for form distribution and collection, and plausible more "observable" peer decisions. Individuals can donate via cash, check or payroll deduction, and we observed these deductions each month.[16] The mean individual CFC participation rate in our sample is 36% and the mean unit participation is 41%. The mean unit donation is $3.79 per individual per month.

Our third outcome measures individual contributions to the Thrift Savings Plan (TSP), the world's largest defined contribution retirement savings plan. The TSP is available to federal government employees (including military members) and managed by the Federal Retirement Thrift Investment Board.[17] TSP rules and eligibility vary some but for the active duty Army members in our sample, the TSP provides traditional and Roth saving accounts but no matching funds, since uniformed service members are also eligible for a defined benefit plan. The TSP offers several different index funds (e.g., government securities, common stock index, and lifecycle) with low fees.[18] Enrollment in the TSP must be completed online and all contributions are made via payroll deduction. As a result, we observe a complete account of all service members' TSP contributions each month, though we only observe total contributions and not fund choices, loans, or withdrawals. The mean individual TSP participation rate in our sample is 24% and the mean unit participation rate is 19%. The mean unit contribution is $40.40 per individual per month. While several studies have evaluated social network effects on retirement savings (e.g., Duflo and Saez, 2002; Madrian and Shea, 2001; Beshears et al., 2015), none have done so in plans of this scale (membership or geographic distribution) or for federal employees.

Finally, we analyze the Servicemembers Group Life Insurance (SGLI), a relatively low- cost term life-insurance program for military members.[19] The basic premium rate is 7 cents for each $1000 of insurance. Eligible members (including the active duty members in our sample) are automatically enrolled in the maximum coverage amount ($400K) but can make changes to reduce or eliminate their coverage, provided the selected coverage is in an increment of $50K. These changes must be made in person at the post personnel office and so the switching costs are not trivial. We observe complete data on the actual payroll deductions for each individual each month and calculate the implied life insurance coverage level (e.g., $400K costs $28/month, $300K costs $21/month). The mean individual SGLI participation rate in our sample is 84% and the mean unit participation is 97%. The mean unit coverage level is $305,000 per individual.

Both the AER and the CFC have annual promotions while the TSP and SGLI programs do not. The AER conducts an annual donation campaign from March 1st through May 15th that is administered separately for each unit. Every year, a designated member of the unit provides standardized information about the AER to unit members, distributes

[10] See www.aerhq.org for more information on this charity. We provide a copy of the donation form in Appendix C.
[11] See Chapter 5 of AR 930-4, available at http://www.apd.army.mil/pdffiles/r930_4.pdf.
[12] For more information on the role of the campaigns, see https://www.army.mil/article/164001/aer_campaign_raises_awareness_funds_for_soldiers_in_need.
[13] Using estimates provided by the AER Deputy Director for Finance and Treasurer (email to authors) for 2014, allotments constituted 74% of donations (by count) and 93% (by amount) of active duty soldiers' contributions.
[14] See http://www.opm.gov/combined-federal-campaign/ for more information on this program. We provide a copy of the donation form in Appendix C.
[15] See Chapters 1, 2, 3 and 5 of AR 600–29, available: http://www.apd.army.mil/pdffiles/r600_29.pdf.
[16] Using data available from OPM (https://www.opm.gov/Data/Index.aspx?tag=CFC), payroll deduction constituted approximately 75% of CFC contributions (by count) worldwide. Data by dollar amount are unavailable for the CFC.
[17] See https://www.tsp.gov/index.shtml for more information. We provide a copy of the enrollment/election form in Appendix C.
[18] Fees were 0.029% in 2014. For a summary of the funds see https://www.tsp.gov/PDF/formspubs/tsplf14.pdf.
[19] See http://www.benefits.va.gov/insurance/sgli.asp for more information on SGLI.

donation forms at group events like unit formations, and collects individual donations (cash, check, or automatic withdrawal forms for payroll deduction). The information provision and collection processes are visible and repeated, with AER representatives sending emails, making public announcements, visiting workspaces, and often announcing updates at unit meetings. Giving is not required, but units often set a 100% contact goal and soldiers might feel especially inclined to donate given the charity's salience and potential impact on them or their colleagues. In some cases unit leaders may also collect donations or donation forms and turn them in to the unit representative, further increasing the salience of the campaign and opportunities to observe peers' decisions. The CFC also conducts an annual campaign (from September 1st through December 15th) that Army units support in much the same way as they do the AER campaign.[20] Representatives solicit donations throughout the workplace, provide email and public announcement updates, and discuss campaign progress with unit leaders and members as the campaign progresses. Unlike the TSP and SGLI, the AER and CFC are common topics of conversation because of these campaigns and individuals' choices are made in public settings. As a result, the observability of choices for the AER and CFC differentiates them from our other financial outcomes. A final distinction, which we exploit later to provide evidence on the role of observability within an outcome is that AER donations can be made anytime during the year, while CFC donations can only be made during the campaign.

Fig. 1a–d present the distributions of the AER, CFC, TSP and SGLI participation rates in our sample units. For the AER and the CFC, soldiers can be sent to units with anywhere from zero participation to nearly complete participation. Participation rates in the TSP program are more condensed, but still vary from no participation up to roughly 50% participation. There is little variation in SGLI participation rates. The amount of variation in unit participation rates, particularly in the AER and CFC, might be surprising given the quasi-random assignment of soldiers to units. However, there are at least three sources that generate this dispersion. First, models of social effects such as Glaeser et al. (1996) suggest that there can be dispersion across groups in equilibrium. Second, there are almost certainly some differences in the environments across military posts that encourage or discourage participation for all individuals at that post. Third, even with quasi-random assignment of soldiers to units, there will be some variation in mean participation rates because of sampling variation.[21]

Fig. 2 presents the distributions for the average dollar amounts for each program. For example, Fig. 2a and b suggest that the average contributions to the AER and the CFC are just a few dollars. Although there is slightly more variation in the amounts for the TSP and SGLI programs, the distributions suggest that the major differences in a soldier's exposure will come from differential participation rates. As such, we will use a unit's participation rate as our main treatment measure.

3. Tests for exogenous assignment of soldiers to units

We have argued that conditional on a full set of interactions between job, rank, post, and month-year, soldiers are exogenously assigned to units. We test this in two ways. First, we check whether soldiers' observable characteristics are correlated with the treatments that they will be exposed to and second, we test whether soldiers' past behaviors are predicted by the treatments they will receive in the future. The four separate treatment variables that we use are the fraction of soldiers in the unit who: 1) give to the AER, 2) give to the CFC, 3) participate in the TSP, and 4) participate in the SGLI. These are measured for the unit that a new soldier arrives at upon completion of his initial training. We use treatment measures for the soldier's new (post-initial training) unit and measure them in the month before the soldier arrives at his new unit to preclude the possibility that the treatment is affected by the soldier himself.

Our balance tests regress the treatment a soldier is exposed to on that soldier's individual demographic characteristics. For each of our four outcomes, we estimate

$$\overline{Y}_{-iut-1} = \beta_0 + X_{it}\beta_1 + \varphi_{jrlt} + \varepsilon_{iut} \quad (1)$$

where $\overline{Y}_{-iut-1}$ is the mean participation for the unit u that soldier i is transferred to at time t (we measure participation rates in the month before the soldier arrives, denoted *t-1* here, and thus individual i's participation is not included in the mean), X_{it} are the individual's demographic characteristics, φ_{jrlt} is a set of fixed effects for combinations of job, rank, post, and month-year (referred to as randomization controls, hereafter), and ε_{iut} is the remaining error term. Standard errors are clustered by post. In the spirit of Altonji et al. (2005), we would be concerned about the exogeneity of the unit assignments if any of the observable demographic variables individually or jointly were strong predictors of the treatment.

The estimates are presented in Table 2. In the first two columns, the treatment is the fraction of the unit that gave to the AER in the month before the soldier arrived. In column (1), no demographic characteristics are included beyond the randomization controls. These controls account for 69.3% of the variation in treatment. As seen in column (2), including covariates for race, education, a quadratic in age, AFQT scores, and marital status does not increase our ability to predict treatment: the R-squared remains constant at 0.693 and an F-test for the joint significance of the added covariates fails to reject the null hypothesis of no effects.

The remaining columns conduct the same analysis for the other treatments. In each case, the R-squared is unaffected by adding our rich set of soldiers' observable characteristics. For both the CFC and TSP, the F-test fails to reject the null that the demographic controls have no impact on the treatment. For the SGLI, the randomization controls account for the great majority of the variation in the treatment variable. Although age appears to be statistically related to the treatment, the magnitude of the impact is very small (adding a year of age at the sample mean is associated with a 0.0027 change in the unit's SGLI participation rate) and explains little of the variation in SGLI participation across units. These results provide support for the assertion that conditional on job, rank, post, and month-year, the soldiers in our sample are exogenously assigned to units.

In addition to the balance tests, we run a placebo test that checks whether the treatment a soldier will receive in the future is correlated with his current behavior. In particular, for soldier i in his training unit u' at time *t-1* (the month before the soldier transfers to the new unit) we estimate

$$y_{iu't-1} = \beta_0 + \beta_1\overline{Y}_{-iut-1} + X_{it-1}\beta_2 + \varphi_{jrlt-1} + \varepsilon_{iu't-1} \quad (2)$$

where $y_{iu't-1}$ is the soldier's AER, CFC, TSP, or SGLI participation while in training (one month prior to arrival at the new unit), $\overline{Y}_{-iut-1}$ is the mean of the participation for the unit that i will join at time t in the month before the soldier arrives (again, individual i does not contribute to this mean), X_{it-1} are the individual's demographic characteristics, φ_{jrlt-1} is a set of fixed effects for combinations of job, rank, post, and

[20] Although there are standardized materials and methods used by all units to promote the AER and CFC, the individuals who are in charge of any given unit's campaign may be more or less persuasive in obtaining donations. We consider this to be a social effect rather than a potential omitted variable bias because it is an influence that an individual service member has on his social group.

[21] We have run simulations that assume that each individual has a 30% chance of participating in a program and individuals are randomly assigned to units. The units follow the observed distribution of unit sizes in the data. Based purely on the sampling variation (not accounting for other factors which generate dispersion), the simulations suggest that the standard deviation of participation rates will be approximately 0.07, approximately one-third of the standard deviations observed for the AER and CFC.

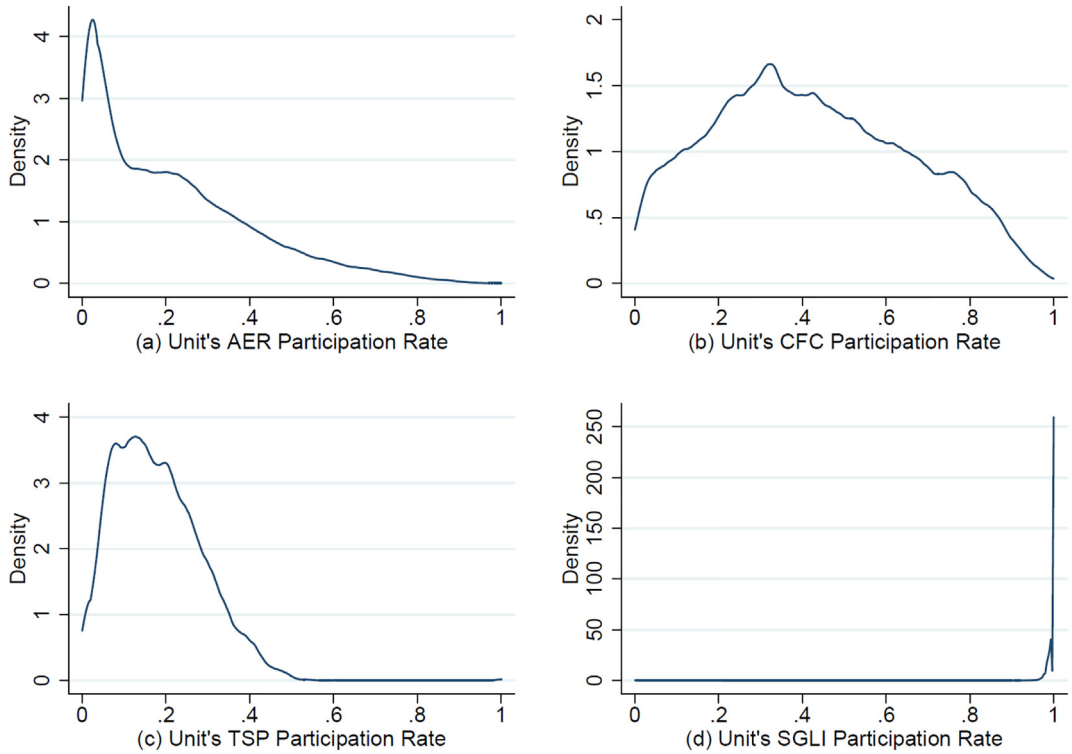

Fig. 1. Pre-arrival unit participation rate distributions. Note: DOD data. The graphs depict the probability distribution functions for the mean unit participation rates for each outcome for the units in the month prior to the new soldiers' arrival.

month-year, and $\varepsilon_{iu't-1}$ is an error term. Standard errors are clustered by post. For example, the regression tests whether soldiers who will be transferred to units with high AER participation rates are more likely to be giving to the AER even before they arrive at their new units. We would not expect the future unit's participation to explain much variation in the soldier's choices while he was training.

The results are presented in Table 3. In the first column, the unit's AER participation rate is negatively related to a soldier's own choice

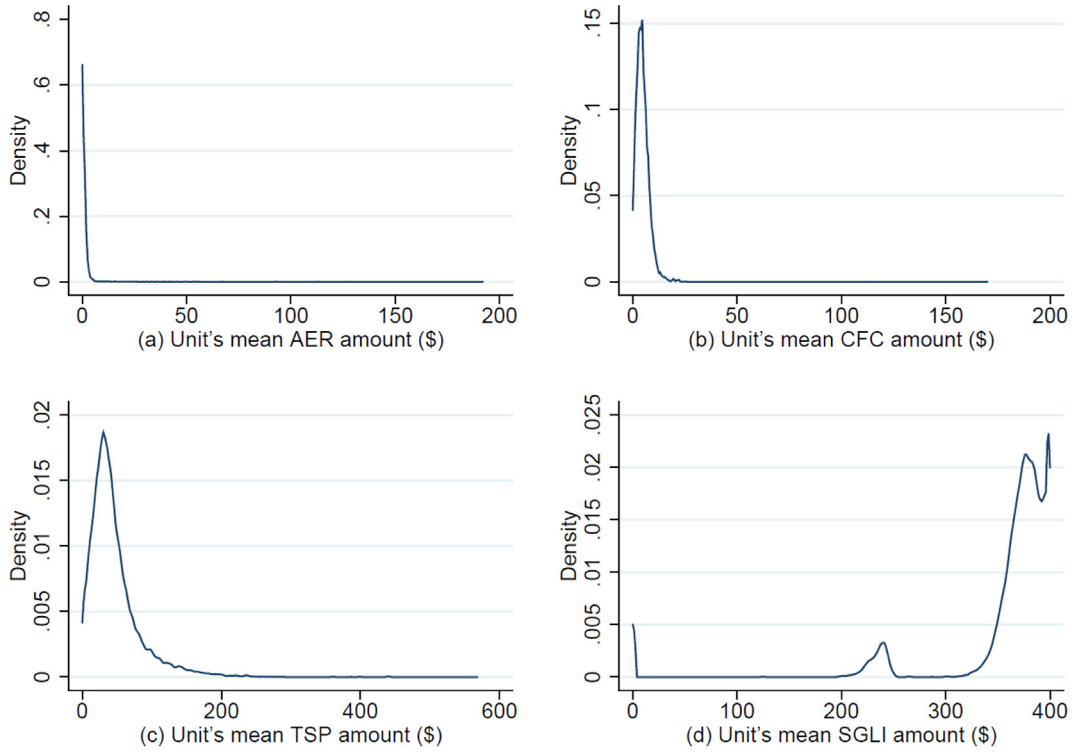

Fig. 2. Pre-arrival unit mean dollar amounts distributions. Note: DOD data. The graphs depict the probability distribution functions for the mean amount selected for each outcome for the units in the month prior to the new soldiers' arrival.

Table 2
Balance tests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
White		−0.000667		0.00138		0.000517		−5.63e−05
		(0.00145)		(0.00123)		(0.000319)		(7.96e−05)
High school degree		0.00162		−0.000786		0.000135		−0.000129
		(0.00206)		(0.00158)		(0.000574)		(0.000183)
College degree		−0.000613		0.00329		0.000549		−0.000276
		(0.00247)		(0.00559)		(0.000942)		(0.000310)
Age		−3.48e−05		−0.00197		−3.28e−06		−0.000203*
		(0.000855)		(0.00204)		(0.000517)		(0.000105)
Age-squared		−1.79e−06		3.36e−05		2.84e−07		3.75e−06**
		(1.65e−05)		(3.90e−05)		(9.31e−06)		(1.82e−06)
AFQT score		4.64e−06		−3.42e−05		−3.30e−06		−1.01e−06
		(2.55e−05)		(5.01e−05)		(9.45e−06)		(2.54e−06)
Married		0.00188		−0.00197		−0.000335		−9.99e−05
		(0.00151)		(0.00161)		(0.000623)		(0.000227)
Observations	122,219	122,219	120,580	120,580	122,219	122,219	122,219	122,219
R-squared	0.693	0.693	0.706	0.706	0.886	0.886	0.995	0.995
Job × rank × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
p-Value of F-stat	–	0.857	–	0.165	–	0.400	–	0.003
Sample mean	0.213	0.213	0.424	0.424	0.180	0.180	0.968	0.968

Note. DOD data. Dependent variable is participation rate of unit the soldier will be transferred to (program given in column heading). Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. P-value of F-statistic for joint significance of demographics reported. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

though the implied magnitude is very small. Although our estimate is precise enough to be statistically distinguishable from zero, a one standard deviation increase in the participation rate is associated with only a 0.004 percentage point reduction in the probability that the soldier had given to the AER. For the CFC, a one standard deviation increase in the new unit's participation rate is associated with a 0.0005 percentage point increase in the probability that the soldier had given to the CFC. For each of the other outcomes, there is no statistically significant impact of future treatment on the soldier's behavior prior to transferring to the new unit. These tests provide further support for plausibly exogenous assignment to units in our sample.

4. Model

Manski's (1993) seminal work continues to be the starting point for many empirical studies of peer effects (Athey and Imbens, 2017). As in Manski (1993), suppose that we can write an individual's choice as a function of her own characteristics, her social group's choices, her social group's characteristics, an unobservable shock that is common to all members of her social group, and other factors that affect her choice. The structural model for individual i in group g at date t is

$$y_{igt} = \alpha + \beta \overline{Y}_{-igt} + z_{igt-1}\eta + \overline{Z}_{-igt-1}\gamma + w_{gt} + \varepsilon_{igt} \tag{3}$$

where y_{igt} is the individual's choice, $\overline{Y}_{-igt} = E_j[y_{jgt}]$ is the average of her social group's choices (excluding individual i's choice), z_{igt-1} is a vector of length k of the individual's exogenous characteristics (determined in period t-1), $\overline{Z}_{-igt-1} = E_j[z_{jgt-1}]$ is a vector of length k of the averages of social group members' exogenous characteristics (excluding individual i's characteristics), w_{gt} is a group-specific, time-varying common shock, and ε_{igt} captures remaining influences on the individual's choice. The social effect, β, the impact of the group's current choices, is distinct from γ, the influence of having a social group with certain characteristics. Manski (1993) terms the former endogenous social effects, the latter exogenous social effects.

There are at least three challenges to recovering the true parameters of Eq. (3). First, there is a simultaneity bias affecting β because not only does the group affect the individual, but the individual affects the group. This is the well-known reflection problem. Second, common shocks are likely to cause a standard omitted variables bias. Third, individuals often select which social group they join. If this selection is related to their characteristics and choices, then the estimated coefficients from Eq. (3) will be biased.

A commonly-used approach to circumvent these issues is to integrate Eq. (3) over individuals (within a group),

$$\overline{Y}_{gt} = \frac{\alpha}{1-\beta} + \overline{Z}_{gt-1}\frac{\gamma+\eta}{1-\beta} + w_{gt}\frac{1}{1-\beta} \tag{4}$$

and substitute this back into Eq. (1) to yield the reduced-form

$$y_{igt} = \left(\frac{\alpha}{1-\beta}\right) + z_{igt-1}\eta + \overline{Z}_{-igt-1}\left(\frac{\gamma+\beta\eta}{1-\beta}\right) + w_{gt}\left(\frac{1}{1-\beta}\right) + \varepsilon_{igt} \tag{5}$$

When combined with exogenous assignment of social groups, estimating the reduced-form yields unbiased estimates of the combinations of endogenous and exogenous structural parameters. Without further restrictions though, the individual structural parameters are not separately identified. Many papers that estimate social effects take this

Table 3
Falsification test - impact of future unit's participation rate on soldiers' behavior in month preceding move.

	(1)	(2)	(3)	(4)
	AER	CFC	TSP	SGLI
Unit participation rate	−0.021**	0.002	−0.021	−0.017
	(0.008)	(0.006)	(0.054)	(0.012)
Observations	119,481	117,858	119,481	119,481
Adjusted R-squared	0.356	0.285	0.242	0.411
Job × rank × post × month-year FE	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
Unit participation rate std. dev.	0.191	0.236	0.104	0.074

Note. DOD data. Dependent variable is whether soldier participated in program (specified in column heading) in the month before arriving at new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in all columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

approach. For example, Sacerdote (2001), Zimmerman (2003), Lyle (2007), and Carrell et al. (2013) regress a student's college GPA on a measure of her academic ability and a measure of her randomly assigned peers' academic abilities; Guryan et al. (2009) regress professional golfer's scores on their own ability and the ability of their randomly assigned playing partners.

In these and many other cases, there is at least one observable variable in z_{igt-1} that influences the individual's choice, i.e. there is at least one variable such that $\eta \neq 0$. This provides a reason to think that the corresponding variable in $\overline{Z}_{-igt-1}$ could also impact the individual's choice if social effects are important. When looking at academic achievement, a student's S.A.T. score is an important predictor of college G.P.A.; in the context of professional golf, indicators of past performance such as average driving distance are tightly linked to current scoring. However, in some contexts, there will not be a set of observable z_{igt-1} or $\overline{Z}_{-igt-1}$ that explain a large portion of the variance in behaviors. When estimating the reduced-form (Eq. (5)) in these cases, it is not clear whether failure to reject the null of no effect is due to there being no true social effects or simply not having measures of the characteristics on which there are social effects.

We show how using a group's past choices can circumvent the problem of observing only a subset (or potentially none) of the group's characteristics that affect an individual's choice. The insight is that a group's behavior reflects all of the exogenous characteristics that impact their choices. First, note that a group's average characteristics, $\overline{Z}_{-igt-1}$, are likely to be correlated from one period to the next. One reason for this is the selection of individuals into groups based on having similar characteristics. However, even if individuals are assigned to groups randomly, group characteristics might still be correlated over time as group members join and leave continuously. In this case, some subset of the group will be the same across adjacent time periods and will mechanically create a non-zero correlation. Thus, we would expect $\hat{\mu}_1$ from the following regression to be nonzero and positive,

$$\overline{Z}_{-igt-1}\left(\frac{\gamma+\beta\eta}{1-\beta}\right) = \mu_0 + \mu_1 \overline{Z}_{-igt-2}\left(\frac{\gamma+\eta}{1-\beta}\right) + \vartheta_{gt-1} \tag{6}$$

Substituting the period *t-1* version of Eq. (4) that has been solved for $\overline{Z}_{-igt-2}(\frac{\gamma+\eta}{1-\beta})$ into Eq. (6) yields

$$\overline{Z}_{-igt-1}\left(\frac{\gamma+\beta\eta}{1-\beta}\right) = \mu_0 + \mu_1\left[-\frac{\alpha}{1-\beta} + \overline{Y}_{-igt-1} - w_{gt-1}\frac{1}{1-\beta}\right] + \vartheta_{gt-1} \tag{7}$$

This shows how all of the social group's characteristics are related to the group's past mean choice. Because $\overline{Z}_{gt-1}(\frac{\gamma+\beta\eta}{1-\beta})$ captures all of the social group's characteristics, positive impacts of some characteristics ($\gamma_j > 0$) can be canceled out by negative impacts of other characteristics ($\gamma_k < 0$). However, to the extent that social groups are a bundle of characteristics, the total impact as presented in Eq. (7) is the relevant object for determining whether a social group's exogenous characteristics have a non-zero net effect on an individual's behavior.

Using the relationship between exogenous characteristics and past behavior in Eq. (7), an individual's choice can be written as a function of her social group's past choice, her own exogenous characteristics, and the current and previous period's common shocks,

$$y_{igt} = \pi_0 + \pi_1 \overline{Y}_{-igt-1} + z_{igt-1}\pi_2 + \left(\frac{1}{1-\beta}\right)(w_{gt} - \mu_1 w_{gt-1}) + \xi_{igt} \tag{8}$$

The coefficients in Eq. (8) can be related back to the structural model's parameters: $\pi_0 = [(\frac{\alpha}{1-\beta}) + \mu_0 - \mu_1(\frac{\alpha}{1-\beta})]$, $\pi_1 = ([\overline{Z}_{-igt-2}(\gamma+\eta)]'[\overline{Z}_{-igt-2}(\gamma+\eta)])^{-1}[\overline{Z}_{-igt-2}(\gamma+\eta)]'[\overline{Z}_{-igt-1}(\gamma+\beta\eta)]$, $\pi_2 = \eta$, and $\xi_{igt} = [\vartheta_{gt-1} + \varepsilon_{igt}]$. This shows that π_1 is a combination of endogenous and exogenous social effects. As is usual in empirical studies based upon Manski's (1993) linear-in-means framework, without additional restrictions, the structural parameters from the model are not individually identified: Eq. (8) provides $k + 2$ coefficients, but there are $2k + 2$ parameters in the original structural model.

The advantage of using the social group's past behavior as a regressor is that it can serve as an index for all of the social group's observed and unobserved, pre-determined characteristics that affect the individual's outcome. Previous work studying the impacts of peers have taken advantage of this approach (e.g. Eisenberg et al., 2014); the analysis of the Moving to Opportunity experiments is closely related, using a neighborhood's poverty rate as an index of all of the neighborhood's characteristics relevant to an individual's choice (Kling et al., 2007). In cases where an incomplete—or even empty—list of appropriate group characteristics is available, using past choices provides a simple and parsimonious solution to the problem.

However, it is clear from Eq. (8) that a simple OLS regression could produce biased estimates of π_1 because $\overline{Y}_{-igt-1}$ is correlated with the previous period's common shock, now a component of the error term. In particular, π_1 will tend to have a negative (downward) bias because the omitted shock from *t-1* is positively correlated with the unit's past choices, negatively correlated with the soldier's outcome in period *t* (due to the negative sign preceding it), and μ_1 will often be positive (because the composition of the unit is largely the same over adjacent periods). Intuitively, this bias is present because a unit's past choice is an imperfect proxy for its bundle of exogenous characteristics; the past choice is directly affected by those common shocks and they are thus introduced into the specification when we use past choices as a proxy for exogenous characteristics. This suggests that estimates of peer effects based on peers' past choices have understated the true magnitudes. We discuss how we overcome this omitted variable bias in the next section.

5. Empirical strategy

Our empirical strategy takes advantage of the exogenous assignment of soldiers to military units (and therefore social groups) with varying financial environments. We limit our sample to soldiers who are just finishing their job qualification training and are transferred to a new unit for the first time. We begin by estimating a version of Eq. (8) and then proceed to implement an instrumental variables strategy that eliminates biases in π_1 due to common shocks.

We first adapt Eq. (8) to our empirical setting and estimate

$$y_{iut} = \pi_0 + \pi_1 \overline{Y}_{-iut-1} + z_{iut-1}\pi_2 + \left(\frac{1}{1-\beta}\right)(w_{ut} - \mu_1 w_{ut-1}) + \varphi_{jrlt} + \xi_{iut} \tag{9}$$

y_{iut} is the outcome of interest twelve months after soldier *i*'s arrival at the new unit *u* in month-year *t*, $\overline{Y}_{-iut-1}$ is the mean of the outcome for the new unit in the month before the soldier's arrival, z_{iut-1} are the individual's demographic characteristics, φ_{jrlt} is a set of fixed effects for combinations of job, rank, post, and month-year, and ε_{iut} is the remaining error term. In all of our regressions, we cluster our standard errors at the post level.

Our primary interest is in the coefficient π_1 which tells us how an individual soldier's behavior is related to the past (but recent) behavior of his peers, where we use the term peers to include soldiers of different ranks. The specification compares outcomes for soldiers who are sent to the same military post in the same month and year, but are assigned to

different units at that post. It is important to recognize that soldiers are not exogenously assigned to values of $\overline{Y}_{-iut-1}$, they are exogenously assigned to particular units whose members differ on many different dimensions. As discussed in the model, we view $\overline{Y}_{-iut-1}$ as a summary measure of the unit's characteristics that affect the soldier's choice ($\overline{Z}_{-igt-2}$).

As we saw in Fig. 1a–d, the means and variances of our treatment variables are quite different across the programs. We use a one standard deviation increase in the participation rates to interpret the size of our point estimates. Although this corresponds to different percentage point increases in the fraction participating in a program, it standardizes the variation in treatments that a soldier would face when being transferred to one unit instead of another.

Because the soldiers in our sample are exogenously assigned to units, our estimates are not impacted by individuals sorting into social groups. We might worry that this same exogenous assignment breaks down the correlation over time of a social group's characteristics (that $\mu_1 = 0$). However, the structure of the military ensures that there will be a fairly strong correlation from one year to the next. When a soldier enlists, his contract typically lasts three to four years and new soldiers rarely change units except when they are starting a new contract. Thus, a soldier's social group twelve months after he arrives at the unit will be comprised of roughly two-thirds of the soldiers who were in the unit when he arrived. Although we cannot estimate μ_1 directly, the structure of the military suggests that it will be strictly positive.

Importantly, our Eq. (9) estimates circumvent the reflection problem by using treatments that could not have been affected by the soldier being treated—because our treatment variable is the unit's behavior in the month before the soldier arrived, the soldier's choices after arrival cannot affect the treatment he receives. This delineation between the treated group (soldiers arriving at a new unit) and the treatment (behaviors of those already at the units) breaks the reflection problem. Our IV models, discussed below, similarly address this concern.

As emphasized in Lyle (2007) and Guryan et al. (2009), common shocks can have meaningful impacts on estimated social effects. The previous period's common shock causes a negative bias in our estimates of Eq. (9). We eliminate this bias via an instrumental variables strategy. In our setting, a valid instrument is one which is correlated with the group's average choices in period *t-1*, uncorrelated with the common shocks in unit u in periods t and *t-1*, and uncorrelated with the unit's current error term, ξ_{iut}. Based on the idea that a soldier's decisions are likely correlated over time, we instrument for $\overline{Y}_{-iut-1}$ with the peer group's members' choices when they were at their previous units $u' \neq u$. This isolates variation in $\overline{Y}_{-iut-1}$ that is unrelated to the shocks at unit u since soldiers are randomized to units.[22] This instrumental variables strategy also overcomes the reflection problem because the new soldier will not have affected his peers' choices in the past when they were at their previous units. Because of the effectively random assignment of soldiers to units, we might worry that there is little variation in this instrument. However, Fig. 3, which shows the distributions of our instruments, suggests that this is not the case. The standard deviation of the instrument for the AER is 0.108, approximately half of the standard deviation of units' AER participation rates. The other outcomes show a similar pattern.

We expect the instrumental variables estimates to be larger than the OLS estimates for two reasons. First, as seen in the model, there is a negative bias in the estimated impact of peers on the individual because of the omitted common shock from the previous period. When we instrument, this bias will be removed and the estimated impact of peers should rise.

Second, the local average treatment effect (LATE) that our IV strategy estimates is based on unit members who were sufficiently senior (in rank and/or tenure) to have a previous unit; our OLS estimates make use of all unit members. The importance of rank and tenure in military organizations is well-established (Moskos, 1971[23]; Rosen, 1992; Asch and Warner, 1994; Warner and Asch, 2001; Soeters et al., 2003[24]; Winslow, 2007[25]; Baker, 2008[26]). As examples, military compensation is a function of rank and tenure, and the Soldier's Blue Book (Training and Doctrine Command, 2014), a guidebook for new soldiers, emphasizes the importance of rank, military courtesies, and looking to seniors for guidance at their first unit. Given the hierarchical nature of the Army, our IV estimate could be larger than our OLS estimate because of which particular groups are weighted more heavily by the estimators. It is worth pointing out again that we use the term peer effects to refer more broadly to all social effects, including those of direct peers and leaders (i.e., non-commissioned officers (NCO) and officers) at several levels; our instrument might be identifying something that could be thought of as a leadership or role model effect as easily as a peer effect.

6. Results

We present the results of our OLS analysis in Table 4. For each of our four outcomes we provide results for two versions of Eq. (9), one without covariates (odd numbered columns) and one with covariates (even numbered columns). If interpreted causally, our point estimate in column (1) suggests that a ten percentage point increase in the unit's participation rate increases the new arrival's probability of participating in the AER by 1.3 percentage points. Relative to the mean unit participation rate, 23.8%, our estimate suggests peers have a small but meaningful influence on the probability of giving. When soldiers' demographic characteristics are included in the regression (column (2)), the results are unchanged.

In columns (3) and (4), we present the same set of regressions for our other charitable giving outcome, participation in the CFC. As in the AER, we find that being sent to a unit with higher social group participation increases the probability that the soldier participates in the CFC. The point estimate implies that a ten percentage point increase in the unit's participation rate increases a soldier's probability of giving to the CFC by 1.2 percentage points. Given that the mean participation rate is 36.2%, our estimates again suggest a small but meaningful role for peer effects. As before, we find that adding in a soldier's demographics does not affect the results.

Columns (5) and (6) present the results for the Thrift Savings Program. Unlike the charitable giving outcomes, we do not find statistical evidence for an impact of the social group on the individual's savings decisions. If the point estimate in column (5) were the true impact, it would imply that a 10 percentage point increase in the unit's participation rate reduces participation in the savings program by 0.2 percentage

[22] Balance and falsification tests using our instrument, but otherwise comparable to those presented in Tables 2 and 3, are presented in Appendix A. We do not find any significant impacts of a unit's previous choices on the choices of a soldier before he arrives at the unit (falsification test). We do find a slight imbalance on covariates for the AER, but the magnitudes of the differences are very small relative to the variation in the treatment variables.

[23] See especially Chapters 2 and 3. Moskos (1971, p.46–47) "…in few contemporary institutions are the lines between superiors and subordinates so sharply and consistently drawn as they are in the military establishment…. The internal stratification of the military is founded almost entirely on status rather than income distinctions. The servicemember witnesses a constant attention to rank in every connection. All of his on-duty activities and much of his off-duty life directly correspond to his military status."

[24] Soeters et al. (2003, p.242) "… it may come as no surprise that military cultures as compared to the cultures of business organizations are more coercive…. This result is hardly surprising since the military organizations traditionally know a strong social order ("grid") based on vertical, power-related classifications and regulations…."

[25] Winslow (2006, p.84) "In any army organization, strong currents and undercurrents co-exist, creating linear orderliness and formalistic hierarchical authority…."

[26] Baker (2008, p. xiv) "Along with this group orientation, the military also places a higher value on hierarchy and obedience than civilian organizations do. From their first few days in basic training, recruits are taught to acknowledge their (lowly) place in the military hierarchy with salutes and formal responses to superiors.

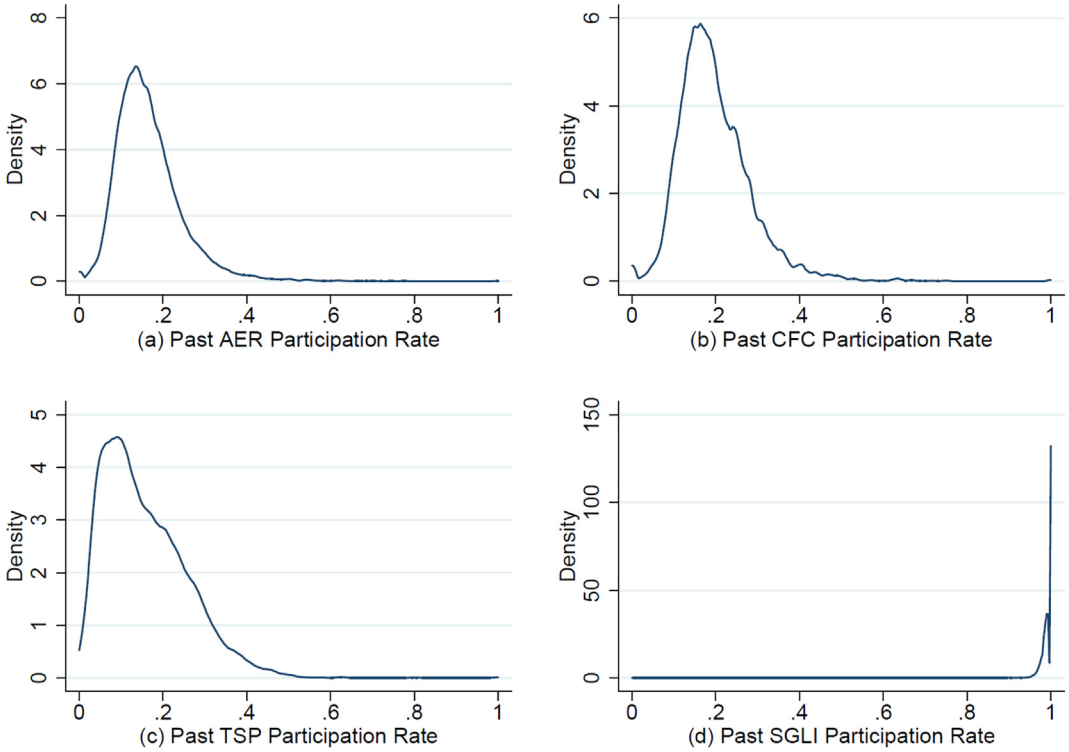

Fig. 3. Distributions of instrumental variables, mean unit members' participation choices at past units. Note: DOD data. The graphs depict the probability distribution functions of the mean of unit members' participation decisions at their previous units.

Table 4
Impact of unit participation rates on soldiers' behaviors twelve months after transfer (OLS).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit participation rate	0.126***	0.126***	0.123***	0.123***	−0.016	−0.017	−0.040	−0.040
	(0.041)	(0.041)	(0.040)	(0.040)	(0.064)	(0.064)	(0.039)	(0.039)
Observations	122,219	122,219	120,580	120,580	122,219	122,219	122,219	122,219
Adjusted R-squared	0.430	0.431	0.460	0.461	0.466	0.468	0.964	0.964
Job × rank × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.238	0.238	0.359	0.359	0.224	0.224	0.865	0.865
Unit participation rate std. dev.	0.192	0.192	0.236	0.236	0.104	0.104	0.157	0.157

Note. DOD data. Dependent variable is whether soldier participated in program (specified in column heading) twelve months after arriving at new unit, except for columns (3) and (4). In those, dependent variable is indicator for participation in the CFC in the January following the soldier's first CFC campaign after arriving at the unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives, except (3) and (4) which use the unit's participation in the January preceding the soldier's arrival. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

points or 0.7% of the baseline savings rate. The results are both statistically and economically insignificant.

The results for our final outcome measure, life insurance purchase, are presented in columns (7) and (8). The point estimate implies that a ten percentage point increase in unit participation would lead to a 0.4 percentage point increase for the individual. As with retirement savings, we do not find meaningful evidence of social effects.[27]

As discussed in the previous section, there is a negative bias in the OLS results in Table 4. We now turn to our instrumental variables strategy. First stage results are presented in Table 5. The structure of this table parallels that of Table 4; demographic controls are omitted (included) in odd (even) numbered columns. We find that peers' previous choices are very strongly and positively related to the choices they have made in the period before the soldier arrives at his new unit for three of our four outcomes. The first stage F-statistic is >91 for the AER; >67 for the CFC; and >2200 for the TSP. For the SGLI, the first stage F-statistic is only 6 and thus weak instruments are a concern for this outcome (Stock and Yogo, 2002).

The IV results are previewed in the four panels of Fig. 4. Each panel presents the regression coefficients and 95% confidence intervals for one of our four outcomes. The impacts of peers on the individual are estimated for the 8 months before and the twelve months after he joins his new unit.[28] For both the AER and CFC,

[27] We also estimate the social effects for the SGLI outcome using the fraction of individuals in the unit participating at the maximum coverage and the results are very similar.

[28] Each of the point estimates is from a separate IV regression. Although each soldier in the data was observed twelve months after he arrived at his new unit, soldiers varied in the number of months before their transfer which we can observe. As a result, as we look further before the soldier arrives at his new unit, the sample becomes progressively smaller.

Table 5
Impact of peers' behavior in previous unit on behavior in current unit (IV first stage).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Previous participation rate	0.532***	0.532***	0.549***	0.549***	0.791***	0.791***	0.452**	0.451**
	(0.056)	(0.056)	(0.067)	(0.067)	(0.017)	(0.017)	(0.185)	(0.185)
Observations	122,217	122,217	120,530	120,530	122,217	122,217	122,217	122,217
R-squared	0.709	0.709	0.720	0.720	0.953	0.953	0.996	0.996
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.213	0.213	0.424	0.424	0.180	0.180	0.968	0.968
First stage F-stat	91.49	91.69	67.30	67.09	2278	2276	5.98	5.98

Note. DOD data. Dependent variable is peer group's participation rate in program (specified in column heading) the month before the soldier arrived at his new unit. Unit participation rate is the average of the choices made by the members of the new unit at their previous units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

there appears to be little impact of future peers in the months before the soldier arrives at his new unit; however, after arriving, the estimated impacts of peers rise and become statistically significant. We do not find strong evidence that peers play an important role in individual soldiers' TSP or SGLI choices. As seen in the AER and CFC panels, we would expect the impact of peers to rise over time for at least two reasons: 1) it takes time to meet one's peers and then be affected by them and 2) because soldiers are arriving throughout the year, the promotional campaigns for the AER and CFC might not occur for some individuals until many months after they have arrived at their new unit. The impacts of the promotional campaigns are explored in more detail below.

The IV regression results are presented in Table 6. As expected, the estimated impacts of peers are larger than their corresponding OLS estimates for both the AER and CFC. Now, a ten percentage point increase in the unit participation rate would imply a 4.7 percentage point increase in the individual's probability of participating. For the CFC, a ten percentage point increase in the unit participation rate is associated with a 2.7 percentage point increase in the individual's participation. Despite the increases for the AER and CFC, there was little change in the estimated influence of peers on soldiers' TSP or SGLI choices. Our coefficients for these outcomes remain economically small and statistically indistinguishable from zero. Taken together, our results suggest that peers play a large role in individual soldiers' charitable giving, but little role in soldiers' savings and life insurance decisions.

Violation of our exclusion restriction requires that the choices that soldiers from unit *u* at time *t-1* made at their past units have

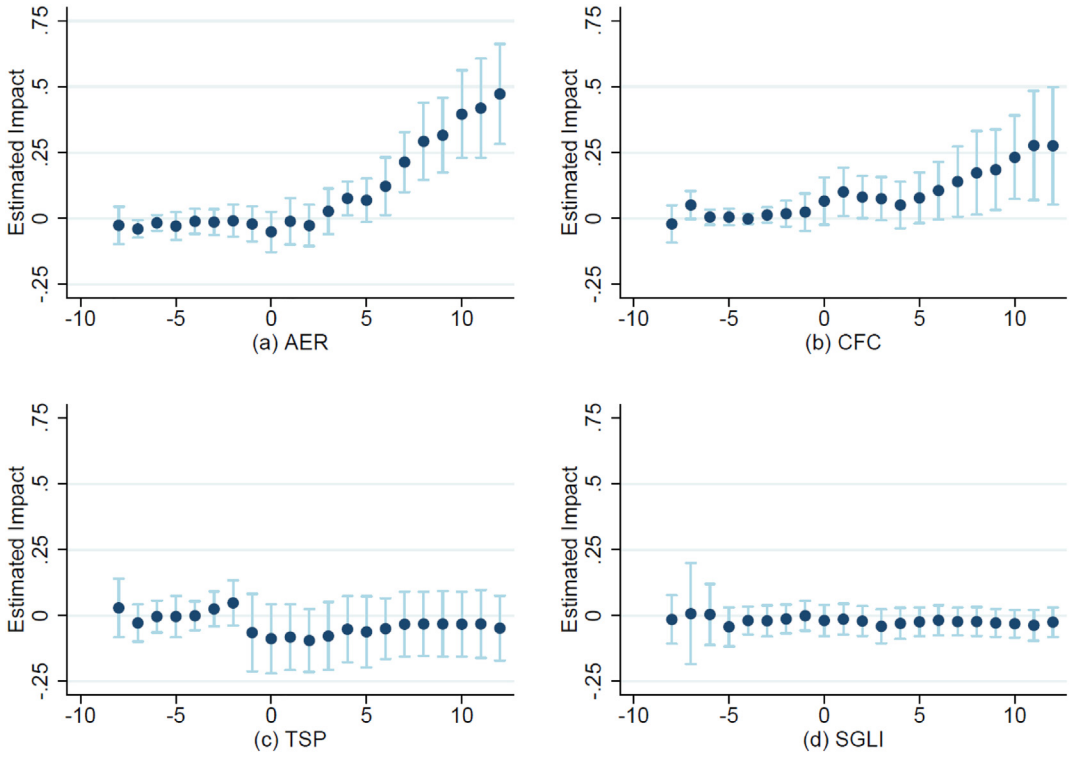

Fig. 4. Impacts of peers relative to month soldier arrives at new unit. Note: DOD data. The graphs depict the point estimates and 95% confidence intervals from our instrumental variables regressions. Each point estimate and confidence interval is from a separate regression where the soldier's outcome is the specified dependent variable in the month relative to arrival at his new unit. Month 0 is the month the soldier moves to the new unit.

Table 6
Impact of unit participation rates on soldiers' behaviors twelve months after transfer (IV).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit participation rate	0.476***	0.473***	0.275**	0.276**	−0.046	−0.048	−0.037	−0.036
	(0.097)	(0.097)	(0.114)	(0.114)	(0.063)	(0.063)	(0.027)	(0.027)
Observations	122,217	122,217	120,530	120,530	122,217	122,217	122,217	122,217
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.238	0.238	0.297	0.297	0.224	0.224	0.865	0.865
Peer participation rate s.d.	0.192	0.192	0.236	0.236	0.104	0.104	0.157	0.157
First stage F-stat	91.49	91.69	67.30	67.09	2278	2276	5.984	5.983

Note. DOD data. Dependent variable is the soldier's participation rate in program (specified in column heading) twelve months after arriving at his new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. That participation rate is instrumented by the mean of the new unit's members' choices at their previous units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

direct impacts on the choices of soldiers who just finished training and arrived to unit *u* at time *t*. Although plausibly exogenous assignment of soldiers to units makes it unlikely, this could occur if the soldiers' past units were the same training unit that the newly arrived soldier just experienced. To address this possibility, we can limit our instrument to unit members who were in operational (and not training) units prior to unit *u*. As seen in Appendix Table B3, this alternative IV produces very similar results and allays concerns that the exclusion restriction is invalid.[29] Note also that the exclusion restriction would have to fail for the AER and CFC, but not for the TSP and SGLI in order to explain our previous results.

Another potential violation of the exclusion restriction could occur if the same person were to lead the AER (or CFC) campaign for multiple years in a row. For example, suppose that a soldier is in unit *u'* at time *t-2* but is transferred to unit *u* at time *t-1*. He then runs very effective AER campaigns in both periods *t-1* and *t*. If this person also tends to participate in the AER, then his choice in period *t-2* will be related to the average decision in unit *u* in period *t-1*. When new soldiers arrive in period *t*, they will receive the direct effect of the campaign, but that same effect will be filtered through the unit's average participation in period *t-1*. There are a few reasons that make this particular threat to the identification unlikely. First, being the AER or CFC campaign leader is typically an assigned duty, not something for which individuals volunteer; it is often assigned to a non-commissioned or junior officer by the unit's leader. While that does not discount the possibility that some campaign leaders run very effective campaigns, it does suggest that individuals are not selecting into these duties based on their ability to run the campaigns. Second, campaign managers usually only head up the promotional campaign for a single year given the frequent rotations inherent in military assignments. Finally, given the number of senior members who may serve as a campaign leader in typical units, it is unlikely that a single individual's choice could drive the average behavior of the peers used in our instrument. The units to which our soldiers are being transferred have on average 44 non-commissioned officers and 10 officers (the 5th percentile unit has 18 NCOs and 5 officers on average, and the 95th percentile has 88 NCOs and 26 officers on average). Together, these institutional details make it unlikely that this particular mechanism is biasing our results.

Although our analysis has focused on the extensive margin of whether or not a soldier participates in the AER, CFC, TSP, or SGLI, we have also explored whether the amount given or saved was affected. In particular, using our IV strategy, we estimated whether a unit's mean contribution in a program (i.e., donations for the AER and CFC, amount saved per month for the TSP, size of life insurance policy for the SGLI) affects the amount a soldier contributes to that program. Those who did not contribute to a program were coded as zero. These results are presented in Table 7. Although we saw significant impacts on the extensive margin, we do not find statistically significant or consistent evidence that the amount given is affected.[30] This is suggestive that the general observability of what peers are doing is quite important to generating peer effects. In our setting, the extensive margin decision (to participate at all) is likely to be easier to observe than the specific amount that a peer contributes to a program. We now turn to exploring the importance of observability more directly.

7. Extensions

7.1. Observability and peer effects within outcomes.

Recent work documents that observability of peers' actions is important to the production of peer effects in labor markets (Bandiera et al., 2005; Mas and Moretti, 2009) and educational settings (Bursztyn and Jensen, 2015). Our findings of strong peer effects on the AER and CFC and a lack of peer effects for the TSP and SGLI provide circumstantial evidence that the observability of peers' choices is important to generating peer effects in financial settings; the extensive campaigns for the AER and CFC are likely to increase discussions about and information on whether peers are contributing to these programs. In addition, donations are often made in public settings where others can observe individuals' participation choices.

To assess the importance of the campaigns, and thereby observability, in the production of peer effects, we explore the dynamics of responses to peers. Note again that we use the term observability broadly; we use it to mean anything from literally seeing the choices that other individuals make to raising awareness or salience of the program. In particular, we take advantage of the fact that a soldier can sign up to give to the AER at any time, including the months between his arrival to his first unit and the first AER campaign to which he is exposed.[31] For example, consider a soldier who arrives to his first unit in August. Every year, the AER campaign runs between March and

[29] Note that the first stage is weak for the SGLI and as a result, it is not clear how to interpret the marginally significant results for that outcome. The estimated effects are also economically insignificant.

[30] These two findings are not incompatible. Intuitively, if those who would have given in the absence of peer effects reduce their giving in response to being exposed to peer effects, then overall giving (or giving per person) could rise, fall, or stay the same even though the fraction of individuals who give rises. We show this mathematically in Appendix D. In our particular setting, for example, observing a greater number of individuals participating in public good provision (charitable giving) may lead an individual who would have given in the absence of the promotional campaign to contribute a lower amount.

[31] Author conversations with AER Headquarters personnel (i.e., Chief Operating Officer and Executive Director Staff) in May 2017 confirmed that soldiers can start their donations at any time of the year using the DA Form 4908.

Table 7
Impact of mean unit participation amount on soldiers' behaviors twelve months after transfer (IV).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit participation amount	−0.146	0.045	2.188	2.199	15.931	15.497	10.645	10.469
	(0.763)	(0.587)	(1.814)	(1.820)	(19.987)	(19.873)	(23.963)	(24.772)
Observations	122,217	122,217	120,530	120,530	122,217	122,217	122,217	122,217
R-squared	0.422	0.422	0.423	0.425	0.417	0.421	0.785	0.787
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	1.284	1.284	2.044	2.044	36.10	36.10	310.6	310.6
Peer participation amount s.d.	3.701	3.701	0.236	0.236	0.104	0.104	0.157	0.157
First stage F-stat	0.277	0.285	67.30	67.09	2278	2276	5.984	5.983

Note. DOD data. Dependent variable is the soldier's participation amount in program (specified in column heading) twelve months after arriving at his new unit. Unit participation amount is the new unit's average amount contributed in the specified program in the month before the soldier arrives. That participation amount is instrumented by the mean of the new unit's members' amounts at their previous units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. $^{***}p < 0.01$.; $^{**}p < 0.05$.; $^{*}p < 0.1$.

May. In practice, AER donation forms collected during the campaign go into effect in the June following the campaign. Thus, this soldier's choices for at least half a year represent the impact of peers in the absence of an AER campaign. At that point, the soldier is exposed to the campaign and we can test whether the impact of peers is larger after the campaign than they were before.[32] Because the CFC only accepts donations during the campaign, we are not able to conduct the same analysis for that outcome.

For this analysis, we estimate variants of Eq. (9) with our IV strategy. Previously, we had used a soldier's choice twelve months after he arrived at his first unit as the dependent variable. Now, we use a soldier's choice from each of his first twelve months at the unit in separate specifications. However, instead of expressing time as months since arrival, we express time as months relative to that soldier's first AER campaign conclusion (i.e., May). For example, consider one soldier who arrives in January and a second soldier who arrives in February. Both soldiers make decisions in their month of arrival, what we have called period t previously. Now, we denote the period of the campaign as c and note that same decision for the soldier who arrived in January will be indexed as time c-5 because it is five months before the end of that soldier's first AER campaign;. For the soldier who arrived in February, his period t choice will be indexed to period c-4 since that choice is made four months before the end his first AER campaign. Applying this logic to each of the full set of choices that all soldiers make in their first twelve months at a unit, we estimate versions of Eq. (9) in which the dependent variables ranges from eleven periods before the campaign to eleven periods after the campaign.[33]

We present the estimates and standard errors for each relative time period graphically in Fig. 5.[34] None of the estimated impacts before the campaign are economically large and none of their 95% confidence intervals exclude zero. However, as soon as the soldier has been exposed to the campaign, the impact of his peers' choices in the month before he arrived at the unit become positive and statistically distinguishable from zero, where we again instrument for peers' choices using their choices at their own previous units. The effects remain positive and economically important for at least nine months after the campaign. Although we cannot identify the exact mechanism through which the campaign leads to peer effects—generation of conversations about the AER, literally seeing others turn in donation forms, etc.—these results suggest that the campaign generates increased awareness that plays an important role in generating peer effects.

7.2. Peer effects by social groups

It is unlikely that a soldier interacts equally with everyone in his unit, especially given the size of the units we observe (mean size = 134). For example, our sample of junior enlisted men is more likely to interact with other junior enlisted men rather than with the commissioned officers. There are a number of reasons for this including that junior soldiers and officers live apart from one another (the latter often living off the base); they eat separately (officers typically do not dine in the military cafeterias and typically sit together if they do); and they do not socialize with one another when off duty (fraternization policies restrict such interactions). Finally, their work interactions are less frequent and conducted with the unit's mission requirements in mind. Normally, this would suggest that the officers' program participation should have little impact on the junior enlisted men, but in our particular case, there could be peer effects in the form of role model effects, driven by the hierarchical nature of the military and the leadership roles that officers occupy. Even though junior enlisted soldiers likely do not observe officers' decisions to participate in programs (the latter have offices), the officers might convey in briefings, personal interactions, or unit communications that the junior enlisted soldiers should participate. It should also be noted that we cannot observe these interactions or publicly stated preferences, only the officers' actual decisions. Thus, it is not clear whether officers' measured participation rates will affect junior enlisted soldiers' decisions.

The potential effects from enlisted leaders (i.e., NCOs) are less ambiguous and likely stronger. NCOs are the first line supervisors for new soldiers, providing direct guidance and enforcement on all aspects of military life and culture, including job performance, professional meetings on duty, and off-duty behavior. Relative to officers, they interact more frequently and have more responsibility for the new soldiers' behaviors. They also hold higher rank than the new soldiers and are entitled to additional customs and courtesies. Finally, since NCOs are also enlisted members, they represent the likely career path for new soldiers who stay in the military.

To evaluate potential differential effects, we augment our specification to have treatment variables for different military rank groupings.

[32] Generally, we might expect there to be some increasing importance of peers over time as individuals get to know each other better. Because soldiers arrive in different months, we can separate the impact of the campaign from general time effects.

[33] We only use soldier's choices from their first twelve months in the new unit. As a result, the set of soldiers used to estimate the impacts in different time periods (relative to their first AER campaign) can change.

[34] For the full set of regression results, see Appendix Table B5.

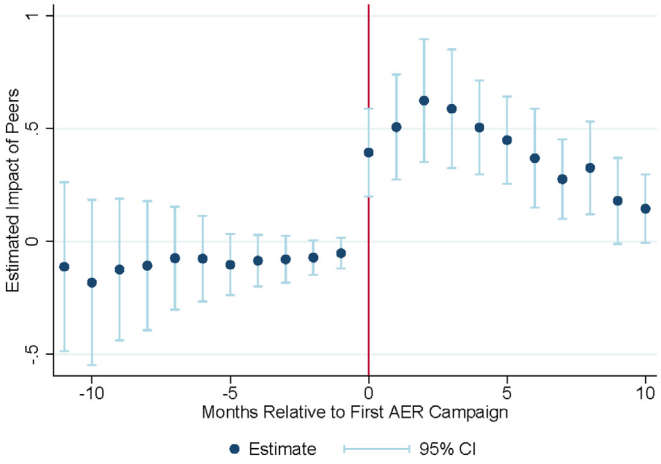

Fig. 5. Peer effects for army emergency relief donations by campaign timing. Note: DOD data. The graph depicts the IV estimates of Eq. (9) for all individuals who were in a unit in the x-axis period c (month relative to the end of the AER campaign). 95% Confidence intervals reflect heteroscedasticity robust standard errors clustered at the base level.

Table 8
Impact of social group participation rates on soldiers' behaviors twelve months after transfer (IV).

Variables	(1)	(2)	(3)	(4)
	AER	CFC	WTSP	SGLI
JE participation rate	0.305	−0.005	−0.050*	−0.098
	(0.185)	(0.132)	(0.029)	(0.068)
NCO participation rate	0.248*	0.172*	0.003	−0.112
	(0.146)	(0.088)	(0.042)	(0.106)
O participation rate	−0.062	−0.004	−0.006	−0.005
	(0.070)	(0.025)	(0.009)	(0.006)
Observations	121,020	121,020	121,020	121,020
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
Sample mean	0.238	0.299	0.225	0.865
First stage F-stat	17.54	70.12	158.7	6.200

Note. DOD data. Dependent variable is the soldier's participation rate in program (specified in column heading) twelve months after arriving at his new unit. JE, NCO, and O participation rate is the new unit's average participation in the specified program in the month before the soldier arrives among the junior enlisted, non-commissioned officers, and officers respectively. Participation rates are instrumented by the mean of group's members' choices at their previous units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year as well as demographics included in all specifications. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

For the unit the soldier will be transferred to, we include separate treatment variables for the participation rates of junior enlisted (i.e., Privates and Specialists), non-commissioned officers (i.e., Sergeants of all ranks), and officers (i.e., Lieutenants and above). We again use participation measures for the month before the soldier arrived and we instrument for them with the mean of group members' choices at their previous units. We present results from these augmented regression specifications in Table 8. For example, the second entry in column (1) reports the estimated impacts of the unit's non-commissioned officers' AER participation rates on the soldier's AER participation (0.248) while controlling for junior enlisted and officer participation. Our estimated impacts on charitable giving are strongest for non-commissioned officers rather than officers.[35] To our knowledge these are the first plausibly causal estimates of the social effects of NCOs (roughly comparable to first and second line work supervisors) and, given the prominence of NCOs in the new soldiers' lives, they are unsurprising to us. The results provide additional suggestive evidence on the importance of observability, since new soldiers are likely to observe the decisions of NCOs in the group solicitation settings, but not those of officers since officers normally have private offices and if they donate, likely submit the form in person to the unit representative. It is also possible that officers could be having impacts by influencing the NCOs, other junior enlisted soldiers, or through other channels.

7.3. Heterogeneity in peer effects

We might also expect that peer effects could vary with a soldier's own characteristics. For instance, just as those with greater cognitive ability are less likely to make financial mistakes (Agarwal and Mazumder, 2013), they might also be less likely to be influenced by their peers. We use soldiers' marital status, education level, AFQT score, military career field (i.e., whether he is in a job in the infantry, field artillery, or armor), and age in additional heterogeneity analyses. In each case, we create instruments for peers' past choices with their choices from their previous units as before, but now create the corresponding instrument for the interaction of the peers' past choices with the demographic characteristic.

The results from this exercise are presented in Appendix Table B5. They suggest some significant differences in the impacts of peers for different demographic groups. Older, more educated, and married soldiers are less likely to be affected by their peers' AER and TSP participation rates, but more likely to be affected by peers' CFC participation rates. However, while there is some statistically significant heterogeneity in peer effects by demographic characteristics, the magnitudes of the differences across groups tends to be relatively small when compared to the size of the main effect.

One notable exception is the impact of peers' AER participation on those in traditional combat jobs (i.e., individuals in the infantry, armor and field artillery branches)—in this case, our estimated peer effect seems to be coming almost entirely from individuals in these jobs. While we cannot definitively identify the mechanism for these heterogeneous effects, potential explanations include the greater importance of hierarchy in these career fields, the distinctly team-oriented nature of the work, the strong social bonds developed given the dangerous tasks, and the greater observability of other unit members' actions since those in combat jobs spend more time with others in combat jobs than do soldiers in other jobs.[36] This latter possibility arises since units organize by functional groups and so soldiers with combat jobs work more closely together. The larger effects for the AER relative to the CFC follow our intuition since the AER is more likely to directly benefit fellow soldiers in general and unit members in particular.

Prior studies have also established that pro-social behavior may emerge within smaller "in-groups" (Goette et al., 2012) and economists have suggested that these groups may be generated when individuals bond with others most like themselves, giving rise to the notion of homophily (Imbens and Goldsmith-Pinkham, 2013). We explore homophily in our setting to see if peer effects are larger for soldiers who

[35] Although this may appear at odds with findings from other military settings (e.g., for academic major choices of West Point cadets as in Lyle (2007) or junior officers' military performance as in Lyle and Smith (2014)), those studies evaluate junior cadets' and officers' decisions while we evaluate junior enlisted soldiers' decisions.

[36] As further suggestive evidence, consider the Army Soldier's Creed (https://www.army.mil/values/soldiers.html), which highlights for example, the strong linkage between fighting and peers (i.e., I am a warrior and a member of a team), and the commitment to group members (i.e., "I will never leave a fallen comrade").

are transferred to units that are more like them.[37] We do not find strong evidence of homophily (see Appendix Table B6) by marital status, education level, AFQT scores, or age. This may be due to the coarse level at which we are able to say a soldier is a "match" with his new unit, but we also note that these (non)findings are consistent with our comments on observability, since the AER and CFC campaigns often utilize larger group settings at the unit level and not in smaller homophilous groups.

8. Discussion

Using plausibly exogenous variation in the financial decisions of an individual's social groups, we find linear-in-means peer effects for the charitable giving programs, but not for retirement savings or life insurance purchase. Some evidence suggests that differences in the observability of peers' decisions plays a key role in generating peer effects. Peer effects in the AER only occur after the promotional campaigns; we find larger effects for soldiers with specialties that make them spend more time together; and our point estimates suggest non-commissioned officers' choices, whose decisions are made in a more public setting than officers' decisions, play a larger role in junior-enlisted soldiers' choices than those of the officers.

Despite this evidence, we cannot entirely rule out other explanations for the differences in findings such as the underlying differences in the outcomes we study. It may be the case that charitable giving is perceived differently from life insurance or retirement savings, which begs the question of why. One possibility is the role of institutional choice architectures. Madrian and Shea (2001), Choi et al. (2003) and Carroll et al. (2009) document the influence of defaults on financial behaviors. The SGLI has an explicit default that >80% of the new soldiers choose. The TSP does not have an explicit default option, but enrollment assistance may act as an implicit default for new soldiers (Skimmyhorn, 2016). These defaults might substitute for information from social groups.

A second potential reason for our different findings across outcomes is that enlisted military members might heavily discount the future. Since both the charitable giving outcomes are short-term in nature compared to the savings and life insurance decisions, the soldiers might be near the margin of participation and thereby able to be influenced by peer effects. If the soldiers are nowhere near the margin of choosing to participate in the TSP or SGLI due to high discount rates, then peers' choices might have little effect. The evidence on discount rates for military members is somewhat mixed: Warner and Pleeter (2001) suggest they are high while Simon et al. (2015) suggest they are not.

Another possibility is that charitable giving is perceived as a pro-social activity while the other two are not. In related work on peer group formation, Goette et al. (2012) find that military members in social groups within units are more likely to demonstrate pro-social behavior to each other. Although the purchase of life insurance is also an other-regarding behavior—the payout from a life insurance policy likely has little value to an individual who does not care about the welfare of others—there could be a distinction between other-regarding behaviors outside and within the family.

A fourth possibility is that social effects are less likely to overcome preferences than information deficits, but existing research discounts this explanation. In our setting, social effects might be more likely to impart information about social norms that change an individual's willingness to donate to the CFC or AER, but they might be unable to change more enduring risk preferences (in the case of SGLI) or time preferences (in the case of the TSP). However, given findings that peers can affect individual risk preferences (Ahern et al., 2014) and entrepreneurial decisions involving risk (Lerner and Malmendier, 2013) this seems unlikely. Our findings do support the social-signaling model of Bénabou and Tirole (2006) since signals are only impactful when observable and we observe larger effects for the charity most closely tied to the military (i.e., Army Emergency Relief).

The external validity of our estimates warrants some attention, both in our sample and in the institutional setting. For the two outcomes where we estimate significant social effects (charitable giving), our sample looks very similar to young individuals (18–24) nationwide. Andreoni (2015) estimates that about 33% of this group donates to charity. Our CFC estimates (which include churches, the most common source for low income family donations) are similar with 36% of soldiers participating and our AER estimates suggest 24% of individuals donate. In addition, our retirement savings (TSP) estimates are also similar to the civilian population with 24% of sample members participating compared to 23% of civilians nationwide.[38] Our sample differs markedly with respect to life insurance decisions; our sample members participate at much higher rates (84%) than their civilian peers (33%), a likely effect of the default and perhaps a Department of Defense effort to overcome adverse selection.[39] Still, military life differs in many important ways from civilian life. Selection into the military, the prevalence of teamwork in most jobs and daily work, and the proximity of work and leisure lives all suggest that social effects may be more likely in the military setting. If so, our estimates might serve as upper bounds for the role of social groups in influencing individual financial decisions. Recall that our IV estimates and our subgroup estimates by rank also suggest a strong effect of "role models" as opposed to strict peers. Given the hierarchical nature of the military relative to other employers, this also suggests that our estimates are upper bounds.

The campaigns we study extend beyond the Army and also generalize meaningfully. Each military service has its own relief society, and the total money raised across all services exceeds $100 M annually. The CFC campaign is even larger, with >20,000 organizations worldwide contributing nearly $200 M per year. Beyond these specific charities, the underlying workplace campaigns appear relatively common. For example, public sector charitable campaigns exist in states as diverse as Alabama, California, Connecticut, New York, Texas, and Wisconsin. Several of the nation's top 10 largest private sector employers (e.g., IBM, GE, Yum! Brands, HP) also have workplace campaigns for charity. Taken together, our estimates might generalize most usefully to other military services, public sector organizations, and settings that include workplace campaigns, substantial teamwork and/or proximate living arrangements.

The policy implications for our findings vary by domain. For charitable organizations and employers interested in increasing donations, workplace campaigns and other organizational policies designed to increase peer interactions may create positive externalities. One important element may be the generation of workplace conversations that enable endogenously selected peers to discuss their choices. Our results might also suggest that if workplace financial education or choice architecture reforms do not induce individuals to invest their own time and effort in a financial choice, then there may be reduced potential for positive externalities or social multiplier effects. Our results also suggest that fostering broader communication about the information received in the multitude of modern financial education efforts could itself be an especially important component to these policies.

[37] To determine whether a soldier matches the unit, we divide both the new soldiers and the units to which they are being transferred into above and below median groups according to each characteristic. If both the soldier and the unit to which he is being transferred are below the median level of that characteristic, then they match; if both are above the median level of that characteristic, then they match as well. However, if one is above median and the other below median, the two do not match. For a binary characteristic such as married, for the soldiers being transferred, we do not calculate the median and then assign the soldiers to above and below median groups. Instead, we say the soldier is matched if he is married and is sent to a unit that has an above median fraction of soldiers who are married or if he is unmarried and is sent to a unit with a below median fraction of soldiers who are married.

[38] Author calculations using the 2009 National Financial Capability Studies. We compare 18–24 year old enlisted military respondents to similarly aged civilian respondents. Data available: http://www.usfinancialcapability.org/downloads.php.

[39] Ibid.

Appendix A. Including female soldiers in analysis

In this appendix, we relax our sample inclusion criteria. Specifically, we include female soldiers in our sample and rerun the balance tests, placebo tests, and primary analyses. Women comprise a small fraction of the junior enlisted in traditional combat troops—only 7% of the sample is female.

The balance tests for the sample with both genders are presented in Appendix Table A1. The first columns examine the AER participation rate at the units the soldiers will be transferred to. Column (2) shows that women are significantly less likely to go to a unit with high AER participation rates. Columns (4) and (6) show that women are systematically less likely to be transferred to units with high CFC participation rates or to units with low savings rates. Taken together, these results suggest that the conditional randomization of soldiers to units might not be entirely independent of a soldier's gender, though the differences in the treatments are small in magnitude.

Although there might be some question about the validity of the conditional randomization across genders, the placebo tests presented in Appendix Table A2 ameliorate these concerns. As we saw in the full sample, the point estimates tend to be very small in magnitude. This suggests that even if the conditional randomization is imperfect across genders, future treatments are not correlated with fixed, soldier-specific variables that drive her participation decisions. This in turn suggests that any bias due to imperfect conditional randomization will be small.

Lastly, we present the primary results from the main text for the sample of both male and female soldiers in Appendix Table A3. The estimated effects are all very similar to those found for the male only sample in Table 4. This is not surprising for two reasons. First, as argued above, any bias that results from imperfect randomization is likely to be quite small. Second, only 7% of the sample is female. As such, the estimated impact for that subgroup (whether due to heterogeneous treatment effects, bias, or other reasons) would have to be extremely large to materially affect the estimated impacts for the full sample of males and females.

Table A1
Balance tests for sample that includes male and female soldiers.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Female		−0.0187***		−0.0270***		0.0109***		−0.000287
		(0.00510)		(0.00761)		(0.00189)		(0.000537)
White		−0.000417		0.00123		0.000491*		−7.78e−05
		(0.00147)		(0.00134)		(0.000245)		(7.68e−05)
High school degree		0.00157		−0.000707		0.000372		−0.000130
		(0.00209)		(0.00139)		(0.000538)		(0.000189)
College degree		−0.000644		0.00337		0.00111		−0.000369
		(0.00233)		(0.00479)		(0.000759)		(0.000356)
Age		0.000270		−0.00151		1.34e−06		−0.000200*
		(0.000809)		(0.00187)		(0.000466)		(9.89e−05)
Age-squared		−7.72e−06		2.54e−05		1.17e−07		3.73e−06**
		(1.55e−05)		(3.56e−05)		(8.31e−06)		(1.72e−06)
AFQT score		1.74e−06		−3.81e−05		−3.21e−07		−5.60e−07
		(2.74e−05)		(4.65e−05)		(1.06e−05)		(2.46e−06)
Married		0.00135		−0.00242		−0.000202		−0.000103
		(0.00138)		(0.00152)		(0.000571)		(0.000216)
Observations	131,108	131,108	129,258	129,258	131,108	131,108	131,108	131,108
R-squared	0.692	0.693	0.708	0.708	0.881	0.881	0.995	0.995
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
F-stat	0	4.89e−06	0	0.000265	0	2.09e−07	0	0.000196
Sample mean	0.209	0.209	0.416	0.416	0.180	0.180	0.969	0.969

Note. DOD data. Dependent variable is participation rate of unit the soldier will be transferred to (program given in column heading). Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. p-Value of F-statistic for joint significance of demographics reported. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table A2
Placebo tests for sample with male and female soldiers.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	TSP	TSP
Unit participation rate	−0.025***	−0.024***	0.001	0.002	−0.020	−0.020	−0.019	−0.019
	(0.008)	(0.008)	(0.005)	(0.006)	(0.052)	(0.052)	(0.012)	(0.012)
Observations	128,193	128,193	126,359	126,359	128,193	128,193	128,193	128,193
Adjusted R-squared	0.347	0.349	0.281	0.282	0.239	0.242	0.418	0.419
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.189	0.189	0.234	0.234	0.102	0.102	0.074	0.074
Unit participation rate std. dev.	0.097	0.097	0.094	0.094	0.175	0.175	0.988	0.988

Note. DOD data. Dependent variable is whether soldier participated in program (specified in column heading) in the month before arriving at new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table A3
OLS results for sample with male and female soldiers.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit participation rate	0.126***	0.126***	0.120***	0.122***	0.004	−0.001	−0.040	−0.039
	(0.039)	(0.039)	(0.041)	(0.041)	(0.060)	(0.060)	(0.037)	(0.037)
Observations	131,108	131,108	129,258	129,258	131,108	131,108	131,108	131,108
Adjusted R-squared	0.143	0.144	0.184	0.186	0.195	0.199	0.948	0.948
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.233	0.233	0.355	0.355	0.221	0.221	0.866	0.866
Unit participation rate s.d.	0.189	0.189	0.234	0.234	0.103	0.103	0.157	0.157

Note. DOD data. Dependent variable is whether soldier participated in program (specified in column heading) twelve months after arriving at new unit, except for columns (3) and (4). In those, dependent variable is indicator for participation in the CFC in the January following the soldier's first CFC campaign after arriving at the unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives, except (3) and (4) which use the unit's participation in the January preceding the soldier's arrival. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table A4
Impact of unit participation rates on soldiers' behaviors twelve months after transfer women included (IV).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit participation rate	0.452***	0.449***	0.265**	0.266**	−0.022	−0.023	−0.029	−0.028
	(0.097)	(0.096)	(0.107)	(0.107)	(0.059)	(0.059)	(0.026)	(0.026)
Observations	131,106	131,106	129,203	129,203	131,106	131,106	131,106	131,106
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.233	0.233	0.290	0.290	0.221	0.221	0.993	0.993
Peer participation rate s.d.	0.189	0.189	0.234	0.234	0.103	0.103	0.0183	0.0183
First stage F-stat	95.32	95.42	74.48	74.31	2680	2679	30.56	30.56

Note. DOD data. Dependent variable is the soldier's participation rate in program (specified in column heading) twelve months after arriving at his new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. That participation rate is instrumented by the mean of the new unit's members' choices at their previous units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Appendix B. Additional tables

Table B1
Impact of future unit's past participation rate on soldiers' behavior in month preceding move (falsification test).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit previous participation rate	−0.011	−0.012	0.014	0.014	−0.049	−0.050	0.000	0.001
	(0.019)	(0.019)	(0.021)	(0.021)	(0.061)	(0.061)	(0.018)	(0.018)
Observations	119,479	119,479	117,808	117,808	119,479	119,479	119,479	119,479
R-squared	0.569	0.570	0.523	0.524	0.493	0.495	0.607	0.607
Job × rank × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Peer previous participation rate s.d.	0.0780	0.0780	0.0870	0.0870	0.0981	0.0981	0.0161	0.0161
Sample mean	0.0951	0.0951	0.0907	0.0907	0.180	0.180	0.987	0.987

Note. DOD data. Dependent variable is whether soldier participated in program (specified in column heading) in the month before arriving at new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in all columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table B2
Balance tests for IV method.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
White		−0.000723		−0.000326		0.000472		2.91e−05
		(0.000715)		(0.000694)		(0.000380)		(0.000106)
High school degree		0.00151*		−0.000447		0.000426		−0.000176
		(0.000869)		(0.000397)		(0.000463)		(0.000131)

(continued on next page)

Table B2 (*continued*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
College degree		0.000782		0.00166		−0.000804		−0.000358
		(0.00172)		(0.00138)		(0.000871)		(0.000312)
Age		−0.000227		−0.000126		0.00262		−0.000879
		(0.00499)		(0.00568)		(0.00350)		(0.00145)
Age-squared		2.24e−08		1.97e−06		−3.82e−06		1.97e−06
		(8.61e−06)		(1.04e−05)		(6.52e−06)		(2.44e−06)
AFQT score		0.000343**		7.59e−05		1.72e−05		−1.20e−05
		(0.000140)		(0.000176)		(0.000105)		(2.89e−05)
Married		0.000635		−0.000174		3.47e−05		−6.56e−05
		(0.000791)		(0.000579)		(0.000516)		(0.000167)
Observations	122,217	122,217	120,530	120,530	122,217	122,217	122,217	122,217
R-squared	0.652	0.652	0.650	0.650	0.882	0.882	0.664	0.664
Job × rank × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
F-stat	0	0.0653	0	0.0138	0	0.323	0	0.138
Sample mean	0.165	0.165	0.197	0.197	0.156	0.156	0.989	0.989

Note. DOD data. Dependent variable is average choice from previous unit made by peers in unit that soldier will be transferred to (program given in column heading). Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. P-value of F-statistic for joint significance of demographics reported. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table B3
Impact of unit participation rates on soldiers' behaviors twelve months after transfer (IV) – operational units.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AER	AER	CFC	CFC	TSP	TSP	SGLI	SGLI
Unit participation rate	0.494***	0.491***	0.304**	0.304**	−0.013	−0.012	−0.081	−0.082
	(0.084)	(0.084)	(0.121)	(0.121)	(0.049)	(0.047)	(0.050)	(0.051)
Observations	122,035	122,035	120,279	120,279	122,035	122,035	122,035	122,035
R-squared	0.422	0.423	0.464	0.464	0.466	0.468	0.964	0.964
Job × grade × post × month-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	Yes	No	Yes	No	Yes	No	Yes
Sample mean	0.239	0.239	0.297	0.297	0.224	0.224	0.865	0.865
Peer participation rate s.d.	0.191	0.191	0.235	0.235	0.103	0.103	0.157	0.157
First stage F-stat	105.1	105.3	83.63	83.60	610.7	610	4.047	4.048

Note. DOD data. Dependent variable is the soldier's participation rate in program (specified in column heading) twelve months after arriving at his new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. That participation rate is instrumented by the mean of the new unit's members' choices at their previous units for those who were in operational (not training) units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in even numbered columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table B4
Impact of unit participation rates on soldiers' AER participation in months relative to AER campaign (IV).

Variables	Months prior to end of AER campaign										
	11	10	9	8	7	6	5	4	3	2	1
Unit participation rate	−0.112	−0.182	−0.124	−0.107	−0.074	−0.076	−0.103	−0.085	−0.079	−0.071*	−0.052
	(0.191)	(0.187)	(0.160)	(0.146)	(0.116)	(0.097)	(0.069)	(0.058)	(0.053)	(0.039)	(0.035)
Observations	11,710	22,539	33,236	42,539	51,704	61,598	70,631	85,066	95,528	107,313	114,680
R-squared	0.452	0.428	0.430	0.420	0.436	0.454	0.448	0.464	0.472	0.480	0.475
Job × grade × post × mo-yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample mean	0.266	0.307	0.304	0.255	0.235	0.209	0.162	0.137	0.123	0.0917	0.0907
Peer participation rate s.d.	0.137	0.213	0.220	0.222	0.220	0.216	0.212	0.206	0.201	0.196	0.194
First stage F-stat	105.7	81.78	45.74	62.43	76.49	61.90	73.87	80.58	91.32	95.30	86.41
	Months after end of AER campaign										
	0	1	2	3	4	5	6	7	8	9	10
Unit participation rate	0.394***	0.507***	0.625***	0.588***	0.505***	0.449***	0.369***	0.276***	0.326***	0.180*	0.145*
	(0.099)	(0.119)	(0.139)	(0.134)	(0.106)	(0.099)	(0.112)	(0.090)	(0.105)	(0.097)	(0.077)
Observations	122,217	110,507	99,678	88,981	79,678	70,513	60,619	51,586	37,151	26,689	14,904
R-squared	0.453	0.478	0.447	0.449	0.409	0.408	0.418	0.402	0.414	0.429	0.478
Job × grade × post × mo-yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample mean	0.335	0.248	0.298	0.304	0.247	0.246	0.243	0.202	0.189	0.177	0.143
Peer participation rate s.d.	0.192	0.195	0.186	0.179	0.171	0.164	0.156	0.151	0.142	0.141	0.140
First stage F-stat	91.69	88.42	91.56	100.2	89.49	82.74	58.07	49.03	39.03	40.64	26.87

Note. DOD data. Dependent variable is the soldier's participation rate in AER program in the specified number of months before (top panel) or after (bottom panel) the first AER campaign he is exposed to in his new unit. Unit participation rate is the new unit's average AER participation in the month before the soldier arrives. That participation rate is instrumented by the mean of the new unit's members' choices at their previous units. Indicators for interactions between job (military occupational specialty), rank, post, and month-year included in all specifications. Soldiers' demographics included in all columns. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table B5
Heterogeneous impacts of unit participation rates on soldiers' behaviors twelve months after transfer (IV).

Variables	(1)	(2)	(3)	(4)
	AER	CFC	TSP	SGLI
Married				
Unit participation rate	0.506***	0.123	−0.036	−0.037
	(0.105)	(0.085)	(0.064)	(0.027)
Interaction term	−0.165**	0.065**	−0.062***	0.005
	(0.079)	(0.031)	(0.022)	(0.006)
Education level				
Unit participation rate	0.479***	0.133	−0.049	−0.036
	(0.097)	(0.082)	(0.060)	(0.027)
Interaction term	−0.227	0.061	0.041	−0.003
	(0.177)	(0.096)	(0.117)	(0.015)
AFQT score				
Unit participation rate	0.560***	0.142	−0.283**	−0.030
	(0.153)	(0.103)	(0.106)	(0.027)
Interaction term	−0.015	−0.001	−0.002	−0.001
	(0.018)	(0.011)	(0.007)	(0.001)
Combat job (Infantry, Armor, Field Artillery)				
Unit participation rate	0.084	0.104	0.110	0.005
	(0.105)	(0.134)	(0.076)	(0.015)
Interaction term	0.572**	0.041	−0.217**	−0.126
	(0.217)	(0.212)	(0.090)	(0.109)
Age				
Unit participation rate	0.991***	0.210	−0.062	−0.018
	(0.257)	(0.142)	(0.116)	(0.064)
Interaction term	−0.236**	−0.034	0.006	−0.008
	(0.086)	(0.044)	(0.034)	(0.019)

Note. DOD data. Dependent variable is the soldier's participation rate in program (specified in column heading) twelve months after arriving at his new unit. Unit participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. That participation rate is instrumented by the mean of the new unit's members' choices at their previous units. Interaction term is the peer participation rate interacted with the italicized demographic characteristic. Interaction terms are instrumented with the instrument previously described interacted with the demographic characteristic. Indicators for interactions between job (military occupational specialty), rank, post, and month-year as well as demographics included in all specifications. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Table B6
Homophilous impacts of unit participation rates on soldiers' behaviors twelve months after transfer (IV).

Variables	(1)	(2)	(3)	(4)
	AER	CFC	TSP	SGLI
Married				
Unit participation rate	0.480***	0.266**	−0.043	−0.036
	(0.100)	(0.114)	(0.063)	(0.027)
Interaction term	−0.013	0.028**	−0.008	0.000
	(0.019)	(0.011)	(0.013)	(0.001)
Education level				
Unit participation rate	0.484***	0.288**	−0.049	−0.036
	(0.097)	(0.112)	(0.061)	(0.027)
Interaction term	−0.022	−0.021**	0.001	−0.000
	(0.028)	(0.009)	(0.025)	(0.001)
AFQT score				
Unit participation rate	0.463***	0.277**	−0.287***	−0.037
	(0.101)	(0.115)	(0.090)	(0.027)
Interaction term	0.021	−0.003	−0.011	0.000
	(0.013)	(0.009)	(0.011)	(0.001)
Age				
Unit participation rate	0.489***	0.271**	−0.062	−0.036
	(0.100)	(0.115)	(0.062)	(0.027)
Interaction term	−0.028	0.011	0.027***	−0.001
	(0.022)	(0.008)	(0.007)	(0.001)

Note. DOD data. Dependent variable is the soldier's participation rate in program (specified in column heading) twelve months after arriving at his new unit. Peer participation rate is the new unit's average participation in the specified program in the month before the soldier arrives. That participation rate is instrumented by the mean of the new unit's members' choices at their previous units. Interaction term is the peer participation rate interacted with an indicator for whether the soldier "matches" his new unit as described in the main text. Interaction terms are instrumented for with the instrument previously described interacted with whether the soldier matches his new unit. Indicators for interactions between job (military occupational specialty), rank, post, and month-year as well as demographics included in all specifications. Standard errors clustered by post. ***p < 0.01.; **p < 0.05.; *p < 0.1.

Appendix C. Enrollment forms

Army Emergency Relief (DA Form 4908)

AER SECTION # _____ (Year)

ARMY EMERGENCY RELIEF FUND CAMPAIGN
To be completed by Contributor - *(Use Ball Point Pen)*

Requirement Control Symbol AG-766 | CONTROL NUMBER

NAME *(Last, first, middle initial)*	GRADE	SOCIAL SECURITY NUMBER
ORGANIZATION/ADDRESS		☐ ACTIVE DUTY SOLDIER ☐ RETIRED SOLDIER ☐ CIVILIAN

CHECK CONTRIBUTION $	CASH CONTRIBUTION $	Names of contributors of $1,000 or more are published in the AER Annual Report. If you do not want your contribution so recognized, check this block. ☐

ALLOTMENT FOR CONTRIBUTION TO AER *(From Active or Retired Military Pay Only)*

CHECK BOX OR FILL IN AMOUNT OF DEDUCTION EACH MONTH. CHECK BOX DESIGNATING PERIOD OF ALLOTMENT. ENTER TOTAL AMOUNT OF ALLOTMENT. *(Minimum amount for payroll deduction is $1.00.)*

AMOUNT OF DEDUCTION EACH MONTH	PERIOD OF ALLOTMENT	TOTAL AMT OF ALLOTMENT
$50.00 ☐ $25.00 ☐ $15.00 ☐ $10.00 ☐ $5.00 ☐ OTHER *(Specify)*	12 MOS ☐ 9 MOS ☐ 6 MOS ☐ 3 MOS ☐	$

I hereby authorize deductions from my monthly pay *(not to exceed 12 months)*, starting with June, in the amount shown, for the period indicated. The amounts so deducted shall be sent to Army Emergency Relief. I understand this allotment authorization must remain in effect for a minimum of 3 months.

SIGNATURE *(Required for allotment contribution only)*	DATE *(YYYYMMDD)*

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APD LF v1.00ES

Combined Federal Campaign (OPM Form 1654)

CFC Campaign Number _____ City/State Code: _____ ATTENTION PAYROLL OFFICES: Use this number only to identify the local campaign.

Last Name, First Name, MI	☐Civilian ☐Military	Federal Agency and Office	SSN/Employee ID
Work Address & ZIP Code			Work Phone Number

CONTRIBUTION: Fill in the blank showing the amount of your payroll allotment, cash or check contribution. Write in the total of your annual contribution in the space provided.

ALLOTMENT SOURCE	AMOUNT	INTERVAL	TOTAL GIFT
MILITARY PAYROLL Branch of Service?	$	x 12 months	$
CIVILIAN PAYROLL	$	x 26 pay periods	$
CASH/CHECK Check Number:		Amount: $	

(make check payable to the Combined Federal Campaign)

CFC organizations do not provide goods or services in whole or partial consideration for any contributions made to the organizations via this pledge card.

CHARITY CODE	ANNUAL AMT
☐☐☐☐☐	$
☐☐☐☐☐	$
☐☐☐☐☐	$
☐☐☐☐☐	$
☐☐☐☐☐	$

DESIGNATED GIFT: To designate to one or more charities or federated groups, fill in the charity code(s) and dollar amounts above. Undesignated gifts are distributed among all organizations in proportion to their pledges.

INFORMATION RELEASE (OPTIONAL)

Any information you enter below will be released, along with your name, to the charity(ies) to which you made a pledge. Do not enter your work address or email.

Home Address: _____

Personal Email Address: _____

☐ In addition to my contact information, I authorize the CFC to release the amount of my pledge to the charity(ies) I designated above.

PAYROLL DEDUCTION AUTHORIZATION

I hereby authorize any agency of the United States Government by which I may be employed during 2015 to deduct the amount(s) shown above from my pay each pay period during the calendar year 2015 starting with the first pay period that begins in January and ending with the last pay period that begins in December, and to pay the amounts so deducted to the Combined Federal Campaign shown above. I understand that this authorization may be revoked by me in writing at any time before it expires.

Signature _____ Date _____

PLEASE USE BALL POINT PEN & WRITE FIRMLY

COPY #1 - PAYROLL OFFICE

OPM 1654
Revised May 2014

Appendix D. Reconciling the extensive margin and overall impacts

As mentioned in the main text, we find that being assigned to a unit increases the probability that an individual participates in the AER and CFC, but no change in the average giving to these programs. We show how these two findings are not contradictory in this appendix.

For simplicity, assume that both our treatment and instrument are binary rather than continuous. This assumption is not material as the standard LATE formula in the binary case can be extended to a case of continuous treatment and instrument. Assume that we have an instrument Z and that an individual is more likely to participate in a program or to participate at a higher level when the instrument is larger. Note that this latter assumption ensures that the denominator of the LATE formula is positive and allows us to concentrate on the numerator given by

$$E[Y|Z=1]-E[Y|Z=0] \tag{D1}$$

We have suppressed individual subscripts for notational ease. Because our outcome variable cannot be negative, we can rewrite the previous formula as

$$E[Y|Z=1,Y>0]\ \Pr(Y>0|Z=1)-E[Y|Z=0,Y>0]\ \Pr(Y>0|Z=0) \tag{D2}$$

THRIFT SAVINGS PLAN
ELECTION FORM

TSP-U-1

Use this form to start, stop, or change the amount of your contributions to the Thrift Savings Plan (TSP). Before completing this form, please read the *Summary of the Thrift Savings Plan* and the instructions on the back of this form. Type or print all information. **Return the completed form to the office of your service that is responsible for enrolling members in the TSP.** That office should return a copy to you after completing Section V. **Note:** To choose your investment funds, see the instructions in the General Information section on the back of this form.

I. INFORMATION ABOUT YOU

1. _____ (Name *(Last)* / *(First)* / *(Middle)*)
2. _____ (Mailing Address *(may be APO or FPO)* / City / State / Zip Code)
3. ___ – ___ – ___ Social Security Number
4. (___) ___ – ___ Daytime Phone *(Area Code and Number)*
5. ___/___/___ Date of Birth *(mm/dd/yyyy)*
6. _____ Office Identification *(Service and Organization)*

II. CHOOSE THE AMOUNT OF YOUR CONTRIBUTIONS

Your choice will cancel all previous elections.

To start or change the amount of your contributions, enter in Items 7–10 the percentage of your pay each pay period that you want as traditional (pre-tax) contributions. Enter in Items 11–14 the percentage of your pay each pay period that you want as Roth (after-tax) contributions. **Note:** You **must** elect to contribute at least 1% of basic pay (or its equivalent) to be eligible to contribute from your other types of pay (see instructions). **Remember:** A blank line next to a type of contribution equals 0% contributed.

	Traditional (Pre-Tax) Contributions All Services	Roth (After-Tax) Contributions All Services
Basic Pay	7. _____ .0%	11. _____ .0%
Incentive Pay	8. _____ .0%	12. _____ .0%
Special Pay	9. _____ .0%	13. _____ .0%
Bonus Pay	10. _____ .0%	14. _____ .0%

III. STOP YOUR CONTRIBUTIONS

When you stop your contributions from basic pay, contributions from incentive, special, and bonus pay will also stop.

To stop all contributions to the TSP, check Item 15 or 19 (or both, as applicable). If you want to stop only your contributions from incentive pay, special pay, or bonus pay, check the appropriate box(es). Your contributions will stop no later than the first full pay period after your service receives this form.

Stop My Traditional Contributions	Stop My Roth Contributions
15. ☐ From **basic pay**	19. ☐ From **basic pay**
16. ☐ From **incentive pay**	20. ☐ From **incentive pay**
17. ☐ From **special pay**	21. ☐ From **special pay**
18. ☐ From **bonus pay**	22. ☐ From **bonus pay**

IV. SIGNATURE

23. _____ Participant's Signature
24. ___/___/___ Date Signed *(mm/dd/yyyy)*

V. FOR SERVICE USE ONLY

25. _____ Payroll Office Number
26. ___/___/___ Receipt Date *(mm/dd/yyyy)*
27. ___/___/___ Effective Date *(mm/dd/yyyy)*
28. _____ Signature of Service Official

PRIVACY ACT NOTICE. We are authorized to request the information you provide on this form under 5 U.S.C. chapter 84, Federal Employees' Retirement System. Your service will use this information to identify your TSP account and to start, change, or stop your TSP contributions. In addition, this information may be shared with other Federal agencies for statistical, auditing, or archiving purposes. The information may also be shared with law enforcement agencies investigating a violation of civil or criminal law, or agencies implementing a statute, rule, or order. It may be shared with congressional offices, private sector audit firms, spouses, former spouses, and beneficiaries, and their attorneys. Relevant portions of the information may also be disclosed to appropriate parties engaged in litigation and for other routine uses as specified in the Federal Register. You are not required by law to provide this information, but if you do not provide it, your agency or service will not be able to process your request.

Form TSP-U-1 (1/2015)
PREVIOUS EDITIONS OBSOLETE

ORIGINAL TO PERSONNEL FOLDER
Provide a copy to the member and to the Payroll/Finance Office.

Adding and subtracting $E[Y|Z = 1, Y > 0]$ Pr $(Y > 0|Z = 0)$ from Eq. (D2) and grouping terms, we find that

$$E[Y|Z = 1, Y>0] \{ \Pr(Y>0|Z = 1) - \Pr(Y>0|Z = 0)\} + \{E[Y|Z = 1, Y>0] - E[Y|Z = 0, Y>0]\} \Pr(Y>0|Z = 0) \quad \text{(D3)}$$

The top line of Eq. (D3) shows the extensive margin effect. In our case, that quantity is positive since a higher fraction of individuals participate in the program $(\Pr(Y > 0))$. However, in the bottom line, we have the difference of the (mean) levels of participation for the individual. This quantity can be positive, zero, or negative. As a result, the overall sign of Eq. (D1) can be positive, zero, or negative even when being exposed to the instrument raises the probability of participating.

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