What sustains social norms and how they evolve? The case of tipping

Ofer H. Azar*
Department of Economics
Northwestern University

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Abstract

The paper presents a model of the evolution of social norms. When a norm is costly to follow and people do not derive benefits from following it except for avoiding social disapproval, the norm erodes over time. Tip percentages, however, increased over the years, suggesting that people derive benefits from tipping, such as impressing others and improving their self-image as being generous and kind. The implications to the norm of not cooperating with new workers who accept lower wages are discussed; the model suggests that incumbent workers have reasons to follow this norm in addition to avoiding social disapproval.

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* Department of Economics, Northwestern University, 2001 Sheridan Road, Evanston, IL 60208, USA. Tel.: +1-847-491-9593; Fax: +1-847-491-7001. E-mail address: o-azar@northwestern.edu.

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1. Introduction

Tipping is a multi-billion-dollar phenomenon ($26 billion a year in U.S. restaurants alone, see Azar, 2003a) that traditional economic models, which assume selfish economic agents, find hard to explain. Tipping is an example of a social norm that people obey even though it is costly to do so. While tipping is an important and intriguing topic for its own sake, it is also useful to study because many issues are common to tipping and to other social norms, and it is easier to obtain data about tipping behavior than about conformity to other social norms, many of which have important economic implications. Few examples include the punishment (by the incumbent workers) of new workers who are willing to work for less than the incumbents' wage; punishment of those who fail to contribute to public goods; and punishment of those who over-extract from the commons.

Tipping is consistent with selfish consumers only if they think that tipping today will improve the service they get in the future, since the service today has already been provided. Most people, however, tip even when they never intend to see the tipped worker again, for example when traveling out of town or when tipping taxi drivers. Moreover, several studies suggest that even tipping by repeated customers is not motivated by future service considerations (see Kahneman, Knetsch and Thaler, 1986; Lynn and Grassman, 1990; Azar, 2002a).

If future service is not the reason for tipping, what is the reason? The usual explanation is that people tip in order to conform to the social norm of tipping (see for example Bodvarsson and

Gibson, 1999).[1] Conformity to social norms is a central topic in sociology and social psychology. This literature (e.g. Aronson, Wilson and Akert, 1999) distinguishes between informational social influence (we conform because we think that others make good decisions) and normative social influence (we conform in order to be liked and accepted by others). Elster (1989) argues that social norms are sustained by the approval and disapproval of others, by feelings of embarrassment, anxiety, guilt and shame that a person suffers at the prospect of violating norms, and by positive emotions, like anger and indignation.

While conformity to the social norm is undoubtedly a major reason for tipping, I claim that it is not the only reason. I substantiate this claim using a theoretical model and historical evidence about tipping in the United States. The model suggests that if tipping were motivated only by the desire to conform to social norms, we would see tip percentages decreasing over time; the historical evidence is the exact opposite. This implies that people (at least some of them) tip not only because this is the norm but also because of other reasons, such as generosity, desire to impress others, willingness to show gratitude when receiving good service, and empathy for workers who work hard and earn low wages, such as waiters.

While the historical evidence is about tipping, the model can be used to analyze the evolution of social norms in general. It therefore contributes to the literature about social norms in general, and in particular their evolution.[2] Tipping is an example of an internal norm, which is

[1] A detailed review of the literature about tipping is beyond the scope of this article; two good reviews of this literature are Lynn and McCall (2000a) and Azar (2003b).

[2] See for example Sethi (1996) for an evolutionary model of social norms, and Sethi and Somanathan (1996) for an evolutionary model in the context of common property resource use. In addition, Bowles (1998) discusses how

defined as "a pattern of behavior enforced in part by internal sanctions, including shame, guilt and loss of self-esteem, as opposed to purely external sanctions, such as material rewards and punishment" (Gintis, 2003a). People internalize norms through three main channels: vertical transmission (from parents to children); oblique transmission (through socialization institutions such as secular and religious rituals, schools, and communications media); and horizontal transmission (from peer interactions) (Gintis, 2003a, 2003b).

Various models of norm evolution use conformist transmission to analyze several questions about social norms.[3] Henrich and Boyd (2001) present a model in which norms for cooperation and punishment are acquired through payoff-biased transmission (a tendency to copy the most successful individual) and conformist transmission. They show that if the number of punishment stages is finite[4] then an arbitrarily small amount of conformist transmission will stabilize cooperative behavior by stabilizing punishment at some finite stage. Gintis (2003a) shows that if an internal norm is fitness enhancing then internalization of norms is likely to be evolutionary stable. Gintis (2003b) presents a model that suggests that altruism can be sustained in equilibrium only when oblique transmission of altruism exists. He also shows that a high level

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markets and economic institutions affect the evolution of norms and the process of cultural transmission, and Elster (1989) and Bergstrom (2002) provide good reviews of the literature about norms and their evolution.

[3] Conformist transmission is a tendency to copy the most frequent behavior in the population, using the popularity of a choice as an indirect measure of its worth. People may want to imitate popular behaviors because they are boundedly rational and cannot evaluate the payoff of each action they may take (and experimentation is too time-consuming and costly). They therefore assume that behaviors that became popular are those who were successful (see Boyd and Richerson, 2001; Henrich and Boyd, 2001).

[4] One stage of punishment is just punishment of non-cooperators; two stages imply punishment of people who fail to punish non-cooperators, and so on.

of cooperation can be sustained by the presence of a minority of individuals who cooperate unconditionally and punish defectors at a personal cost, the remaining individuals being self-interested. Similarly, Akerlof (1980) claims that social customs can persist even when they are disadvantageous to the individual.

As opposed to the articles mentioned in the last paragraph, which suggest that under a few conditions norms are likely to be sustained in equilibrium, the model presented here offers a few reasonable conditions under which norms are likely to be eroded over time and may eventually vanish. In particular, if the agent chooses his action from a continuum of possible actions, the disutility from deviating from the norm is continuously differentiable, and the norm is costly to follow, it will be eroded over time. It follows that if we have a continuous action space and continuously differentiable disutility function and yet a norm is not eroded over time, it is not costly to follow; that is, following the norm offers benefits (other than conformity) that exceed its costs.

How do we compromise between the observation (supported by decades of research in sociology, anthropology and psychology) that people care about social norms, and the basic assumption in economics, that people are motivated by their own self-interest? Gintis (2003b) summarizes well the common assumption in economic models involving social norms: "… internalized norms are accepted not as instruments towards and constraints upon achieving other ends, but rather as *arguments in the preference function that the individual maximizes*" (see also Akerlof, 1980; Bernheim, 1994), an assumption adopted also in the current article.

2. The model

A social norm of tipping exists and may change over time. The norm in period t is denoted by n_t, where n_t represents the appropriate tip (as a percentage of the bill).[5] Following the standard assumption in this literature (see Akerlof, 1980; Bernheim, 1994), I assume that the utility function is additively separable with respect to its traditional components and its social-norm component. More specifically, the utility function is given by

$$u(g; n_t, \theta) = d(g - n_t) + \theta p(g) - bg, \quad (1)$$

where g is the tip in percentage of the bill, d is a function representing the disutility from social disapproval, b is the bill size ($b > 0$), and p is the utility from tipping that arises from feeling generous, impressing others, and so on.[6] It follows that $p' \geq 0$. The consumer takes as given the values of n_t and θ and maximizes utility by choosing g, under the obvious constraint $g \geq 0$. For simplicity, I leave the determination of b outside the model and treat b as a constant.[7]

The value of θ captures how much the consumer gets positive feelings from tipping, where $\theta \geq 0$. I do not assume that such positive feelings exist ($\theta = 0$ captures the case that they

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[5] This assumption follows the actual norms in most instances – tips are usually computed as a percentage of the bill. The model has the same results, however, even if tip percentage is replaced with tip amount.

[6] g stands for "gratuity" (to avoid having t for both tip and time), d for "disapproval," b for "bill," and p for "positive feelings."

[7] Beyond its simplifying role, this assumption has two good justifications. First, when the customer determines how much to tip, the bill is already fixed. Second, the determination of b is a standard consumer choice in which the consumer equates marginal utility from quantity and quality of food to its marginal cost. Adding the determination of b to the model (which will require adding also the utility from dining) adds nothing to the understanding of tipping, while unnecessarily complicating the model.

do not exist), but rather show below that they must exist in equilibrium (at least for some consumers) if tips remain unchanged or increase over time. The population is potentially heterogeneous with respect to θ, with a cumulative distribution function F(θ).

The term –bg in the utility function is equal to the monetary amount of the tip, meaning that the utility function is quasi-linear in money. Since the tip is a small amount compared to the customer's wealth, assuming quasi-linearity in money (and therefore risk neutrality in the range of wealth changes that result from tipping) is very reasonable, and in addition simplifies the analysis.

The function d has several natural characteristics: first, the desire to conform to the social norm means that absent other motivations, the individual derives higher utility the closer his tip is to the norm. This means that $d'(x) \geq 0$ for all $x < 0$ and $d'(x) \leq 0$ for all $x > 0$ (where $x = g - n_t$). I assume that d is continuously differentiable (I justify this assumption in the following section); it follows that $d'(0) = 0$. The following assumption summarizes the above:

Assumption 1. *d is continuously differentiable, $d'(x) \geq 0$ for all $x < 0$, and $d'(x) \leq 0$ for all $x > 0$ (it follows that $d'(0) = 0$).*

The social norm is endogenous and evolves according to the following rule: the norm in each period is the average tip in the previous period. Denoting the optimal choice of the tip in period t–1 by type θ as $g_{t-1}(\theta, n_{t-1})$, we get:[8]

$$n_t = E_\theta [g_{t-1}(\theta, n_{t-1})] = \int g_{t-1}(\theta, n_{t-1}) dF(\theta), \quad (2)$$

[8] That is, while g represents the tip percentage generally, g_t stands for the optimal tip in period t.

where the integration is over all the possible values of θ. Each consumer is a negligible fraction of the overall population and therefore the effect of his tip on the norm next period is negligible. I therefore assume for simplicity that an individual consumer does not think that he personally has any effect on the norm next period.[9]

3. Justifying the assumption that d is continuously differentiable

The assumption that d is continuously differentiable is crucial in order to prove Propositions 1 and 2, so I want to explain why it makes sense. I argue that this assumption is reasonable when the norm represents the average action in the population, rather than a very specific action that everyone adheres to. This is because the norm is vague enough so that infinitesimal deviations from the norm do not cause a discrete (i.e. significantly higher than zero) disutility. I will give a few examples to clarify what I mean. Suppose first that we have a norm of not shirking at work. The question is what is considered shirking. Is saying "good morning" to your colleague shirking? Probably not. What about talking with him about matters that are unrelated to work for a minute? For 5 minutes? Is it considered shirking to talk with your spouse over the phone for 2 minutes if she calls? 5 minutes? 15 minutes? What about if you call? Is it fine to call your travel agency about personal travel? Does the answer depend on how much time you expect the call to take? What if the agency is closed when you are not at work, so you have

[9] The alternative assumption, that consumers consider the effect of their actions on the norm, complicates the analysis to a great extent, but in fact reinforces the conclusion of the paper. Consumers then have another reason to tip below the norm, so that the norm next period will be lower and require them to pay less in tips. If the norm nevertheless remains unchanged, this reinforces the conclusion that consumers derive some benefits from tipping (this will be more clear in a few pages).

no choice? The vagueness of what exactly is the norm implies that slight deviations do not trigger discrete disutility. In terms of the model, the norm in this context may be that the average worker actually works for 7 hours, 16 minutes and 13 seconds on an average 8-hours day. A worker who works 10 hours may feel that he is taken advantage of, and a worker who works 5 hours may feel guilty. The question is whether a worker who works 7 hours, 16 minutes and 12 seconds feels so guilty that it causes him a discrete disutility. Probably he does not.

I argue that the same idea applies to many social norms. Consider the norm of not cooperating with workers who are willing to work for less than the incumbents' wages. Does the norm require to actually harass them? To exercise violence? How much? Should you actually prevent them from getting to the factory, or just not train them? If you do not actively train them but they stand by you and watch you as you work, is this considered that you trained them and disobeyed the norm? If yes, how far do you have to stand from them? 3 feet? 10 feet? 50 feet? How do you get them to be far enough? Should you refuse to work at all if they are present somewhere in the factory? Once again, the norm is some kind of average behavior, but is not such a clear focal point that infinitesimal deviations from it are likely to cause discrete disutility.

As a third example, let us consider tipping in restaurants. It seems that here we have a norm that everyone knows exactly what it is; most people in the US will tell you that the norm is to tip 15 percent. Yet etiquette books report that the figure is moving toward 20 percent for excellent service in upscale restaurants, and that in buffet or smorgasbord restaurants it is only 10 percent (Post, 1997). Moreover, most people find it hard to compute exactly 15 percent; what should they do then (those who do not carry with them a calculator)? Also, it is not clear whether the 15 percent should be computed on the amount before or after tax.

In addition, 15 percent of the bill is often not an integer number of dollars and cents. Should it be rounded up to the next penny? Nickel? Dime? Quarter? Dollar? Is it acceptable to round it down rather than up? And what about service quality? If the tip was automatically computed as 15 percent regardless of service quality, then people should prefer service charges of 15 percent to tipping, as this saves them the need to compute the tip and find the exact amount required. Yet most people seem to prefer tipping to service charges.[10] Presumably, people prefer tipping because it allows them to punish the waiter for bad service and reward him for good service. Empirical research about tipping also finds that tips are positively correlated with service quality (though the effect of quality on tips is not large), see the meta-analysis by Lynn and McCall (2000b). This raises additional vagueness about the appropriate tip. What service quality deserves 15 percent tip? What service quality requires that we tip less, or more, and how much should we change the tip? If the waiter was kind and friendly but did not know to answer our questions about different dishes, should we take it against him when choosing the tip? How much? What if he was efficient but unfriendly?

Once again, the vagueness implies that slight deviations from the norm do not cause a discrete disutility. We may find empirically that the average tip for a bill of $40.65 (before tax) in a certain restaurant, for a certain waiter and a certain service quality, is $6.77, so that the norm in this case is to tip 16.65 percent. Yet the norm is vague enough that the customer is not likely to experience a discrete amount of disutility from guilt and shame if he tips instead just 16.6 percent.

As empirical evidence that people in fact deviate from the 15 percent rule, I examined a

[10] See the on-line polls on www.tipping.org.

dataset that I obtained about tipping behavior of people.[11] The original data consists of surveys of 697 customers in six different Minnesota restaurants and one coffee shop, conducted during 1991. The customers were approached after they finished dining and were asked about several variables pertaining to their dining experience, including the bill size and tip size. Eliminating the data from the coffee shop due to the different tipping practices in coffee shops, I have 597 observations, for which I computed the tip in percentage of the bill. Only 24 of these 597 customers (4 percent) tipped between 14.9 and 15.1 percent of the bill. As an alternative, we can take the norm to be the average tip in the sample (13.72 percent of the bill) rather than taking 15 percent. Only 25 out of 597 customers (4.2 percent) tipped between 13.62 and 13.82 percent of the bill. If the norm were clear and if small deviations from the norm triggered discrete disutility, we would expect tips to be much more concentrated around the norm than the evidence suggests.

4. The equilibrium with type $\theta = 0$ consumers

The next proposition characterizes the optimal choice of a type $\theta = 0$ consumer:

Proposition 1. *Assume that $\theta = 0$. If $g_t > 0$ then $n_t - g_t = k > 0$, where k is a constant that does not depend on n_t. It follows that $g_t = \max [n_t - k, 0]$.*

Proposition 1 suggests that a consumer of type $\theta = 0$, who does not derive any benefit from tipping except for the utility from conformity, always chooses to tip strictly less than the norm if the norm is positive. As long as his tip is positive, the difference between his tip and the

[11] I am grateful to Orn Bodvarsson and William Gibson for the data and to Michael Lynn for help obtaining the data.

norm is constant. The following proposition summarizes what happens if everyone is of type $\theta = 0$:

Proposition 2. *If all consumers are of type $\theta = 0$, the norm converges to zero in a finite number of periods starting at any initial norm n_0.*

Proposition 2 suggests that if consumers had no benefit from tipping and they tipped only to avoid disutility that results from disobeying the norm, we should see the percentage tipped decreasing over time, and eventually the tipping norm would vanish. The intuition behind this result is that everyone tries to save a little bit every time he tips, and therefore tips below the norm. Since everyone does so, the norm becomes lower, consumers tip even less, and so on, until tipping vanishes.

5. Historical evidence about tipping

To examine the evolution of the tipping norm, I consulted etiquette books from different years and other sources, focusing on tipping of waiters in restaurants and taxi drivers.

5.1. Tipping waiters

Segrave (1998, p. 14) reports that by 1895 the common tip for waiters in the United States was 10 percent. Hathaway (1928, p. 317) indicates that the percentage did not change: "There is, of course, the well-established ten-per-cent-of-the-check rule, which is in most instances, especially in public eating places, an excellent one to follow." Post (1937, p. 833) reports the same number, with a qualification: "The usual tip for a waiter in a restaurant is 10 per cent of the bill, but never less than twenty-five cents in a restaurant with tablecloth on table."

Eventually, however, the percentage tipped started to increase: Post (1984, p. 392) mentions "Fifteen percent of the bill is standard in any restaurant." Recently, this changed somewhat, again upwards; Post (1997, p. 532) writes, "It wasn't long ago that 15 percent of the bill, excluding tax, was considered a generous tip in elegant restaurants. Now the figure is moving toward 20 percent for excellent service. In ordinary family-style restaurants 15 percent is still the norm."

5.2. Tipping taxi drivers

Tipping taxi drivers shows a similar trend of gradual increase in percentage tipped: Hathaway (1928, p. 324) claims, "In the large cities taxicab drivers expect a tip. Ten percent of the check is the usual amount." Post (1937, p. 834) suggests the following non-linear scheme: "Taxi drivers are tipped about ten cents for a fifty-cent drive, fifteen cents for a dollar drive, and ten per cent for a long wait or distance." Post (1984, p. 397) mentions higher tips: "Twenty-five cents is generally considered the minimum tip for a fare of up to $1.50. For higher fares a tip of approximately 15 percent is correct." A little more than a decade later, Post (1997, p. 538) suggests: "In a large city such as New York, you should tip a minimum of 50 cents. In general, a tip to a taxi driver is about 20 percent of the fare."

6. Can the model explain the historical evidence?

The theoretical model suggests that if consumers derive no benefits from tipping and tip only because this is the norm, tip percentages should decrease over time. The historical evidence presented in the previous section, however, suggests the exact opposite: tip percentages in restaurants (which account for the majority of tipping) and taxis actually increased over the years. These observations suggest that the assumption that consumers do not derive benefits from

tipping is not consistent with the historical evidence. The model will turn out to be even more useful, however, if it can make another step forward and show that when some consumers derive benefits from tipping, the model can be consistent with increasing tips over time. Fortunately, it can.

It is necessary, however, to be more specific about the model in order to analyze the evolution of the norm (and then show that it can explain increasing tip percentages). The goal now, therefore, is to find specific functions for d and p and the distribution $F(\theta)$ that show how the norm can increase over time. Simple functions are of course preferred to complicated ones, as they make reading more enjoyable and the results more convincing. It turns out that even very simple functions enable to explain various possibilities of how the norm evolves.

Consider the functional forms $d(x) = -x^2$ and $p(g) = g$, and assume that there are two types of consumers: a proportion $1-q$ (where $0 < q < 1$) of the population is "low-type," with $\theta = 0$, and the rest are "high-type," with $\theta = \beta b > 0$, where β is a parameter to be analyzed below. The utility function for both types becomes

$$u(g; n_t, \theta) = -(g - n_t)^2 + \theta g - bg.$$

Proposition 3. *The evolution of the norm is determined according to the values of β and q as follows:*

(i) If $\beta < 1$, the norm converges to zero in a finite number of periods, and once it does, no one tips. If $\beta = 1$, the norm converges to zero but does not reach zero in any finite number of periods, for any $n_0 > 0$.

(ii) If $1 < \beta < 1/q$, the norm converges to $N = qb(\beta - 1)/2(1 - q) > 0$, either from below or from above, depending on the initial norm n_0. In equilibrium, high-type consumers tip and low-type do not.

(iii) If $\beta = 1/q$, any norm N such that $N \geq b/2$ is stable. If the initial norm is below b/2, the norm will converge to b/2 and only high-type consumers tip. If the initial norm is above b/2, it will not change, and everyone tips.

(iv) If $\beta > 1/q$, the norm increases over time indefinitely and does not converge: $n_t \to \infty$ as $t \to \infty$. Once the norm exceeds b/2, everyone tips.

Proposition 3 suggests that even with the simple functional forms and distribution assumed in this section, the model can explain an increase in tip percentage. In fact, such an increase can happen in two different scenarios: either there is some finite stable norm and the initial norm is below it (part ii of the proposition), or it may be that the norm is increasing indefinitely (part iv). As with any model, the model is a simplification rather than an accurate description of the modeled phenomenon. I hope, however, that the model is convincing about its main points: the increase in tip percentages over the years is not consistent with the view that consumers tip only because this is a social norm, but is easily explained once we assume that at least some consumers derive benefits from tipping. The next section discusses briefly what these benefits may be.

7. Reasons for tipping

Beyond the desire to conform to the social norm (to avoid social disapproval, guilt and shame), what are the additional benefits that some people have when tipping? I suggest several

such benefits. First, some people tip because they know that the worker's wage is low since he and his employer expect tips to complement his income. Tipping poorly is then perceived not as withholding some extra income from the worker, but as withholding his wage, making poor tipping seems unfair. Tipping then prevents a disutility associated with the negative feeling of being unfair.

In addition, people often feel empathy and compassion for workers who earn low wages (especially if they also work hard). By tipping they reinforce their own self-image as good-hearted people and therefore increase their utility. One indication of the importance of the worker's income in the decision whether to tip him can be found by consulting books that discuss who should be tipped. For example, Star (1988, p. 11) writes about tipping ship crews, "The only other variable, from ship to ship, is whether or not the cruise line pays its crew top salaries. When it doesn't, the crew is largely dependent on your tips for income."

Another reason for tipping is that people want to feel generous and do not want to feel "cheap." It is a somewhat philosophical question whether the actions taken by someone might change his perception of himself, but it seems reasonable to claim that when someone tips 20 percent he feels more generous and has a better self-image than when he tips 10 percent. Tipping generously therefore improves the tipper's self-esteem, encouraging him to tip even more than the norm. In addition to the internal positive feeling from being generous, the tipper often wants to impress others, for example other customers at the table or even the waiter. Tipping generously is a way to impress others that the tipper has the appreciated quality of generosity.

Finally, people may derive utility from tipping because of our desire to reward people who help us. This desire for reciprocity and fairness received a lot of attention in economics recently (for excellent literature reviews of this subject see Fehr and Gächter, 2000; Sethi and

Somanathan, 2003), and may be another reason why people enjoy tipping (when they feel that the service was good).

The reasons mentioned above also provide a potential explanation why tip percentages in upscale establishments are often higher than in lower-level ones (see Post, 1997, p. 532; Star, 1988, p. 26). The tip being a percentage of the price already compensates workers in upscale establishment very generously for the higher service quality they are expected to provide. Why should tip percentages then be higher in upscale establishments? The previous paragraphs may explain this puzzle. Naturally, the customers of an upscale restaurant are wealthier than those of a family-style restaurant. This increases the difference between the income of the tipper and the worker, and causes the tipper to feel more empathy and compassion for the worker, encouraging higher tips. In addition, the desire to feel generous and to impress others is higher on average for wealthier customers, since they are expected to show more generosity.

8. Implications for other social norms

While the paper discusses the case of tipping, the theoretical model is applicable to other social norms as well. The benefits from following the norm may be different than those discussed here, and the costs of following other social norms may be non-monetary, but as long as such costs are present, the results of the model are valid. In particular, the model suggests that norms that are costly to follow (and offer no benefits that compensate for the costs) will be eroded over time (assuming a continuous action set, a norm that evolves according to the population's behavior, and disutility from deviations that is continuously differentiable). This result shows that a reasonable change in the assumptions undermines the conclusions of Akerlof (1980) and others (see the introduction) about the sustainability of norms that are costly to

follow. The major difference that leads to the different results in Akerlof's model is that while Akerlof assumes that a person can either obey the norm or not (and therefore the punishment to deviations from the norm is not a function of the size of the deviation), the current model allows for deviations of different magnitude, and also allows for the change of the norm over time.[12]

Given the variety of social norms, probably both models are useful for analyzing some social norms. Tipping is a norm that seems to fit better under the current model; some other norms may be analyzed better using Akerlof's framework. There are many norms other than tipping, however, for which it seems more reasonable to assume that the action set is continuous and that small deviations from the norm are not punished as harshly as large ones.

The model also implies that if norms that seem to be costly are nevertheless sustained over time, examining these norms carefully may show that these norms are not really costly, because people who follow them derive some benefits (in addition to conformity) that exceed the costs of following the norm. One general norm in which this insight is important is the norm of punishment of people who deviate from other social norms. This norm is of great importance, because it in turn supports a wide range of social norms – all the norms whose sustainability depends on punishment of deviators. Examples for such norms include contributing to public goods and avoiding over-extracting of the commons.

If the social norm of contributing to a certain public good is not eroded over time, then the model suggests that people derive benefits from contributing to public goods, for example from feeling altruistic and generous. Alternatively, people may contribute to public goods because this is the social norm, and whoever deviates is punished by others. The question is then

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[12] Akerlof assumes that the norm is fixed, but allows changes over time in the number of people who believe in the norm and who follow it. Bernheim (1994) also considers a fixed norm, though he allows for continuous actions sets.

why do others punish deviators (presumably, punishing is costly)? Several explanations were offered for this puzzle (see for example Henrich and Boyd, 2001). This article suggests another simple explanation: maybe punishing is in fact not costly, because it yields benefits that exceed its costs. A person who does not contribute to the public good according to the norm hurts my interests as someone who enjoys the public good. In that case, my desire for reciprocity may lead me to derive a utility from hurting that person, despite the cost that I have to incur to do so.[13]

As Akerlof (1980) suggests, the norm according to which workers do not train and cooperate with new workers who are willing to do the same jobs for lower wages is of great importance in economics, as it provides a potential explanation for unemployment. The common terminology denotes the incumbents as insiders and the underbidding new workers as outsiders. As was discussed in detail in Section 3, there is a continuum of actions the insiders can take against the outsiders. While harassing the outsiders may be rational even in the absence of a social norm (see Lindbeck and Snower, 2001), it is obviously also a social norm: a worker's utility from harassing an outsider depends on whether it is acceptable to do so and whether other insiders harass the outsider as well. Other things equal, an insider has higher utility (or lower disutility) from harassing the outsider if this is the norm. Nevertheless, small deviations from the norm (being slightly less hostile than others) do not entail a significant social disapproval or shame. The model presented here is then applicable.

Since this norm prevailed over time and yet being hostile to others is generally costly, it

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[13] Most people derive utility from acting against others who hurt them. This is substantiated by experimental evidence that shows that people are willing to take costly actions to punish people who hurt them. For excellent reviews of some of this literature and related topics see Fehr and Gächter (2000); Fehr and Falk (2002); and Sethi and Somanathan (2003).

follows that insiders derive benefits from following this norm in addition to conformity. One such benefit is the desire for revenge that results in willingness to act against the outsiders who hurt the insiders' interests (since the firm may reduce the insiders' wages or at least not increase them in the future when cheaper workers are available). Another benefit is simply to obtain monopoly power that allows the insiders to achieve higher wages than they could otherwise. By being hostile to outsiders and not training them, insiders decrease the outsiders' productivity and increase their reservation wages (since the work becomes less pleasant for outsiders); these two effects reduce the profitability of hiring cheaper labor and increase the monopolistic power of the insiders (Lindbeck and Snower, 1986). A third benefit is to create a reputation that makes similar attempts to bring cheaper workers in the future less likely. The conclusion is, as Akerlof (1980) suggested, that this norm may cause involuntary unemployment, but unlike Akerlof's assumption, the conclusion from the model presented here is that insiders have reasons to follow this norm in addition to conformity.

9. Conclusion

The article presents a theoretical model and historical evidence about the evolution of the tipping custom in the United States. Comparing the theory and the evidence suggests that at least some people derive benefits from tipping in addition to conforming to the social norm. Several such benefits are discussed, including the desire to feel generous and kind, to impress others, and to show gratitude and reward the worker for good service. The article also discusses the implications of the model to other social norms, including the general norm of punishing people who deviate from certain social norms, and the norm of harassing outsiders who are hired at lower wages than the insiders'.

Which directions for future research seem the most promising? Tipping is a significant economic phenomenon that attracted a lot of attention from psychologists, but little from economists. There is still much left to explore by both disciplines. One natural direction for future research that the current paper raises is to examine the different positive feelings that were suggested as possible explanations for tipping and to try to evaluate their relative magnitude using customer surveys and evidence on tipping behavior.

As for social norms more generally, they obviously affect our behavior, including our economic behavior, in many circumstances. There are many directions for future research in this area. The current article focuses on the evolution of norms and what sustains them. Other questions worth pursuing are how norms are created, and in what circumstances they are likely to emerge. Why different cultures reach different norms? Are social norms generally welfare improving or not? While these questions received some attention in the literature, they are far from being exhausted.

In addition to trying to understand social norms in general, norms are often very different from one another, suggesting that research that focuses on only one class of norms or even one norm is also worthwhile. It may be hard to gain insights about social norms if we try to obtain results that are true for all norms, but easier if we realize that social norms belong to different categories.

Another direction for future research is to think about how we should incorporate conformity with social norms in the utility function. The current article and previous ones suggest several alternatives, but this issue is important enough to justify additional research. Such research may also encourage more frequent consideration of social norms in economic models. Since social norms affect our economic behavior in many significant ways,

incorporating them in economic models will provide us with a richer framework and predictions that are closer to the actual behavior of people; it will bring Homo Economicus and Homo Sapiens closer together.

Appendix: proofs

Proof of Proposition 1. Substituting $\theta = 0$ in (1) yields the utility function $u(g; n_t, \theta = 0) = d(g - n_t) - bg$. It follows from Assumption 1 that u is strictly decreasing in g for all $g \geq n_t$. Moreover, the continuity of d' implies that there exists $r > 0$ such that for all $x \in [0, r)$ we have $0 \leq d'(-x) < b$. It follows that for all $g > n_t - r$ we have $\partial u(g; n_t, \theta = 0)/\partial g = d'(g - n_t) - b < 0$. This implies that if the constraint $g_t \geq 0$ does not bind (i.e. if $g_t > 0$) then optimality of g_t requires that $g_t \leq n_t - r$. Notice that the value of r does not depend on n_t.

In addition, notice that $\partial u(g; n_t, \theta = 0)/\partial g = d'(g - n_t) - b$. The value of g does not enter the marginal utility independently, only as part of the term $g - n_t$. Since the utility function is continuous, information about the marginal utility is sufficient to determine the optimal value of g, implying that the condition for optimality is a function only of $g - n_t$ and b. Since b is a constant, it follows that $g_t - n_t$ (i.e. the value of $g - n_t$ that maximizes utility) is a constant (assuming that the constraint does not bind, i.e. $g_t > 0$). Combining this result with the first part of the proof yields $g_t = \max [n_t - k, 0]$, where $k \geq r > 0$.[14] □

[14] If we assume that u is strictly concave, the first-order condition $d'(g_t - n_t) - b = 0$ determines the optimal value g_t; rearranging shows that $k = -[d']^{-1}(b)$, where $[d']^{-1}$ is the inverse function of d' ($[d']^{-1}$ exists because d' is a monotonic function when d is strictly concave). For example, if $d(x) = -x^2$, solving the consumer's problem yields g_t

Proof of Proposition 2. By the definition of the norm in (2), we get in this case that $n_t = g_{t-1}(\theta = 0, n_{t-1})$. Using Proposition 1, we obtain $n_t = \max [n_{t-1} - k, 0]$. Substitute for n_{t-1}, then for n_{t-2}, and so on, to get the general result $n_t = \max [n_0 - tk, 0]$. Therefore, for all $t \geq n_0/k$ we get $n_t = 0$, meaning that the norm converges to zero in a finite number of periods (the first integer number that is greater or equal to n_0/k), and stays zero afterwards. □

Proof of Proposition 3. Since u is strictly concave in g, the optimal choice of g, denoted by g_t, is given by the solution to the first-order condition, which after rearranging becomes $g_t = n_t + (\theta - b)/2$, unless this value is negative; if it is negative, the concavity of u implies that $g_t = 0$ is the optimal choice (given the constraint $g_t \geq 0$). It follows that for the high-type consumers ($\theta = \beta b$), the optimal tip is given by $g_t^h = \max [n_t + b(\beta - 1)/2, 0]$, while for the low type it is $g_t^l = \max [n_t - b/2, 0]$. To analyze the evolution of the norm over time, we should examine the function $n_{t+1}(n_t) = E_\theta [g_t(\theta, n_t)]$.

(i) When $\beta \leq 1$, it is easy to see that if $n_t = 0$ then no one tips and therefore $n_{t+1} = 0$. Now consider any $n_t > 0$. If $\beta < 1$, both types tip strictly less the norm, and the difference between the tip and the norm is bounded from below by a constant, so the norm converges to zero in a finite number of periods (in a similar fashion to Proposition 1 and Proposition 2), and once it is zero, no one tips. If $\beta = 1$, we get $g_t^h = n_t$, and $n_{t+1} = qn_t + (1 - q)[\max (n_t - b/2, 0)]$, so the norm converges to zero but does not reach zero in any finite number of periods.

$= n_t - b/2$ (unless the constraint $g_t \geq 0$ binds). Since I do not assume concavity of u, I cannot specify the exact condition that determines g_t, but can still obtain the result that $g_t = \max [n_t - k, 0]$ as shown above.

(ii) – (iv) Notice that $g_t^l > 0$ if and only if $n_t > b/2$. In cases (ii) – (iv) we have $\beta > 1$, so $g_t^h = \max [n_t + b(\beta - 1)/2, 0] = n_t + b(\beta - 1)/2 > 0$. Therefore, for all $n_t \leq b/2$, we have $n_{t+1} = q[n_t + b(\beta - 1)/2] > 0$, and for $n_t \geq b/2$ we have $n_{t+1} = q[n_t + b(\beta - 1)/2] + (1 - q)(n_t - b/2) = n_t - b/2 + q\beta b/2$. Notice that when we draw the function $n_{t+1}(n_t)$, the resulting vertical intercept is strictly positive, and the slope is q for all $n_t < b/2$ and is 1 for all $n_t > b/2$ (in $n_t = b/2$ the function is kinked and the slope is not defined).

What determines the dynamics of the norm is how $n_{t+1}(n_t)$ is situated compared to the 45-degree line from the origin (see Figure 1). This can be determined by comparing $n_{t+1}(b/2)$ to b/2. Since at $n_t = b/2$ low-type consumers do not tip, $n_{t+1}(b/2) = q[n_t + b(\beta - 1)/2] = qb\beta/2$. Therefore, $n_{t+1}(b/2) > b/2$ if and only if $q\beta > 1$.

(ii) When $1 < \beta < 1/q$ we get that $n_{t+1}(b/2) < b/2$, so $n_{t+1}(n_t)$ and the 45-degree line cross at only one point, where $n_t < b/2$. To the left of the intersection n_{t+1} is above the 45-degree line, and to the right n_{t+1} is below the 45-degree line. Since at the intersection the slope of n_{t+1} is $q < 1$, the norm converges to that point either from above or from below, depending on the initial norm n_0. The point to which the norm converges is also the unique stable norm (denote it as N), and we can easily find it by substituting $n_{t+1} = n_t = N$. Since we know that $n_t < b/2$ at that point, we get $N = n_{t+1} = q[n_t + b(\beta - 1)/2] = q[N + b(\beta - 1)/2]$, which after rearranging becomes $N = qb(\beta - 1)/2(1 - q) > 0$. Since $N < b/2$, it follows that in equilibrium high-type consumers tip and low-type do not.

(iii) When $\beta = 1/q$ we get that $n_{t+1}(b/2) = b/2$ and since the slope of n_{t+1} is 1 when $n_t > b/2$, it follows that the 45-degree line and $n_{t+1}(n_t)$ overlap for all $n_t \geq b/2$ (this can also be seen directly, since for $n_t > b/2$ we have $n_{t+1} = n_t - b/2 + q\beta b/2 = n_t$). In addition, n_{t+1} lies above the 45-degree line for all $n_t < b/2$. This implies that if the initial norm is below b/2 it will converge to

b/2 (only high-type consumers tip in this case) and if it is weakly above b/2 it remains the same and everyone tips (except for the knife-edge case where $n_0 = b/2$, in which the norm remains b/2 but only high-type consumers tip).

(iv) When $\beta > 1/q$ we get $n_{t+1}(b/2) > b/2$, implying that n_{t+1} is always above the 45-degree line. This means that the norm never converges, but rather increases over time indefinitely. Since $g_t^l = \max [n_t - b/2, 0]$, once the norm exceeds b/2, everyone tips. □

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Figure 1. Evolution of the norm for different values of β

[Dimensions of figure axes: three by three inches]