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Mutual Altruism: Evidence from Alzheimer Patients and Their Spouse Caregivers *

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Abstract

Background: Preferences of both Alzheimer patients and their spouse caregivers are related to a willingness-to-pay (WTP) measure which is used to test for the presence of mutual (rather than conventional unilateral) altruism.

Methods: Contingent valuation experiments were conducted in 2000 – 2002, involving 126 Alzheimer patients and their caregiving spouses living in the Zurich metropolitan area (Switzerland). WTP values for three hypothetical treatments of the demented patient were elicited. The treatment *Stabilization* prevents the worsening of the disease, bringing dementia to a standstill. *Cure* restores patient health to its original level. In *No burden*, dementia takes its normal course while caregiver's burden is reduced to its level before the disease.

Results: The three different types of therapies are reflected in different WTP values of both caregivers and patients, suggesting that moderate levels of Alzheimer's disease still permit clear expression of preference. According to the WTP values found, patients do not rank *Cure* higher than *No burden*, implying that their preferences are entirely altruistic. Caregiving spouses rank *Cure* before *Burden*, reflecting less than perfect altruism which accounts for some 40 percent of their total WTP. Still, this constitutes evidence of mutual altruism.

Conclusions: The evidence suggests that WTP values reflect individuals' preferences even in Alzheimer patients. The values found suggest that an economically successful treatment should provide relief to caregivers, with its curative benefits being of secondary importance.

Keywords: willingness-to-pay; dementia; altruism

JEL: C93, D03, I10

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1 Introduction

Dementia refers to a group of diseases characterized by progressive deterioration in cognitive function. According to ICD-10, the international statistical classification of diseases, the symptoms are memory loss, disorientation, and inappropriate social behavior. Whereas ICD-10 distinguishes between four different types of dementia, this paper focuses on Alzheimer's disease, the most common type of dementia. According to Brookmeyer et al. (2007), more than 26 million people worldwide suffer from Alzheimer's disease. About 70 percent of patients are in need of care, while 60 percent live at home. Therefore, informal care (usually provided by the spouse) constitutes the major part of the care received by patients with dementia (Alzheimer Disease International 2012). Providing care for a person with dementia is stressful and demanding (Bédard et al. 2000; Whitlatch 1998; Simpson and Carter 2013). Hence, caregivers bear not only the opportunity cost of their time devoted to caring but also a loss of well-being. Trepel (2011) estimates the cost of informal dementia care in Ireland to range between 240 and 570 Euros per day (1 Euro = 1.3 US\$ at exchange rates of 2011), depending on the stage of the disease. Therefore, dementia affects not only the patient but also the caregiving relative.

Dementia is a chronic disease, for which currently no cure exists. However, in this paper a hypothetical 'magic cure' for dementia is postulated in order to experimentally identify and estimate altruistic preferences. The objective is to elicit willingness-to-pay (WTP) values for different types of this hypothetical cure, which is presented to participants in the experiment as having two main benefits. One is to improve the health status of the patient, the other, to reduce caregiver burden and time needed to take care for the patient. The first benefit therefore accrues to patients, whereas the second, to caregivers.

There are two basic hypotheses to be tested in this paper. The first states that these two types of benefit translate into differences in preferences, measurable as WTP values. The second is that WTP values reflect mutual altruism in that patients are willing to sacrifice wealth (by purchasing the 'magic cure') to ease caregiver's burden, while caregivers are prepared to do the same in order to achieve an improvement in patient well-being. Willingness to sacrifice one's wealth (or time) to the benefit of others falls under almost all definitions of altruism advanced in the literature (Simon 1993; Rose-Ackerman 1996; for an economic formulation of altruism in a healthcare context, see Arana and Leon 2002). Individuals' WTP for improving their own health has been analyzed before (see e.g. Nocera et al. 2002). Also, altruism of caregivers towards patients related through kin has been subject of research (see e.g. Byrne et

al., 2009). However, to the best of our knowledge, there has not been a study examining mutual altruism, expressed through WTP values.

The remainder of this paper is organized as follows. The next section contains a review of the pertinent literature. This is followed by a presentation of the experimental method used and the data obtained. The core section presents the WTP estimates which permit testing the two hypotheses advanced in this paper, viz. that preferences can be identified and measured in the guise of WTP values also of Alzheimer patients, and that preferences reflect mutual altruism both on the part of patients and caregivers. The final section of the paper is devoted to a summary and conclusions.

2 Literature Review

In health care and especially long-term care, Contingent Valuation (CV) is widely accepted and frequently used to measure the value of non-market goods (Diener et al. 1998; Klose 1999; Olsen & Smith 2001; Gustafsson-Wright et al. 2009). The CV method is based on asking persons directly about the amount of money they are willing to pay for a reduction in their risk of illness or death or for an improvement in their quality of life. Generally, the aim is to identify a subjective trade-off: How much income or wealth is someone prepared to sacrifice in return for the health benefit proposed? In economic terms, respondents are made to move along their indifference curves, with an indifference curve defining the locus where their (expected) utility is kept constant (Shiell and Rush 2003). The underlying theory is that individuals are optimizers, i.e. utility maximizers subject to constraints imposed by income, wealth, or time. However, this formulation does not exclude the possibility of utility also depending on the well-being of someone else rather than just one's own. This is compatible with self-interest as long as the individual considered wants to retain the right to decide how much of his or her own resources are to be devoted to another person and who this person is to be (Becker 1976, Sen 1973). In this sense, altruism is conditional; it also may be induced by the expectation of future reciprocity. Since reciprocity can be excluded for practical reasons in the context of Alzheimer's disease, this literature review focuses on what may be dubbed 'true' altruism.

'True' altruism can be defined as *warm glow* (Andreoni, 1995), meaning that it is induced by the good conscience caused by engaging in an activity that is approved by society. Fehr and Schmidt (2006) define altruism as the utility gain derived from helping others. However, note that in their formulation, even 'true' altruism is conditional because it turns into envy (reflecting a loss in utility) as soon as the potential donor is worse off than the potential recipient.

Since utility gains can be expressed in positive WTP values, altruism will be identified in this paper with positive WTP for benefits accruing to the other party in the interaction between caregiver and patient (Shiell and Rush 2003). Note that according to Fehr and Schmidt (2006), negative WTP values cannot be excluded in principle – unless ‘health’ is considered as being something different from ‘wealth’, as argued by the proponents of extra-welfarism in health (Brower et al., 2008).

Attempts at identifying and estimating preferences with regard to health come in two categories. The first deals with an improvement of one’s own health. Since these studies are of limited relevance to the present paper with its emphasis on altruism, only those directly related to Alzheimer’s disease are mentioned here. Nocera et al. (2002) performed a CV experiment involving the general population to find out whether three specific programs designed to fight Alzheimer’s disease have WTP values that exceed their marginal cost and therefore should be implemented from a societal point of view. König and Wettstein (2002) analyze informal caregivers’ WTP for relief from their burden, using the same data as this study (see the Data subsection below). The high WTP values found point to substantial utility losses on the part of informal caregivers.

Contributions in the second category revolve around altruism between persons related through kin. Most of them estimate parents’ WTP for the health of their children (see e.g. Agee & Crocker 1996; Liu et al. 2000; Viscusi et al. 1987). For example, Liu et al. (2000) show that a mother’s WTP for keeping her child safe from suffering a cold is about twice her WTP for avoiding a cold of comparable duration and severity herself. By way of contrast, Schwarze (2004) finds but weak evidence of parental altruism regarding children’s health. More recently, however, Goldberg et al. (2009), examining parents’ WTP for a quality label on infant’s milk formula, infer a high degree of parental altruism. In addition, Loomis et al. (2009) use a so-called Discrete Choice Experiment (an alternative to CV; see e.g. Louviere et al., 2000) to investigate parents’ WTP to reduce health risks to their children. Their estimated WTP values point to strong altruism.

Finally, a study by Byrne et al. (2009) deals with adult children’s provision of informal long-term care as a potential substitute of formal care. They identify a considerable degree of altruism in adult children with regard to their parents’ health.

While the literature presented here revolves around unilateral (intergenerational) altruism, this study seeks to identify mutually altruistic behavior by estimating WTP values for both caregivers and patients. Caregivers are hypothesized to be willing to sacrifice some of their income and wealth in order to pay for a cure of their parents’ Alzheimer’s disease; patients are

hypothesized to do the same if the cure eases the burden falling on their children as caregivers. Note that perfectly altruistic individuals fully adopt the beneficiary's preferences, resulting in WTP values that are identical with those of the beneficiaries for themselves. In that case, patients are predicted to display the preferences of caregivers and vice versa. In the case of imperfect altruism, WTP values contain one component reflecting the beneficiary's preferences and another component reflecting the donor's own. We are not aware of any other study that distinguishes between these two components of WTP in both patients and their caregivers.

3 Method

3.1 Measurement of preferences and of willingness-to-pay (WTP)

While cost-effectiveness and cost-utility (usually based on quality-adjusted life years QALYs, see e.g. Dolan 2000) have become popular concepts in medical science, they suffer from a crucial drawback. They cannot answer the policy question, "Should more public resources be spent on health care or on education?" For this, cost-benefit analysis is needed, which measures both costs and benefits in monetary terms. For goods traded on free markets, the price consumers are willing to pay provides a lower bound for their benefit, i.e. the intensity of their preferences with regard to the good in question. In the case of non-marketed goods (such as medical treatments that do not yet exist), no revealed preferences can be measured. Instead, WTP must be inferred from stated preferences expressed with regard to a hypothetical situation created in an experiment. The popular criticism that individuals have unstable preferences when it comes to medical care ('no interest when healthy, willing to sacrifice their fortune when ill') can be shown to be spurious because the alleged instability may be interpreted as resulting from state-dependent (objective) capabilities to "produce" consumption services and health rather than state-dependent preferences (Zweifel 2001). Therefore, there is no a priori argument against measuring WTP for improvements in health status.

In economics, the traditional approach for measuring WTP has been Contingent Valuation (Mitchell and Carson, 1989), where all the attributes of a product are held constant except price, while respondents are asked to indicate the maximum amount of money they would be willing to sacrifice to obtain the good. This approach is used here (for details, see the subsection, Survey and WTP questions below).

3.2 Hypotheses to be tested

In the experiment, WTP values for three hypothetical treatments of the demented patient are elicited (for their description, see Exhibit). The first (*Stabilization*) prevents the disease from worsening, bringing dementia to a standstill. Interviewers explicitly informed participants that the treatment does not lead to any improvement in the health state of the patient. In the second case (*Cure*), participants are asked about their WTP for a hypothetical treatment that restores the patient's health status to its original level. The time required for care and the burden falling on the caregiver are reduced to the level prior to the onset of the disease. In the third case (*No burden*), dementia takes its normal course while caregiver burden returns to its level before the onset of the disease.

Exhibit: Elements of the Questionnaire

Stabilization: Imagine that further cognitive impairment of your spouse could be prevented using a very expensive treatment that is not covered by health insurance. Thus there would be no further deterioration – but no improvement either!

Cure: Imagine that the cognitive impairment of your spouse could be reverted using a very expensive treatment that is not covered by health insurance, resulting in the situation that obtained before the onset of the illness.

No burden: Imagine that there are ways not covered by health insurance to reduce your burden caused by the cognitive impairment of your spouse (which might become even more marked in the future), resulting in a burden as is usual between healthy partners.

All treatments: Would you want to opt for this treatment if you had to pay the following amounts just once? Please consider that you will have that much less to spend for other purposes! Bids offered: 5000, 10,000, 20,000, 50,000, 100,000, 150,000, 200,000, and 500,000 Swiss francs. Answers offered: yes, rather yes, not sure, rather no, no.

All treatments: What percentage of your wealth would you be willing to pay for such a treatment?

In all three cases, respondents were told that the hypothetical treatment was expensive and not covered by health insurance. Therefore, they would have to pay for it out of their pocket. Outcomes were presented as being certain and due to treatment (rather than e.g. behavioral adjustment).

Under the counter-hypothesis of egoism on the part of both patients and caregivers, the following rankings of treatments are expected in terms of WTP values. For patients, the predicted ranking is *Cure* > *Stabilization* > *No burden* in view of the implied differences in their health status. For caregivers, it is *No burden* = *Cure* > *Stabilization* since *No burden* and *Cure* offer the same relief to them.

These rankings may be contrasted to those that obtain if both patients and caregivers are perfectly altruistic, causing them to fully adopt the other's preference structure. This means that patients are predicted to display the ranking of caregivers, viz. *No burden* = *Cure* > *Stabilization*, and caregivers, the ranking of patients, viz. *Cure* > *Stabilization* > *No burden*.

3.3 Survey and WTP questions

The unique data set used in this paper comes from a larger study on 'Effects of training relative caregivers of patients with dementia'. It includes only patients in the mild to moderate stage of the disease because the training offered to spouse caregivers was thought to be ineffective for patients having severe Alzheimer's. The WTP questions analyzed below were developed with the help of survey specialists and gerontologists and added on to the existing questionnaire of the larger study. A pretest comprising a dozen couples with an Alzheimer spouse suggested a few minor adjustments of the questionnaire. Patients and caregivers are from the Zurich metropolitan area in Switzerland and were interviewed between September 2000 and August 2002. Since more than 90 percent of the caregivers are spouses, analysis is limited to couples in the interest of increased homogeneity. The sample thus contains 126 pairs of patients with dementia and their spouse caregivers.

The WTP information comes from face-to-face interviews with patients and their caregivers. Caregivers and their demented relatives were interviewed separately and contemporaneously by a study nurse and a physician, respectively. They had to state their WTP independently of each other without any possibility of contact and cooperation. Caregivers and patients answered the same questions, involving identical treatments and offered bids. No randomization of bids to prevent sequencing effects was performed because the possible biases would be similar in the two groups. Such biases should therefore be of limited relevance when the objective is to compare the WTP values of patients and caregivers.

The questions about WTP were put in two different ways. First, a payment card format was used, with prices of 5,000, 10,000, 20,000, 50,000, 100,000, 150,000, 200,000, and 500,000 Swiss francs (CHF; 1 CHF = 0.7 US\$ at 2002 exchange rates) for every hypothetical treatment. The second way to obtain WTP information was to directly ask respondents to state the

maximum percentage of their wealth they were willing to give up for buying able to pay for the hypothetical treatment. This sequence of the two approaches was chosen because several studies had shown that the use of payment cards serves to reduce the number of non-responses and protest responses compared to directly asking respondents for their WTP (Klose 1999).

The wealth share is the preferred measure because it puts a limit imposed by ability to pay on stated WTP values. Such a limit is of importance when WTP values tend to be inflated, which is to be expected in the present context (Chiu et al. 1998). Thus, WTP expressed as a percentage of wealth will be used (results in terms of absolute amounts of money are quite similar). However, note that none of the absolute WTP values was negative, suggesting that ‘health’ indeed differs from ‘wealth’ when it comes to altruism (see the section, Literature review again)

3.4 Data

A mere 36 percent of patients are female. This low percentage results from the fact that only patients living at home and cared for by relatives were included in the study. Patient age ranges from 52 to 91, with a mean of 75 years. The youngest caregiver is 42 and the oldest, 90 years old, with mean age at 71 years. On average, patients thus are four years older than their caregivers. Some 31 percent of patients have a Clinical Dementia Rating (CDR) score exceeding six. The CDR is a measure of impairment (Hughes, Berg & Danzinger, 1982), has scores ranging from 0 to 18, and is widely used in studies to gauge the severity of dementia.

Household wealth ranges from zero to CHF 10 million. Mean and median wealth are CHF 614,000 (US\$ 430,000) and CHF 300,000 (US\$ 210,000), respectively, indicating considerable skewness in the distribution of household wealth.

4 Empirical Evidence

4.1 Results

Only couples both of whom answered the WTP questions are included in the analysis. Therefore, there is a one-to-one relationship between patients and caregivers.

Table 1 shows results for mean and median WTP, measured as a share of household wealth. To just prevent future worsening of their disease (*Stabilization*), the Alzheimer patients sampled are willing to sacrifice an average of 14 percent of their wealth, to be completely cured (*Cure*), an average of 22 percent, and to obtain relief for their caregivers (*No burden*), 22 per-

cent. The corresponding values for caregivers amount to 24 percent for *Stabilization*, 31 percent for *Cure*, and 18 percent for *No burden*, respectively. Differences between the three treatments therefore are clearly reflected in intuitive differences in WTP values, mirroring preferences not only among caregivers but also Alzheimer patients.

Table 1: Willingness to pay expressed in percentage of wealth

		(1)	Test ^{a)}	(2)	Test ^{a)}	(3)	Test ^{a)}
		<i>Stabilization</i>	$\bar{\Delta}, \Delta\downarrow$	<i>Cure</i>	$\bar{\Delta}, \Delta\downarrow$	<i>No burden</i>	$\bar{\Delta}, \Delta\downarrow$
Mean	Patients	13.8	$\bar{\Delta}(1,2)**$	21.6	$\bar{\Delta}(2,3)$	21.9	$\bar{\Delta}(1,3)**$
	Caregivers	23.9	$\bar{\Delta}(1,2)*$	30.7	$\bar{\Delta}(2,3)**$	17.5	$\bar{\Delta}(1,3)*$
	Test ^{a)}	$\Delta\downarrow **$		$\Delta\downarrow **$		$\Delta\downarrow$ n.s.	
Median	Patients	10.0		10.0		10.0	
	Caregivers	10.0		20.0		10.0	
SD	Patients	2.1		2.8		2.9	
(Mean)	Caregivers	2.7		3.0		2.1	
Number of observations		96		95		94	

^{a)} Test for significance of difference, $\bar{\Delta}$ (horizontal) and $\Delta\downarrow$ (vertical); *(**) significant at the 0.10 (0.05) level or better.

The WTP values displayed in Table 1 can be compared horizontally, using t tests to determine whether the WTP values associated with the three treatments differ significantly. Patient WTP for *Stabilization* is significantly lower than for both *Cure* ($t = 2.22$, calculated on the simplifying assumption of zero covariance between WTP values) and *No burden* ($t = 2.26$). There is no statistical difference between *Cure* and *No burden* ($t = 0.07$). Turning to the caregivers, they seem also to value *Stabilization* less than *Cure*, although this difference is significant at the 0.10 level only ($t = 1.68$). In contrast to patients, however, they tend to put a higher value on *Stabilization* than on *No burden*, albeit subject to the same proviso ($t = 1.87$).

In order to check whether the emerging differences in preference between patients and caregivers are in fact significant, a vertical comparison (in Table 1) is performed as well. Indeed, patients value *Stabilization* less highly than caregivers ($t = 2.95$); interestingly, this also holds for *Cure* ($t = 2.16$), although *Cure* is in their primary own interest – an indication of perfect altruism. However, with regard to *No burden*, preferences of patients and caregivers do not differ ($t=0.35$).

Observed rankings are juxtaposed with predicted ones in Table 2. Patients rank the three treatments exactly as predicted by perfect altruism. In particular, they do not exhibit WTP for *Cure* in excess of *No burden*. Therefore, patient WTP consists of the altruistic component only. As to caregivers, their observed ranking again points to altruism rather than egoism. Specifically, caregivers exhibit WTP for *Cure* in excess of *No burden*, the excess amounting to an altruistic component (WTP for improving patient health). Their total WTP for *Cure* divides into some 60 percent for the reduction of their own burden (17.5/30.7 in Table 1) and 40 percent for improving their partner’s health ((30.7 – 17.5)/30.7). Taken together, these results can be summarized in the provocative conclusion that a *Cure* of dementia is only in the interest of caregivers. In order to meet with sufficient willingness to pay, a future treatment would therefore have to provide relief to caregivers (*No burden*) more than anything else, while its curative benefits (*Cure*) would be of secondary importance.

Table 2: Predicted and actual rankings

Hypothesis	Predicted	Observed (from Table 1, differences $\bar{\Delta}$)
WTP of patients		
Egoism	<i>Cure > Stabilization > No burden</i>	
Altruism	<i>No burden = Cure > Stabilization</i>	<i>No burden = Cure > Stabilization</i>
WTP of Caregivers		
Egoism	<i>No burden = Cure > Stabilization</i>	
Altruism	<i>Cure > Stabilization > No burden</i>	<i>Cure > Stabilization > No burden</i>

Note: (>) denotes 0.10 rather than 0.05 significance level

4.2 Discussion

In this study, 126 pairs of Alzheimer patients and their spouse caregivers stated their willingness to pay (WTP) for three hypothetical treatments of dementia. A first major result is that differences in the benefits of the proposed treatments clearly go along with intuitive differences in WTP values, suggesting that measured WTP reflects preferences of both caregivers and patients, in spite of cognitive impairment due to Alzheimer’s disease among the latter. A possible objection to this first conclusion is that the WTP values obtained especially for *Cure* are too low, amounting to less than one-third of wealth on average (see Table 1 again). As dementia is a fatal disease, should respondents not be willing to spend their entire wealth for curing it?

Of course, estimated WTP values may fall short of true values. However, there are several reasons for the true values to be less than wealth, in keeping with economic theory (Jones-Lee et al. 1985; Thaler and Rosen 1975). First, most patients are old. Therefore, curing dementia only means prolonging life for a few years. Second, because of age and other diseases beside Alzheimer's, quality of life during these additional years may be low. Third, all participants in this study have a spouse, who on average is four years younger. Spending money on treatment thus means reducing the material welfare of the spouse, whose higher remaining life expectancy serves to lower her per-period resources to begin with. Fourth, most of the patients and caregivers are retired, usually lacking the possibility to relax their wealth constraint by earning additional income. During the face-to-face interviews, respondents in fact mentioned these considerations when searching for their WTP for the three types of Alzheimer treatment.

The second main finding is that the structure of the WTP values obtained points to mutual altruism. From the literature (see e.g. Liu et al. 2000; Goldberg et al. 2009; Loomis et al. 2009), unilateral altruism on the part of the (parent) caregiver in favor of the child is an established fact. However, the present study suggests the existence of altruism also on the part of patients. Their ranking of the three treatments is precisely the one predicted by the altruism hypothesis while contradicting the egoism counter-hypothesis (see Table 2 again). Specifically, patients put *No burden* first; they worry more about the burden falling on their spouse caregivers than their own health. Second, compared to their caregivers, they differ in their valuations of the three treatment alternatives in the way predicted by the altruism hypothesis. In particular, they are willing to pay the same amount as their caregiving spouses for the *No burden* alternative but less for the *Cure* and *Stabilization* options, which clearly would be in their self-interest.

Caregiver altruism is documented by their rankings as well. They put the *Cure* alternative first and *No burden* last, although the two are equivalent in terms of their own situation (see Table 2).

Of course, hypothetical treatments being associated with hypothetical payments, there is always scope for stated WTP values to be inflated. This tendency must be expected especially when the alternative considered (helping a patient or a caregiver) is socially accepted [leading to 'warm glow' (Andreoni 1995), 'yea-saying' (Blamey et al. 1999), and starting point bias (Carson 2000)]. However, by having to express WTP as a share of their (predetermined) wealth, respondents were prevented from grossly overstating their WTP values. One could still doubt that either partner of the couple would in fact sacrifice one-third (or even more) of his or her fortune to have Alzheimer cured. Possibly, patients' WTP might be sufficiently

inflated to exceed that of caregivers in the case of *No burden*, creating spurious evidence in favor of altruism. However, it is far from clear that this particular effect will result in the equivalence element in the ranking $No\ burden = Cure > Stabilization$ predicted by altruism and confirmed by the data (Table 2). On the whole, it seems difficult to explain the full set of observed rankings with reference to bias in WTP estimation.

5 Conclusion

Alzheimer patients constitute a group in society that importantly depends on informal care. Unilateral altruism is a likely motive to provide such care and has also been established in parent-child relationships. In the context of Alzheimer disease, however, both patient and spouse caregiver are in similar (advanced) age. Their altruism might therefore be mutual, although patients cannot express it easily through their activity anymore.

An experiment involving 126 Alzheimer patients and their caregiving spouses living in the Zurich (Switzerland) metropolitan area was conducted in 2000 – 2002 to throw light on this issue by confronting them with three hypothetical therapies, *Stabilization*, *Cure*, and *No burden* (for caregivers). The objective was to find out whether preferences are reflected in the economic concept of willingness-to-pay (WTP) and to test whether the rankings of WTP values obtained conform to full mutual altruism, in the sense that the patient adopts the preferences of the caregiver and vice versa.

The WTP values derived from the experiment consistently reflect differences in the benefits associated with the three treatments, suggesting that they do mirror preferences also of patients suffering from moderate Alzheimer's disease. Also, these WTP values exhibit rankings that conform to the altruism hypothesis but contradict the egoism hypothesis both for patients and caregivers. First, patients rate *No burden* and *Cure* as equivalent (although *No burden* would not improve their health), while caregivers have maximum WTP for *Cure* (although this would not benefit them more than *No burden*). Second, caregivers and patients are prepared to pay the same amount for *No burden*, whereas caregivers value *Cure* (which would be in the interest of patients) higher than patients themselves. The startling implication is that curing Alzheimer's disease would benefit caregivers rather than patients. Therefore, to be economically successful, any future treatment of Alzheimer's disease would (in the interest of both patients and caregivers) have to reduce the burden of caregivers; its curative benefit would be of secondary importance.

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