

# It Hurts to Ask

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## **Abstract**

We analyze the offering, asking, and granting of help or other benefits as a three-stage game with bilateral private information between a person in need of help and a potential helper. Asking entails the risk of rejection, which can be painful: since unawareness of the need can no longer be an excuse, a refusal reveals that the person in need, or the relationship, is not valued very much. We show that people may fail to ask even when most helpers would help if told about the need, and that even though a greater need makes help both more valuable and more likely to be granted, it can reduce the propensity to ask. When potential helpers concerned about the recipient's ask-shyness can make spontaneous offers, this can be a double-edged sword: offering reveals a more caring type and helps solve the failure-to-ask problem, but not offering reveals a not-so-caring one, and this itself deters asking. This discouragement effect can also generate a trap where those in need hope for an offer while willing helpers hope for an ask, resulting in significant inefficiencies.

# 1 Introduction

Classical economists were keenly aware that human behavior is driven as much by the pursuit of esteem as that of material consumption. After a long period of neglect, the importance of ego is being incorporated into modern economics through models in which the individual aims to persuade others, and ultimately himself, of his worth: signaling wealth, talent, desirability, prosociality, etc. Still missing, however, is the complementary role of others as “mirrors” from which the individual instead *learns* about his actual worth and standing, and calibrates his self-esteem.<sup>1</sup>

In psychology, by contrast, this aspect is a key component of the influential “sociometer theory” (Leary et al. 1995; Leary 2005), according to which being liked and respected is so essential for evolutionary fitness that humans have developed an automatic “program” that monitors our social standing and sends a hedonic signal that we experience as low or high self-esteem—similar to other motivational feeling states such as hunger or anxiety. The sociometer is always operating in the cognitive background, gauging how we are treated by others and making us sensitive to even minor slights. Others, in turn, are quite mindful of this.

In this paper, we integrate these demand and supply aspects of esteem (Brennan and Pettit 2004) to analyze the wide range of non-market behaviors that involve the seeking and conferring of help. Helping (or not) immediately brings questions of mutual worth into play, and it is of key importance for both interpersonal and workplace relationships. In many such settings, it is required to achieve efficiency (public-goods provision, cooperation), and can be a powerful source of good will (when help is provided) or bad feelings (when it is not).

Substantial evidence shows that many people are willing to help others, especially when asked explicitly, and that when the request is public, this “power of the ask” is amplified by the image concerns it sets into play. So if someone has a need or request, why not ask? As the popular expressions go, “It can’t hurt to ask,” and “All they

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<sup>1</sup>Adam Smith (1759), once again, put it best: *“Was it possible that a human creature could grow up to manhood in some solitary place, without any communication with his own species, he could no more think of his own character, of the propriety or demerit of his own sentiments and conduct, of the beauty or deformity of his own mind, than of the beauty or deformity of his own face... Bring him into society, and he is immediately provided with the mirror which he wanted before. It is placed in the countenance and behaviour of those he lives with, ...and it is here that he first views the propriety and impropriety of his own passions, the beauty and deformity of his own mind.”*

can say is no.” The ubiquity of these admonitions, however, as well as the prevalence of influential career- and management-advice books such as “Women Don’t Ask” (Babcock and Laschever 2009) and “All You Have To Do Is Ask” (Baker 2020), suggests that people are often reluctant or shy to ask—for a favor or loan from a friend, a job recommendation, a raise or promotion, etc.<sup>2</sup> The same holds for asking someone for a date, or conversely to stop something unwelcome (harassment). People in need, it seems, often refrain from asking, foregoing significant potential benefits; try to use an intermediary to make the request for them—a noisier form of asking; or wait for a spontaneous offer that may never come.

Asking can in fact “hurt,” particularly for two reasons that involve a person’s sense of worth or identity. The first one is *shame or embarrassment*: Asking can reveal a neediness, lack of competence, or dependency. The second one, on which this paper focuses, is a *fear of rejection*: Getting a “no” can be psychologically painful or even humiliating, as it reveals that the potential helper cares little about the person in need, or does not value the relationship very much.<sup>3</sup> The “ashamed to ask” mechanism corresponds to a standard signaling model, and it is not so applicable to cases like recommendations and promotions, where a request is typically associated with desirable rather than stigmatized attributes. The “afraid to ask” mechanism, in contrast, can operate both when the need is potentially embarrassing (e.g., financial help) and when it is not, or even when it is a sign of merit (e.g., professional endorsement). It has received much less attention in economics, even though it connects to a large literature in psychology that emphasizes people’s universal need to “belong,” to feel valued and accepted by others (e.g., Leary 1990, 2005), and which documents rejection sensitivity as an important personal trait in both behavior and mental health (e.g., Downey and Feldman 1996; Berenson et al. 2009; Maiolatesi et al. 2022). From a modeling point of view, it places at the heart of the interaction what the person in need learns about the potential helper rather than (or in addition to) what the latter learns about the former, and emphasizes the *strategic interdependence* of offering, asking, and granting decisions.

A first key insight stemming from this perspective is that asking *takes away the*

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<sup>2</sup>A message to students appearing on posters plastered around the campus of the London School of Economics similarly admonishes students: “Don’t be afraid to ask for help.”

<sup>3</sup>There are also costs of asking for help that do not call self-worth into play: A person in need may be uncomfortable with burdening the helper, or worry that a request would create an implicit obligation to repay the favor in the future.

*excuse* that one did not know about the existence or extent of the other person’s need. By making the need common knowledge, a request raises the informational stakes concerning the value of the relationship: an explicit rejection sends a much worse signal than the lack of a spontaneous offer, and the fear of such news may deter asking.

That such situations entail substantial inefficiencies is strongly suggested by the common exhortations of “Don’t be afraid to ask for help” proffered by parents, teachers, managers, and organizations. But this is something of a puzzle. Do people, across a wide range of situations, somehow not ask enough for their own good? And if potential helpers think that those in need are too ask-shy, why don’t they just volunteer help without waiting for a request?

A second insight of the paper offers an answer to these questions. While the possibility of spontaneous offers may appear to go a long way toward solving the failure-to-ask problem, we show that it is instead a double-edged sword, which sometimes *prevents* help from being given even when both parties would benefit. Pledging help without waiting to learn more about the other person’s need entails a risky commitment,<sup>4</sup> which only more caring types will be ready to make. An offer then simultaneously conveys good news about the relationship and helps solve the failure-to-ask problem; but then the lack of an offer (even when it is really due to an unawareness of the need) conveys bad news, and this itself can discourage asking, by exacerbating the fear of rejection.

**Model outline.** Motivated by these intuitions, we develop a flexible framework to analyze the *offering-asking-helping* interactions between a person with a need (the “Receiver,  $R$ ”) and one who is in a position to fulfill it (the “Sender,  $S$ ”). While acknowledging the existence of other impediments to asking, our focus is on the more novel fear-of-rejection mechanism and its interplay with spontaneous offers. The basic setup is as follows.  $S$  can take some costly action (“helping”), from which  $R$  would derive a benefit  $w$ . This “need”  $w$  is  $R$ ’s private information, but he can credibly communicate it to  $S$  (“the ask”).  $S$  internalizes  $R$ ’s needs as  $gw$ , where her degree of “caring” about  $R$  or the relationship ( $g$ ) is her own private information. In addition to material payoffs,  $R$  cares about feeling valued by  $S$ , deriving (concave) utility from his beliefs over  $g$ . At the outset of the game,  $S$  can commit to helping without waiting for an ask, or wait to see if one comes, from which she would learn more about  $R$ ’s need. Following such a request, she can accept or decline it.

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<sup>4</sup>As illustrated by, e.g., “Anything you need, my door is always open, I am always here for you,” etc.

**Applications.** The scope of the model extends beyond settings that involve a literal need for help. In the personal realm, the “ask” can be reaching out for a friendship or for a date;  $w$  then represents the intensity of  $R$ ’s feelings, and  $g$  the extent to which they are reciprocated. In the professional realm, the request can be for a letter of recommendation, with  $w$  being the value of the job at stake—salary, top-tier versus lower-tier university, etc., and  $g$  reflecting the potential letter-writer’s liking or professional respect toward the requester. Moving away from cases where  $g$  is altruism, consider the case of asking for a promotion. The employee makes his case by demonstrating his motivation and qualifications for the position:  $w$  is the number of new ideas he would implement, or other attributes that would make him both valuable to the firm and rewarded (intrinsically or financially) if promoted. The manager has her own, private evaluation ( $g$ ) of the quality of the ideas, or of the importance to the firm of retaining the worker. He, in turn, would like to think that he is a valued member of the team. A similar case is proposing a collaboration (coauthorship, joint project, etc.): the risk is finding out, should the other party decline or abstain, that they judged the idea (or you) to be mediocre, or poorly aligned with their interests.

Recommendations, promotions, and collaborations are economically important cases that help distinguish fear of rejection from embarrassment as the main reason for not asking. Here, requests are more likely to come from desirable types, and  $w$  represents an opportunity or merit more than a literal need. Empirically, the Receiver would thus have a positive (respectively, negative) willingness to pay for having the fact that they received (respectively, did not receive) the “help” in question become public information, rather than the reverse.<sup>5</sup>

**Results outline.** While the model’s ingredients are quite simple, their combination into a three-stage game with bilateral private information leads to a rich set of effects.

*Fear of asking and (non)monotonicity.* Although a higher level of need makes help both more valuable to receive and more likely to be granted if requested, it can reduce the propensity to ask. Intuitively, being turned down when in dire need is significantly worse news about the relationship than when the need is a modest one.<sup>6</sup> When rejection sensitivity is high enough, this greater fear dominates the other two effects and such

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<sup>5</sup>The embarrassment channel can still be operative and limit asking if requests are interpreted as denoting “presumptuous” or “entitled” types, who overestimate their true deservedness  $gw$ .

<sup>6</sup>The cost of helping is kept constant in this comparison, but the point holds as long as it rises less than one-for-one with the need being alleviated.

paradoxical, non-monotonic asking behavior will occur. When it is dominated, help will be requested when its value to the Receiver is above some cutoff.

*Generosity, rejection-sensitivity, and offering.* More generous Senders are more likely to offer without waiting for an ask. Indeed, they are more concerned about needs going unmet due to a failure to ask, and less concerned about regretting their pledge should the need turn out to be low. We further show that offering unsolicited help yields a better reputation than could be gained by later accepting any equilibrium ask. Intuition also suggests that the more sensitive to rejection a Receiver is, the less likely they are to ask, and therefore the more likely the Sender, knowing this, should be to offer. As we shall see, the asking part of that intuition is generally true, but Senders who are driven by image concerns more than a genuine desire to help may in fact take advantage of greater ask-shyness to reduce their offering.

*Discouragement and the waiting trap.* Failures to ask may occur specifically due to the bad news conveyed by the Sender *not offering* first, without waiting for an ask. Absent the opportunity for such unsolicited offers, the Receiver would have asked; but when that option is present yet not chosen, he will not, and the need will go unmet. An important implication is that even though spontaneous offers may seem like a natural “fix” for the failure-to-ask problem, there are important ways in which one or both sides can be ex-ante better off if these are ruled out. Relatedly, the discouragement effect can generate an inefficient equilibrium in which the Receiver waits for an offer but is too afraid to ask if it did not come, while the Sender waits for an ask, regretting that it will not always come at levels of need at which they would like to help, but unwilling to offer without hearing more. Alongside is another equilibrium replicating the full-information outcome, in which Receivers with legitimate needs always ask, and help is delivered in all and only those states of need where the helper wants to do so. The waiting-trap equilibrium can be risk-dominant, moreover, and thus more likely to emerge. These results provide a simple and rational explanation for the puzzle of “exhortations to ask” by institutions and others: they may serve as devices to coordinate on the more efficient equilibrium.

*Helper’s beliefs and offering.* Before deciding whether to offer help to someone, Senders will often have access to some imperfect private signals about that Receiver’s situation. Learning of greater needs (in the sense of stochastic dominance) can make the Sender more likely to offer—becoming more concerned about meeting legitimate needs

that would otherwise remain unexpressed, and less concerned about wasting their help on trivial ones. It can also make them *less* likely to offer, however, if they become more confident that, when the Receiver has a legitimate need, it is probably a high enough one that he will ask.

*Cost of helping.* When help becomes more costly to provide, requests for it are less likely to be accepted, yet the Receiver can become more likely to ask, since being turned down for more costly help is less severe of a negative signal. And, when a higher helping cost does reduce the likelihood of asking, this generates an increased concern among generous Senders about unmet needs in states where they would still like to help, which can lead to more offering even though the cost of such pledges has unambiguously risen.

## 1.1 Related Literature

The pervasiveness of helping and other prosocial behaviors has given rise to a large literature seeking to understand the motives underlying such actions.<sup>7</sup> The two most broadly recognized ones are altruism and image concerns, each of which comes in two main varieties.

Pure altruism stems from an empathic desire to alleviate another person’s pain, or otherwise make them better off (Batson et al. 1981, 2002), whereas “impure” or “warm glow” altruism corresponds to a satisfaction derived from the mere act of giving, independently of the impact on others’ well-being (Andreoni 1989, 1990). In our model, pure or at least clearly “consequentialist” altruism (Roth and Kagel 1995; Goeree et al. 2002; Andreoni et al. 2010; Brock et al. 2013; Gneezy et al. 2014) is represented by the potential helper’s utility increasing in the needy person’s material well-being, and possibly also in his psychological or emotional well-being. Warm-glow motives (e.g., DellaVigna et al. 2012), meanwhile, arise endogenously in the form of feelings of pride or shame of the potential helper in light of her own actions.

Indeed, the second main motive identified in the literature on prosocial behaviors is the quest for a positive moral image, whether in the eyes of others or in one’s own. Helping signals caring and generosity, whereas not helping signals disinterest and selfishness, thereby creating reputational incentives to behave well (Camerer 1988; Carmichael and MacLeod 1997; Bénabou and Tirole 2006, 2011b; Ellingsen and Johannesson 2011;

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<sup>7</sup>For surveys in psychology see, e.g., Penner et al. (2005) and Oppenheimer and Olivola (2011).



Golman 2016). Prior work has thus demonstrated that people are more likely to behave prosocially: (i) when their choices are more visible to others (Harbaugh 1998a,b; Bursztyn et al. 2020); (ii) when the self-benefiting choice would be transparently selfish rather than veiled by uncertainty that can serve as an excuse, such as ignorance about the consequences of the act (Bénabou and Tirole 2006; Dana et al. 2007; Andreoni and Bernheim 2009; Gneezy et al. 2020); and (iii) when lacking a plausible rationale to justify deviating from the norm (Bénabou et al. 2018; Foerster and van der Weele 2021; Bursztyn et al. 2023). Eliminating excuses can, for this reason, be an effective way of increasing helping and giving behavior (Linardi and McConnell 2011; Exley et al. 2020). In our model, the potential helper may be motivated by (social or self) image considerations, on top of true altruistic preferences. Even absent such direct reputational concerns, however, the recipient will read into the would-be helper’s choices (offering, granting, or not) how much he is valued or respected, care about that, and act accordingly, with the plausibility of potential excuses playing a central role in these inferences.

Another strand of literature shows that receiving a request increases the chances of a person helping (Anderson and Williams 1996; Freeman 1997; Flynn and Lake 2008; Andreoni and Rao 2011; Bekkers and Wiepking 2011; Ratchford et al. 2019; Goette and Tripodi 2022). Potential helpers themselves recognize this “power of the ask,” and sometimes shun situations in which they might face explicit tests of their generosity. For instance, people may avoid solicitations to give to charities (DellaVigna et al. 2012; Kamdar et al. 2015; Lin et al. 2016; Andreoni et al. 2017) or to peers (Dana et al. 2006; Broberg et al. 2007; Lazear et al. 2012). In our theory, the power of the ask arises *endogenously* from the fact that a request eliminates the excuse of ignorance about needs, and this is anticipated by both sides.

Despite the power of the ask, people in need often fail to solicit valuable help or benefits even when, if they asked, they would likely get them (Gross et al. 1979; Fisher et al. 1982; Nadler 2012). In the workplace, similarly, both male and especially female employees are often hesitant to ask for a raise or promotion to which they would have legitimate claims (Babcock and Laschever 2009; Roussile 2022). Extant work has discussed a number of factors that inhibit asking (see Jaroszewicz et al. (2024) for a recent survey). One of the most commonly cited is shame or embarrassment (Goffman 1963; Tessler and Schwartz 1972; Chandrasekhar et al. 2018), stemming from a fear of revealing that one is ignorant, incompetent, or in need. More relevant to the present research is work

in psychology arguing that people have a fundamental desire to be *accepted and valued* by others (Leary 1990; Baumeister and Leary 1995; Leary 2005)—and that they dislike and often deeply *fear rejection* (Downey and Feldman 1996; Eisenberger 2003; MacDonald and Leary 2005; Kross et al. 2007, 2011; Berenson et al. 2009; Romero-Canyas et al. 2010). In our model, this fear arises because rejection constitutes a negative signal of how little the (would-be) helper values the person in need, or cares about the relationship. This feature, and the resulting information aversion (e.g., Golman et al. 2017, Vu et al. 2023) also ties the paper to the literature on self-esteem management and the preservation of ego utility (Bénabou and Tirole 2002, 2011a; Köszegi 2006; Grossman and van der Weele 2016; Köszegi et al. 2022; Gottlieb 2024). Novel insights and results arise in our strategic framework from the two-way interactions between the *asking-granting* stages of the game and a prior *offering stage* in which potential helpers concerned about needs going unmet can proactively offer help without waiting for an ask—or not. The dynamic aspect of our model and the role of beliefs as direct sources of utility (or “feelings”) also relates our work to psychological game theory (Geanakoplos et al. 1989; Battigalli and Dufwenberg 2022), though the relevant beliefs here are about players’ types rather than their actions.

Relatedly, some psychology literature has argued that rejection is painful not only when it is active (being excluded due to another person’s actions), but also when it is passive (being excluded due to another person’s inaction) (Leary 1990; Williams 2007; Molden et al. 2009; Hartgerink et al. 2015). Being left out of an activity or ignored decreases mood and self-esteem (Zadro et al. 2004; Blackhart et al. 2009; Lustenberger and Jagacinski 2010), and can have negative effects on interpersonal feelings, such as increasing anger towards the excluder (Leary 2006). This damage to the relationship by acts of omission, rather than commission, is captured very naturally in our model by the negative inferences that a person in need draws from the lack of an offer.<sup>8</sup>

Finally, our framework captures the key role of *respect* in social interactions. A large literature in personal and organizational psychology demonstrates that “how worthy and recognized one feels” (Cremer and Tyler 2005) by partners, peers, and hierarchical superiors, and more generally the “feeling of being appreciated in importance and worth as a person” (treated with proper dignity irrespective of one’s specific abilities; van Quaque-

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<sup>8</sup>In the “ashamed to ask” mechanism, by contrast, it is offering help that conveys bad news, by revealing knowledge of the recipient’s need or weakness (as in Bénabou and Tirole (2003)).

beke and Eckloff 2010) has major impacts on morale, engagement, and performance; see Grover (2014) for a survey. “Respectful leadership” is considered key to effective management, whereas disrespect and contempt are highly destructive of both personal relationships and work environments. In our model, the Sender shows respect (or not) for the Receiver’s worth by recognizing and attending to important needs he may have, and the Receiver cares deeply about feeling treated with appropriate respect.

## 2 General Framework

We first lay out the model, then discuss its main assumptions.

**Players.** There are two actors, a potential help Sender  $S$  (she) and a potential help Receiver  $R$  (he). Help-sending is a costly action for  $S$  and a benefit to  $R$ . This benefit may be direct (time, money, effort) or indirect (employer engaging in environmentally responsible practices, which her employees care about).

Initially, there is private information about: (i) the value  $w$  of the help to  $R$ , known to him only; (ii) the generosity  $g$  of  $S$  toward  $R$ , meaning how much she cares about alleviating  $R$ ’s needs, or about  $R$ ’s total utility. This altruism, which is known to  $S$  but not to  $R$ , may be relation-specific, or have a broader scope (e.g.,  $S$ ’s attitude towards  $R$ ’s ethnic group). The variables  $g$  and  $w$  have supports  $G$  and  $W$  respectively, which can be discrete or continuous. The prior distribution on  $g$  has cdf  $P(g)$ , density  $p(g)$ , and mean  $\bar{g}$ , while that on  $w$  has cdf  $Q(w)$ , density  $q(w)$ , and mean  $\bar{w}$ . For further results we may allow  $S$  to receive, at the start of the game, some imperfect signal  $\sigma$  about  $R$ ’s need, which then indexes her prior  $Q_\sigma(w)$ . In the benchmark case, the cost of helping  $c$  is fixed and independent of  $w$ , but later we extend the results to all cost functions such that  $c(w)/w$  is decreasing.

**Timing.** The interactions take place in three stages, as described in Figure 1.

1. Nature determines the signal  $\sigma$ , which can be observed privately by  $S$ , or publicly, in which case it becomes common knowledge.
2.  $S$  spontaneously *offers* help to  $R$ , or does not,  $o = 0, 1$ . If she does offer,  $S$  is then committed to the helping action,  $h \equiv 1$ , irrespective of what its benefit  $w$  to  $R$  will turn out to be. For instance,  $S$  cancels some trip or meeting to make herself

available to  $R$ . Equivalently, she just takes the costly action outright before fully knowing how valuable it is to  $R$ . The game then ends with help being provided and  $R$ 's (and/or other observers') beliefs about  $S$ 's generosity updated from the initial prior  $P(g)$  to some higher posterior  $P_O(g)$ . If there has been no offer by  $S$ , the posterior falls to some lower  $P_N(g)$ .

3. When no offer has been received,  $R$  may *ask* for help, or not,  $a(w) = 0, 1$ . If he does, the request (justifying and explaining his need to  $S$ ) takes the form of disclosing hard information about  $w$ .
4. Following an ask,  $S$  decides whether to *grant* the request,  $h(w, g) = 0, 1$ . This choice also determines the final beliefs  $F(g|w, h)$ , or  $F(g)$  for short. Thus  $F(g) = P_O(g)$  if help has been unconditionally offered, while  $F(g) = F(g|w, 1)$  if it was granted only after an explicit ask for need  $w$ , etc.

To the prior distribution  $P$  over the Sender's type, we associate the reputational functions:

$$M^-(g) = E[g'|g' < g], \quad M^+(g) = E[g'|g' \geq g], \quad \Delta(g) \equiv (M^+ - M^-)(g), \quad \forall g \in G.$$

For the interim belief distribution  $P_N$  following no offer (but prior to the asking stage), we use the same notations with a subscript  $N$  on each of the three functions.

**Payoffs.** With the above notations, final utilities are

$$U_R(h, F) = wh + \psi(F), \tag{1}$$

$$U_S(h; g, w) = (gw - c)h + \mu\varphi(F), \tag{2}$$

where again  $F$  denotes final beliefs over  $S$ 's generosity, and the functionals  $\psi$ ,  $\varphi$  capture the followings ideas. First, and most importantly,  $\psi$  is concave in beliefs, meaning that  $R$  suffers more from revising downward his perception of *how much S cares about him*, or equivalently *respects* him or his group, than he enjoys revising it upward by the same amount.<sup>9</sup> The psychology literature on rejection sensitivity (e.g., Downey and Feldman 1996; Berenson et al. 2009) measures it as a combination of high ‘‘concern

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<sup>9</sup>In Section 3 we will use  $\psi(F) = u(E_F[g])$  where  $u$  is concave, and in Section 4 a loss-aversion-type formulation.

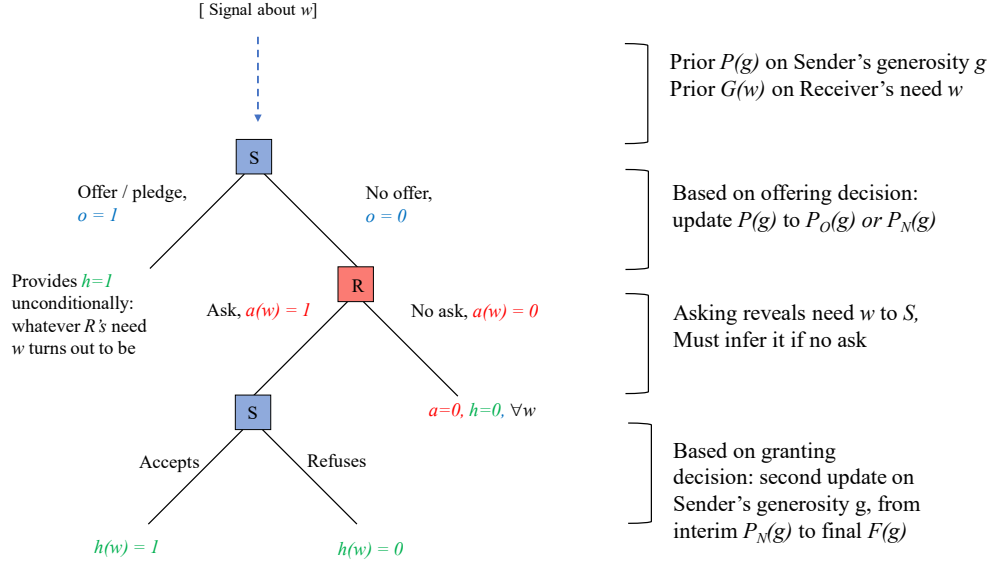


Figure 1: Timing of moves and information structure.  $P$  is for “prior,”  $F$  for “final,”  $w$  for material “welfare” or need,  $g$  for “generosity.”

and anxiety” about being rejected (which corresponds to concavity) and pessimistic expectations about its likelihood (Flynn and Lake 2008; Roussile 2022), which could be captured with probability weighting and would result in similar effects. Prior work also provides some evidence of group differences in this trait, with women showing greater sensitivity to rejection in personal relationships than men (Maiolatesi et al. 2022), and African-Americans greater sensitivity to potentially race-based rejection in institutional relationships than other ethnic groups (Mendoza-Denton et al. 2002).<sup>10</sup>

Second, when  $\mu > 0$  the Sender cares about her image, whether in the eyes of the Receiver or those of others. While not needed for the core results, this will capture the effects of public observability on the whole equilibrium. For simplicity we will focus on the linear benchmark  $\varphi(F) = E_F[g]$ , meaning that  $S$  is risk neutral with respect to her reputation, but other cases could be analyzed.<sup>11</sup>

Without loss of generality, we focus on pure-strategy equilibria and break any ties

<sup>10</sup>A convex  $\psi$  would instead represent a Receiver’s curiosity to find out his social standing, or a decision value of knowing who his true friends are, to invest more in those relationships. While this could be an interesting variant of the model to explore, our focus is here on the “fear of asking.”

<sup>11</sup>Being altruistic,  $S$  may also internalize  $R$ ’s psychological or emotional utility from his beliefs (feelings of being valued or not by  $S$ ); in this case,  $\varphi(F)$  is replaced by  $g\psi(F)$ .

that arise in the direction of “good feelings,” by assuming that: (i) the Receiver will not make an ask that is certain to be rejected; (ii) the Sender will offer help when she is indifferent between doing so and waiting for an ask. Where relevant, off-path beliefs are restricted using the D1 refinement criterion.

## 2.1 Discussion

We now discuss the model’s main features and the robustness of its insights to relaxing specific assumptions.

(1) *Helping.* When the Sender has no image motive, her decision to accept or reject an ask of  $w$  is straightforward: she grants it if  $g \geq c/w$ , and otherwise not. When  $\mu > 0$ , even this last stage of the social interaction becomes a signaling game. Because it is of a familiar type (e.g., Bénabou and Tirole 2006) and our interest is with new effects occurring at the offering and asking stages, we will always take  $\mu$  to be small enough that the equilibrium in this last subgame is unique.<sup>12</sup>

(2) *Asking.* For asking to be meaningful, it must convey some new information; otherwise,  $S$  simply helps, or not, based on her prior. We represent asking as a disclosure of hard information about  $w$ , as this is both simplest and quite plausible:  $R$  “makes his case”. Persuasion about  $w$  could instead occur through costly signaling, or an informative equilibrium of a cheap-talk subgame, at the cost of extra complexity. Whatever the channel, reducing the informational asymmetry about  $w$  erodes  $S$ ’s ability to use ignorance as an excuse for not helping –this is the “power of the ask”– but at the same time it exposes  $R$  to the risk of even more painful news, via an explicit rejection.

(3) *Offering.* If  $S$  is concerned that  $R$  will not ask in some states where she would really like to help, she can offer without waiting for a request. Pledging help, or providing it ex-ante, is risky, however: we assume that it commits  $S$  to incurring the opportunity cost  $c$  (e.g., making the time) no matter what  $R$ ’s level of need may turn out to be. All that is needed, however, is that an offer commit the Sender to helping in *some* state(s) of the world where, had she known the level of need, she would have preferred not to help. Only Senders with sufficient generosity  $g$ , or who received appropriate signals  $\sigma$  about needs, will then be willing to offer help without learning more through an ask. If

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<sup>12</sup>Sufficient conditions will be provided. Uniqueness then also extends to the two-stage subgame that starts with  $R$ ’s asking decision, so multiplicity can only arise from the paper’s novel offering-asking coordination effects; see Section 3.5.

Senders could credibly make contingent offers of the form “I will help when  $w$  is above some  $\tilde{w}$ ,”  $R$  would ask only in those cases, and never be turned down. There would be no fear of rejection, nor any role for commonly-observed exhortations to ask.

(4) *Variable costs of helping.* The models’ realism could be enriched by incorporating private shocks to the Sender’s helping cost  $c$ . Because these have no direct relevance to the Receiver’s sense of worth or being appreciated (“nothing personal”), however, they cannot be the source of any reluctance to ask by  $R$ , nor therefore lead  $S$  to offer help before all uncertainty is resolved. To affect these behaviors, in particular by serving as potential “excuses” for  $S$  not helping, they must combine with the esteem-relevant private type  $g$ , resulting in more complex two-dimensional signaling by the Sender without changing the model’s main insights.

We study two main versions of the model. In Section 3, we use a few discrete types and a flexible specification of the Receiver’s utility from beliefs to demonstrate most simply the main forces at work, and how they generate both interesting non-monotonicities and the “waiting-trap” equilibrium multiplicity. We do not carry out a systematic analysis of the equilibrium set as a function of parameters, as this would be quite tedious. For this, we turn in Section 4 to a version with more restrictive Sender preferences and continuous types distributions, which allows a complete analysis including existence, uniqueness and full comparative statics of the equilibrium.

### 3 Discrete Version

Let the Sender’s type take here values  $g_L < g_M < g_H$ , with probabilities  $(p_L, p_M, p_H)$ . The Receiver may have a “real need,” either severe or moderate, or just a “trivial” one: help is worth  $w_H, w_L$  or  $\varepsilon$  to him, with probabilities  $q_H, q_L$  and  $q_\varepsilon$  respectively and

$$0 \lesssim \varepsilon \ll w_L < w_H. \tag{3}$$

Absent a real need, the value of help  $\varepsilon$  is still positive (so it would be accepted), but so small that no Sender would find it worth her while to incur the cost of providing it. When there is a real need,  $g_H$  and perhaps  $g_M$  may be willing to help, but to cut down on the number of cases we will assume that the lowest type  $g_L$  never is (dominant

strategy).<sup>13</sup>

The Receiver's psychological payoff is

$$\psi(F) \equiv u(E_F[g \mid a, h]), \quad (4)$$

where  $u(\cdot)$  is a strictly increasing and concave function. In contrast (but mainly for simplicity), the Sender is risk-neutral with respect to her image,  $\varphi(F) = E_F[g]$ . We allow  $\mu \geq 0$  to be either strict or an equality, as none of the results in this section depend on the Sender having image concerns (these are more of a focus in Section 4).

### 3.1 Benchmark: Always Ask, No Offer

We now analyze the different types of equilibria that emerge from the model, starting with a natural benchmark that also serves to introduce the notation. In Table 1 and subsequently, for each  $(g, w) \in \{g_L, g_M, g_H\} \times \{\varepsilon, w_L, w_H\}$ , and whether on or off the equilibrium path: (i) in the first column, the entries for  $(g, o)$  are the probabilities that a Sender of type  $g$  offers help without waiting for an ask; (ii) in the top row, the entries for  $(a, w)$  are the probabilities that, following no offer, a Receiver of type  $w$  asks for help; (iii) the interior entries for each type  $(g, w)$  are the probabilities that a Sender with generosity  $g$  will accept an ask that reveals a level of need  $w$ .

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	1	1
$g_L$	0	0	0	0
$g_M$	0	0	$s$	$t$
$g_H$	0	0	1	1

Table 1: No-Offer Equilibrium ( $0 \leq s \leq t \leq 1$ )

When the Receiver has little concern for how much the Sender values him ( $u$  is constant, or linear) and the  $g_H$  type cares enough to help whenever there is a real need, there is only one type of equilibrium, depicted in Table 1: There is no ask at  $\varepsilon$  as it

<sup>13</sup>Formally,  $\max\{g_H\varepsilon, g_Lw_H\} + \mu \max\{g_H - M_N^-(g_H), M_N^+(g_M) - g_L\} < c$ , for which a simple sufficient condition is that  $\max\{g_H\varepsilon, g_Lw_H\} + \mu(g_H - g_L) < c$ . It always holds, for instance, when  $\varepsilon, g_L$ , and  $\mu$  are low enough.



would be turned down for sure, always an ask when there is a real need (“it can’t hurt”), and no Sender ever offers help before hearing an ask expressing such a need.<sup>14</sup>

### 3.2 Monotonic-Ask Equilibrium

To demonstrate a first type of inefficiency that can arise, we focus on the asking-and-granting subgame, or the simple case in which  $S$  has no initial opportunity to offer help,  $o \equiv 0$ . Subsequently we will add a condition such that no Sender wants to help, which similarly leads to  $P_N = P$ . In the type of equilibrium depicted in Table 2a (where  $s \in \{0, 1\}$ ),  $R$  asks for help only when it is most valuable, namely at  $w_H$  but not at  $w_L$ . This is intuitive, since both the intensity of the need and the probability of acceptance are maximal there. We can further distinguish two cases.

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	0	1
$g_L$	0	0	0	0
$g_M$	0	0	$s$	1
$g_H$	0	0	1	1

Table 2a: Monotonic-Ask Equilibrium

(1) **Type  $g_M$  helps at  $w_L$ .** If  $s = 1$ , the informational content of a rejection is the same at  $w_L$  or  $w_H$ , (in both cases indicating that  $g = g_L$ ) so the proposed strategies are an equilibrium if

$$\begin{aligned} (p_H + p_M) [w_L + u(M^+(g_M))] + p_L u(g_L) &< u(\bar{g}), \\ (p_H + p_M) [w_H + u(M^+(g_M))] + p_L u(g_L) &> u(\bar{g}) \end{aligned}$$

on the Receiver’s side, while on the Sender’s side

$$g_M w_L - c + \mu M^+(g_M) > \mu g_L.$$

Simplifying the first two yields

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<sup>14</sup>This outcome can also arise when  $R$  does care about  $S$ ’s generosity, but the equilibrium is uninformative in the region where he is sensitive to rejection e.g.,  $s = t = 0$  and  $R$  cares mostly whether  $g = g_L$ , but not so much whether  $g = g_M$  or  $g_H$ .

$$w_L < \frac{u(\bar{g}) - p_L u(g_L)}{p_H + p_M} - u(M^+(g_M)) < w_H,$$

where the middle term is positive by concavity of  $u$ . Hence, this equilibrium requires  $w_L$  to be sufficiently low and  $w_H$  sufficiently high, given everything else. From the third condition, it is then sufficient for existence that  $g_M w_L > c$  and  $\mu$  not be too large.

**(2) Type  $g_M$  helps only at  $w_H$ .** Now, let  $s = 0$ . The likelihood of  $w_L$  being granted is lower, but the bad news if it is not granted is not as bad as in the previous situation ( $g$  may be  $g_M$  or  $g_L$ ), and thus not as damaging as the news from being turned down at  $w_H$  ( $g$  can still only be  $g_L$ ). The proposed strategies constitute an equilibrium if, on the Receiver's side,

$$\begin{aligned} p_H [w_L + u(g_H)] + (p_M + p_L)u(M^-(g_H)) &< u(\bar{g}), \\ (p_H + p_M) [w_H + u(M^+(g_M))] + p_L u(g_L) &> u(\bar{g}), \end{aligned}$$

while on the Sender's side

$$\begin{aligned} g_M w_L - c + \mu g_H &< \mu M^-(g_H) < g_H w_L - c + \mu g_H, \\ g_M w_H - c + \mu M^+(g_M) &> \mu g_L. \end{aligned}$$

The first two conditions can be rewritten as

$$\begin{aligned} w_L &< \frac{u(\bar{g}) - (p_M + p_L)u(M^-(g_H))}{p_H} - u(g_H), \\ w_H &> \frac{u(\bar{g}) - p_L u(g_L)}{p_H + p_M} - u(M^+(g_M)), \end{aligned}$$

which again holds when  $w_L$  is sufficiently low (the upper bound is positive, due as before to concavity) and  $w_H$  sufficiently high. If  $g_M w_H > c$ ,  $g_H w_L > c$  and  $g_M w_L < c$ , these conditions ensure existence of the equilibrium, provided that  $\mu$  is small enough.

These results extend to incorporating an *offering stage* in which even the most generous type does not offer, preferring to first learn of a real need. Since  $R$  asks only when  $w = w_H$ , it does not matter here whether  $s = 0$  or  $s = 1$ : in both cases, we have  $o(g_H) = 0$  (and a fortiori  $o(g_M) = 0$ ) if

$$g_H \bar{w} - c + \mu g_H < q_H [g_H w_H - c + \mu M^+(g_M)] + (1 - q_H) \mu \bar{g},$$

where we recall that  $\bar{w} = E[w]$ . The condition holds, for instance, if  $\mu$  is relatively small

and  $g_H E[w|w < w_H] < c$ , for which it suffices that  $q_\varepsilon/q_L$  be high enough.

### 3.3 Non-Monotonic Ask Equilibrium

Building on the previous intuition that when  $s = 0$ , being turned down at a high level of need  $w_H$  is worse news than at a moderate level  $w_L$ , consider now the equilibrium described in Table 2b. It is now when his need is most *dire* that  $R$  fails to ask, afraid of what such a rejection would mean: only the least caring person would refuse to help in such circumstances.

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	1	0
$g_L$	0	0	0	0
$g_M$	0	0	0	1
$g_H$	0	0	1	1

Table 2b: Non-Monotonic-Ask Equilibrium

These strategies are an equilibrium if, on the Receiver's side

$$\begin{aligned} p_H [w_L + u(g_H)] + (p_M + p_L)u(M^-(g_H)) &> u(\bar{g}), \\ (p_H + p_M) [w_H + u(M^+(g_M))] + p_L u(g_L) &< u(\bar{g}), \end{aligned}$$

while on the Sender's side

$$\begin{aligned} g_M w_L - c + \mu g_H &< \mu M^-(g_H) < g_H w_L - c + \mu g_H, \\ g_M w_H - c + \mu M^+(g_M) &> \mu g_L. \end{aligned}$$

If we add an initial offering stage, finally, the condition for no Sender to avail herself of it (waiting instead for an ask, which will occur only if  $w = w_L$ ) is now

$$\begin{aligned} g_H \bar{w} - c + \mu g_H &< q_L [g_H w_L - c + \mu g_H] + (1 - q_L) \mu \bar{g} \iff \\ g_H (q_L w_L + q_\varepsilon \varepsilon) &< c (q_L + q_\varepsilon) - \mu [g_H - q_L g_L - (1 - q_L) \bar{g}], \end{aligned}$$

which holds under similar conditions to those of the previous case.

### 3.4 Discouragement

To demonstrate the double-edged-sword nature of spontaneous offers, we first construct an equilibrium such that:

(i) Sender  $g_H$  offers unconditional help, whereas neither  $g_M$  nor  $g_L$  do.

(ii) At the asking stage, having learned that he faces one of the two lower types,  $R$  refrains from asking in at least one state  $w_L$  or  $w_H$ .

(iii) Had his beliefs about  $g$  not declined due to the lack of an offer (e.g., absent an offer stage), he would have asked in both states (implying that at least the  $g_H$  Sender, and possibly  $g_M$  as well, would then have accepted).

In what follows, we show how this discouragement effect can deter asking at need  $w_L$ . In the Appendix, we enrich the support of  $g$  slightly and show how it can induce an even more severe failure to ask, at need  $w_H$ .

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	0	1
$g_L$	0	0	0	0
$g_M$	0	0	1	1
$g_H$	1	0	1	1

Table 3a: Discouragement Effect Prevents Asking at Moderate Need

$a \backslash o$	$\varepsilon$	$w_L$	$w_H$
$a$	0	1	1
$g_L$	0	0	0
$g_M$	0	1	1
$g_H$	0	1	1

Table 3b: No Discouragement Effect When Offers Are Infeasible

*Discouragement induces failure to ask at moderate need.* Consider first Table 3a, where the lack of an initial offer leads to a subgame with monotonic asking. If no offer is extended, type  $g_H$  is ruled out from there on, leading to a conditional mean of  $\bar{g}_N = M^-(g_H) = (p_M g_M + p_L g_L) / (p_M + p_L)$ . The above strategies thus constitute an equilibrium if the following conditions hold.

First, at the ask-granting stage, a Sender with generosity  $g_M$ , and a fortiori  $g_H$ , always helps with real needs

$$g_M w_L - c + \mu g_M > g_L.$$

Second, at the asking stage, a Receiver with need  $w_L$  knows that asking will reveal whether  $g = g_M$  or  $g_L$ , and the latter outcome is sufficiently aversive that he abstains.

When his need is  $w_H$ , on the other hand, the value to be gained dominates the fear of rejection, so he does ask. Formally,

$$p_M^N(w_L + u(g_M)) + p_L^N u(g_L) < u(\bar{g}_N) < p_M^N(w_H + u(g_M)) + p_L^N u(g_L).$$

Third, at the initial stage, offering reveals type  $g_H$ , whereas not offering will lead to beliefs  $g_M$  or  $g_L$  if an ask at  $w_H$  occurs, and to no update otherwise (unchanged belief  $\bar{g}_N$ ). It must therefore be that:<sup>15</sup>

$$\begin{aligned} g_H \bar{w} - c + \mu g_H &> q_H(g_H w_H - c + \mu g_M) + (1 - q_H)\mu \bar{g}_N, \\ g_M \bar{w} - c + \mu g_H &< q_H(g_M w_H - c + \mu g_M) + (1 - q_H)\mu \bar{g}_N. \end{aligned}$$

Now, suppose that the Sender's possibility of offering unconditional (or not fully state-contingent) help is simply removed:  $o(g) \equiv 0$ . At the asking stage, since nothing has yet been learned, the probability that an ask of  $w_L$  will be accepted is  $p_H + p_M$  rather than  $p_M$ . If  $p_H$  is high enough and  $w_L$  not too low (see the appendix), the Receiver will ask whenever he has a real need, and this need will be met. By the same token, no help will ever be wasted on a trivial need,  $w = \varepsilon$ . The outcome, depicted in Table 3b, is the same as under symmetric information, and from the point of view of material payoffs (but not necessarily that of agents' welfare, as we discuss below), it is more efficient.

### 3.5 The Waiting Trap

Even more interestingly, in the full game in which offers are made endogenously, the “discouragement” equilibrium can coexist (for the same set of parameters) with an “always ask, no offer” equilibrium that replicates the no-offers-possible outcome, and thus achieves trading efficiency, as depicted in Tables 4a-4b.<sup>16</sup> Indeed, if the expectation is that even Sender  $g_H$  will wait for an ask, the lack of an offer is uninformative. The likelihood that an ask at  $w_L$  would be accepted thus rises from  $p_M$  to  $p_M + p_H$ , making the Receiver willing to take his chance on expressing such a need. This, in turn, validates waiting for an ask as the optimal decision for Sender  $g_H$ , and all others a fortiori.<sup>17</sup>

<sup>15</sup>The appendix provides sufficient conditions for all inequalities to hold simultaneously.

<sup>16</sup>This requires just one more inequality condition on top those for that make Table 4a an equilibrium and Table 4b the outcome when offers are infeasible. See the appendix for details.

<sup>17</sup>This multiplicity arises from the fact that, even when  $S$  has no image concern *per se*,  $\mu = 0$ , endogenous offers constitute signals about her type. These affect  $R$ 's interim beliefs  $P_N$  and therefore her asking behavior, which in turn is internalized by  $S$ 's offering strategy. One can construct a similar

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	0	1
$g_L$	0	0	0	0
$g_M$	0	0	1	1
$g_H$	1	0	1	1

Table 4a: The Waiting Trap

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	1	1
$g_L$	0	0	0	0
$g_M$	0	0	1	1
$g_H$	0	0	1	1

Table 4b: No-Waiting Equilibrium

The waiting-for-an-offer equilibrium Table 4a is then an *inefficient trap*. Senders  $g_M$  and  $g_H$  would both want to help whenever there is a real need. However, given the risk that there may be only a trivial one, only  $g_H$  is willing to pledge unconditionally, whereas  $g_M$  will wait for an ask. For the Receiver who has not heard an offer, however, the fear of a rejection that would reveal that  $g = g_L$  is enough to dissuade him from asking at  $w = w_L$ . Thus, sometimes help fails to be provided when it should ( $g = g_M, w = w_L$ ), and sometimes it is provided when it should not ( $g = g_H, w = \varepsilon$ ).

This is also a case where, from an *ex-ante* welfare point of view, the no-offer equilibrium (alternatively, removing the possibility of offers) makes the Sender better off: she gains  $p_H q_\varepsilon (c - g_H \varepsilon) + p_M q_L (g_M w_L - c) > 0$  in expected utility from helping when she will want to, while reputational payoffs average to zero over her three types, since image is a zero-sum game. For the Receiver, a similar ranking generally holds in terms of ex-ante material payoffs, but not total welfare: the help gained from  $g_M$  (by asking) when  $w = w_L$  is typically worth more than that lost from  $g_H$  when  $w = \varepsilon$ , but on the other hand when the Sender is  $g = g_L$ ,  $R$  will more often find this out (by being turned down), and suffer a lot as a result.<sup>18</sup>

In terms of equilibrium selection, relatedly, the waiting-trap equilibrium can easily be *risk-dominant* for the two relevant player types, namely Sender  $g_H$  and Receiver  $w_L$ . Such is the case (as shown in the appendix) if  $R$  is sufficiently averse to finding out that  $g = g_L$  for sure, and/or the Sender of type  $g_H$  is sufficiently more concerned about letting a need  $w_L$  go unmet (by not offering) than about wasting her help on a trivial need  $\varepsilon$ .

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“waiting-for-an-offer” trap coordination failure with unmet needs at  $w_H$  rather than  $w_L$ .

<sup>18</sup>In contrast to *ex-ante* rankings, different (*ex-post*) types of Senders, and also Receivers, clearly have conflicting preferences over how to rank the outcomes in the two panels of Table 4.

The “waiting trap” result and *ex-ante* ranking of the two outcomes by Senders provide a natural explanation for the ubiquitous exhortation of “*Don’t be afraid to ask!*” Even without any mistaken priors or failures of rationality by the Receiver or Sender, such a message can serve as a valuable *coordination device*, helping both parties achieve the more allocatively efficient equilibrium.

### 3.6 Signal of Need and Likelihood of an Offer

Consider now private signals that the Sender may have received or noticed, such as non-verbal cues from  $R$ , or reports from others about  $R$ ’s need for help. To analyze this situation, we can simply reinterpret the  $\{g_L, g_M, g_H\}$  generosity types as different “varieties” of types  $\{g_L, g_H\}$  who received different private signals about the Receiver’s needs. We highlight two cases, which together reveal another interesting non-monotonicity.

1. *Learning of greater needs leads to more offering.* Suppose that, whenever the Receiver does have a real need ( $w \neq \varepsilon$ ), the Sender privately learns of it with probability  $\pi$  at the start of the game; with probability  $1 - \pi$  she observes no such signal, but still updates using Bayes’ rule. In both cases, the relative probabilities of  $w_H$  and  $w_L$  remain unchanged. It is not difficult to construct an equilibrium with the same strategies as in Table 3a, except that: (i) type  $g_M$  is replaced by the uninformed type  $g_H$  (who did not receive a signal); thus, as before, no offer is bad but not damning news, as only rejecting an ask can reveal the least generous type; (ii) type  $g_H$  is now a high type who has learned that there is real need, making her sufficiently concerned that it could be  $w_L$ —in which case the Receiver will fail to ask—that she becomes willing to offer.

2. *Learning of greater needs leads to less offering.* Consider instead a signal that, when received, says nothing about  $\varepsilon$ , but increases the relative likelihood of  $w_H$  relative to  $w_L$ . If we combine this information structure with a monotonic-ask equilibrium configuration (in which Sender  $g_H$  offers because she knows that  $R$  will ask if  $w = w_H$  but not if  $w = w_L$ ), receiving the signal clearly *reduces*  $S$ ’s propensity to offer and risk ending up helping at  $\varepsilon$ . She can rightly tell herself, “*If he really needs it, he will ask.*”

If the same signal structure is instead combined with parameters leading to a non-monotonic-ask equilibrium, receiving a signal of higher needs will now increase  $S$ ’s propensity to offer: she becomes even more concerned that “*He may be desperate, yet afraid to ask.*”

## 4 Continuous Version with Disappointment

The previous section demonstrated the rich set of phenomena that arise in our simple model, including non-monotonic asking, the discouragement effect, and coordination failures between hoping for an offer and hoping for an ask. We now turn to a version with continuous type distributions (where such results are generally harder to show) and, most importantly, a less “permissive” Receiver’s utility from beliefs, governed by a single parameter. Cutting down on degrees of freedom will preclude some of the more intriguing outcomes listed above, but yield in return a very clean equilibrium structure, with uniqueness and a full set of comparative-statics predictions.

Let the Sender’s generosity and the Receiver’s need take values in  $[0, g^{\max}]$  and  $[w^{\min}, w^{\max}]$  respectively, with strictly positive densities on the interior of these supports. The Sender’s preferences remain unchanged: imperfectly altruistic and risk-neutral with respect to her image,  $\varphi(F) = E_F[g]$ . As for the Receiver, since he may observe two consecutive events ( $S$ ’s offering or not, then her response if an ask is made), we consider two specifications for his utility from beliefs, both of them linear but for a single kink. The first one is

$$\psi(F) = \alpha \int_{\bar{g}} (g - \bar{g}) dF(g) - (1 + \lambda) \alpha \int^{\bar{g}} (\bar{g} - g) dF(g), \quad \lambda > 0, \quad (5)$$

where  $\lambda > 0$  captures the “letdown” feeling from learning that the Sender cares about the relationship less than initially expected, i.e. less than  $\bar{g} = E_P[g]$ .

The alternative one involves a slight departure from (2), in that disappointment occurs when an explicit ask is *rejected*, whereas  $R$  is risk neutral (or even indifferent) with respect to the first round of news conveyed by an offer being made or not:

$$\psi(F, P_N) = \alpha \int_{\bar{g}_N} (g - \bar{g}_N) dF(g) - (1 + \lambda) \alpha \int^{\bar{g}_N} (\bar{g} - g_N) dF(g), \quad \lambda > 0. \quad (6)$$

The only difference with (5) is that the reference point for the psychological loss aversion is now the *interim*  $\bar{g}_N \equiv E_{P_N}[g]$  following no offer, rather than the initial  $\bar{g}$ . Because it leads to simpler expressions, we analyze (6) here, and (5) in the appendix. One could combine the two sets of preferences, at the cost of greater complexity.<sup>19</sup>

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<sup>19</sup>In either case, the presence of the reference point can also be interpreted as representing the Receiver’s aspirations or goals (Hsiaw 2013; Genicot and Ray 2020; Azmat et al. 2020) for how valued



The equilibrium is solved from the last period backward. Section 4.1 shows that an ask at  $w$  is accepted by Senders with generosity above a threshold  $\hat{g}(w)$ , which decreases with  $w$ . This also means that a given Sender  $g$  will agree to help only with needs that exceed  $\hat{w}(g) \equiv \hat{g}^{-1}(g)$ . Section 4.2 shows that Receivers ask when their need is above some critical level  $w^*$ , and not below. Section 4.3 shows that offering is also monotonic: Senders with generosity above some threshold  $\tilde{g}$  pledge help spontaneously, those below it wait for an ask. The key results are gathered in Propositions 1-3.

## 4.1 Granting an Ask

At the asking stage, since no offer occurred,  $R$ 's belief about  $g$  is  $P_N(g)$  on  $[0, g_N^{\max}] \subset [0, g^{\max}]$ , with mean  $\bar{g}_N$ . The Sender therefore accepts a request  $w$  if and only if

$$gw + \mu (E_N[g|h(w) = 1] - E_N[g|h(w) = 0]) \geq c, \quad (7)$$

which defines a unique threshold  $\hat{g}(w)$  and verifies the intuition that accepting a request is always good news.<sup>20</sup>

We will focus on interior solutions, so that<sup>21</sup>

$$w\hat{g}(w) + \mu\Delta_N(\hat{g}(w)) \equiv w\hat{g}(w) + \mu [M_N^+(\hat{g}(w)) - M_N^-(\hat{g}(w))] = c. \quad (8)$$

Intuition suggest that this threshold should be *decreasing in  $w$* , but in general it could be non-monotonic (or there may even be multiple equilibria), due to the signaling content of the acceptance decision. Two important cases where  $\hat{g}$  is indeed decreasing are when:

(a) The Sender's reputation concern  $\mu$  is small enough, so that  $\hat{g}(w) \approx c/w$ . As we shall see, this also simplifies other aspects of the overall game.<sup>22</sup>

(b) The function  $\Delta_N(g)$  is increasing in  $g$ , which is ensured if its density  $p_N(g)$  is

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they hope to be in the relationship.

<sup>20</sup>In the sense of first-order stochastic dominance: for any  $w$ ,  $F(\cdot|w, 0) \preceq P_N(\cdot) \preceq F(\cdot|w, 1)$ .

<sup>21</sup>The solution is interior when  $0 + \mu(\bar{g}_N - 0) < c < wg_N^{\max} + \mu(g_N^{\max} - \bar{g}_N)$ , which holds for all  $w$  provided that  $\mu\bar{g}_N < c < w^{\min}g_N^{\max}$ . Otherwise: (i)  $\hat{g}(w) = g_N^{\max}$ , if  $c \geq wg_N^{\max} + \mu(g_N^{\max} - \bar{g}_N)$ ; there is then no Sender who accepts a request  $w$ , and therefore no ask at  $w$ ; or (ii)  $\hat{g}(w) = 0$  if  $c < \mu\bar{g}_N$ ; all Senders then accept  $w$ , implying also that if there has been no offer, there will be an ask at  $w$ .

<sup>22</sup>We also see here why results remain similar when  $c$  is a function of  $w$ , as long as  $c(w)/w$  is decreasing.

decreasing or not too increasing.<sup>23</sup> Indeed,

$$\hat{g}'(w) = -\frac{\hat{g}(w)}{w + \mu\Delta'_N(\hat{g}(w))}, \quad \hat{w}'(g) = -\frac{\hat{w}(g) + \mu\Delta'_N(g)}{g}. \quad (9)$$

where we define  $\hat{w} = \hat{g}^{-1}$  in the well-behaved case where  $\hat{g}$  is decreasing, on which we will focus throughout. A Sender of type  $g$  (and above) thus accepts a request  $w$  if and only if  $w \geq \hat{w}(g)$ , as illustrated by the downward-sloping *green locus* in Figure 2. Conversely, the lower the need for which a Sender agrees to pay the helping cost, the better the news conveyed about her generosity.<sup>24</sup>

## 4.2 Asking

Since the Receiver's actual need becomes common knowledge in the process of asking, he can only request his actual  $w$ . The expected value of doing so is

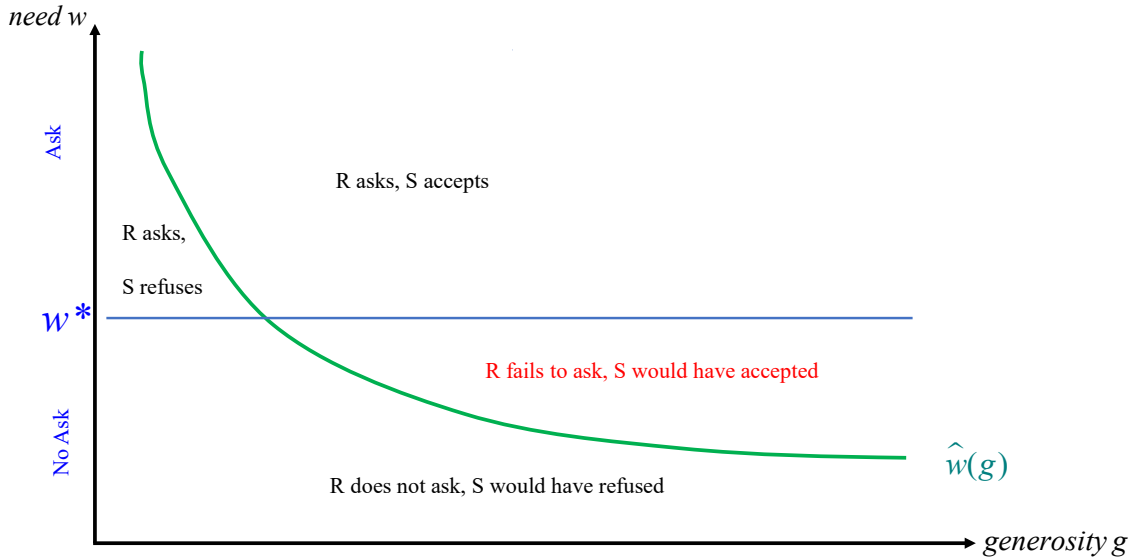


Figure 2: Asking (or Not) and Receiving (or Not).

<sup>23</sup>See Bénabou and Tirole (2006, 2011b). In equilibrium, moreover, offering types will be those above some cutoff  $g_N^{\max}$  (see below), implying that  $p_N(g) = p(g)/[1 - P(g_N^{\max})]$  for  $g \leq g_N^{\max}$ . The above condition on  $p_N$  thus reduces to a similar one on the *exogenous* unconditional density  $p(g)$ .

<sup>24</sup>Formally, for all  $w \leq w'$ ,  $F(\cdot|w', 0) \preceq F(\cdot|w, 1)$ .

$$\begin{aligned}
A(w) &= [1 - P_N(\hat{g}(w))] [w + \alpha (M_N^+(\hat{g}(w)) - \bar{g}_N)] \\
&\quad + P_N(\hat{g}(w))(1 + \lambda)\alpha [M_N^-(\hat{g}(w)) - \bar{g}_N],
\end{aligned}$$

where the first line corresponds to the case where the ask is granted, and the second to that where it is not. By Bayes' rule,  $[1 - P_N(g)]M_N^+(g) + P_N(g)M_N^-(g) = \bar{g}_N$ , allowing us to rewrite

$$A(w) = [1 - P_N(\hat{g}(w))] [w - \lambda\alpha (M_N^+(\hat{g}(w)) - \bar{g}_N)], \quad (10)$$

Therefore,  $a(w) = 1$  if and only if  $\hat{g}(w) < g_N^{\max}$  and  $w > \lambda\alpha [M_N^+(\hat{g}(w)) - \bar{g}_N]$ .<sup>25</sup> Given that  $\hat{g}(w)$  is decreasing, there is a unique threshold such that  $R$  asks if and only if  $w > w^*$ , illustrated by the *blue horizontal locus* in Figure 2. It is defined by

$$w^* = \lambda\alpha [M_N^+(\hat{g}(w^*)) - \bar{g}_N] \quad (11)$$

when  $\hat{w}(g_N^{\max}) > \lambda\alpha(g_N^{\max} - \bar{g}_N)$ , and by  $w^* = \hat{w}(g_N^{\max})$  otherwise.

### Properties.

(1) *Level of need.* In Section 3, the Receiver's utility from beliefs  $\psi(F)$  could have varying curvature over its range, and when this information aversion was stronger between "very bad" and "moderately bad" news than between the latter and "good news," this could lead to non-monotonic asking. With the single-kink specification (5), or similarly (6), this is no longer possible: a greater need *always* leads to more asking.

(2) *Rejection-sensitivity.* When offers are known to be infeasible or impossible, it is clear that a Receiver who fears bad news more is less prone to ask:  $M_N^+ = M^+$  and  $\bar{g}_N = \bar{g}$ , so (11) implies that  $\partial w^*/\partial(\lambda\alpha) > 0$ . When (not) offering is chosen by  $S$ , however, this is generally non-obvious: the interim expectations  $M_N^+$  and  $\bar{g}_N$  are themselves functions of  $\lambda\alpha$ , as the Sender's offer strategy internalizes the Receiver's asking behavior, and vice versa. We show, as part of Proposition 1 below, that the intuitive property of greater rejection sensitivity leading to more reluctance to ask remains true in equilibrium, provided that  $\lambda\alpha$  is not too large.

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<sup>25</sup>Recall that when  $A(w) = 0$ , we break indifference by assuming that the Receiver does not make an ask that is sure to be rejected.

### 4.3 Offering

Following a signal  $\sigma$ ,  $S$  has prior distribution  $Q_\sigma(w)$  on  $w$  in  $[w_\sigma^{\min}, w_\sigma^{\max}] \subset [w^{\min}, w^{\max}]$ . Offering implies helping at any level of  $w$  that may realize, so it has expected value:

$$V_\sigma^1(g) = -c + g \int w dQ_\sigma(w) + \mu \bar{g}_O, \quad (12)$$

where  $\bar{g}_O \equiv E[g|o = 1]$ . Not offering, on the other hand, has expected value:

$$\begin{aligned} V_\sigma^0(g) &= \mu \bar{g}_N + \int_{\max\{w^*, \hat{w}(g)\}} [gw - c + \mu (M_N^+(\hat{g}(w)) - \bar{g}_N)] dQ_\sigma(w) \\ &+ \int_{w^*}^{\max\{w^*, \hat{w}(g)\}} [\mu (M_N^-(\hat{g}(w)) - \bar{g}_N)] dQ_\sigma(w), \end{aligned} \quad (13)$$

where the first term corresponds to no offer and no ask, the second to no offer and an ask that is accepted, and the third to no offer and an ask that is turned down.

The net return to offering,  $O_\sigma(g) \equiv V_\sigma^1(g) - V_\sigma^0(g)$ , is comprised of: (i) a pure “helping more” term,  $\int_{\max\{w^*, \hat{w}(g)\}} (gw - c) dQ_\sigma(w)$ , the sign of which depends on the Sender’s generosity  $g$  and what she expects the Receiver’s needs to be; (ii) a reputational return (beyond what can be achieved by responding to asks) proportional to  $\mu$ , which is complex but we will show to be positive in equilibrium.

#### Properties.

(1) *Sender’s generosity.* Differentiating (12)-(13), we have, quite intuitively,

$$\frac{\partial O_\sigma}{\partial g} = E_\sigma[w] - \int_{\max\{w^*, \hat{w}(g)\}} w dQ_\sigma(w) = \int_{\max\{w^*, \hat{w}(g)\}} w dQ_\sigma(w) > 0.$$

The result is immediate when  $w^* \geq \hat{w}(g)$ . In the reverse case, it is due to  $\partial V_\sigma^0 / \partial \hat{w}(g) = g\hat{w}(g) - c + \mu \Delta_N^-(\hat{g}(\hat{w}(g))) = 0$ , reflecting the envelope theorem: a Sender who does not offer knows that her later responses to any ask will be chosen optimally.

For any given signal  $\sigma$ , more generous Senders are thus always more likely to offer, and the decision is governed by a *cutoff*  $\tilde{g}_\sigma$ .<sup>26</sup> In the case where  $w^* \geq \hat{w}(g)$  and reputation concerns are absent or weak, moreover, it has a very simple expression (or approximation)

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<sup>26</sup>Recall that when  $O_\sigma = 0$ , we break the Sender’s indifference in the direction of offering.

as a function of the Receiver's asking strategy:

$$\tilde{g}_\sigma = \frac{c}{E[w|w < w^*, \sigma]} \equiv \frac{c}{N_\sigma^-(w^*)}. \quad (14)$$

This is intuitive: the Sender becomes more likely to offer, the higher is, in light of her signal, the average level of need among Receivers who will *not* ask. When  $\tilde{g}_\sigma < g_N^{\max}$ , Senders with  $g \geq \tilde{g}_\sigma$  offer, otherwise none does.<sup>27</sup>

(2) *Receiver's asking propensity.* Intuition also suggests that  $\partial O_\sigma / \partial w^* \geq 0$ , meaning that the less likely it is that  $R$  will ask, the more likely  $S$  is to offer; but things are actually more subtle. First, recall that  $w^*$  is endogenous, jointly determined with  $P_N(g)$  and the distribution of  $\tilde{g}_\sigma$ . Suppose, however, that we treat  $w^*$  as parametric and just ask what is the Sender's best response to it, or that we do know how  $w^*$  varies with some exogenous parameter, such as  $\lambda\alpha$  (see above). It turns out that Senders who are motivated by *genuine concerns* for the Receiver, and those who are primarily concerned about *image*, will respond in exactly *opposite* directions to greater ask-shyness.

**(a) Case  $w^* \geq \hat{w}(g)$ , i.e.  $g \geq \hat{g}(w^*)$ .** Such a Sender would accept any request  $w > w^*$  that  $R$  would dare to make, so her primary motive for offering is to make sure that  $R$  gets help for  $w \in [\hat{w}(g), w^*]$ , when he will be afraid to ask. Equation (14) then shows that, indeed,  $\partial \tilde{g}_\sigma / \partial w^* < 0$  provided the Sender's reputational concern  $\mu$  is low enough. More generally, however,

$$\frac{\partial O_\sigma}{\partial w^*} \propto gw^* - c + \mu [\bar{g}_O - \bar{g}_N - \bar{g}_O + M_N^+(\hat{g}(w^*))] = gw^* - c + \mu [M_N^+(\hat{g}(w^*)) - \bar{g}_N],$$

where  $\propto$  denotes "having the same sign as." For  $g$  high enough (e.g.,  $g \geq c/w^*$ ), the sign is clearly positive: a *sufficiently generous* Sender is indeed more prone to offer when she knows that the Receiver is more reluctant to ask, because she becomes even more concerned about unmet needs.

For a *not-so-generous* Sender, on the other hand, reputational considerations are the critical motive ( $\mu > 0$  is required for  $O_\sigma(g)$  to be positive), and can make her offering

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<sup>27</sup>More generally, if the cost of alleviating a need  $w$  is some function  $c(w)$ , then  $\tilde{g}_\sigma = E[c(w)|w < w^*, \sigma] / E[w|w < w^*, \sigma]$ . See Corollary 2 in Section 4.5. In the case where  $w^* < \hat{w}(g)$ ,  $w^*$  is replaced by  $\hat{w}(g)$  in this equation (and in 14), which remains intuitive but is now implicit.

response go the other way: as  $g$  declines toward  $g = \hat{g}(w^*)$ , the expression above falls to

$$\hat{g}(w^*)w^* - c + \mu M_N^+(\hat{g}(w^*)) - \mu \bar{g}_N = \mu [M_N^-(\hat{g}(w^*)) - \bar{g}_N] < 0. \quad (15)$$

Thus, for a Sender just indifferent between accepting and refusing an ask of  $w^*$ , the relative value of *not* offering increases when the Receiver becomes a bit more ask-shy:  $\partial \tilde{g}_\sigma / \partial w^* > 0$ , revealing a new form of non-monotonicity. Intuitively, for realizations of  $w$  slightly above  $w^*$ ,  $S$  will no longer be asked, and thus keep reputation  $\bar{g}_N$ . Previously she would have been asked, and her generosity  $\hat{g}(w^*)$  is low enough that an optimal response would have been to refuse, leading to the worse reputation  $M_N^-(\hat{g}(w^*))$ .

**(b) Case  $w^* < \hat{w}(g)$ , i.e.  $g < \hat{g}(w^*)$ .** For an even less generous Sender, who would decline to help at  $w^*$ , the result is even clearer. Such a Sender is not at all concerned about unmet needs due to  $R$ 's shyness in asking, and the *only* reason she may offer without waiting for an ask is reputational: it allows her to pool with higher  $g$ 's who are genuinely worried about a possible failure to ask. From (12)-(13), the net value of offering is easily seen to be strictly negative for  $\mu$  close to zero, but potentially positive for  $\mu$  large enough. Most interestingly, such a Sender is *unambiguously* less likely to offer when knowing that the Receiver is more ask-shy:

$$\begin{aligned} \frac{\partial O_\sigma}{\partial w^*} &\propto gw^* - c + \mu(\bar{g}_O - \bar{g}_N) - gw^* + c - \mu [\bar{g}_O - \mu M_N^-(\hat{g}(w^*))] \\ &= \mu [M_N^-(\hat{g}(w^*)) - \bar{g}_N] < 0. \end{aligned}$$

This last expression is the same as in (15), and so is the intuition: a key part of the benefit of offering for a Sender with  $g < \hat{g}(w^*)$  is that she *avoids being confronted with an ask* in  $(w^*, \hat{w}(g))$  that she would (here, strictly) turn down. As  $w^*$  rises, this very reputation-damaging scenario becomes less likely, so the net incentive to offer declines.

(3) *Sender's signal about Receiver's needs.* Suppose  $S$  initially receives a *private* signal  $\sigma$  about  $R$ 's need, shifting her prior  $Q_\sigma(w)$ , with a higher  $\sigma$  indicating greater needs in the sense of first-order stochastic dominance,  $\partial Q_\sigma / \partial \sigma < 0$ . Importantly,  $w^*$  is independent of  $\sigma$ , since that signal is known to the Sender only, and so is  $\hat{w}(g)$ , as it reflects her decision when fully informed of the Receiver's need.<sup>28</sup> Variations in  $\sigma$  can

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<sup>28</sup>Note that: (i) offering,  $o = 1$ , signals something about both  $\sigma$  and  $g$  to  $R$ , but that is irrelevant to his behavior since the game then ends, with help being provided unconditionally; (ii) not offering,  $o = 0$ ,

thus be analyzed as simply reallocating density between the integrals in (13), without changing their bounds. As in the discrete version (but in a richer manner, especially when image is important), we show in the Appendix that the effects on the likelihood of an offer critically depend on where from and to, in the range of possible needs, the probability shift(s) occur.

## 4.4 Equilibrium

We showed that a more generous Sender is always more likely to offer:  $\partial O_\sigma / \partial g \geq 0$ , with strict inequality when  $Q_\sigma(w^*) < 1$ . Therefore, for any  $\sigma$ , the offering set is an interval  $[g_N^{\min}, g_N^{\max}] = [\tilde{g}_\sigma, g^{\max}]$  and the non-offering set is  $[0, \tilde{g}_\sigma)$ , with  $O(\tilde{g}_\sigma) \equiv 0$  when both intervals are non-empty. Thus, not offering is indeed (at least weakly) *bad news* about  $g$ , and in particular

$$\bar{g}_N = E_\sigma [M^-(\tilde{g}_\sigma)] \leq E_\sigma [g] = \bar{g} \leq E_\sigma [M^+(\tilde{g}_\sigma)] = \bar{g}_O, \quad (16)$$

using the fact that  $g$  and  $\sigma$  are independent. Gathering all the results so far into two propositions, we have first:

**Proposition 1 (structure of equilibrium)** *In any equilibrium,*

1. *A more generous Sender is more likely to offer unconditionally ( $g \geq \tilde{g}_\sigma$ ), and when faced with an ask, more likely to accept it ( $g \geq \hat{g}(w)$ ). Offering leads to a higher interim reputation  $\bar{g}_O$ , and not offering to a lower one  $\bar{g}_N$ , relative to the initial prior  $\bar{g}$ .*
2. *Absent an offer, the Receiver asks if and only if his need  $w$  exceeds a fixed threshold  $w^*$ . The higher the need, the more likely the request is to be accepted by the Sender ( $\hat{w}'(g) < 0$ , since  $\hat{g}'(w) < 0$ ).*
3. *A Receiver who is more rejection-averse (larger  $\lambda\alpha$ ) refrains more from asking (higher  $w^*$ ), as long as  $\lambda\alpha$  is not too large.*

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signals something about  $\sigma$  and  $g$  as well, but all that matters for the choice of  $w^*$  is the conditional distribution  $P_N(g) = \Pr[g' \leq g | O_\sigma(g') = 0]$ , which does not depend on the particular realization of  $(\sigma, g)$  that led to  $o = 0$ .

4. When the Receiver is more reluctant to ask (higher  $w^*$ ), sufficiently generous Senders (in particular,  $g \geq c/w^*$ ) become more prone to offer unconditionally. If  $\mu$  is small this is true of all Senders, so  $\partial \tilde{g}_\sigma / \partial w^* < 0$ . Otherwise, less generous Senders (in particular,  $g < \hat{g}(w^*)$ ), who offer primarily for the reputational benefits involved, become less likely to offer, so  $\tilde{g}_\sigma$  may increase.

*Implications.* If one takes on board the findings that women are, on average, more rejection sensitive than men in personal relationships (Maiolatesi et al. 2022), and Blacks than Whites in anonymous, institutional interactions where racial bias could be at play (Mendoza-Denton et al. 2002), this means that these groups have higher situation-specific values of  $\lambda$  than their respective counterparts. An immediate implication is, of course, that they are more hesitant to ask for help, accommodations, and other benefits (e.g., Babcock and Laschever 2009). A more subtle and unexpected prediction follows from the fourth result above: even absent any discriminatory preferences, Senders (friends, employers, teachers, etc.) with different motivations will *respond in opposite ways to these group differences*. Those with genuinely high levels of concern will be more prone to spontaneously help (say) women than men, so as to compensate for the greater ask-shyness. Less caring Senders, who mostly want to avoid looking bad by explicitly turning down a request, will on the contrary be less prone to spontaneously help women, feeling more confident that such an ask is less likely than for a man.

*Further results.* We can derive sharper results about equilibrium behaviors by abstracting from private signals received by the Sender prior to the offering stage: assume there is no such signal, or equivalently it is publicly observed, so varying  $\sigma$  just means varying  $S$ 's prior  $Q_\sigma$  while maintaining common knowledge of it (the subscript  $\sigma$  can then remain implicit, to lighten the notation). This yields the important simplification that there is a *single cutoff*  $\tilde{g}$  for the Sender's offering behavior, which is *known to the Receiver* in equilibrium. From the absence of an offer  $R$  can then infer that  $S$  is *at best* type  $g_N^{\max} = \tilde{g}$ , who would accept no request below  $\hat{w}(\tilde{g})$ . Therefore, we must be in Case (a) above, namely  $w^* \geq \hat{w}(\tilde{g})$ , as illustrated by the *red vertical locus* in Figure 3.

Furthermore, for any  $w > w^*$ ,  $M_N^+(\hat{g}(w)) < M_N^+(\hat{g}(w^*)) < M_N^+(\tilde{g}) = \bar{g}_O$ , and more generally  $F(\cdot|w, 1) \preceq P_O(\cdot)$ , since  $P_N(\cdot)$  and  $P_O(\cdot)$  are truncations of the prior  $P(\cdot)$  from below and above, respectively. Thus, as claimed in the introduction, offering earns the Sender a final reputation higher than *any* she may end up with if she waits and takes



her chances on  $w$ .<sup>29</sup>

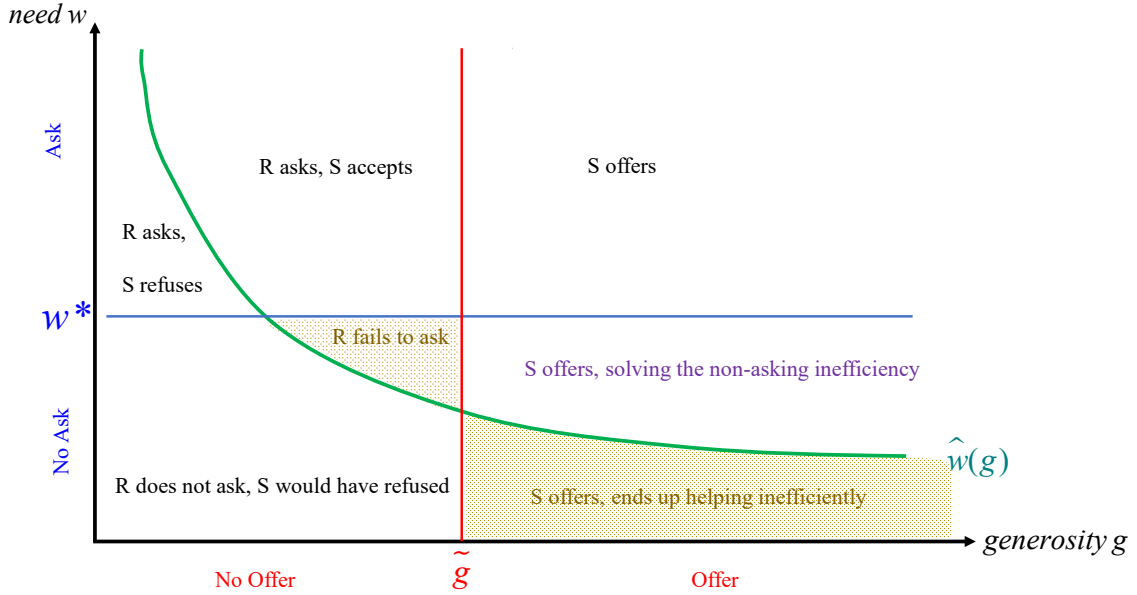


Figure 3: Equilibrium.

The nature of the equilibrium is illustrated in Figure 3, which also provides insights into the efficiency consequences. Focusing on the case  $\mu = 0$  to abstract from standard signaling distortions in Senders' acceptance decisions at the final stage, let us evaluate outcomes relative to the natural *full-information benchmark*.<sup>30</sup> From this “gains from trade” point of view, the higher shaded region is where help should be provided ( $S$  is willing to alleviate  $R$ 's need) but it is not ( $S$  does not offer, and  $R$  does not ask). The lower shaded region, in contrast, is where help should not be provided, but it is:  $S$  has offered unconditional assistance and is bound to deliver it, even though  $R$ 's realized need is not one that she would have found worth alleviating, had she known what it was. The other regions are those where help is delivered if and only if doing so is “appropriate”: when  $R$ 's level of need is such that  $S$  is willing to help, she does end up doing so, through either an unconditional pledge or after the need is revealed by an ask. Conversely, there is no help at levels of need where  $S$  would not want to help: either  $R$  does not ask, or

<sup>29</sup>Note that the statement pertains to the equilibrium path; for  $w < w^*$ , accepting such a (deviating) ask could reveal even higher types of  $g$ . Indeed, those choosing  $o = 1$  only commit to  $h = 1$  given facing the ex-ante distribution of  $w$ 's (equivalently, given risk-neutrality, they are willing to help at  $\bar{w}$ ).

<sup>30</sup>As usual, when  $\mu > 0$  image concerns induce excessive helping (granting asks and possibly offering unconditionally) for social or self-signaling purposes.

he does but  $S$  turns him down.<sup>31</sup>

The second proposition gathers the results on how the Sender's prior affects important aspects of the equilibrium.

**Proposition 2 (Sender's prior beliefs)**

1. *If the Sender's initial prior about the Receiver's need is common knowledge, offering leads to a higher final reputation than any that can be achieved after not offering ( $\bar{g}_O \geq M^+(\hat{g}(w))$ , for all  $w \geq w^*$ ).*
2. *When the Sender's belief about the Receiver's need privately rises (in the sense of FOSD), she can become more likely to offer help, or less likely, depending on where from, and where to, probability mass over  $w$  is redistributed upward.*

From here on, we will focus on the case where the Sender's prior is common knowledge, and drop the subscript  $\sigma$ . The tradeoffs faced by  $R$  in choosing  $w^*$  and by  $S$  in choosing  $\tilde{g}$  are easily visualized by the changing area of each region in Figure 3, as either other cutoff is increased or decreased. Of course, in equilibrium  $(\tilde{g}, w^*)$  and the acceptance function  $\hat{g}(w)$  are co-determined, as solutions to the system:

$$c = w\hat{g}(w) + \mu [M_N^+(\hat{g}(w)) - M_N^-(\hat{g}(w))], \quad (17)$$

$$w^* = \lambda\alpha [M_N^+(\hat{g}(w^*)) - M^-(\tilde{g})], \quad (18)$$

$$0 = \int_{w^*}^{\tilde{g}} \mu [M^+(\tilde{g}) - M_N^+(\hat{g}(w))] dQ(w) + \int_{w^*}^{\tilde{g}} [\tilde{g}w - c + \mu (M^+ - M^-)(\tilde{g})] dQ(w), \quad (19)$$

in which the second equation requires that  $\hat{g}(w^*) \geq \tilde{g}$ . Moreover, the function  $M_N^+$  itself (but not  $M_N^-$ ) depends on the offering cutoff  $\tilde{g}$ :

$$M_N^+(g) = \frac{\int_g^{\tilde{g}} g' dP(g')}{P(\tilde{g}) - P(g)}, \quad M_N^-(g) = \frac{\int^g g' dP(g')}{P(g)}, \quad \text{for all } g < \tilde{g}. \quad (20)$$

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<sup>31</sup>Other efficiency criteria can also be considered, as in Section 3, though none is unambiguously “the right one” in this context. Computing ex-ante aggregate utility, for instance, would “double count” the help provided as  $(1+g)w$ , and conversely positively value the extent to which the Receiver's not asking protects him from learning information that he fears. Reputational payoffs, on the other hand, are a zero-sum game, given linearity.

This system is quite complex, leaving two possible routes to analyze the existence, uniqueness and comparative statics of equilibrium. One is that of numerical solutions. The other, which we pursue, is that of analytical results, by: (i) using specific distributional assumptions, detailed in the next section; (ii) focusing on the case where the Sender has no or only weak reputational concerns ( $\mu \approx 0$ ), so that  $\hat{w}(w)$  simply equals (or is close to)  $c/w$ , which is independent of  $\tilde{g}$ . Furthermore, condition (19) then simplifies to  $\tilde{g} = c/E[w|w < w^*] \equiv c/N^-(w^*) > c/w^*$ , ensuring an interior  $\hat{w}(\tilde{g}) < w^*$ , and (18)-(19) then become:

$$w^* = \lambda\alpha \{E[g|c/w^* < g < c/N^-(w^*)] - E[g|g < c/N^-(w^*)]\}. \quad (21)$$

**Proposition 3 (Sender with no reputational concern)** *Let  $\mu = 0$ . An interior equilibrium corresponds to an asking threshold  $w^*$  that solves equation (21). Senders with  $g \geq \tilde{g} \equiv c/N^-(w^*)$  offer unconditional help. Those with  $c/w^* \leq g < c/N^-(w^*)$  wait for an ask, which the Receiver will make only when his need exceeds  $w^*$ , and which they will accept if  $g > c/w = \hat{w}(w)$ .*

## 4.5 Uniqueness and Comparative Statics

To go further, let Senders' generosity be uniformly distributed on  $[0, g^{\max}]$ . The prior density is then  $p(g) = 1/g^{\max}$ , the truncation moments are  $M^+(g) = (g + g^{\max})/2$  and  $M^-(g) = g/2$ , and the net reputational return a constant,  $\Delta(g) = g^{\max}/2$ . Similarly, following the absence of an offer, which reveals that  $g \in [0, \tilde{g}]$ , the interim density on that support is  $p_N(g) = 1/\tilde{g}$ , the moments are  $M_N^+(g) = (\tilde{g} + g)/2$  and  $M_N^-(g) = g/2$ , and the reputational return  $\Delta_N(g) = \tilde{g}/2$ . The resulting equilibrium equations are given by (A.31)-(A.32)-(A.33) in the appendix.

We solve first the simpler case where the Sender has no reputational concerns.

**Proposition 4** *Let Senders' generosity types be uniformly distributed on  $[0, g^{\max}]$ , and  $\mu = 0$ . Then:*

1. *There is a unique equilibrium, with Sender's acceptance threshold  $\hat{w}(g) = c/g$ , Receiver's asking threshold  $w^* = \sqrt{\lambda\alpha c}/2$ , and Sender's offering threshold  $\tilde{g} = c/E[w|w < w^*]$ .*

2. Thus,  $w^*$  is increasing, and  $\tilde{g}$  decreasing, in  $\lambda\alpha$ . Both  $\hat{w}(\cdot)$  and  $w^*$  are increasing in  $c$ , and so is  $\tilde{g}$  if and only if the distribution of  $w$  is such that  $w^2/E[w'|w' < w]$  is increasing in  $w$ .

Note that offers occur with positive probability if and only if  $\tilde{g} < g^{\max}$ . In this case, it must be that failures to ask also occur with positive probability, as  $w^* > N^-(w^*) = \hat{w}(\tilde{g}) > \hat{w}(g^{\max})$ . Intuitively, absent reputation concerns, potential failures to ask are the only motives for Senders to offer. When there are never any offers ( $\tilde{g} \geq g^{\max}$ ), asks will occur with positive probability if  $\hat{w}(g^{\max}) < w^{\max}$ , and both parties will remain silent throughout otherwise.

We next extend the results of Proposition 4 in three directions.

1. *How the cost of helping affects offering behavior.* Intuition would seem to suggest that, as helping becomes more costly, fewer Senders offer unconditionally, rather than waiting for an ask that they can choose to grant or decline. It can also happen, however, that higher costs lead to *more offering* —yet another surprising result. Expanding on Part 2 of Proposition 4, we thus show:

**Corollary 1** 1. If needs are distributed as  $Q(w) = (1 + \gamma)(w/w^{\max})^\gamma$  on  $[0, w^{\max}]$  with  $\gamma > -1$ , then  $\tilde{g} = \left(\frac{2+\gamma}{1+\gamma}\right) \sqrt{\frac{2c}{\lambda\alpha}}$ , which is always increasing in  $c$ .

2. In contrast, if  $Q(w) = \left(\left[1 - (w^{\max}/w^{\min})^{\theta-1}\right] / \left[1 - (w/w^{\min})^{\theta-1}\right]\right)^{\frac{\theta}{\theta-1}}$  on  $[w^{\min}, w^{\max}]$  with  $w^{\min} > 0$ , then  $\tilde{g} = (w^{\min})^{\theta-1}(\lambda\alpha)^{-\theta/2}c^{1-\theta/2}$ , which is decreasing in  $c$  when  $\theta > 2$ .

In the latter case, *the higher the cost of helping, the more Senders offer* unconditionally, even though when faced with *any* ask  $w > w^*$  that the Receiver would dare to make, more Senders would now refuse ( $\hat{g}(w)$  increases). The explanation for this “paradox” is that, because of the latter effect, the Receiver becomes too afraid to ask ( $w^*$  increases) in the eyes of some of moderately generous Senders (just above the original  $\tilde{g}$ ), who then become willing to offer, for fear of leaving too many needs unmet.

2. *Helping costs that depend on the extent of the need.* Alleviating greater needs often entails higher costs; as long as this rise is less than one-for-one, our main results easily extend. Thus, let the cost function be  $cw^{1-\chi}$ ,  $\chi > 0$ . Replacing  $c$  by  $cw^{1-\chi}$  in the formulas of Proposition 4 and solving, we show:

**Corollary 2** *Let the cost of alleviating a need  $w$  be  $cw^{1-\chi}$ , and let needs be distributed as  $Q(w) = (1 + \gamma)(w/w^{\max})^\gamma$  on  $[0, w^{\max}]$ , with  $\chi > 0$  and  $\gamma > -1$ . There is a unique equilibrium with acceptance, asking and offering thresholds given by*

$$\hat{w}(g) = \left(\frac{c}{g}\right)^{\frac{1}{\chi}}, \quad w^* = \left(\frac{\lambda\alpha c}{2}\right)^{\frac{1}{1+\chi}}, \quad \tilde{g} = \left(\frac{2 + \gamma}{2 - \chi + \gamma}\right) \left(\frac{\lambda\alpha}{2}\right)^{-\frac{\chi}{1+\chi}} c^{\frac{1}{1+\chi}}. \quad (22)$$

Thus, the faster costs rise with the extent of need (smaller  $\chi$ ), the more *responsive* are the offering, asking and acceptance thresholds to changes in the baseline cost  $c$ , the Sender's generosity  $g$ , and the Receiver's rejection sensitivity  $\lambda\alpha$ .

3. *Sender's reputational concerns.* When  $\mu > 0$ , the system (A.31)-(A.32)-(A.33) remains complicated even with uniform  $P(g)$ . With simple distributional assumptions on  $w$  as well, however, we can obtain results for positive but relatively small values of  $\mu$ , including how variations in this image concern affect equilibrium behavior.

**Proposition 5** *Let  $P(g)$  be uniform on  $[0, g^{\max}]$  and  $Q(w) = w^2$  on  $[0, 1]$ . Then, there exists  $\bar{\mu} > 0$  such that, for all  $\mu < \bar{\mu}$ , Proposition 4 remains unchanged, except that the equalities in Part (1) are now approximations. The comparative-statics monotonicities in Part (2) continue to hold, and furthermore:*

1. *The more important reputation is to the Sender, the more asks she accepts, and therefore the less hesitant the Receiver is to ask:  $\partial\hat{w}(\cdot)/\partial\mu < 0$  and  $\partial w^*/\partial\mu < 0$ .*
2. *Starting from  $\mu = 0$ , a marginal increase in the Sender's image concerns leaves her propensity to offer unchanged:  $\partial\tilde{g}^*/\partial\mu|_{\mu=0} = 0$ .*

The last result reflects two effects that offset each other, at the first order. As  $\mu$  becomes positive, so does the Sender's reputation-seeking incentive to offer; on the other hand, she anticipates less ask-shyness by the Receiver (who knows that more asks will be granted, due to reputational pressure), and thus becomes less concerned about unmet needs.

## 5 Conclusion

Opportunities for helping are ubiquitous, spanning domains that range from personal relationships to education, health, money, and the workplace. Despite their pervasive-

ness, these situations are often fraught with uncertainty over whether to ask or not, to offer or not, and who should take the first step. By studying the dynamics of actors' strategies and beliefs in resolving this uncertainty, our model helps shed light on the determinants of behavior in these economically and personally important interactions, the resulting inefficiencies, and how they might be ameliorated.

Our framework is quite flexible, and could be extended in a number of directions. First, other aspects of the relationship may be subject to uncertainty, or heterogeneous priors. For instance, if the Receiver has incorrect beliefs  $P(g)$  about the Sender's valuation of him, she will misperceive the likelihood that an ask would be granted (with pessimism acting like a more concave utility); and, more interestingly, misinterpret the meaning of not having received an offer. Alternatively, the Sender may underestimate the Receiver's rejection sensitivity  $\lambda\alpha$ , and as a result not only cause unexpected upset by declining requests, but also be less likely to offer, since she does not properly anticipate the fear of asking. Both mechanisms would tend to make the inefficient "waiting trap" equilibrium even more likely.

When a Receiver's rejection sensitivity level is not common knowledge, as is likely in practice, the Receiver may also try to convince the Sender that he would be devastated, "crushed" (child, partner) or deeply insulted (bargaining situation) by experiencing rejection. This may happen when the Sender internalizes the Receivers' feelings, or when the interaction is public and the Sender has strong reputational concerns. But even absent these factors, signaling rejection sensitivity communicates a fear of asking, which in turn can prompt the Sender to offer help from the outset.

Second, there are interesting sorting and selection issues: what is the optimal group of friends, partners, etc., which a person would seek as potential sources of help—and within it, whom would they ask for different levels or types of needs? In particular, a group or individual with a "safer" prior distribution of caring types  $P(g)$  may sometimes be preferable to one with greater generosity on average but also higher variance, or one from whom experiencing rejection would be especially painful (higher  $\lambda\alpha$ ), such as close relatives. On the other hand, while such matching can facilitate asking, it would reduce the likelihood of offering (directly if Senders are less generous, and always because of more asking itself).

A third application concerns the increasingly common use of intermediaries and platforms to convey both personal requests and responses to them: crowdfunding platforms,

social media campaigns to find an organ donor, dating websites and the like.<sup>32</sup> Besides reducing transactions costs, these should also be understood as “behavioral information design” devices that facilitate big asks (in contexts in which ex-ante pledges are typically not feasible), by injecting noise into the reasons why the request may fail, and thus dampening the resulting hurt.

At a broader level, the idea that people constantly reassess, from the manner in which others treat them, their own *place in the world*, and that these feelings of worth or worthlessness in turn drive both sides’ behaviors, remains a rich topic for further research.

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<sup>32</sup>On looking for an organ donor, see [National Kidney Foundation](#) or [American Transplant Foundation](#).

## 6 Appendix

### 6.1 Non-monotonic ask equilibrium

Let  $\mu$  again be small and  $\min\{g_M w_H, g_H w_L\} > c > g_M w_L$ , which ensures that the last two conditions hold. The other two take the form

$$(p_H + p_M) [w_H + u(M^+(g_M))] + p_L u(g_L) < u(\bar{g}) < p_H [w_L + u(g_H)] + (p_M + p_L) u(M^-(g_H)). \quad (\text{A.1})$$

To ensure the second inequality, let  $w_L$  be such that  $p_H w_L > u(\bar{g}) - [p_H u(g_H) + (p_M + p_L) u(M^-(g_H))]$ ; the right-hand side is a positive quantity by concavity of  $u$ , but  $w_L$  can always be taken to be large enough. Finally, if  $u(g_L)$  is low enough (possibly even equal to  $-\infty$ ), the first inequality clearly holds. With an initial offering stage, finally, even the Sender type  $g_H$  will choose  $o = 0$  if

$$\begin{aligned} g_H \bar{w} - c + \mu g_H &< q_L [g_H w_L - c + \mu g_H] + (1 - q_L) \mu \bar{g} \iff \\ g_H (q_H w_H + q_\varepsilon \varepsilon) &< c (q_H + q_\varepsilon) - \mu [g_H - q_L g_H - (1 - q_L) \bar{g}], \end{aligned}$$

which is the case if, for instance,  $q_\varepsilon/q_H$  is large enough and  $\mu$  relatively small. ■

### 6.2 Discouragement effect

#### 6.2.1 Discouragement induces failure to ask at moderate need

**1. Basic result.** We find here the conditions such that Sender  $g_H$  but not  $g_M$  offers and, following no offer, Receiver  $w_H$  but not  $w_L$  asks, with only  $g_L$  refusing to help in either case. First, at the granting stage, after  $R$  has asked, we must have:  $h_M(w_L) = 1$  and  $h_L(w_H) = 0$ , i.e.:

$$g_M w_L + \mu [g_M - g_L] > c > g_L w_H + \mu [g_M - g_L].$$

With  $\mu = 0$ , this simplifies to  $g_M w_L > c > g_L w_H$ . Second, at the asking stage, given that  $S$  did not offer help and (in equilibrium)  $g_H$  is expected to, we must have:

$$a(w_L) = 0 \iff p_M^N (w_L + u(g_M)) + p_L^N u(g_L) < u(\bar{g}_N), \quad (\text{A.2})$$

$$a(w_H) = 1 \iff p_M^N (w_H + u(g_M)) + p_L^N u(g_L) > u(\bar{g}_N), \quad (\text{A.3})$$



where  $p_M^N = p_M/(1 - p_H) = 1 - p_L^N$  and  $\bar{g}_N = M^-(g_H)$ . These conditions reduce to:

$$p_M^N(w_L + u(g_M)) + p_L^N u(g_L) < u(\bar{g}_N) < p_M^N(w_H + u(g_M)) + p_L^N u(g_L). \quad (\text{A.4})$$

Finally, at the initial offering stage, we must have  $o(g_H) = 1, o(g_M) = 0$ , or:

$$\begin{aligned} g_H \bar{w} - c + \mu g_H &> q_H(g_H w_H - c + \mu g_M) + (1 - q_H)\mu \bar{g}_N \\ g_M \bar{w} - c + \mu g_H &< q_H(g_M w_H - c + \mu g_M) + (1 - q_H)\mu \bar{g}_N, \end{aligned}$$

since offering reveals that  $g = g_H$ , whereas not offering leads to an ask only at  $w_H$ , which if accepted reveals that  $g = g_M$ . The two conditions can be rewritten as:

$$g_M(\bar{w} - q_H w_H) < c(1 - q_H) + \mu[q_H g_M + (1 - q_H)\bar{g}_N - g_H] < g_H(\bar{w} - q_H w_H). \quad (\text{A.5})$$

With  $\mu = 0$ , this simplifies to:

$$\begin{aligned} g_M(\bar{w} - q_H w_H) &< c(1 - q_H) < g_H(\bar{w} - q_H w_H) \iff \\ g_M \left( \frac{q_L w_L + q_\varepsilon \varepsilon}{1 - q_H} \right) &< c < g_H \left( \frac{q_L w_L + q_\varepsilon \varepsilon}{1 - q_H} \right). \end{aligned} \quad (\text{A.6})$$

**2. Commitment to no offer.** If  $g_H$  were unable to offer (constraint, commitment), or more generally not expected to ask (possible alternative equilibrium), there would be no failure to ask, provided that

$$\tilde{a}_L(w_L) = 1 \iff (p_H + p_M)(w_L + u(M^+(g_M))) + p_L u(g_L) > u(\bar{g}), \quad (\text{A.7})$$

which then implies that  $a_L(w_H) = 1$  as well. The full set of conditions for discouragement to preclude asking at  $w_L$  is therefore  $g_M w_L > c > g_L w_H$ , (A.4), (A.5), and (A.7).

**3. The waiting trap.** If  $g_H$  is able to offer but not expected to (alternative equilibrium), there will be no failure to ask, and even Sender indeed  $g_H$  does not offer,  $\tilde{o}(g_H) = 0$ , if

$$g_H \bar{w} - c + \mu g_H < q_H(g_H w_H - c) + q_L(g_H w_L - c) + \mu M_N^+(g_M).$$

With  $\mu = 0$ , this simplifies to

$g_H \bar{w} - g_H (q_H w_H + q_L w_L) < c(1 - q_H - q_L)$ , or finally

$$g_H q_\varepsilon \varepsilon < c q_\varepsilon \iff g_H \varepsilon < c \quad (\text{A.8})$$

Putting everything together, for  $\mu = 0$  we have equilibrium multiplicity in  $(o(g_H) = 1, a(w_L) = 0)$  versus  $(\tilde{o}(g_H) = 0, \tilde{a}(w_L) = 1)$  if and only if

$$g_M w_L > c > \max \{g_L w_H, g_H \varepsilon\}, \quad (\text{A.9})$$

$$g_M \left( \frac{q_L w_L + q_\varepsilon \varepsilon}{1 - q_H} \right) < c < g_H \left( \frac{q_L w_L + q_\varepsilon \varepsilon}{1 - q_H} \right), \quad (\text{A.10})$$

$$\begin{aligned} p_M^N (w_L + u(g_M)) + p_L^N u(g_L) &< u(\bar{g}_N) \\ &< p_M^N (w_H + u(g_M)) + p_L^N u(g_L), \end{aligned} \quad (\text{A.11})$$

$$(p_H + p_M)(w_L + u(M^+(g_M))) + p_L u(g_L) > u(\bar{g}), \quad (\text{A.12})$$

Simplifying with  $g_L = 0$  from here on, the first two conditions (for Senders) become

$$\max \left( g_H \varepsilon, g_M \left( \frac{q_L w_L + q_\varepsilon \varepsilon}{1 - q_H} \right) \right) < c < \max \left( g_M w_L, g_H \left( \frac{q_L w_L + q_\varepsilon \varepsilon}{1 - q_H} \right) \right) \quad (\text{A.13})$$

These define, for any  $(w_L, w_H)$  and other relevant parameters, a nonempty interval for  $c$  if and only if

$$g_H \varepsilon < g_M w_L, \quad (\text{A.14})$$

which holds provided  $\varepsilon$  is small enough. Turning now to the two Receiver conditions, and using the abbreviated notation

$$u_M^+ \equiv u(M^+(g_M)) = u \left( \frac{p_H g_H + p_M g_M}{p_H + p_M} \right), \quad \bar{u}_N \equiv u(M^-(g_H)) = u \left( \frac{p_M g_M + p_L g_L}{p_M + p_L} \right),$$

conditions (A.11)-(A.12) take the form

$$\begin{aligned} p_M (w_L + u_M) + p_L u_L &< (1 - p_H) \bar{u}_N < p_M (w_H + u_M) + p_L u_L, \\ (p_H + p_M)(w_L + u_M^+) + p_L u_L &> \bar{u}, \end{aligned}$$

With  $w_H$  large enough, the second inequality in the first condition always holds, and we are left with

$$p_M w_L < (1 - p_H) \bar{u}_N - p_M u_M - p_L u_L, \quad (\text{A.15})$$

$$(p_H + p_M) w_L > \bar{u} - (p_H + p_M) u_M^+ - p_L u_L, \quad (\text{A.16})$$

which defines a nonempty interval for  $w_L$  if and only if

$$\frac{\bar{u} - (p_H + p_M) u_M^+ - p_L u_L}{p_H + p_M} < \frac{(1 - p_H) \bar{u}_N - p_M u_M - p_L u_L}{p_M}.$$

This can be rewritten as:

$$\left( \frac{p_L}{p_M} - \frac{p_L}{p_H + p_M} \right) (-u_L) > \frac{\bar{u} - (p_H + p_M) u_M^+}{p_H + p_M} - \frac{(1 - p_H) \bar{u}_N - p_M u_M}{p_M}. \quad (\text{A.17})$$

As  $u_L$  becomes low enough, ensured for instance by  $g_L$  small and  $u(g) = \ln g$ ,

$$\bar{u}_N = u \left( \frac{p_M g_M}{p_M + p_L} \right) = u \left( \frac{p_M g_M}{1 - p_H} \right)$$

remains finite provided  $p_M g_M$  is bounded away from zero. Inequality (A.17) then holds, defining a nonempty interval of  $w_L$  (with values that become large together with  $-u_L$ ), and for each of them an appropriate interval of  $c$  that, together with a  $w_H$  large enough, ensure all the desired conditions for an equilibrium with discouragement effect.

Turning now to the additional requirement ensuring that removing offer possibilities restores asking at  $w_L$ , (A.7) can be rewritten similarly as

$$(p_H + p_M) w_L > \bar{u} - (p_H + p_M) u_M^+ - p_L u_L, \quad (\text{A.18})$$

which is the same as (A.16). Combining with (A.15),  $w_L$  must be such that

$$\frac{1}{p_H + p_M} (\bar{u} - (p_H + p_M) u_M^+ - p_L u_L) < w_L < \frac{p_M + p_L}{p_M} \left( \bar{u}_N - \frac{p_M u_M + p_L u_L}{p_M + p_L} \right), \quad (\text{A.19})$$

where the lower bound makes the  $w_L$  Receiver unwilling to ask when he has learned from the absence of an offer that  $g < g_H$ , and the upper one make him willing to ask when he has learned nothing. For this condition to define a nonempty interval for  $w_L$ , it must be that the term on the right is indeed larger than that on the left. Letting as before  $u_L \rightarrow -\infty$  (for instance,  $g_L \rightarrow 0$  and  $u(g) = \ln(g)$ ) while keeping  $u(p_M g_M)$  bounded away from zero so that  $\lim_{g_L \rightarrow 0} \bar{u}$  is positive and finite, both sides of (A.19) tend to  $+\infty$ ,

but their ratio has the finite limit

$$\frac{p_L}{p_M} \frac{p_H + p_M}{p_L} = \frac{p_H + p_M}{p_M} > 1, \quad (\text{A.20})$$

so the interval between them is indeed nonempty (and, in fact, arbitrary large). This inequality reflects, intuitively and precisely, the better odds of avoiding the large loss  $u_L$  (from having an ask turned down) when the Sender can still be  $g_H$  in spite of there having been no offer. The required range for  $w_L$  is therefore nonempty for  $-u_L$  large enough.

Note, finally, that the waiting-trap equilibrium (Table 4a) risk can easily dominate the always-ask, no-offer equilibrium (Table 4b) for player types  $(g_H, w_L)$ , which are the only two whose behavior differs between the two. This occurs if

$$\begin{aligned} & \left[ \bar{u}_N - \frac{p_M}{p_M + p_L} w_L - \frac{p_M}{p_M + p_L} u_M - \frac{p_L}{p_M + p_L} u_L \right] [q_L(g_H w_L - c) + q_\varepsilon(g_H \varepsilon - c)] \\ & > [(p_H + p_M)u_M^+ + p_L u_L + (p_H + p_M)w_L - \bar{u}] [-q_\varepsilon(g_H \varepsilon - c)]. \end{aligned} \quad (\text{A.21})$$

The first product multiplies the payoff deviations to each of these two types from playing their strategy of Table 4b when the opponent is playing that of Table 4a, the second one does the reverse.

To verify that (A.21) indeed corresponds to these products, suppose the type  $w_L$  Receiver deviates from the strategy in Table 4a to that in 4b, while the Sender (of each type) sticks to 4a. Since type  $g_H$  is already ruled out after not receiving an offer, the expected difference in  $R$ 's payoffs is:

$$\begin{aligned} L_R & \equiv \frac{p_M}{p_M + p_L} [(w_L + u_M) - \bar{u}_N] + \frac{p_L}{p_M + p_L} (u_L - \bar{u}_N) \\ & = \frac{p_M}{p_M + p_L} w_L + \frac{p_M}{p_M + p_L} u_M + p_L u_L - \bar{u}_N < 0 \end{aligned}$$

(by (A.4)), which gives the first bracket in the first line of (A.21). Conversely, suppose type  $w_L$  Receiver deviates from the strategy in Table 4b to that in 4a, while all Senders stick to 4b. The expected difference in  $R$ 's payoffs is now:

$$\begin{aligned} L'_R & \equiv p_H [\bar{u} - (w_L + u_M^+)] + p_M [\bar{u} - (w_L + u_M^+)] + p_L (\bar{u} - u_L) \\ & = \bar{u} - (p_H + p_M)u_M^+ - p_L u_L - (p_H + p_M)w_L < 0 \end{aligned}$$

(by (A.16)), which gives the second bracket in the first line of (A.21).

Next, suppose type  $g_H$  Sender deviates from the strategy in Table 4a to that in 4b, while the Receiver sticks to 4a. The expected difference in  $S$ 's payoffs is

$$\begin{aligned} L_S &\equiv q_H[(g_H w_H - c) - (g_H w_H - c)] + q_L(-g_H w_L + c) + q_\varepsilon(-g_H \varepsilon + c) \\ &= -q_L(g_H w_L - c) - q_\varepsilon(g_H \varepsilon - c) < 0 \end{aligned}$$

(by (A.6) with small  $\varepsilon$ ). Conversely, suppose type  $g_H$  Sender deviates from the strategy in Table 4b to that in 4a, while the Receiver sticks to 4b. The expected difference in  $S$ 's payoffs is

$$\begin{aligned} L'_S &\equiv q_H[((g_H w_H - c) - (g_H w_H - c))] + q_L[(g_H w_L - c) - (g_H w_L - c)] \\ &\quad + q_\varepsilon[(g_H \varepsilon - c) - 0] = q_\varepsilon(g_H \varepsilon - c) < 0. \end{aligned}$$

We now compare deviations pairwise. On the Sender side,  $|L_S| > |L'_S|$  if and only if

$$q_\varepsilon(g_H \varepsilon - c) + q_L(g_H w_L - c) > -q_\varepsilon(g_H \varepsilon - c),$$

which holds given that (A.13) implies that  $g_H \varepsilon < c < g_H w_L$ .

On the Receiver side, note that  $|L'_R|$  is the difference between the left- and right-hand sides of (A.16), which when set to zero defines the lower bound of the admissible interval for  $w_L$  shown to be nonempty in (A.17). Similarly,  $|L_R|$  is the difference between the right- and left-hand sides of (A.15), which when set to zero defines the upper bound of that interval. It thus suffices to pick, for each value of  $u_L$  (and the other parameters),  $w_L$  slightly above the lower bound of the interval, meaning that  $|L'_R| \approx 0 < |L_R|$ , hence the result. ■

### 6.2.2 Discouragement induces failure to ask at high need

Can not receiving an offer deter the Receiver from asking at high need  $w_H$ , but not at  $w_L$ ? This combination of discouragement and non-monotonic asking does not arise with three Sender types, but is easily obtained by splitting the intermediate  $g_M$  into nearby “middle-high” and “middle-low” types, respectively denoted  $g_{\bar{M}}$  and  $g_{\underline{M}}$ . This equilibrium is depicted in Table 3c, and constructed very similarly to that of Table 3a.

Intuitively, asking at  $w_L$  is now justified because there remains the hope that the

Sender is of type  $g_{\bar{M}}$ , who will accept, and even if she refuses she could still not be the worst possible type  $g_L$ , but instead  $g_{\underline{M}}$ . Asking at need  $w_H$  entails much higher informational stakes, however, because a refusal reveals  $g_L$  for sure. A Receiver who is sufficiently averse to this worst-case scenario ( $u(g_L)$  low enough) will therefore refrain from asking at  $w_H$ , even though two of the three remaining Sender types would accept such an important request.<sup>33</sup>

$a \backslash o$	$o$	$\varepsilon$	$w_L$	$w_H$
$a$	-	0	1	0
$g_L$	0	0	0	0
$g_{\underline{M}}$	0	0	0	1
$g_{\bar{M}}$	0	0	1	1
$g_H$	1	0	1	1

Table 3c: Discouragement Effect Prevents Asking at High Need

We now derive sufficient conditions for the coexistence of the equilibrium in Table 3c with another equilibrium where: (i) offers by  $S$  are either infeasible, or not expected;  $R$  asks for help whenever she has a real need.

1. The strategies in Table 3c constitute an equilibrium (with non-monotonic asking) if the following hold. First, at the granting stage, after  $R$  has asked, it must be that:

$$\begin{aligned}
 g_{\bar{M}}w_L - c + \mu M_N^+(g_{\underline{M}}) &> \mu g_L, \\
 g_{\underline{M}}w_H - c + \mu M_N^+(g_{\underline{M}}) &> \mu g_L, \\
 g_{\underline{M}}w_L - c + \mu g_{\bar{M}} &< \mu M^-(g_{\bar{M}}).
 \end{aligned}$$

For  $\mu \approx 0$ , this reduces to:

$$g_{\underline{M}}w_H > c > g_{\underline{M}}w_L. \tag{A.22}$$

Next, normalize  $g_L = 0$ , as before. At the asking stage, given that  $S$  did not offer, we

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<sup>33</sup>Here again, absent the offer stage, the Receiver may (for appropriate parameters) have felt sufficiently confident to ask. Note also that with a convex-concave (S-shaped)  $u(\cdot)$ , not receiving an offer can lead to a reverse “encouragement” to ask and force resolution (a form of gambling for resurrection).

must have

$$p_M^N[w_L + u(g_M)] + (p_M^N + p_L^N)u(M_N^-(g_M)) > u(\bar{g}_N), \quad (\text{A.23})$$

$$(p_M^N + p_M^N)[w_H + u(M_N^+(g_M))] + p_L^N u(g_L) < u(\bar{g}_N), \quad (\text{A.24})$$

which can be satisfied by picking  $w_L$  sufficiently high and sending  $u(g_L) \rightarrow -\infty$  (e.g. with log-utility), while keeping  $g_M > 0$  so that  $u(M_N^-(g_M)) = u\left(\frac{p_M g_M + p_L g_L}{p_M + p_L}\right) = u\left(\frac{p_M g_M}{p_M + p_L}\right)$  remains finite. Finally, at the initial offering stage, we require

$$\begin{aligned} g_H \bar{w} - c + \mu g_H &> q_L(g_H w_L - c + \mu g_M) + (1 - q_L)\mu \bar{g}_N, \\ g_M \bar{w} - c + \mu g_H &< q_L(g_M w_L - c + \mu g_M) + (1 - q_L)\mu \bar{g}_N, \\ g_M \bar{w} - c + \mu g_H &< q_L \mu M_N^-(g_M) + (1 - q_L)\mu \bar{g}_N. \end{aligned}$$

For  $\mu \approx 0$ , these conditions reduce to

$$\frac{g_H(\bar{w} - q_L w_L)}{1 - q_L} > c > \frac{g_M(\bar{w} - q_L w_L)}{1 - q_L}, \quad (\text{A.25})$$

$$c > g_M \bar{w}. \quad (\text{A.26})$$

Note that if (A.25) holds, so does (A.26), since  $\bar{w} < \frac{\bar{w} - q_L w_L}{1 - q_L}$ . To ensure that (A.25) is compatible with (A.22, i.e.

$$\left(\frac{g_M(\bar{w} - q_L w_L)}{1 - q_L}, \frac{g_H(\bar{w} - q_L w_L)}{1 - q_L}\right) \cap (g_M w_L, g_M w_H) \neq \emptyset$$

it is thus necessary and sufficient that

$$g_M w_H > \frac{g_M(\bar{w} - q_L w_L)}{1 - q_L} = g_M \frac{q_H w_H + q_\varepsilon \varepsilon}{q_H + q_\varepsilon}, \quad (\text{A.27})$$

which holds strictly for  $g_M = g_M$ , hence for some interval of values where  $g_M > g_M$ .

**2.** When offers are infeasible (or not expected), asking will occur provided:

$$(p_M + p_H)[w_L + u(M^+(g_M))] + (p_M + p_L)u(M^-(g_M)) > u(\bar{g}), \quad (\text{A.28})$$

$$(1 - p_L)[w_H + u(M^+(g_M))] + p_L u(g_L) > u(\bar{g}). \quad (\text{A.29})$$

(A.28) can be satisfied by  $w_L$  sufficiently large, which coincides with the assumption made for satisfying (A.23). Let us verify that (A.29) is then compatible with the other condition corresponding to Table 3c, specifically (A.24). This means that

$$\begin{aligned} (1 - p_L)[w_H + u(M^+(g_M))] + p_L u(g_L) &> u(\bar{g}) \\ (p_M^N + p_M^N)[w_H + u(M_N^+(g_M))] + p_L^N u(g_L) &< u(\bar{g}_N). \end{aligned}$$

These inequalities define a non-empty interval of  $w_H$  values if

$$\begin{aligned} \frac{u(\bar{g}_N)}{p_M^N + p_M^N} - u(M_N^+(g_M)) - \frac{p_L^N}{p_M^N + p_M^N} u(g_L) &> \frac{u(\bar{g})}{1 - p_L} - u(M^+(g_M)) - \frac{p_L}{1 - p_L} u(g_L) \\ \iff \left( \frac{p_L}{1 - p_L} - \frac{p_L^N}{p_M^N + p_M^N} \right) u(g_L) &> \frac{u(\bar{g})}{1 - p_L} + u(M_N^+(g_M)) \\ &- u(M^+(g_M)) - \frac{u(\bar{g}_N)}{p_M^N + p_M^N}. \end{aligned} \quad (\text{A.30})$$

where the right-hand and left-hand sides in the first equation are always positive since  $u(\cdot)$  is concave. As  $u(g_L) \rightarrow -\infty$ , both go to  $+\infty$ , but since  $\frac{p_L}{1 - p_L} < \frac{p_L^N}{p_M^N + p_M^N}$ , equation (A.30), in which the right-hand side remains bounded, shows that the required inequality indeed holds.

Finally, since the lower bound of the interval defined just above (A.30) goes to  $+\infty$  as  $u(g_L) \rightarrow -\infty$ ,  $w_H$  also becomes arbitrarily large. Thus, although we assumed in (A.23) that  $w_L$  was ‘‘sufficiently large’’,  $w_H > w_L$  can still be ensured. ■

### 6.3 Asking decision when the reference point is prior mean $\bar{g}$

In this case, corresponding to (5), we have:

$$\begin{aligned} A(w) &= [1 - P_N(\hat{g}(w))] [w + \alpha (M_N^+(\hat{g}(w)) - \bar{g}_N + (\bar{g}_N - \bar{g}))] \\ &+ P_N(\hat{g}(w))(1 + \lambda)\alpha [M_N^-(\hat{g}(w)) - \bar{g}_N + (\bar{g}_N - \bar{g})] \\ &= [1 - P_N(\hat{g}(w))][w - \lambda\alpha P_N(\hat{g}(w))][\bar{g}_N - M_N^-(\hat{g}(w))] + \alpha(\bar{g}_N - \bar{g})[1 + \lambda P_N(\hat{g}(w))], \end{aligned}$$

or, finally

$$A(w) = [1 - P_N(\hat{g}(w))] [w - \lambda\alpha (M_N^+(\hat{g}(w)) - \bar{g}_N)] + \alpha(\bar{g}_N - \bar{g})[1 + \lambda P_N(\hat{g}(w))],$$



where we used again Bayes's rule. Therefore,  $a(w) = 1$  if and only if

$$w \geq \lambda\alpha (M_N^+(\hat{g}(w)) - \bar{g}_N) + \frac{\alpha(\bar{g} - \bar{g}_N)[1 + \lambda P_N(\hat{g}(w))]}{1 - P_N(\hat{g}(w))}.$$

Because the new, second term (relative to (6)) is also increasing in  $\hat{g}(w)$ , hence decreasing in  $w$ , the asking decisions again determined by a unique threshold, now denoted  $w^{**}$ . It is such that  $w^{**} > w^*$ , because  $\bar{g}_N < \bar{g}$ , since not offering is a negative signal about  $g$ , by a reasoning similar to that in Section 4.3. ■

## 6.4 Proof of Proposition 1

The only claim not shown in the text is the third one. Differentiating (11), we have:

$$\frac{\partial w^*}{\partial(\lambda\alpha)} = \frac{M_N^+(\hat{g}(w^*)) - \bar{g}_N}{1 - \lambda\alpha \{M_N^{+'}(\hat{g}(w^*))\hat{g}'(w^*) + (\partial g_N^{\max}/\partial w^*) \partial [M_N^+(\hat{g}(w^*)) - \bar{g}_N] / \partial g_N^{\max}\}},$$

The numerator is positive, and so is the denominator for  $\lambda\alpha$  small enough.<sup>34</sup> ■

Note also that (i) if  $M_N^+(\cdot) - \bar{g}_N$  decreases with  $g_N^{\max}$ ,  $\partial w^*/\partial(\lambda\alpha)$  remains positive (whatever the size of  $\lambda\alpha$ , in fact), but is dampened; (ii) if it increases, then  $\partial w^*/\partial(\lambda\alpha)$  is actually magnified, raising the equilibrium  $w^*$  further: this is a form of the *discouragement effect*, previously encountered in the discrete case.

## 6.5 Sender's private signal in the continuous model

Consider how the different terms in (13) change when the conditional distribution  $Q_\sigma(w)$  increases stochastically.

i) If mass is reallocated toward higher values of  $w$  within the range  $w \geq w^*$  where the Receiver would ask, this increases the relative reputational value of offering, since not doing so is now likely to lead to an ask at a high level of  $w$ , which accepting is not particularly glorious, and refusing particularly shameful.

(ii) If mass is reallocated upward within low values  $w < \hat{w}(g)$  at which the Sender would "regret" having committed to help, or within intermediate ones  $w \in [\hat{w}(g), w^*]$  for which she is concerned about a failure to ask, or between these two ranges, this again

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<sup>34</sup>If  $\lambda\alpha (\partial \hat{g}/\partial w^*) \partial [M_N^+(\hat{g}(w^*)) - \bar{g}_N] / \partial g_N^{\max} > 1$  the sign of  $\partial w^*/\partial(\lambda\alpha)$  can be reversed, and multiple equilibria in  $(\tilde{g}, w^*)$  may even arise.

increases the propensity to offer. All  $S$ 's who would grant an ask, and even some who would turn it down but prefer to avoid that embarrassment by offering preemptively and looking very generous instead, will offer.

(iii) If mass is reallocated from  $[\hat{w}(g), w^*]$  to above  $w^*$ , however, this *reduces* the value of offering, since taking the risk of helping at  $w < \hat{w}(g)$  is less necessary to avoid needs remaining unmet.

(iv) If mass is reallocated upward from  $w < \hat{w}(g)$  to  $w > w^*$ , the effect is ambiguous: offering is now less risky, but also reputationally less valuable, since waiting may lead to an ask at a high  $w$ , which again is not good from a signaling point of view.

## 6.6 Proof of Proposition 4

With  $\Delta_N(g) = \tilde{g}/2$  the Sender's acceptance threshold (17) simplifies to

$$\hat{w}(g) = \frac{c - \mu\tilde{g}/2}{g}, \text{ requiring } c > \mu\tilde{g}/2. \quad (\text{A.31})$$

Next, with  $M_N^+(g) = (\tilde{g} + g)/2$  and  $M_N^-(g) = \tilde{g}/2$ , the Receiver's asking threshold (18) becomes

$$\begin{aligned} \frac{w^*}{\lambda\alpha} &= \frac{\tilde{g} + \hat{g}(w^*)}{2} - \frac{\tilde{g}}{2} = \frac{\hat{g}(w^*)}{2} = \frac{1}{2} \left( \frac{c - \mu\tilde{g}/2}{w^*} \right) \iff \\ w^* &= \sqrt{\frac{\lambda\alpha}{2} (c - \mu\tilde{g}/2)}, \end{aligned} \quad (\text{A.32})$$

implying in particular that  $\partial w^*/\partial \tilde{g} < 0$ .<sup>35</sup> For the equilibrium to be interior as assumed, moreover, it must be that  $w^* > \hat{w}(\tilde{g})$ .

At the offering stage, the payoffs inside the two integrals in (19) are, respectively:

$$\begin{aligned} M^+(\tilde{g}) - M_N^+(\hat{g}(w)) &= \frac{\tilde{g} + g^{\max}}{2} - \frac{\tilde{g} + \hat{g}(w)}{2} = \frac{1}{2} \left[ g^{\max} - \frac{c - \mu\tilde{g}/2}{w} \right], \\ \tilde{g}w - c + \mu [M^+(\tilde{g}) - M^-(\tilde{g})] &= \tilde{g}w - c + \mu g^{\max}/2. \end{aligned}$$

Therefore, the Sender's offering  $\tilde{g}$  is given as a function of  $w^*$  by:

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<sup>35</sup>Interestingly, with the uniform distribution and our choice of  $\psi(P_N, F)$ , the discouragement effect only operates when the Sender has reputational concerns,  $\mu > 0$ .

$$0 = \int_{w^*}^{\mu} \frac{\mu}{2} \left( g^{\max} - \frac{c - \mu \tilde{g}/2}{w} \right) dQ(w) + \int_{w^*}^{\tilde{g}w - c + \mu g^{\max}/2} (\tilde{g}w - c + \mu g^{\max}/2) dQ(w). \quad (\text{A.33})$$

With  $\mu = 0$  we obtain the desired formulas for  $\hat{w}(g), w^*$ , and  $\tilde{g}$ . The first required inequality is trivially satisfied, and the second becomes  $w^* > c/\tilde{g} = E[w|w < w^*]$ , which also holds. ■

## 6.7 Proof of Corollaries 1 and 2

(1) Let first  $q(w) = (1 + \gamma)w^\gamma/(w^{\max})^{1+\gamma}$ ,  $Q(w) = (w/w^{\max})^{1+\gamma}$  on  $[0, w^{\max}]$ . Then

$$\begin{aligned} \int_0^w x dQ(x) &= \frac{1 + \gamma}{(w^{\max})^{1+\gamma}} \int_0^w x^{1+\gamma} dq(x) = \left( \frac{1 + \gamma}{2 + \gamma} \right) \frac{w^{2+\gamma}}{(w^{\max})^{1+\gamma}}, \\ E[w | w < w^*] &= \left( \frac{1 + \gamma}{2 + \gamma} \right) \frac{1}{(w^*/w^{\max})^{1+\gamma}} \frac{(w^*)^{2+\gamma}}{(w^{\max})^{1+\gamma}} = \left( \frac{1 + \gamma}{2 + \gamma} \right) w^*. \end{aligned}$$

Similarly,

$$\begin{aligned} \int_0^w (x)^{1-\chi} dq(x) &= \left( \frac{1 + \gamma}{(w^{\max})^{1+\gamma}} \right) \int_0^w (x)^{1-\chi+\gamma} dq(x) = \left( \frac{1 + \gamma}{2 - \chi + \gamma} \right) \frac{w^{2-\chi+\gamma}}{(w^{\max})^{1+\gamma}}, \\ E[w^{1-\chi} | w < w^*] &= \left( \frac{1 + \gamma}{2 - \chi + \gamma} \right) \left( \frac{(w^*)^{2-\chi+\gamma}}{(w^{\max})^{1+\gamma}} \right) \left( \frac{w^{\max}}{w^*} \right)^{1+\gamma} = \left( \frac{1 + \gamma}{2 - \chi + \gamma} \right) (w^*)^{1-\chi}, \end{aligned}$$

and therefore

$$\tilde{g} = \frac{cE[w^{1-\chi} | w < w^*]}{E[w | w < w^*]} = c \left( \frac{2 + \gamma}{2 - \chi + \gamma} \right) (w^*)^{-\chi} = \left( \frac{2 + \gamma}{2 - \chi + \gamma} \right) \left( \frac{2}{\lambda\alpha} \right)^{\frac{\chi}{1+\chi}} c^{\frac{1}{1+\chi}}.$$

This establishes Corollary 2, and setting  $\chi = 1$  yields the first part of Corollary 1.

(2) To show the second part of Corollary 1, we look for distributions  $Q(w)$  such that  $N^-(w)/w \equiv E[w'|w < w]/w$  is either increasing or decreasing, or more generally such that  $E[w'|w < w]$  rises faster / slower than a given power function  $w^\delta$ . Specifically, we look for distributions  $Q(w)$  such that  $N^-(w) \sim w^\theta$ ,  $\theta \geq 0$ . Solving this integral equation,

$$\begin{aligned} \frac{\int_{w_{\min}}^w xq(x)dx}{\int_{w_{\min}}^w q(x)dx} &= \zeta w^\theta \Rightarrow wq(w) = \zeta [w^\theta q(w) + \theta w^{\theta-1} Q(w)] \iff \\ (w - \zeta w^\theta) \frac{q(w)}{Q(w)} &= \zeta \theta w^{\theta-1} \iff (\ln Q(w))' = \frac{\zeta \theta w^{\theta-1}}{w - \zeta w^\theta} \iff \\ \ln Q(w) &= C + \int_{w_{\min}}^w \frac{\theta x^{\theta-1}}{x/\zeta - x^\theta} dx. \end{aligned} \quad (\text{A.34})$$

We also need  $\ln Q(w_{\min}) = -\infty$  and  $\ln Q(w^{\max}) = 0$ . The former will require that  $w_{\min} - \zeta w_{\min}^{\theta} = 0$  for the integral to diverge, so let us impose  $\zeta = w_{\min}^{1-\theta} > 0$ . Thus

$$\ln Q(w) = - \int_w^{w^{\max}} \frac{\theta x^{\theta-1}}{x w_{\min}^{\theta-1} - x^{\theta}} dx. \quad (\text{A.35})$$

Defining  $z = x/w_{\min}$ , we can rewrite:

$$\begin{aligned} \ln Q(w) &= - \int_{w/w_{\min}}^{w^{\max}/w_{\min}} \frac{\theta (z w_{\min})^{\theta-1}}{z w_{\min}^{\theta} - (z w_{\min})^{\theta}} w_{\min} dz = - \int_{w/w_{\min}}^{w^{\max}/w_{\min}} \frac{\theta z^{\theta-1}}{z - z^{\theta}} dz \iff \\ Q(w) &= \exp \left( - \int_{w/w_{\min}}^{w^{\max}/w_{\min}} \frac{\theta z^{\theta-1}}{z - z^{\theta}} dz \right). \end{aligned}$$

To compute the integral, we note that

$$\begin{aligned} \ln(1 - z^{\theta-1})' &= \frac{-(\theta - 1)z^{\theta-2}}{1 - z^{\theta-1}} = \frac{-(\theta - 1)z^{\theta-1}}{z - z^{\theta}} \Rightarrow \\ - \int \frac{\theta z^{\theta-1}}{z - z^{\theta}} dz &= \left( \frac{\theta}{\theta - 1} \right) \ln(1 - z^{\theta-1}). \end{aligned}$$

So, finally,

$$Q(w) = \left( \frac{1 - (w^{\max}/w_{\min})^{\theta-1}}{1 - (w/w_{\min})^{\theta-1}} \right)^{\frac{\theta}{\theta-1}}. \quad (\text{A.36})$$

In the context of Proposition 4, we have  $\tilde{g} = c/N^-(w^*) = c/N^-(\sqrt{\lambda\alpha c/2})$ , so with the above family of distributions

$$\tilde{g} = \frac{c}{\xi(\lambda\alpha c/2)^{\theta/2}}, \quad (\text{A.37})$$

which is decreasing in  $c$  for  $\theta > 2$ : *the higher the cost of helping, the more* (marginally less generous) *Senders offer unconditionally*, even though—and in a sense, because—when faced with *any* ask  $w > w^*$  that the Receiver would dare to make more Senders would now refuse ( $\hat{g}(w)$  increases), making asks less likely. ■

## 6.8 Proof of Proposition 5

Recall that with a uniform distribution of  $g$ 's, the equilibrium equations are (A.31)-(A.32)-(A.33), together with the required inequalities

$$0 < 2c - \mu\tilde{g} < \lambda\alpha\tilde{g}^2. \quad (\text{A.38})$$

Using now the distribution  $q(w) = 2w$  on  $[0, 1]$ , the system in  $(w^*, \tilde{g})$  becomes

$$\begin{cases} 4(w^*)^2 - 2c\lambda\alpha + \mu\tilde{g}\lambda\alpha = 0 \iff w^* = \sqrt{\frac{\lambda\alpha}{2}(c - \mu\tilde{g}/2)} \\ \int_{w^*} \mu \left( g^{\max} w - \frac{2c - \mu\tilde{g}}{2} \right) dw + \int^{w^*} [2(\tilde{g}w - c) + \mu g^{\max}] w dw = 0 \end{cases}, \quad (\text{A.39})$$

where the latter equation can be explicitated as

$$\tilde{g} = \frac{3[-2c\mu + g^{\max}\mu + 2c\mu w^* - 2c(w^*)^2]}{-3\mu^2 + 3\mu^2 w^* - 4(w^*)^3} \approx \frac{3[\mu(2c - g^{\max}) + 2cw^*(w^* - \mu)]}{4(w^*)^3} \approx \frac{3c}{2w^*}.$$

1. *Existence and characterization of equilibrium.* The above system in  $((w^*)^2, \tilde{g})$  has a unique solution for  $\mu = 0$ , given by Proposition 4. For small  $\mu$  this remains true, with  $w^* \approx \sqrt{\lambda\alpha c/2}$  and  $\tilde{g} \approx 3c/2w^* \approx 3\sqrt{c/2\lambda\alpha}$ . Furthermore, the first inequality in (A.38) trivially holds as long as  $c > 0$ , while the second one becomes  $2c < \lambda\alpha(3c/2w^*)^2$ , or  $8(w^*)^2 < 9c\lambda\alpha$ , which also holds.

2. *Comparative statics.* For  $\mu$  sufficiently small, differentiating the first equation in (A.39) yields

$$\frac{\partial w^*}{\partial \lambda\alpha} \approx \frac{2c}{8w^*} > 0, \quad \frac{\partial w^*}{\partial c} \approx \frac{2\lambda\alpha}{8w^*} > 0, \quad \frac{\partial w^*}{\partial \mu} \approx -\frac{\tilde{g}\lambda\alpha}{8w^*} \approx -\frac{3}{8} < 0,$$

Turning now to the variations of  $\tilde{g}$ ,

$$\begin{aligned} \frac{\partial \tilde{g}}{\partial \lambda\alpha} &\approx -\frac{3c}{2(w^*)^2} \frac{\partial w^*}{\partial \lambda\alpha} < 0, \\ \frac{\partial \tilde{g}}{\partial c} &\approx \frac{3}{2w^*} - \frac{3c}{2(w^*)^2} \frac{\partial w^*}{\partial c} \approx \frac{3}{2w^*} - \frac{3}{2(w^*)^2} \frac{4(w^*)^2}{8w^*} = \frac{6}{8w^*} > 0. \end{aligned}$$

Finally,

$$\begin{aligned} c - \mu\tilde{g}/2 &= \frac{2}{\lambda\alpha}(w^*)^2 \Rightarrow -\frac{1}{2} \left( \tilde{g} + \mu \frac{\partial \tilde{g}}{\partial \mu} \right) = \frac{4w^*}{\lambda\alpha} \frac{\partial w^*}{\partial \mu} \approx -\frac{3w^*}{2\lambda\alpha} \Rightarrow \\ \mu \frac{\partial \tilde{g}}{\partial \mu} &= 3\sqrt{\frac{c}{2\lambda\alpha}} - \tilde{g} = 0. \blacksquare \end{aligned}$$

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