Norms and Contracting[*]

Judd Kessler[†] Stephen Leider[‡]

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Abstract

We argue that contracts establish the norms of a relationship and that individuals incur disutility when deviating from these norms. In a laboratory experiment, we allow agents to make simple contracts before they play one of four games, and the most effective contract always includes an unenforceable "handshake" agreement to take the first best action. In three games, a contract with only this handshake agreement is (at least weakly) optimal. The handshake is particularly effective in games with strategic complements. Our results highlight an explanation for contractual incompleteness: establishing a norm can effectively substitute for weak enforceable restrictions.

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[†]Harvard University, 25 Harvard Way, Baker Library 420F, Boston MA 02163, jkessler@hbs.edu

[‡]University of Michigan Ross School of Business, 701 Tappan Street R4486, Ann Arbor MI 48109, leider@umich.edu

1 Introduction

Contracts have long been studied as a means of making commitments, establishing payments, and allocating decision and control rights to promote more efficient exchange. Most contracts, however, tend to be remarkably simple and frequently omit potentially useful and feasible provisions.[1] Many reasons why economic actors may write such incomplete contracts have been proposed in the literature, including direct costs of contracting, non-verifiability of outcomes, and unforeseen outcomes (see Hart 1995 and Tirole 1999 for surveys).

We propose a new reason why incomplete contracts may be so prevalent. We argue the unenforceable components of a contract ("handshake agreements") establish norms that are endogenous and local to a relationship ("induced norms")[2] that agents feel beholden to follow.[3] Making a handshake agreement to take the first best action leads individuals to take more efficient and prosocial actions, despite the absence of legal enforcement of the promise. Consequently, handshake agreements may substitute for (costly) enforceable restrictions and may be particularly useful when verifiability or other limitations prevent writing a more complete contract.[4]

To identify the role of handshake agreements on behavior, we conduct a laboratory experiment in which subjects make simple contracts before playing one of four games. The contracts consist of either (a) an enforceable minimum action ("Minimum contract"), (b) an unenforceable handshake agreement to play the first best action ("Handshake contract"), or

[1]Macauley (1963) is a seminal paper documenting the under-specification of many manufacturing contracts; similarly, Carlton (1986) suggests that for many industrial transactions the "contracts specify neither price nor quantity." See also Lyons (1996) for a survey. Employment contracts often specify only hours, duration, and compensation. Service contracts are often similarly simple (e.g. hourly rate or fixed price contracts) and, generally, neither specify particular behaviors nor make provisions contingent on potentially verifiable information (see Eggleston et al. 2000).

[2]Induced norms are distinct from (and act in addition to) personal prosocial inclinations (e.g. altruism) and general norms (e.g. fairness) that are present across many environments. Induced norms are created by the agreement between individuals.

[3]Our conception of induced norms, which are established in the contracting stage of a relationship, differs significantly from the way other papers have suggested contracts and norms interact. Sliwka (2007) argues that an employer's unilateral contract choice signals her belief about which behavioral norm applies for her employees. Hart and Moore (2008) argues that contracts set reference points and that individuals will provide less effort when outcomes differ from these reference points (see also Fehr et al. 2009 for an experimental demonstration). It also shares some commonalities with the organizational behavior literature on psychological contracts—the often implicit set of expectations and obligations that develop from a contract and/or working relationships (see Rousseau 1989, for a seminal paper in this literature, as well as Morrison and Robinson 1997, on psychological contract violation and Rousseau and Parks 1992, who contrast psychological contracts with other forms of contracts).

[4]Parties can always create an unenforceable handshake agreement to take the first best action. For example, even if the specific first best action is not known ex ante, the parties can agree to take the first best action when it becomes known.

(c) both a minimum and an unenforceable handshake agreement ("Combined contract"). The Handshake contract substantially increases actions towards the first best in all of our games. Furthermore, the optimal contract always includes a Handshake agreement, and often adding an enforceable minimum to a handshake agreement provides little additional benefit.

We also consider whether enforceable restrictions and incentives have a detrimental effects on prosocial motivation in our context, as has been shown to be the case in principal-agent settings. Requesting a contract with a minimum could be insulting or signal a lack of trustworthiness, suggesting that the Handshake contract could outperform the Combined contract in our setting.[5] However, the Handshake contract performs strictly better than the Combined contract in only one of our four games (the Bertrand game). This result suggests that control mechanisms may not undermine prosocial motivations in a setting like ours with bilateral actions and symmetric contractual restrictions.

While norms can be induced explicitly in a contract,[6] as in our experiment, we believe they can also be created verbally through writing the contract as each party states their commitments and expectations. Similarly, company mottos or credos, which are the basis for corporate culture, might work to establish a norm across an entire organization.

The rest of the paper proceeds as follows: Section 2 presents the design of our experiment; Section 3 describes our experimental predictions; Section 4 reports and analyzes the results of our experiment; Section 5 interprets and discusses the implications of our results and how our findings fit into related literatures; and Section 6 summarizes our major conclusions.

2 Experimental Design

In the experiment, subjects make simple contracts before choosing actions in games in which higher actions are personally costly but socially beneficial. All games are symmetric, two-person, one-shot, simultaneous-move games in which both subjects face the same incentives and choose actions simultaneously. Subjects play with either symmetric contracting rules (where any contract must be mutually agreed upon) or unilateral contracting rules (where one individual is randomly selected to set the contract).[7]

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[5]Both the "hidden costs" (e.g. Falk and Kosfeld 2006) and "crowding out" (e.g. Gneezy and Rustichini 2000) literatures demonstrate that enforceable control and incentive mechanisms can be detrimental to efficiency; these literatures are discussed further in Section 5.

[6]For an example of a contract explicitly creating a norm see the Partner's Agreement of Accenture LTD (http://contracts.onecle.com/accenture/partners.pma.2001.04.18.shtml) where the specification of the partners' duties and obligations are almost entirely described in terms of principles such as "stewardship" and "subordination of personal interests."

[7]Environments in which two agents mutually set the norms for a relationship and have symmetric obligations within the relationship, as under the symmetric contracting rule, encompass many workplace settings

2.1 Round Structure

Each round had the following structure (for all games):

1. Subjects are randomly matched with a new, anonymous partner.
2. One subject (under the unilateral rule) or both subjects (under the symmetric rule) ask for or decline each of the three contracts, one at a time.
3. One contracting environment is selected randomly, and the contract is imposed if the chosen subject (under unilateral) or both subjects (under symmetric) asked for it.
4. Subjects make action choices for the stage game.
5. Subjects guess the action of their partner.
6. Action choices and payoffs are revealed.

2.2 The Stage Games

We examined four different games: an Additive Public Good Game (APG), a Multiplicative Public Good Game (MPG), a Double Dictator Game (DDG), and a Bertrand Game (BG).[8] The MPG and the BG are games with strategic complements (an individual's monetary best response is increasing in the action of the other player), while the APG and the DDG have strategic independence (an individual's monetary best response does not depend on the action of the other player). The payoffs for the games were as follows:

Additive Public Goods Game (APG):	$\pi_i(x_i, x_j) = 10(x_i + x_j) - x_i^2 - 50$
Multiplicative Public Goods Game (MPG) :	$\pi_i(x_i, x_j) = 3(x_i * x_j) - 2x_i^2 + 25$
Double Dictator Game (DDG):	$\pi_i(x_i, x_j) = 20 - 2x_i + 6x_j$
Bertrand Game (BG):	$\pi_i(x_i, x_j) = x_i$ if $x_i < x_j$
	$\pi_i(x_i, x_j) = \frac{x_i}{2}$ if $x_i = x_j$
	$\pi_i(x_i, x_j) = 0$ if $x_i > x_j$

as well as joint projects and cooperative agreements. By also studying environments in which one agent unilaterally determines the contract, we are able to to investigate whether the symmetry of the contracting environment is necessary for the beneficial effects of the contracts. Variation in the contracting rules also allows us to speak to the "hidden cost" literature (i.e. Falk and Kosfeld 2006) by examining settings in which one agent places unilateral restrictions on the relationship. Our setting remains distinct from Falk and Kosfeld (2006) as we only examine relationships where two parties both take actions and have symmetric payoffs.

[8] Public goods games have been used extensively to study the effect of preplay communication (e.g. Dawes at al. 1977). The Bertrand Game was used previously in Dufwenberg and Gneezy (2000) and Dufwenberg et al. (2007) to study competitive structures such as minimum price floors.

For all of the games, the selfish best response is at (or near) the minimum action in the action space and the first best action is at (or near) the maximum action in the action space. Consequently, higher actions are more costly but more socially beneficial. In particular, in the APG, subjects could choose any (integer) action between 4 and 11: the selfish equilibrium action is 5 and the first best action is 10. For the MPG, subjects could choose any (integer) action between 0 and 6: the selfish equilibrium is 0 and the first best action is 6. For the DDG, subjects could choose any (integer) action between 0 and 10: the selfish equilibrium is 0 and the first best action is 10. For the BG, subjects could choose any (integer) action between 0 and 100: the selfish equilibria are 0, 1, and 2 and the first best action is 100.

Subjects played 10 rounds each of two different games. They played either the APG and the MPG or the DDG and the BG.[9] For each pair of games, the order of the games was randomized across sessions. Subjects were randomly and anonymously paired with a new subject in each period, and they never played with the same subject more than once for each game. For all games in all sessions, each experimental unit was worth \$0.15. One period from each of the two games was selected randomly for payment at the end of the experiment.[10] Since quadratic action costs might have been difficult for subjects to calculate, a payoff table (showing the payoff from every pair of actions) was displayed on every screen for both the APG and MPG.

2.3 The Contracting Phase

Subjects were informed that each round, before the stage game, one of four contracting environments would be randomly selected. In one environment no contract was allowed ("No Contract"). In the three other environments, subjects could have a Minimum contract (labeled a "restriction" in the instructions), a Handshake contract (called an "agreement" in the instructions), or a Combined contract (which had both a restriction and an agreement).[11]

Before subjects knew which contracting environment had been randomly selected, subjects

[9] Subjects played these two pairs of games because our experiment occurred in waves over the course of several months. For each wave we wanted subjects to play both a game with strategic independence and a game strategic complements. We selected the DDG and BG games for the second, third and fourth waves both because they have simpler payoff functions than the APG and MPG and to look at a game (the BG) with stronger strategic complements than the MPG.

[10] We chose to pay one of each set of ten periods so that we could increase the nominal size of the payoffs in each period without making the overall subject payment too large.

[11] Several experiments have considered a form of preplay communication that is related to our "handshake agreements," allowing subjects to promise what action they will take (see Charness and Dufwenberg 2006 and Vanberg 2008, as well as Sally 1995 for an early meta-analysis of prisoner's dilemma games). Our paper differs from the previous literature in three important ways. We consider this communication in the context of contracting, we demonstrate that the effect of promises can be modeled as one of norm formation, and we directly compare unenforceable communication to enforceable contracts.

asked for ("suggested") or declined each of the three potential contracts, one at a time. Because the contracting environment was randomly selected, these contracting choices did not affect what contract was available that period, only whether the available contract was implemented. Under the symmetric contracting rule, both subjects had to ask for a contract for it to be implemented when its contracting environment was randomly selected. Under the unilateral contracting rule, one subject was randomly chosen to determine the contract in each round and that subject had to ask for the contract for it to be implemented when its contracting environment was randomly selected.

We had subjects ask for or decline each of the three contracts in every round so we could rule out the possibility that our experimental results were driven by selection. In particular, we wanted to eliminate the alternative hypothesis that only inherently prosocial subjects wanted handshake contracts and thus handshake contracts were associated with higher actions due to selection rather than treatment. Because we observe all the contracting choices, we can compare subjects with the same contracting preferences (eliminating selection) but who faced different contracting environments (the treatment). We generally focus on subjects who requested all three contracts in a given round and thus received a particular contract randomly.[12] After the subjects made their choice for each kind of contract, one of the three contracts (or no contract) was randomly selected to be available in that period. The random sequences were constructed so that over the 10 periods the No Contract and Minimum contract environments would be selected twice and the Handshake contract and Combined contract environments would be selected three times, in random order.

The content of the three contracts were fixed exogenously and were described by the clauses in quotes below. For each game, X was an integer that was the minimum action allowed under the enforceable restriction, which was the same for the Minimum contract and the Combined contract, and was held constant throughout each game (X was selected to be a fairly weak restriction). For each game, Y was the integer of the first best (i.e. socially optimal) action.[13]

[12]For such a subject (who had requested all three contracts) to appear in the data and be playing under a particular contract, it only required that the contract was randomly selected to be available for that period and (under the symmetric contracting rule) the randomly selected partner to have suggested that contract. To appear in the data playing under the no contracting environment all that was required was that the no contract environment was randomly selected that period.

[13]We look at exogenously determined contract terms to cleanly focus on the content of the contracts and to control for selection issues. Because we wanted to compare subjects who made the same contracting choice, but were randomly placed in different contracting environments, we limited the number of potential contracts so that there would be a large enough set of subjects who made the same choice and so that there would be enough observations within each contract. Allowing subjects to choose contractual terms endogenously is an interesting direction of future research that we intend to pursue.

- Minimum contract: "We must each choose an action of at least X"
- Handshake contract: "We agree to each take action Y"
- Combined contract: "We must each choose an action of at least X, and we agree to each take action Y"

For the APG, X was 6 and Y was 10. For the MPG, X was 2 and Y was 6. In the baseline analysis of the DDG, X was 1 and Y was 10. In the baseline analysis of the the BG, X was 10 and Y was 100. For the latter two games, we also ran additional sessions under the symmetric contracting rule with a higher minimum action (X was 3 in the DDG and X was 30 in the BG) to directly test the effect of different minimum actions (i.e. levels of enforceability) on behavior.

After asking for or declining each contract, subjects were informed of which contracting environment had been randomly selected by the computer and whether the contract for that environment was in effect.[14] Subjects then selected their action for the game (restricted by the minimum if it was enacted) and guessed what action their partner would take (subjects earned $0.25 for each correct guess).[15] Finally, subjects were reminded of their own action, informed of their partner's action, and informed of both their earnings and their partner's earnings for the round.

3 Behavioral Predictions

In this section we sketch a simple framework to help motivate our predictions.[16]

To capture our intuition that norms influence the actions subjects take, we assume that, in addition to standard utility from monetary payoffs, an individual receives disutility to the extent that her action x_i deviates from a norm $\hat{x}$. This generates a utility function:

$$U_i(x_i, x_j; \hat{x}) = \pi_i(x_i, x_j) - \phi_i g(\hat{x} - x_i) \text{ if } x_i < \hat{x}$$
$$U_i(x_i, x_j; \hat{x}) = \pi_i(x_i, x_j) \text{ otherwise}$$

[14]Subjects were also reminded of their own contracting choice and, under the symmetric contracting rule, told whether their partner had also asked for the contract.

[15]We elicit subject beliefs so that we can distinguish between strategically motivated effects of the handshake (particularly in the MPG and BG, which have strategic complements) from direct effects of the handshake on behavior (i.e. concern for following the norm independent of beliefs about partner's action).

[16]While we present only a brief sketch of a model here, we solve a full model in an earlier version of this paper (Kessler and Leider, 2009). López-Pérez (2008) also considers a general model of social norms that has some features in common with our framework (although it does not consider contracting or handshake agreements).

where g is an increasing function that denotes the disutility from deviating from the norm and ϕ_i indicates individual i's level of norm-sensitivity (relative to pecuniary motivations). An individual with $\phi = 0$ is a standard selfish individual who does not incur disutility from deviating from the norm, while as $\phi \to \infty$ an individual becomes perfectly norm-fulfilling.

Our motivating intuition is that the contract the two agents choose establishes an induced norm, $\hat{x}_{\mathrm{H}}$, that sets $\hat{x}$ for the relationship.[17]

Hypothesis 1 *The mean action taken under each contract with a handshake agreement (the Handshake contract and Combined contract) will be higher than the mean action taken under the corresponding contract without a handshake agreement (the No Contract and the Minimum contract, respectively).*

Given our behavioral assumptions, it is straightforward to see that as long as there are some norm-sensitive individuals (with $\phi > 0$), the average action taken by subjects in our experiment should be higher when the norm is higher. In all the games, individuals have a material incentive to take a relatively low action (either the minimum action possible in the games with strategic independence, or an action lower than the other agent in the games with strategic complements). When the agent is norm sensitive, and therefore receives disutility for taking an action below the norm, he has a countervailing incentive to take a higher action (in order to reduce this disutility). When the norm increases, players increase their action to reduce the disutility from violating the norm.[18]

In our experiment, the contracts with the handshake agreement require subjects to agree to take the first best action. We therefore argue that making a handshake agreement creates an induced norm to take the first best action. Consequently, whenever subjects have a handshake agreement, they should take higher actions than the corresponding contract without a handshake agreement. This is the cleanest and most basic prediction of our intuition because we hold constant the presence or absence of an enforced minimum action. Depending on

[17]We do not rule out the existence of a preexisting "background norm" that might encourage subjects to take a higher action than they would if only selfish motives were at play. In this case, we argue that when the contract includes a handshake agreement (i.e. the Handshake contract and the Combined contract) the resulting induced norm, $\hat{x}_{\mathrm{H}}$, is higher than any preexisting background norm $\hat{x}_0$ that might exist when there is no handshake agreement: $\hat{x}_{\mathrm{H}} > \hat{x}_0$.

[18]The exact actions individuals take will depend on the form of the utility function U. In general, if U is concave (e.g. if π is linear and g is convex, or if π is concave and g is linear), solutions will be interior (i.e. individuals will take an action between the selfish optimum and the norm), while if U is linear or convex, solutions will be bang-bang (i.e. individuals will take either the selfish action or the normative action). We expect average actions to increase when the norm increases either because many individuals increase their actions slightly (if the optimal action is interior) or because a few individuals change their action to the norm (if the optimal action is bang-bang).

the functional form of the material payoffs and the disutility from violating the norm, the response to a handshake agreement can either be a bang-bang response (subjects either play the first best or play the selfish action) or can be a partial response (subjects take an action between the first best and the selfish action).

Hypothesis 2 *The effect of the handshake agreement will be larger in the games with strategic complements: the Multiplicative Public Good Game (MPG) and the Bertrand Game (BG).*

In games with strategic independence, only subjects who are norm sensitive should respond to a handshake agreement. A selfish subject only cares about his monetary payoffs and his incentives do not depend on the action of his partner. In games with strategic complements, however, a selfish subject has a material incentive to increase his action under a handshake agreement if he believes his partner is norm sensitive and will also increase his action. For example, if a selfish subject in the Bertrand Game believes a handshake agreement will increase his partner's action from 20 to 60, then his best response increases from 19 to 59. Therefore, we expect the handshake agreement to have the greatest effect in the games with strategic complements, the MPG and the BG.

Hypothesis 3 *An enforceable minimum will only affect the subjects for whom it binds, so adding an enforceable minimum will be particularly useful when actions under No Contract are particularly low.*

The enforceable minimum should have its greatest effect on subjects who would otherwise take an action below the minimum. Therefore, the Minimum contract should have its largest effect when the average action under No Contract is low.[19] Similarly, the Combined contract will have a larger effect than the Handshake contract in games where there are still many subjects choosing low actions under the Handshake contract. This hypothesis additionally assumes that adding the enforceable minimum will not impact the strength of the induced norm set by the handshake agreement of the contract. We find mixed evidence of this assumption and discuss it further in Section 5.

4 Experimental Results

Sessions were run at the Computer Lab for Experimental Research (CLER) at Harvard Business School using its standard subject pool. The experiment was programmed and conducted

[19]We expect low actions under no contract when general prosocial inclinations or preexisting background norms are weak. Games and decision contexts will likely differ in the norm that exists absent a specific agreement and in the distribution of individuals' willingness to follow the norm. Therefore, the minimum should be most important in settings where $\hat{x}$ (without a handshake) is low and/or where ϕ_i is low.

with z-Tree (Fischbacher 2007). 78 subjects participated in the first wave of sessions, playing the Additive Public Good (APG) and Multiplicative Public Good (MPG) games under the symmetric contracting rule. 102 subjects participated in the second wave of sessions, playing the Double Dictator Game (DDG) and the Bertrand Game (BG) with the very low minimum actions (i.e. weak enforceable restrictions) under the symmetric contracting rule. 70 subjects participated in the third wave of sessions, playing the DDG and BG with higher minimum actions under the symmetric contracting rule. Finally, 62 subjects participated in the fourth wave of sessions, playing the DDG and BG with the very low minimum actions under the unilateral contracting rule. Subjects earned on average approximately $20 in all waves, and all sessions lasted less than one hour.

We first analyze the first two waves of sessions, in which subjects played two of the four games under the weak enforceable restrictions. Unless otherwise noted, results are from these two waves. We then compare results from the second and third waves, in which subjects played the same two games (DDG and BG) but with different enforceable minimum actions (i.e. different levels of enforceability). Finally, we compare results from the second and fourth waves, in which subjects played the same two games (DDG and BG) but under different contracting rules to investigate the structure of contracting on behavior.

4.1 Contracting

[INSERT TABLE 1 HERE]

Table 1 reports the fraction of subjects who requested each kind of contract in each of the four games across all periods. It also reports the fraction of subjects who requested all three contracts and the fraction who requested none. The vast majority of subjects (at least 80% for every contract in every game) asked for each of the contracts, and subjects generally asked for all three of the contracts (at least 70% did this in every game). Even though the Handshake contract had no effect on action spaces, it was just as appealing to subjects as the enforceable contracts. Additionally, there were no notable trends across periods in the aggregate usage of the contracts (although we will highlight in a later section an interesting trend for a subset of subjects).

4.2 Effectiveness of a Handshake

The reason behind the popularity of the Handshake contract is readily apparent: handshake agreements are remarkably effective at raising actions towards the socially optimal action. The most efficient contract always includes a handshake; a handshake always increases actions relative to the corresponding no-handshake contract; and, when compared to contracts with relatively weak enforceable restrictions in the first two waves of sessions, the Handshake contract was weakly or strictly optimal for three of the four games.

4.2.1 Average Actions

Figure 1 displays the average action (conditional on the contract) of subjects who asked for all three contracts in a given round (and who had the contract in those rounds). While we restrict attention to subjects who requested all three contracts in order to rule out differences due to selection effects, the results are essentially the same if we include all subjects or only subjects who asked for all three contracts in every round.[20] For comparability across the games, we scale the actions into percentages so that 0% denotes the selfish equilibrium action (5 in the APG, 0 in the other three games) while 100% denotes the socially optimal (first best) action (10 in the APG and DDG, 6 in the MPG, and 100 in the BG). The figure displays the average action for each contract as well as for the condition where no contract was possible. The horizontal bar denotes the enforceable minimum action for each game.

[INSERT FIGURE 1 HERE]

Introducing a handshake agreement to a contract substantially increases the efficiency of actions. The Handshake contract increases actions by 30% to 90% over No Contract. The Combined contract increases actions by 17% to 45% over the Minimum contract. These differences are significant for all four games (a two-tailed t-test yields $p < 0.01$ for each of the four games for both comparisons) and strongly support Hypothesis 1.

The Handshake contract also yields significantly higher actions than the Minimum contract for the two games with strategic complements, the MPG and the BG ($p < 0.01$ for both games), but not for the games with strategic independence (only directionally higher for the DDG where $p = 0.17$ and directionally lower for the APG). This data supports Hypothesis 2 that the handshake agreements should be particularly strong in games with strategic complements. In games with strategic complements, even a selfish subject has a strategic incentive to increase his action under a high induced norm (if he believes the other subject may be norm sensitive or thinks the other subject believes he is norm sensitive). This result also supports Hypothesis 3, in that the Minimum contract only leads to higher actions than the Handshake in the APG, where average actions are quite low and the minimum is binding for many subjects.

[20] Results are also essentially the same if we only include subjects who asked for all three contracts and whose partner also asked for all three contracts in that round. Since subjects are only informed of their partner's contract suggestion for the contracting environment that is randomly selected, the partner's contract choices for the unavailable contracts should not (and do not) affect behavior.

Once a contract includes the handshake agreement to play the first best, adding an enforceable minimum does not necessarily further increase subjects' actions and can, in fact, decrease them. While the Combined contract leads to significantly *higher* actions than the Handshake contract in the APG ($p < 0.01$), the actions are not significantly different in the MPG or DDG ($p = 0.97$ and 0.21, respectively) and actions are significantly *lower* under the Combined contract in the BG ($p = 0.04$).

[INSERT TABLE 2 HERE]

We confirm these results by regressing subjects' actions on contract clause dummy variables as well as controls for time trends, treatment order, and game order within a session.[21] The estimates, and the total difference between the Combined contract and the Handshake contract, are presented in Table 2. We see that the presence of a handshake agreement in the contract significantly increases actions in all four games; moreover, the effect is significantly larger than the effect of an enforceable minimum for the MPG, DDG, and BG (Wald test: $p < 0.01$ for each game).[22] In the BG, introducing a minimum action has a marginally significant negative effect. Lastly, the only significant differences between the Handshake and Combined contracts are in the APG (where Combined is better) and in the BG (where Handshake is better).

4.2.2 Time Trends

Having shown that the handshake agreements substantially increase actions on average, we now want to examine their effects across rounds.

[INSERT FIGURE 2 HERE]

Figure 2 presents the average action taken for No Contract and for the Handshake contract for rounds 1 to 5 and rounds 6 to 10. The bars are stacked, so the light bar indicates the average action as a percent of the social optimum under No Contract, and the dark area denotes the *increase* in actions for the Handshake contract above the No Contract baseline. To avoid selection problems, we again focus on subjects who requested all three contracts.[23] While the absolute level of the actions declines between the first and second

[21] We find quantitatively similar results using fixed effects. While we again focus on subjects who requested all the contracts to avoid problems of selection, the results are the same if we include all observations or instead look only at subjects who asked for all three contracts in every round.

[22] We also regressed, using only data from when the Handshake contract environment was randomly selected, subjects' actions on dummy variables for requesting the Handshake contract, the partner requesting the Handshake contract, and an interaction term (for this specification we included all subjects). In all four games, there is only a significant positive effect of the asking for a handshake agreement when both parties requested it (so the handshake agreement was actually enacted).

[23] The results are the same if we look at all observations or if we look at only those subjects who request all three contracts in every round.

half of the experiment for three of the four games, as is typical in public good games, the *difference* between the Handshake contract and No Contract remains essentially the same for all four games.[24] Additionally, since the subjects play all four contracting environments in a random sequence, the fact that even in later rounds the effect on actions occurs only when the handshake agreement is actually present indicates that the contract itself is critical for setting the norm, rather than merely causing some kind of coordination or demand effect that could spread to the other contracting environments.

This result suggests that the effect of the handshake agreement in increasing actions is stable over time. Even if parties learn to take lower actions over time, there may still be a benefit to establishing an induced norm in the relationship.

4.2.3 Controlling for Guesses

One alternative hypothesis for why subjects' actions change in response to the contract is that the contract changes subjects' beliefs about partner actions, which leads subjects to alter their own actions (for strategic reasons or otherwise). If this were the case, subjects might respond to contracts due to changes in beliefs, rather than internal desires to fulfill the norm set by the contract.

To test this hypothesis, we also ask subjects to guess their partner's action each round. Agreeing to a Handshake contract (compared to no contract being available) has a similar, but larger, effect on guesses than on actions. On average, subjects who request all three contracts make higher guesses of partner actions under the Handshake contract than under No Contract. For APG, they guess 63% under the Handshake contract and 26% under No Contract; for MPG, 83% vs 62%; for DDG, 59% vs 27%; for BG, 86% vs 59%.[25] Also, average guesses are higher than realized actions: on average subjects are overoptimistic about the actions of their partners. Nevertheless, the contract has a strong, significant effect beyond the changes in beliefs. Table 3 presents the estimates of regressing a subject's action (in the Handshake contract) on a dummy for agreeing to the contract, as well as the subject's guess for his partner's action.[26]

[INSERT TABLE 3 HERE]

While subjects' actions are significantly positively correlated with their beliefs about their partners' actions,[27] there is also a separate effect from having the contract. If we compare

[24] We find similar results comparing the Combined and Minimum contracts in each half.

[25] All four differences are significant, with $p < 0.01$ for each game.

[26] For this analysis we include all subjects from the first two waves of sessions in order to increase the number of observations.

[27] As one would expect, the coefficient is larger for the games with strategic complements where subjects

the direct effect of the contract to the indirect effect from the change in the subject's guess, the direct effect accounts for roughly 30% to 40% of the total effect on actions.

We can also directly compare a subject's action to his guess. In particular, in the MPG and the BG, a subject's guess uniquely defines a selfish best response (if subjects have point beliefs rather than belief distributions). In both games, we observe a substantial number of subjects taking actions strictly larger than their selfish best response, indicating non-strategic motivation to take a high action, as is predicted by our model of contracts inducing norms. In the MPG, 61% of actions are strictly larger than the best response under both the Handshake contract and the Combined contract, 55% of subjects chose an action higher than their best response in the No Contract condition, and 50% chose a higher action under the Minimum contract. In the BG, 29% of actions are strictly larger than the best response for the Handshake contract, 31% for the Combined contract, 30% for No Contract, and 38% for the Minimum contract.

In all four games, many subjects take actions strictly larger than their guess of partner's actions. Under the Handshake contract, 15% of subject actions in the APG are strictly larger than the corresponding guess of the other subjects' action.[28] Similarly, 40% of actions in the MPG, 14% of actions in the DDG, and 24% of actions in the BG are strictly larger than the subject's guess. This result is particularly striking for the BG, since if these subjects' reported beliefs are accurate, they expect a modal outcome in which they receive a payoff of zero. We also observe a similar number of actions that are larger than corresponding guesses under the Combined contract (7% in the APG, 21% in the MPG, 14% in the DDG, and 19% in the BG).

4.3 The Role of Norms

Having demonstrated that the handshake agreement substantially increases the efficiency of subjects' actions, we now look for further evidence that the handshake agreement is changing behavior by setting a norm, rather than some other effect. In particular, we look for evidence that subjects experience disutility from taking actions that deviate from the induced norm set by the handshake agreement.

While we noted previously that the fraction of subjects asking for each contract is stable throughout the experiment, in each game there are a substantial number of subjects who dramatically decrease their usage of the Handshake contract between the first half and second

have a pecuniary incentive to increase actions as partner actions increase.

[28] To avoid ceiling effects we exclude cases where the subject guessed that his partner would take the largest individually rational action. For example, if a subject guesses that his partner will take action 10 in the DDG, it is not possible to take a strictly higher action.

half of the experiment.[29] Table 4 displays the number of these subjects in each game, their average payoff in the second half with and without the Handshake contract, as well as the average payoff of other subjects with the Handshake contract.

[INSERT TABLE 4 HERE]

Between 9% and 20% of subjects decrease usage of the Handshake contract in each game, decreasing their frequency of requesting the contract between 34% and 54%. However, these subjects are still requesting the Handshake contract in one fifth to one half the periods; consequently, we can compare the average payoff of this group in periods when they do not have the contract to periods when they do.[30] If we compare the average payoff of these subjects in periods without the contract to periods with the contract, we see that without the contract subjects earn substantially less: between \$0.93 and \$4.64 less each round. These subjects could increase their monetary earnings simply by requesting the contract more often and playing the same strategy. Similarly, if we compare the "decreased usage" subjects' average payoff without the contract to the average payoff of the other subjects with the contract, the "decreased usage" subjects' payoff is again substantially lower: they earn between \$1.48 and \$2.89 less each round. Because there are relatively few observations, in order to test the difference statistically, we convert the earnings within each game to z-scores (so that they will be comparable across games) and pool across games. Among the pooled data, the earnings for "decreased usage" subjects without the Handshake contract are significantly lower than with the Handshake contract ($p = 0.04$) and significantly lower than earnings for other subjects with the Handshake contact ($p < 0.01$).[31] Thus, these subjects are making a large monetary sacrifice by not requesting the contract. Since having the contract will on average increase the action of the other subject, and because no matter what action an individual intends to take he will receive a higher payoff when the other subject increases her action, there must be something about agreeing to the contract itself that these subjects dislike.[32]

We suspect that the subjects stopped using the Handshake contract because they knew

[29] The fraction asking for each contract is the same because other subjects increase their usage.

[30] Since these subjects are requesting the contract much less often than the other subjects, it is almost always the case that they do not have the contract because they rejected it.

[31] We obtain similar results from a regression with subject random effects and game dummies.

[32] It is unlikely that the contract choices were mistakes due to incorrect learning. In the first half of the experiment "decreased usage" subjects also earned lower payoffs without the Handshake contract than with it ($p = 0.01$). Moreover, the "decreased usage" subjects did not have less accurate beliefs about the actions of their partners than the other subjects. More specifically, in the second half of the experiment, the average difference between subjects' guesses and the actual action of their partner was not significantly different between the "decreased usage" subjects and the other subjects, either overall in the Handshake condition or specifically for cases without the contract ($p > 0.10$ in both cases). To compare across games, we apply the same transformation to guesses as we do to actions so that any differences represent errors in subjects' beliefs.

they were not going to fulfill it. In all four games, the subjects who decreased usage of the Handshake contract were on average taking higher actions than their partners in the first half of the experiment. The average difference of a decreased usage subject's action and his partner's action under the Handshake contract (i.e. own action - partner action) was: APG, 0.91; MPG, 1.17; DDG, 1.85; BG, 3.95.[33] Moreover, recall that in all the games except the MPG, average actions decline over time; this observation is also true for decreased usage subjects. Hence, both the general unraveling over time and the lower actions of their partners pushed these subjects to decrease their average actions under the Handshake contract and thus further increase the gap between their agreement to play the first best and their actual action. The substantial decrease in the frequency of requesting the Handshake contract (despite its monetary benefits), a reluctance to make agreements from which they would ultimately deviate, is consistent with subjects experiencing disutility for violating the induced norm established by the handshake agreement.

4.4 30% Minimum Condition (Wave 3)

Comparing across games, the Handshake contract is more effective when the enforceable minimum is low relative to the average action when no contract is available. To further investigate the role of the enforceable minimum, we ran a third wave of experimental sessions that replicated the design and procedures for the second wave of sessions (the DDG and BG games) but set the enforceable minimum for the Minimum and Combined contracts at 30% of the first best (i.e. the minimum actions were 3 and 30, respectively). This allows us to test whether our results are robust to different levels of the enforceable minimum action.

Demand for the contracts was quite similar in both the DDG and the BG to the 10% minimum condition.[34] Figure 3 presents the average action taken (again scaled so that 0% is the selfish equilibrium action and 100% is the first best) for both the second wave at 10% and the third wave at 30%.

[INSERT FIGURE 3 HERE]

In both games, we again find that the optimal contract includes a handshake agreement. In the DDG, the overall pattern is quite similar, although (unsurprisingly) the Minimum and Combined contracts yield higher actions with the higher minimum.[35] These results lend

[33] Within each game we construct z-scores for the difference. Pooling across games, the average standardized difference of the decreased usage subjects is significantly different from zero (two-tailed t-test, $p = 0.04$).

[34] In the DDG: Minimum contract, 88%; Handshake contract, 90%; Combined contract, 92%; and All, 79%. In the BG: Minimum contract, 84%; Handshake contract, 88%; Combined contract, 87%; and All, 76%.

[35] All three contracts yield significantly higher actions than No Contract (two-tailed t-test: $p < 0.01$ for all three contracts). The Minimum contract and Handshake contract are not significantly different ($p > 0.90$),

more support for Hypothesis 3. If we compare the pattern of actions in the 30% DDG to the APG, another game with strategic independence where the minimum action is also larger than the average action under No Contract, we see that in both the 30% DDG and the APG, the Minimum and Handshake contracts yield approximately equal actions and the Combined contract is superior to both. Thus it is quite clear that the minimum is particularly effective when the enforceable minimum is high compared to the action under No Contract. On the other hand, in the BG, the relationships between the contracts in the 30% condition is essentially the same as in the 10% condition.[36]

Thus it seems that allowing for more complete contracts does not affect the efficiency of the Handshake contract in either game, increases somewhat the efficiency of the Minimum and Combined contracts in the DDG, and has either no effect or a negative effect on those contracts in the BG.[37] We find the same results using regression analysis.[38]

These findings suggest that our results are robust to moderate increases in the strength of the enforceability of contracts. Handshake agreements continue to have a substantial effect on behavior, increasing efficiency significantly. While the higher minimum increases actions when the minimum binds often (as in the 30% DDG), it has little effect when the minimum is still largely slack (as in the 30% BG). Even when the minimum binds often, it still has a comparable effect on behavior as the handshake agreement alone, and the handshake agreement still appears to contribute substantially to the effectiveness of the Combined contract.

4.5 Unilateral Contracting (Wave 4)

We also conducted an additional experiment to explore the role of bilateral contracting in the relative performance of the Handshake and Combined contracts. In previous experiments in the "hidden cost of control" literature (see Falk and Kosfeld 2006) and the "crowding out" literature (see Gneezy and Rustichini 2000), prosocial behavior can be damaged by the

and the Combined contract leads to significantly higher actions than both the Minimum and Handshake contracts ($p = 0.03$ and $p = 0.06$ respectively). Between the 10% and 30% minimum conditions, actions are not significantly different under No Contract or the Handshake contract ($p > 0.40$ for both treatments), while actions are significantly higher under the Minimum contract ($p < 0.01$), and are marginally significantly higher under the Combined contract ($p = 0.06$).

[36] The Minimum contract is not significantly different from No Contract ($p > 0.20$), the Combined contract leads to significantly higher actions than both No Contract and the Minimum contract ($p < 0.01$ in both cases), and the Handshake contract induces significantly higher actions than all three other contracts ($p < 0.01$ in all three cases).

[37] In the BG, actions under the Combined contract are somewhat lower in the 30% condition than in the 10% condition. The difference for the Combined contract is statistically significant ($p < 0.01$) while the other three contracting environments do not differ significantly (No Contract: $p > 0.30$, Minimum contract: $p > 0.30$, and Handshake contract: $p > 0.16$).

[38] The regression analysis is available on request from the authors.

addition of enforceable controls or fines. While the contexts considered in those experiments are different (in many respects) from the context here, if the overall intuition extended to our setting we might expect that the Combined contract would perform less well than the Handshake contract due to the addition of an enforceable restriction. However, the results we have analyzed so far indicate that adding an enforceable restriction to a Handshake contract was only harmful in one of the games we studied, the Bertrand Game. In contrast, in the APG and the 30% DDG, adding enforceability improves performance.

One of the major differences between our design and those of the previous literature is that in the games we have analyzed thus far, the contracting environment is symmetric. One main intuition of the "hidden cost" literature is that subjects respond negatively to being distrusted, and settings in which both parties have agreed to a restriction might not generate a feeling of distrust. This intuition suggests that the hidden cost results may arise in our setting if the contract were set unilaterally rather than bilaterally.

Our setting is also symmetric in the effects of the contract (a minimum action affects both subjects). In the "hidden cost of control" literature, control is imposed unilaterally by the principal and affects only the agent. In the unilateral contracting environment we now consider, we preserve this symmetric restriction of the contract on subject actions, but allow control to be imposed unilaterally. Consequently, this analysis will allow us to investigate the effect of unilaterally imposing control on prosocial motivations in our symmetric setting. It will also allow us to see whether our results are robust to a change in contracting rules.

We ran a fourth wave of experimental sessions that replicated the design and procedures for the second wave of sessions (the DDG and BG games with the minimum at 10%) but in which the contracting environment was unilateral. One subject was randomly selected at the start of the round to set the contract for the pair of actors.

Demand for the contracts was again quite similar in both the DDG and the BG to demand for contracts under the symmetric contracting rule.[39] Figure 4 presents the average action taken (again scaled so that 0% is the selfish equilibrium action and 100% is the first best) in the fourth wave with unilateral contracting for the subjects choosing the contract in that round (the first and third sets of bars), and the subject not choosing the contract (the second and fourth sets of bars). Since we do not observe contract choices for every subject in every period, we use a slightly different restriction: we look at subjects who asked for all three contracts in at least one period.

[INSERT FIGURE 4 HERE]

[39] In the DDG: Minimum contract, 77%; Handshake contract, 84%; Combined contract, 82%; and All, 67%. In the BG: Minimum contract, 82%; Handshake contract, 89%; Combined contract, 85%; and All, 76%.

Overall, the actions under each contract are very similar between subjects who choose the contract and those who do not. As in our previous experimental waves, we find that contracts that include a handshake agreement (the Handshake and Combined contracts) lead to a substantial increase in the action taken, both by the subject who chose to make the handshake agreement and by the other subject who merely sees the contract choice.[40] Thus the statement "we agree" to take the first best action, chosen by only one subject, increases the actions of both subjects. Unlike our previous results, however, we do not find evidence for a negative effect in the Bertrand Game of imposing a minimum action (compared to the corresponding contract without a minimum).[41]

Table 5 presents the estimates from regressing subject actions on contract dummies (and additional controls) for all subjects who choose all three contracts in at least one period, as well as for the contract choosers and non-choosers separately. Contract choosers take somewhat higher actions than non-choosers across all the contracts in both games. In both games, handshake agreements increase the actions of both contract choosers and non-choosers by similar amounts. As is visible in Figure 4, there is less of a crowding out effect from combining a handshake agreement with a minimum action under unilateral contracting than under symmetric contracting—the Combined contract does not lead to significantly lower actions than the Handshake contract in the BG. Therefore, the differences between our results and the "hidden cost" and "crowding out" literatures cannot be due to unilateral contracting. Instead, one of the other differences in the design, for example the symmetric actions or symmetric payoffs, may lead to the differences in our results.

[INSERT TABLE 5 HERE]

5 Discussion

Following the intuition laid out in Section 3, our experimental results suggest that an induced norm can be established through a simple contract and that such a norm can have a significant impact on behavior. Confirming our main prediction (Hypothesis 1), subjects take significantly more prosocial actions when they have made a handshake agreement as part of the contracting process. These results support our intuition that setting norms is an

[40] Actions in the DDG under the Handshake and Combined contracts are significantly higher than under the No Contract and Minimum contract conditions respectively for contract choosers (two-tailed t-test: $p = 0.03$ and $p < 0.01$ respectively) and for non-choosers ($p = 0.06$, $p < 0.01$). Similarly, actions in the Bertrand Game are significantly higher for both groups under the Handshake and Combined contracts ($p < 0.01$ for all cases).

[41] While actions under the Minimum contract are directionally lower than in the No Contract case for both groups, the differences are not significant ($p = 0.13$, $p > 0.40$). Similarly, actions under the Combined contract are directionally lower than under the Handshake contract, but the difference is not significant ($p > 0.40$ in both cases).

important part of the efficacy of incomplete contracts.

Furthermore, in our experiment it appears that the major benefit of the Combined contract came from its ability to set a high norm. Taking the estimates from Table 2 (and corresponding analysis from the 30% minimum games), we can measure the percentage benefit of the Combined contract that is generated by the handshake agreement alone.[42] The handshake agreement contributes between 51% and 173% of the efficiency increase of the Combined contract, with the smallest effect in the APG and the largest effect in the 10% and 30% BG.[43] Thus, merely establishing the norm through the handshake agreement is sufficient to generate most (or all) of the effect of the Combined contract. It may be that much of the benefit of simple real-world contracts comes from their role in establishing high norms, compared to the effect of their weak enforceable restrictions.[44] In addition, our results suggest that when there are contracting costs to add enforceable restrictions to a contract, fairly incomplete contracts may be attractive, since such contracts achieve similar levels of efficiency without the costs of enforceability. Similarly, Scott (2003) argues in a legal context that incomplete, legally unenforceable contracts are useful because agents respond to "reciprocal fairness," which can make unenforceable contracts self-enforcing.

Our results are consistent with several of our other behavioral predictions. Violating the norm appears to generates negative utility, since 10% to 20% of subjects forego material payoff by not asking for the Handshake contract. As predicted in Hypothesis 2, the handshake agreement was particularly effective in the two games with strategic complements (the MPG and BG). Similarly, the Minimum contract was most effective in the APG, where the average action under No Contract was quite low and many subjects were acting below the minimum when no contract was allowed. The minimum was least effective in the BG, where the actions without a contract were particularly high relative to the minimum action and few subjects were acting below the minimum. When we directly increased the minimum, both the Minimum and the Combined contract became relatively more effective in the DDG. In the BG, increasing the minimum did not effect the Minimum contract and made the Combined contract less effective. This result contrasts somewhat with the assumptions underlying Hy-

[42]We divide the estimated coefficient from the handshake agreement by the estimated total effect of the Combined contract to construct an upper bound on the percentage of the effect coming from the handshake. For a lower bound, we add the coefficient on the interaction effect to the numerator (i.e. subtracting out all of the substitutability).

[43]Percentages greater than 100% indicate cases where the Handshake contract is more efficient than the Combined contract.

[44]We find strong results using structured contractual statements. In the business settings, where communication is free form, the effect may be stronger. For example, Charness and Dufwenberg (2007) find that structured communication fails to change beliefs and actions in their trust game where free form communication is more effective.

pothesis 3 that the only effect of an enforceable minimum is to increase the actions of subjects contributing below the minimum—we discuss this further in section 5.2 below.

5.1 Alternative Explanations

We have demonstrated that handshake agreements have a substantial effect on actions, consistent with our intuition that contracts establish induced norms that influence behavior. We also observe that alternative theories of behavior cannot explain our data. In addition to the specific reasons given below, all of the alternative explanations discussed in this section fail because: (a) they do not depend on the content of the contract and therefore cannot explain different contracts generating different outcomes; and (b) they assume that contractual content does not affect utility and thus cannot explain why certain subjects choose to stop using the Handshake contract when the handshake agreement increases the average action taken by the other player and thus private earnings.

Purely rational coordination among selfish individuals cannot explain our results, since all of the games we study have a unique equilibrium (or a small set of equilibria, with very low actions, in the case of the BG), and so there is no room for coordination to change actions in equilibrium. Additionally, subjects cannot use the contracts to signal altruism since the Handshake contract can be established with zero cost, and therefore there is no equilibrium that separates altruists and selfish types, only a single pooling equilibrium. Subjects cannot use the contracts to signal that they are conditional cooperators. Again, if there are multiple types, there is no separating equilibrium, as every subject will want to signal that they will play a high action in order to increase the action of their partner. This single pooling equilibrium cannot have actions above the selfish equilibrium.[45]

5.2 Crowding Out Effects

The literatures on the "hidden costs of control" (e.g. Falk and Kosfeld 2006) and the "crowding out" of intrinsic motivation (e.g. Gneezy and Rustichini 2000a,b) have shown that imposing incentives (like fines) or other forms of control can significantly undermine individuals' prosociality. More generally, one might imagine that setting multiple reference actions, such as an enforceable minimum action and the first best action, could create confusion in what the norm is, providing two focal actions to coordinate on, or otherwise bias the norm.[46] However,

[45] In addition, conditional cooperators would not take actions strictly above their guess of their partner's action. A pure conditional cooperator wants to take the exact same action as his guess, and any self-interested monetary motivations would lead to lower actions. Thus, this theory could not explain our observation that a substantial number of subjects take an action larger than their stated belief.

[46] For example, the literature on anchoring (see Kahneman et al 1999 for a survey) has shown that even obviously arbitrary reference values can bias subjects' construction of estimates or expectations. In particular,

we find only weak evidence of crowding out in our (rather different) setting.

There are a number of reasons why our results might differ from those found in the hidden cost literature. First, the Falk and Kosfeld (2006) “hidden costs” paradigm is a principal-agent setting in which control is imposed unilaterally by the principal; we focus primarily on control being imposed bilaterally (i.e. by both agents agreeing to the contract). We address this difference directly in the experiment and find that symmetric contracting is not leading to difference in results across the paradigms. Second, in the the hidden costs paradigm, the impact of the control is only imposed on the agent; our setting has symmetry in the imposition of control such that both agents are restricted by the contract. Third, in the hidden costs paradigm only the agent chooses an action after control has been implemented; in our setting payoffs are symmetric in the actions of the two agents.

As noted above, we manipulate the contracting rules in our experiment to investigate the effect of contracting being unilateral rather than bilateral. We find that our results look very similar across unilateral and bilateral contracting. In particular, we do not see results that are more consistent with the hidden costs literature under unilateral contracting; instead, we see somewhat less crowding out. In the unilateral contracting sessions of Wave 4, handshake agreements are beneficial, but enforced minimum actions do not lead to crowding out in the Bertrand Game. Unilateral contracting is neither necessary nor sufficient for enforceable minimums to undercut the power of an induced norm.

Consequently, it is more likely that the differences between our results and the results of the hidden costs literature is caused by the difference in which individuals are affected by the contractual terms. Specifically, in our setting both players have symmetric roles in the game, and any contractual restriction affects both players equally (rather than restricting the action of only one player). This mutuality of control may be the reason we find much less crowding out in our data. An interesting direction for future research is to directly compare contractual settings with equal and unequal performance obligations to further identify the role of unequal obligations on agents' prosocial behavior.

Furthermore, an additional characteristic that is different from the mechanisms in the “crowding out” and “hidden cost” literatures may help explain crowding out in our Bertrand Game. In the Bertrand Game, coordination among the two subjects' actions is more important than in the three other games, since failure to coordinate leads one subject to earn a payoff of zero. The introduction of the minimum in the Bertrand Game may lead to lower actions because it provides an alternate and relatively “safe” focal action at the minimum.

Robbennoltt and Studebaker (1999) show experimentally that (generally non-binding) limits on punitive damages lead to a significant increase in both punitive and compensatory damages.

The minimum action provides a payoff of at least half the minimum and is an action on which subjects can more easily coordinate since it is the unique selfish equilibrium of the game when a restriction in place. Alternatively, if a subject attempts to coordinate on the first best, he will receive a payoff of zero whenever his partner chooses an action that is not the first best. We see direct evidence of subjects gravitating towards the minimum when it is available: only 0.83% of subjects with a Handshake contract choose an action of 10 or less, compared to 5.24% who choose 10 under the Combined contract (for the Combined contract we look at 10 alone since subjects cannot choose less than 10; test of proportions: $p < 0.01$). While the focality of the minimum makes it a much more common choice, we also see a significant increase in the fraction of other low actions in the Combined contract: 7.50% of subjects with a Handshake contract choose and action between 11 and 40, compared to 13.33% of subjects with a Combined contract ($p = 0.04$). This result suggests that such a coordination mechanism does push actions to the minimum and can explain part of the crowding out in the BG, but it cannot explain all of the crowding out. This kind of coordination mechanism should also matter in the unilateral setting of Wave 4. Indeed, we find a similar jump in actions 10 or less from 3.13% with a Handshake contract to 8.33% with a Combined contract, even though in the unilateral setting we do not find an overall crowding out effect when comparing those two contracts.

In attempting to identify a crowding out effect, we want to make sure we are not mispecifying the nature of crowding out. Up to now, we have identified crowding out by comparing the actions under the Handshake contract to actions under the Combined contract (or by comparing actions under no contact to actions with the Minimum contract). Some previous studies have found that the imposition of extrinsic incentives can continue to undermine intrinsic motivation even after the removal of the incentives (see, for example, Gneezy and Rustichini 2000b; see Deci et al. 1999 for a survey). If this kind of intertemporal crowding out were to occur in our experiment, then subjects who had even once experienced a contract with a minimum might take lower actions in all future periods with a handshake. This could mean that while we do not observe crowding out when comparing the handshake to the combined contract, crowding out could simply cause actions to be lower under the Handshake contract than they would have been if subjects had never been exposed to an enforceable minimum. While this alternative type of crowding out could be at play in our experiment, we do not find evidence of it in our data. First, we replicate our crowding out results in the for Handshake and Combined contracts when looking only at subjects who had not previously experienced a contract with a minimum. Again, we find no significant difference between the Handshake and Combined contracts in the APG, MPG or DDG (Ranksum: $p = 0.34$, $p = 0.75$ and $p = 0.31$ respectively) while there is a significant difference in the BG ($p = 0.02$). Second, if we replicate the analysis of Table 2 with an additional control for the number of previous periods the subject had a contract with a minimum, our results are similar and the control for the number of previous contracts with a minimum is never significant. More exposure to minimum contacts does not generate lower actions in our data.[47] We take these two results as evidence that there is not intertemporal crowding out in our experiment.

6 Conclusion

In this paper we argue that contracts establish induced norms for a relationship and that incomplete contracts can substantially affect behavior by setting such norms. In our experiment, the optimal contract always includes an unenforceable handshake agreement. Contracts with handshake agreements lead to substantially higher actions than the corresponding contracts without handshakes, with the greatest difference observed in games with strategic complements. In many games, a contract consisting of only an unenforceable handshake agreement is (weakly) optimal. Similarly, when a contract contains both an enforceable restriction and an unenforceable handshake agreement, the majority of the effect on behavior comes from the handshake. Our results are best explained by a model in which contracts establish norms and individuals experience disutility for taking actions that deviate from such norms.

These results suggest why incomplete contracts might be so prevalent in many settings. If incomplete contracts can set high norms that increase efficiency, and if adding enforceable components is costly and does not generate much additional benefit, contracts may be left intentionally simple and substantially incomplete.

Having demonstrated the important role of norms and contracts in these simple games, our results could be developed and extended along several dimensions in future research. In our experiment, the contracts were presented with the minimum and the handshake agreements fixed and subjects were only able to accept or reject the whole contract. Future experiments could allow subjects to directly negotiate each of these clauses. It would be quite interesting to see whether the benefit of the handshake agreement would be enhanced or diminished when subjects can set the exact unenforceable agreement. In addition, we restricted our attention to single dimensional action spaces and consequently to one simple handshake agreement. Many economic interactions are multi-dimensional; and it may be interesting to examine the optimal mix of enforceable and unenforceable clauses in the contract. In particular, if there

[47] Furthermore, if we add an interaction between the handshake agreement and the number of previous periods with a minimum, we find that it is not significant in any of the games.

are limitations on how many unenforceable agreements an individual will feel beholden to follow (if too many handshake agreements dilute their influence), then it may be optimal to focus on establishing a norm for the most important dimensions of the relationship and rely on enforceable components of the contract for the others.

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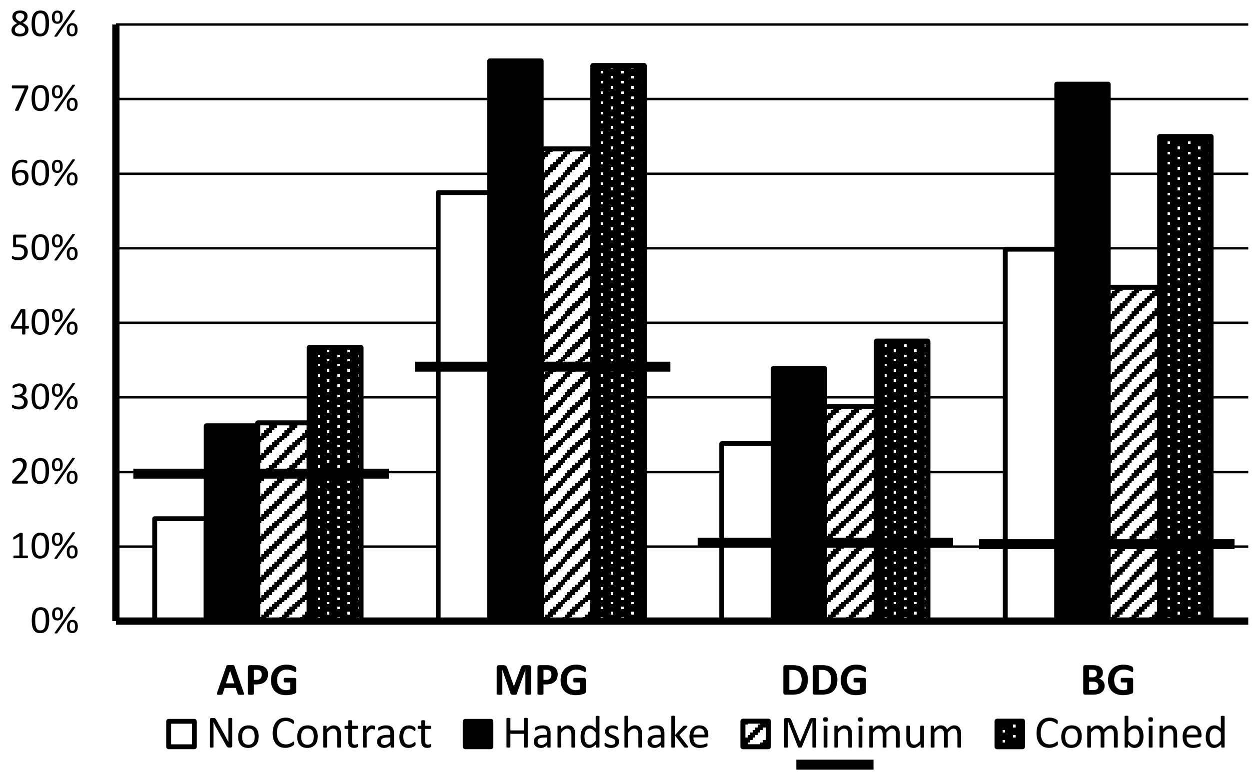
Table 1: Contract Choices

% Request the Contract	APG	MPG	DDG	BG
Minimum	80.51%	82.56%	87.00%	81.88%
Handshake	80.13%	88.33%	87.75%	86.38%
Combined	81.54%	85.38%	86.88%	84.75%
Request All	71.67%	77.69%	79.63%	74.63%
Request None	10.64%	7.18%	5.63%	7.63%

Figure 1: Subjects' Actions for Each Contract



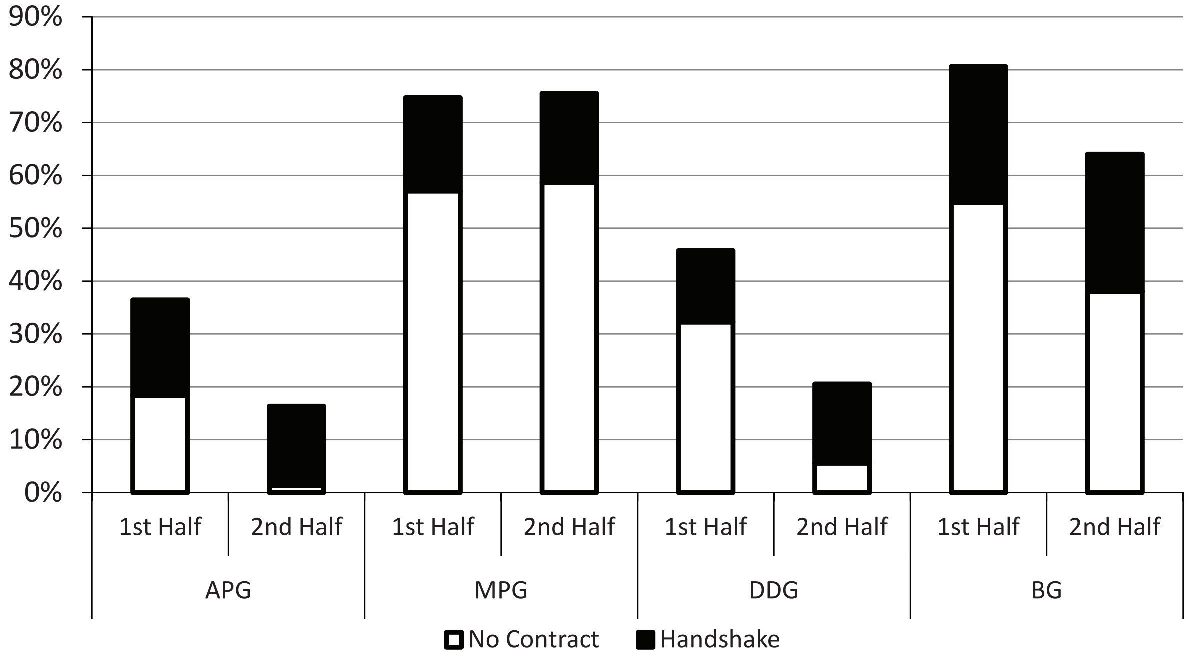
Actions scaled so that 0% denotes the selfish optimum action and 100% denotes the first best action. Only subjects who requested all contracts are included. Horizontal bar denotes the minimum action required by the Minimum/Combined contracts.

Table 2: Effect of Contracts on Actions

Coefficients	APG (1)	MPG (2)	DDG (3)	BG (4)
Partner Rejected Contract	-0.00687	-0.257	-0.693**	-3.497
	(0.17)	(0.22)	(0.29)	(2.84)
Contract w/ Minimum	0.762***	0.379**	0.675**	-4.545*
	(0.16)	(0.17)	(0.27)	(2.36)
Contract w/ Handshake	0.892***	1.292***	1.571***	26.94***
	(0.20)	(0.16)	(0.28)	(2.13)
(w/ Minimum) x (w/ Handshake)	-0.0899	-0.417**	-0.219	-0.478
	(0.25)	(0.21)	(0.40)	(3.16)
Constant	6.764***	3.087***	3.189***	58.08***
	(0.29)	(0.33)	(0.53)	(3.65)
Period Controls	Yes	Yes	Yes	Yes
Session Order Controls	Yes	Yes	Yes	Yes
Observations	559	606	793	732
Number of Subjects	73	69	95	95
* Total Difference [Combined - Handshake]	0.672***	-0.0374	0.456	-5.024**
	(0.19)	(0.12)	(0.29)	(2.12)

Robust standard errors reported in parentheses. Significance is denoted: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. The specification includes subject random effects, and the observations are restricted to periods where the subject requests all contracts. The omitted category is the No Contract environment where no contract was available.

Figure 2: Time Trend in Effect of Handshake Contract



Actions scaled so that 0% denotes the selfish optimum action and 100% denotes the first best action. Only subjects who requested all contracts are included. The dark portion of the bar indicates the additional increase in the average action for the Handshake contract compared to the No Contract environment.

Table 3: Effect of Handshake Contract and Guesses on Actions

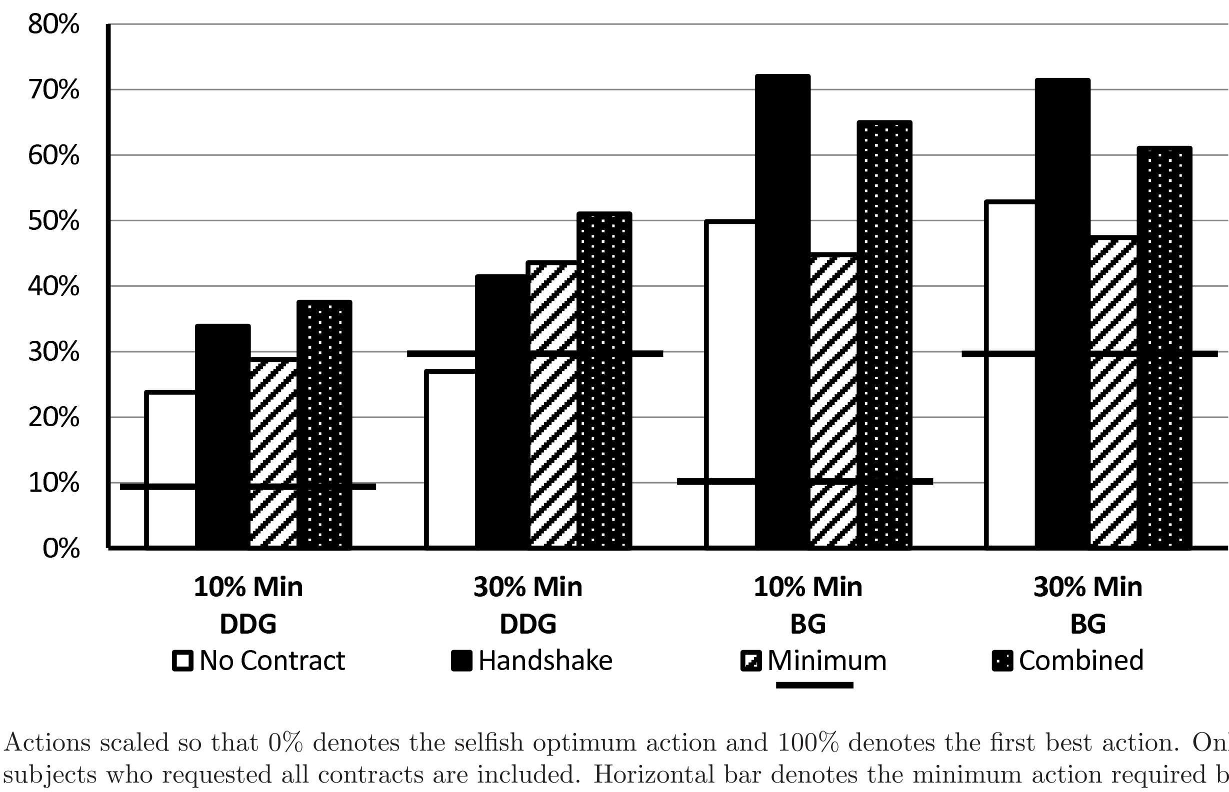
Coefficients	**APG (1)**	**MPG (2)**	**DDG (3)**	**BG (4)**
Handshake Contract	0.235	0.663***	0.841*	9.403***
	(0.23)	(0.25)	(0.45)	(2.95)
Guess of Partner's Action	0.308***	0.672***	0.302***	0.547***
	(0.061)	(0.059)	(0.062)	(0.066)
Constant	4.447***	0.636**	1.821***	29.83***
	(0.65)	(0.32)	(0.70)	(6.41)
Period Controls	Yes	Yes	Yes	Yes
Session Order Controls	Yes	Yes	Yes	Yes
Observations	234	234	306	306
Number of Subjects	78	78	102	102

Robust standard errors reported in parentheses. Significance is denoted: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. The specification includes subject random effects, and the observations are restricted to periods where the Handshake contract was available.

Table 4: **Subjects Who Decrease Usage of the Handshake Contract**

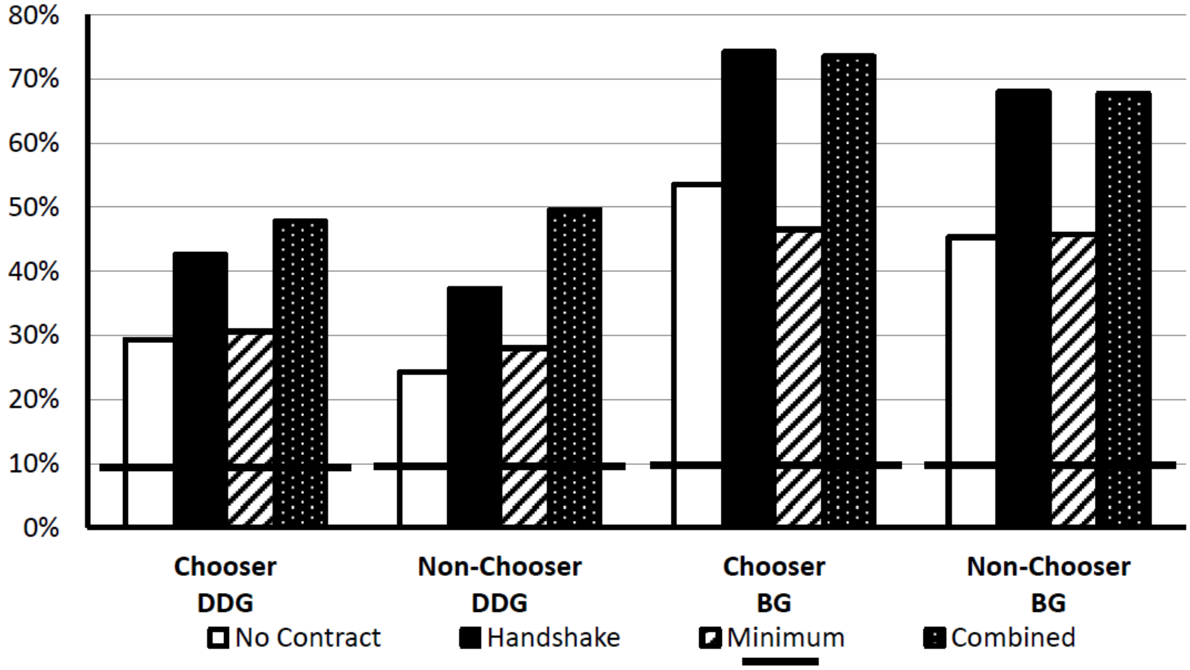
	# of Subjects Decreasing Usage	Pr. Request Contract (1st/2nd Half)	Subjects' Payoff (2nd Half) w/o Contr.	Subjects' Payoff (2nd Half) w/ Contr.	Other Subj. (2nd Half) w/ Contr.
APG	13 of 78	65% / 23%	22.06	53.00	29.44
MPG	7 of 78	74% / 20%	21.86	34.33	41.15
DDG	20 of 102	88% / 54%	20.50	26.71	30.42
BG	16 of 102	75% / 40%	16.13	25.20	27.20

Figure 3: Subjects' Actions: 10% **Minimum versus** 30% **Minimum**



Actions scaled so that 0% denotes the selfish optimum action and 100% denotes the first best action. Only subjects who requested all contracts are included. Horizontal bar denotes the minimum action required by the Minimum/Combined contracts.

Figure 4: Subjects' Actions: Unilateral Contracting Treatments



Actions scaled so that 0% denotes the selfish optimum action and 100% denotes the first best action. Only subjects who requested all contracts in at least one period are included. Horizontal bar denotes the minimum action required by the Minimum/Combined contracts.

Table 5: Effect of Contracts on Actions: Unilateral Contracting

Coefficients	DDG All (1)	DDG Chooser (2)	DDG Non-Chooser (3)	BG All (4)	BG Chooser (5)	BG Non-Chooser (6)
Reject Contract	0.0502	-0.176	0.0667	-6.153*	-7.043	-8.050
	(0.376)	(0.628)	(0.536)	(3.493)	(5.308)	(4.965)
Contract w/ Minimum	0.595*	1.087**	-0.113	-4.482	-5.863	-3.447
	(0.308)	(0.465)	(0.499)	(2.763)	(4.134)	(4.355)
Contract w/ Handshake	1.703***	1.670***	1.501***	23.82***	25.39***	22.38***
	(0.349)	(0.503)	(0.539)	(2.628)	(3.658)	(4.204)
(w/ Minimum) x (w/ Handshake)	0.0423	-0.425	0.884	1.849	2.983	1.870
	(0.467)	(0.689)	(0.712)	(3.816)	(5.522)	(6.013)
Constant	3.912***	4.406***	3.481***	54.74***	61.76***	48.96***
	(0.672)	(0.772)	(0.757)	(4.597)	(5.275)	(5.659)
Period Controls	Yes	Yes	Yes	Yes	Yes	Yes
Session Order Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	540	274	266	580	296	284
Number of Subjects	54	54	54	58	58	58
* Total Difference	0.637*	0.662	0.771	-2.633	-2.880	-1.577
[Combined - Handshake]	(0.35)	(0.51)	(0.51)	(2.61)	(3.61)	(4.06)

Robust standard errors reported in parentheses. Significance is denoted: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. The specification includes subject random effects, and the observations are restricted to subjects who request all contracts in at least one period. The omitted category is the No Contract environment where no contract was available.