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Other-regarding behavior and motivation in health care provision: An experiment with medical and non-medical students



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ABSTRACT

Other-regarding motivation is a fundamental determinant of public service provision. In health care, one example is physicians who act benevolently towards their patients when providing medical services. Such patient-regarding motivation seems closely associated with a personal sacrifice that health service providers are willing to make. Surprisingly, evidence on physicians' motivation is rare. This paper contributes to the literature by investigating prospective physicians', in particular, medical students', motivations and behavior. We measure the willingness to sacrifice own profit in order to increase the patients' health benefit. We conduct the same analysis for non-medical students. In a controlled incentivized laboratory experiment, participants decide, in the role of physicians, on the provision of medical services under fee-for-service or capitation schemes. Overall, 42 medical students and 44 non-medical students participated in five experimental sessions conducted between 2006 and 2008. We find substantial differences under both payment systems: compared to medical students, students of non-medical majors are less patient-regarding, less willing to sacrifice their own profit, and they state less motivation to improve patients' health. This results in significantly lower patient health benefits. Some implications for health care policies in light of physician shortage and for physician payment systems are discussed.

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1. Introduction

Other-regarding motivation is a fundamental determinant of public service provision, the importance of which has been emphasized in the public economics literature (e.g., Francois, 2000; Besley and Ghatak, 2005; Delfgaauw and Dur, 2007, 2008). In particular, this literature assumes that most public service providers derive great personal satisfaction from helping other people. A prominent example is physicians who provide medical services for their patients. Early theoretical models in health economics accounted for the physicians' other-regarding motivation when caring for patients' health benefit (e.g., Woodward and Warren-Boulton, 1984; Ellis and McGuire, 1986). At the same time, patient-regarding motivation seems to depend upon the degree of personal sacrifice associated with the act (Le Grand, 2003).

Presumptions on human motivations are crucial for an effective public policy design. Policies based on the assumption that people

are entirely other-regarding might have considerable negative consequences if, in fact, they are predominantly selfish. The same holds for policies that assume people to be selfish, particularly if that would result in suppressing their natural other-regarding impulses (Le Grand, 1997). Thus, assumptions on other-regarding motivations are important, for example, for designing optimal payment schemes for physicians (e.g., Jack, 2005; Choné and Ma, 2011; Makris and Siciliani, 2013).

Field evidence on the motivation of health care providers and physicians, in particular, is surprisingly rare. A survey study analyzing the behavior of dentists in the UK, e.g., finds heterogeneity in behavior that hinges on both self-interested and patient-regarding motivations (Taylor-Gooby et al., 2000).

In our paper, we wish to contribute to filling this gap by applying an experimental economics approach. The rising number of experimental studies in health economics indicates the increasing importance of running controlled laboratory experiments for this research area (e.g., Levy-Garboua et al., 2008; Schram and Sonnemans, 2011; Ahlert et al., 2012, 2013; Buckley et al., 2012; Brosig-Koch et al., 2013a, 2013b; Godager et al., 2013). In our experiment, we investigate whether prospective physicians, i.e.,

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medical students (MEDs), show patient-regarding behavior and are willing to sacrifice their own profit in order to increase patients' health benefit as conjectured by [Le Grand \(2003\)](#). As our workhorse, we use a fully incentivized, controlled laboratory experiment equivalent to [Hennig-Schmidt et al. \(2011\)](#).

Subjects decide on the provision of medical services under a capitation (CAP) or a fee-for-service (FFS) payment system in a stylized physician decision-making context. When paid by FFS, subjects receive a monetary reward for each unit of medical services provided. Under CAP, subjects receive a lump-sum payment per patient, independent of the number of chosen medical services. A post-experimental questionnaire collects information on subjects' motivations. Our experimental design allows us to identify patient-oriented behavior and, in particular, to quantify individual sacrifices – physicians' choices imply a tradeoff, as increasing a patient's benefit comes at the cost of foregoing own profit.

[Le Grand's \(2003\)](#) assertion of a personal sacrifice being a major characteristic of other-regarding behavior in the context of public service provision, involves physicians sticking out in that respect, compared to other people. Therefore, we also run our experiment with students of various other majors, i.e., non-medical students (NON-MEDs). We analyze whether MEDs are more caring for patients than NON-MEDs by exhibiting a higher willingness to sacrifice their own profits and by taking into account the patient-optimal treatment to a greater extent.

Knowledge about differences between MEDs' and NON-MEDs' motivations is essential to investigate [Le Grand's \(2003\)](#) conjecture. In case NON-MEDs do show less patient-regarding behavior, important implications for health policy design might arise in view of the present severe physician shortage in many countries. To enhance the supply of physicians, health care policies mainly follow two strands: first, fostering immigration of physicians from abroad and, second, increasing the admission rates to medical schools. Attracting physicians from other countries is not a sustainable policy option, as it transfers the problem from one country to another, and causes substantial negative effects for the source countries ([Astor et al., 2005](#); [Chen and Boufford, 2005](#); [Mullan, 2005](#); [McDonald and Worswick, 2012](#)). Increasing the admission rates to medical schools has therefore been widely promoted as an alternative policy option ([Association of American Medical Colleges, 2012](#)). However, extending the pool of potential future doctors, in particular to young people, who did not intend to become physicians from the outset, would result in quite negative consequences for the patients in case the former show less patient-regarding motivations and behaviors when payment schemes are given. In light of the increased variation in other-regarding motivations and behaviors, the implications for overall social welfare might be ambiguous, however (see, e.g., [Makris and Siciliani, 2013](#)).

Our main findings are, first, that MEDs are willing to sacrifice a considerable part of their profits to increase the patient benefits. Second, MEDs and NON-MEDs differ substantially in their provision behavior. MEDs' decisions are more strongly motivated by the patients' benefit, leading to a lower tendency to overprovide (underprovide) patients under FFS (CAP) than observed for NON-MEDs. This difference can be explained by MEDs' higher willingness to sacrifice their own profit compared to NON-MEDs. Participants' stated motivations from the questionnaires corroborate the behavioral findings.

2. Research questions

The first research question is concerned with the willingness of MEDs to show patient-regarding behavior. In particular, we are interested in whether the prospective physicians sacrifice their own profits in order to increase patients' health benefits. In the

context of public service provision, [Le Grand \(2003\)](#) describes a personal sacrifice as a major characteristic of other-regarding behavior. Our experimental design allows us to measure individual sacrifices, as tradeoffs between increasing a patient's benefit and increasing own profit is implied in a physician's treatment decision. We conjecture that medical students do sacrifice a substantial amount of their own profit. One reason for our expectation can be found in the arguments and findings of [Le Grand \(1997, 2003\)](#). Another reason is the emphasis on moral and other-regarding aspects being part of the medical education ([Jagsi and Lehmann, 2004](#)). The other-regarding motivation of prospective physicians is supposed to result in high awareness for the patient's needs and, thus, in benevolent patient-regarding behavior.

Research Question 1. *Are medical students willing to sacrifice their own profits in order to increase patient benefits?*

Research Question 2 deals with a comparison of patient-oriented behavior between MEDs and NON-MEDs. Are the former more caring for patients than the latter by taking into account patient-optimal treatment to a greater extent and by a higher willingness to sacrifice their own profits? Only if this is the case, [Le Grand's \(2003\)](#) conjecture holds that other-regarding behavior, in particular personal sacrifices, is an essential attribute of public service provision. Given our arguments in favor of medical students' benevolent behavior, we expect MEDs to be more caring for patients compared to NON-MEDs. Moreover, recent studies by [Ahlert et al. \(2012, 2013\)](#) seem to suggest that medical students are less profit-oriented than non-medical students. Our conjecture implies less overprovision by MEDs in FFS, less underprovision under CAP, and a higher willingness to sacrifice own profits.

NON-MEDs, showing less patient-regarding behavior, would have important implications for health policy design, e.g., when coping with physician shortage. One necessary option seems a policy of enlarging the pool of applicants for medical schools to young people who do not opt for the medical profession in the first place. Yet, their less patient-regarding behavior could result in quite negative consequences for patients' health under a given payment scheme.

Research Question 2. *Are medical students more concerned with patients' health benefit and are they willing to sacrifice their own profit to a higher extent than non-medical students?*

Finally, our third research question is concerned with differences between MEDs and NON-MEDs in their stated motivations regarding their choices. In a questionnaire at the end of the experiment, participants reported reasons and motivations underlying their decisions throughout the experiment. We are therefore able to analyze the questionnaire data to check for further evidence on MEDs' and NON-MEDs' motivations. Our arguments put forward with regard to Research Questions 1 and 2 lead us to expect that more MEDs are motivated by the patients' health benefit than NON-MEDs. We believe the reverse to hold for their own profit.

Research Question 3. *Are medical students' treatment decisions more motivated by the patient's health benefit and less by their own profit than the ones of non-medical students?*

3. Experimental design and procedure

3.1. Design and decision situation

We study behavior of MEDs and of NON-MEDs. Using the design of [Hennig-Schmidt et al. \(2011\)](#), experimental participants decide, in the role of physicians, on the provision of medical services incentivized either by FFS or by CAP payments. The experimental treatments were approved by the Ethics Committee of the University of Bonn. When paid by FFS, participants receive a monetary

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