

TIM BENNING

A Consumer Perspective on Flexibility in Health Care

Priority Access Pricing and Customized Care



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Priority access pricing and customized care

Flexibiliteit in de gezondheidszorg vanuit het oogpunt van de consument

Betaalde snellere toegang en maatwerk in de zorg

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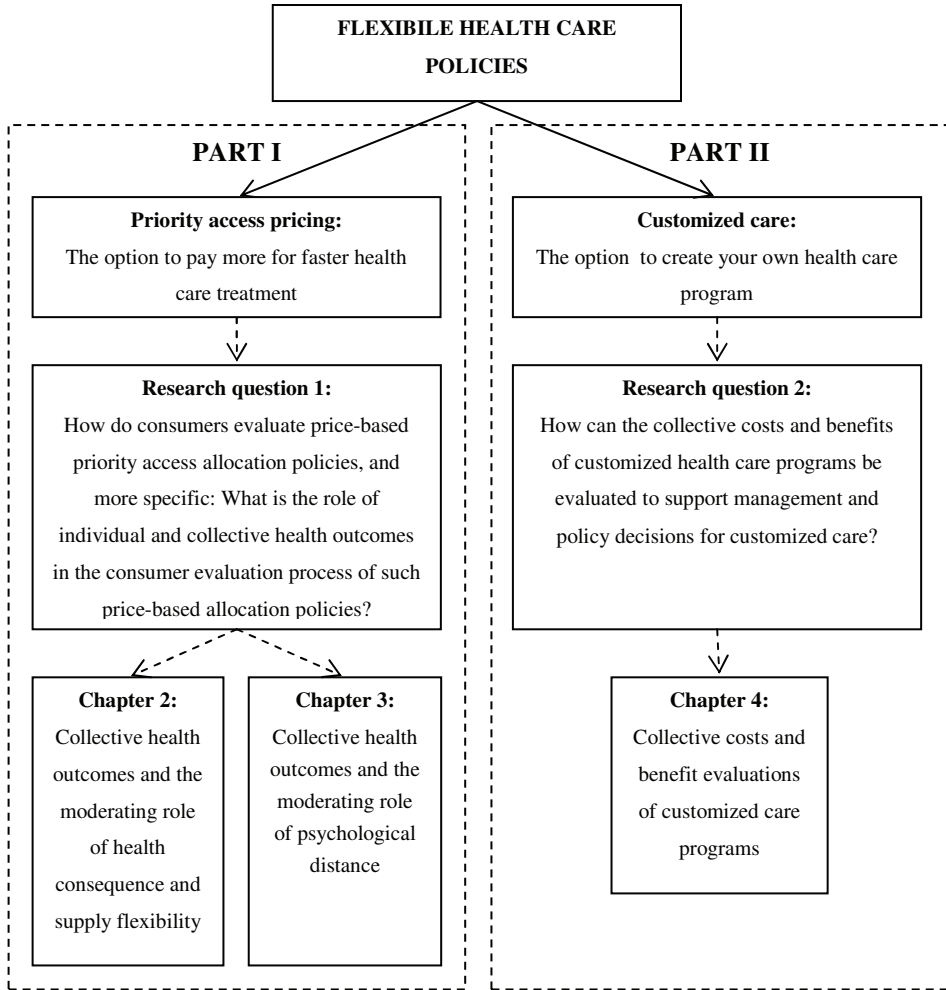
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Chapter 1. Introduction

People are unique and have their own specific preferences. This heterogeneity in taste is also prominent in health care. Consider, for instance, the variation in preferences between individuals with regard to treatment programs. One treatment certainly does not fit all patients (Morey, Thacher, & Craighead, 2007). The rise of consumerism and the available information through the Internet raised patients' expectations about care and increased patients' demand for care according to their preferences even more (Frank & Zeckhauser, 2007). Hospitals took advantage of this by listening to the patients and using their suggestions to improve medical decision making. In this way a more patient-centered health care approach arose (Bergeson & Dean, 2006). In short, there is a growing recognition that preference heterogeneity should be taken into account in future health care policies. This can be accomplished by offering patients care that is more flexible (i.e., offers more possibilities) and therefore better serves their needs.

Flexibility comes in many different kinds. On the one hand one can seek more flexibility in the pricing aspect of health care allocation. Due to financial considerations like the huge pressure on public budgets and increased competition market-based solutions to problems in health care are getting more and more attention (Cutler, 2002; Rice, 1997). Some people might be willing to pay an extra amount of money to receive earlier health care access. If this is the case hospitals could offer patients the option to either choose for standard access or to pay extra and receive priority access. Although such a policy violates the basic uniform treatment of all principle, a well-accepted principle in the Netherlands (Brouwer & Schut, 1999; Den Exter, 2010), the additional revenues from such a policy and the additional flexibility offered can be beneficial for both hospitals and patients. On the other hand, it is possible to offer patients freedom in creating their own health care programs given the available attributes they can choose from. This seems an interesting strategy, particularly because of the fact that patients often do not only know exactly what they want, but also how and when they want it. Flexible health care policies are key in this thesis and relates the chapters two, three, and four (Figure 1).

Figure 1: Thesis structure



The first part of this thesis is about flexible health care policies in which hospitals introduce a market (i.e., price) mechanism for health care allocation by offering patients the option to pay more for faster health care treatment/access (i.e., price-based priority access allocation). The central goal in this part is to investigate what the role of individual and especially collective health outcomes is in the consumer evaluation process of such price-based allocation policies. Chapters two and three address this question in two different ways by focusing on, respectively, the moderating role of health consequence and supply flexibility (chapter two), and psychological distance (chapter three). The second

part of this thesis (chapter four) discusses a flexible health care policy in which patients have the option to create their own health care programs (i.e., customized care). The central goal in part two is to illustrate a method of how to organize and use the collective costs and benefits of such health care programs to evaluate customized care (Figure 1).

1.1 Priority Access Pricing

It is well known that there are not enough resources available to fulfill all consumers' needs and wants in health care management. Therefore choices have to be made about how to allocate the resources at hand. For this purpose, governments and policy makers have utilized many different types of allocation policies ranging from non-price-based policies (e.g., expert-based decisions and waiting lists) to price-based policies (e.g., market-based priority access prices and auctions), to combinations of these (Evans, Vossler, & Flores, 2009). In recent years these price-based policies received a lot of criticism because they violate the "uniform treatment of all" principle, which is a well-accepted principle in the Netherlands (Brouwer & Schut, 1999; Den Exter, 2010). Despite this criticism it is unknown how consumers exactly evaluate such allocation policies that allow differences in treatment between patients. In particular, the role of collective outcomes in consumers' allocation policy evaluations is relatively unexplored.

1.1.1 *Collective health outcomes*

There is considerable evidence that besides their self-interest (Agerström & Björklund, 2009a/b) consumers care about the interests of others in the society. This is based on the fact that people show fair, reciprocal, and altruistic behavior (Fehr & Fischbacher 2002; Fehr & Schmidt, 2006). A nice quote that strengthens the importance of collective interests even more is the one by Culyer (1976, p.89): "Individuals are affected by others' health status for the simple reason that most of them care".

The literature on health care discusses two types of collective interests, which we expect to play a decisive role in consumer evaluations of allocation policies, referred to in this dissertation as total collective health outcome and distributional collective health outcome. The total collective health outcome (i.e., the efficiency of the allocation policy) expresses the expected total gain in health that results from an allocation policy, and the distributional collective health outcome (i.e., the equity of the allocation policy) expresses how equally the health outcome resulting from the allocation policy is distributed among individuals (Wagstaff, 1991). Interestingly, individuals are often willing to sacrifice some

part of the total collective health outcome in return for a better distributional collective health outcome (e.g., Andersson & Lyttkens, 1999; Ratcliffe, 2000). This strengthens our argument that evaluations of both total and distributional health outcomes play a substantial role when consumers evaluate allocation policies. We are interested in how consumers evaluate price-based allocation policies, and especially what role collective health outcomes play in the allocation policy evaluation process. Therefore we formulate the following research question that is addressed in chapters two and three of this thesis:

Research question 1: How do consumers evaluate price-based priority access allocation policies, and more specific: What is the role of individual and collective health outcomes in the consumer evaluation process of such price-based allocation policies?

1.1.2 Chapter 2: Collective health outcomes and health consequences

Little is known about how consumers evaluate price-based priority access allocation policies. We use studies in two countries that have totally different health care settings (i.e., the Netherlands versus the United States of America) to address some interesting issues with regard to this gap in the literature. First of all, we investigate the direct relationship of price-based priority access allocation policies on collective health outcome evaluations. It is interesting to test how price-based priority access allocation policies affect consumers' collective health outcome evaluations, because these evaluations likely have a huge impact on the overall consumer attitude towards such policies. Then, we address a possible moderating effect of health consequence of treatment on the collective health outcome allocation policy evaluation relationship and offer an explanation of our findings by means of luxury-necessity theory (Berry, 1994; Kemp, 1996; Kemp, 1998; Mahoney, Kemp, & Webley, 2005). Finally, we scrutinize the effect of price-based priority access allocation policies on the collective health outcome evaluations in case of additional supply, that is, when patients are offered the option to pay extra for treatment that takes place outside, instead of within, regular working hours of the hospital. This is of paramount importance because it eliminates possible disadvantages for total health outcomes, since treatment for regular patients is not delayed, and consumer attitude towards such price-based policies might be much more positive than price-based priority access policies in which treatment takes place within the regular working hours of the hospital.

1.1.3 Chapter 3: Collective health outcomes and psychological distance

To deal with the scarcity of service resources, public policy makers implement allocation policies to assign service access to consumers. Oftentimes, allocation decisions create conflicts between different interests: collective vs. individual, or efficiency (total) vs. equity (distributional) focal outcomes. In chapter three we investigate how such allocation policies (i.e., individual outcome based vs. collective outcome based policies, and efficiency based vs. equity based policies) that lead to conflicting health outcomes are evaluated over psychological distance. We propose that consumers mentally represent these outcomes at different levels of abstraction, and investigate how allocation policy evaluations are affected by the psychological distance that is inherently present in the decision context by means of two experiments in the health care domain. We expect that evaluations are more positive if there is congruency¹. Moreover, we explore whether consumers' personal experience with the object of evaluation (i.e., health care treatment) activates a concrete mindset that diminishes the effect of the mindset activated by the psychological distance in the decision situation.

This chapter is based on construal level theory which states that outcomes or events are evaluated differently over psychological distance due to a difference in their mental representation. More precisely, abstract (high-level) construals are evaluated more positively in a psychologically far situation, whereas concrete (low-level) construals are more positively evaluated in a psychologically close situation (Liberman & Trope 1998; Trope & Liberman, 2003).

1.2 Customized Care

1.2.1 Chapter 4: Collective costs and benefit evaluations of customized care

For patients, full customization of care according to their preferences would be optimal because it maximizes their utility. Yet, there is little guidance about how the costs and benefits of non-health-related aspects of care can be measured, organized, and used in medical decision making to evaluate (customized) health care programs. In chapter four we propose and test a discrete choice experiment (DCE) based approach to use these costs and benefits to evaluate (customized) health care programs in which non-health-related aspects of care play a role by using individual-specific DCE estimates. The approach is illustrated

¹ Congruency means that there is a match in mental representation between the decision context (psychological distance) and the information presented on the focal object (policy type).

for post-treatment breast cancer care. In this chapter (part two of the thesis) we investigate the final research question, which is as follows:

Research question 2: How can the collective costs and benefits of customized health care programs be evaluated to support management and policy decisions for customized care?

1.3 The Data

For study one of chapter two we send an online survey, consisting of several conjoint based scenarios, to North American respondents and finally used a dataset of 577 respondents in our analysis. For study two of chapter two we send an online survey, also consisting of several conjoint based scenarios, to Dutch respondents and finally used a dataset of 1446 respondents. For study one and two of chapter three we did two online experiments among Dutch respondents and, for each study, got a different representative dataset (based on age and gender) containing 678 respondents. In chapter four we used data of 331 Dutch breast cancer patients based on a choice experiment that they completed at home. For an overview of the datasets used in all thesis chapters see Table 1.

Table 1: Description of the datasets used in the thesis

| Chapter | Study | N | Respondents | Region | Sample | Survey | Data |
|---------|-------|------|--------------------|-----------------|-----------------------------|----------|-------------------------|
| 2 | 1 | 577 | Average population | North America | Ad hoc | Online | Scenario based conjoint |
| | 2 | 1446 | Average population | The Netherlands | Representative age & gender | Online | Scenario based conjoint |
| 3 | 1 | 678 | Average population | The Netherlands | Representative age & gender | Online | Experiment |
| | 2 | 678 | Average population | The Netherlands | Representative age & gender | Online | Experiment |
| 4 | 1 | 331 | Patients | The Netherlands | Volunteer participants | On paper | Choice experiment |

Chapter 2. Collective Health Outcomes and Health Consequences²

ABSTRACT

Increased competition in the health sector has led hospitals and other institutions to explore new allocation mechanisms that move away from traditional expert-based allocation to price-based allocation mechanisms. Little is known, however, about consumer evaluations of such price-based allocation mechanisms and how these evaluations differ between treatments. To fill this gap the authors investigate how consumers evaluate new hospital care allocation mechanisms and find that offering individuals the opportunity to pay more for faster access to treatment negatively affects their evaluations of both total and distributional collective health outcomes of a hospital's care. Furthermore, the effects of these two key collective outcome evaluations on consumers' attitude towards allocation mechanisms are found to be moderated by the health consequence of a treatment (life saving vs. life improving). Finally, the authors find that offering more flexible health care operations that are less restricted in terms of supply (i.e., treatment outside versus within the regular working hours of the hospital) affect total collective health outcome evaluations positively instead of negatively. The results of this chapter are helpful for marketing managers that consider implementing new service allocation policies, in particular in health care management.

2.1 Introduction

Price-based allocation mechanisms are increasingly proposed as a viable strategy to allocate access to services in semi-public domains such as health care, education, and recreation (Brouwer & Schut, 1999; Lewis & Sappington, 1995). Access to the most sought after services and at the most popular service times is typically limited in these domains and not all consumers can be served at their most preferred time (e.g., Boyd & Potter, 1986; Govind, Chatterjee, & Mittal, 2008). In such instances price-based allocation mechanisms (e.g., market-based priority access pricing) are an economically efficient way to allocate service access (Brouwer & Hermans, 1999; Carlton,

² Based on Benning and Dellaert (2010).

1991). However, consumers and policy makers do not always prefer to use such mechanisms to gain access to services (Anderson et al., 1997). In particular because price-based allocation mechanisms can result in distributions with very unequal access levels between consumers (Petrou & Wolstenholme, 2000; Vagero, 1994).

This hesitancy to use price-based allocation mechanisms is perhaps most prominent in the field of health care where different levels of access (e.g., differences in service waiting time) have strong health implications for the individual (Fryer, Pellar, Ormond, Koffron, & Abecassis, 2003; Stremersch, 2008). Yet, high pressure on budgets, policy trends towards deregulation of government activities, and increased competition still lead hospitals and other health care institutions to experiment with new price-based allocation mechanisms (Cutler, 2002; Rice, 1997). Such priority access pricing moves away from traditional non-price-based allocation mechanisms like doctors' expert decisions to allocate patients to treatments based on medical urgency or allocations based on a first-come-first-served principle (Evans, Vossler, & Flores, 2009). While in some instances the pricing process is implemented through intermediary markets (e.g., through health maintenance organizations in the US) increasingly health care providers are also exploring the possibility to interact directly with patients in the access allocation process. For example, recently a well known Dutch hospital experimented with allowing individuals to have priority access to treatments in exchange for higher health care fees. This initiative led to a large political and public opinion backlash, despite the hospital's insistence that the new allocation process improved the overall efficiency of the hospital's care system and did not come at the expense of other patients (Den Exter, 2010).

To date, the question how consumers evaluate price-based vs. non-price-based allocation mechanisms has received only little attention in the literature. Notable exceptions are Kahneman, Knetsch and Thaler (1986), who reported that in the case of football tickets non-price-based allocation mechanisms (i.e., waiting lines) are preferred by consumers over price-based allocation mechanisms (i.e., auctions), and Anderson et al. (1997), who found that there is only limited patient support for paying physicians directly to shorten patient waiting times. Therefore, the objective of this chapter is to develop a better understanding of the consumer evaluation process of price- vs. non-price-based priority access allocation mechanisms, with a particular emphasis on the role of consumers' evaluations of collective health outcomes in the context of health care allocation mechanisms.

First, drawing on recent research on altruism in individual decision making (Fehr & Schmidt, 2006), we propose that the effect of a health care allocation mechanism on consumer attitude towards this mechanism is determined not only by the consumer's

evaluation of his or her own personal chance of treatment and the personal costs involved in participating in the allocation mechanism, but also by the consumer's evaluation of the collective health outcome of the mechanism since individuals also care about the health of others (Jacobsson, Carstensen, & Borgquist, 2005). In particular, we anticipate that based on consumer intuitions about the effects of income inequality in markets for scarce resources (Van Doorslaer & Wagstaff, 1992) their evaluations of the collective outcomes of a health care allocation mechanism are negatively affected by the introduction of price-based allocation mechanisms, which in turn lowers their attitude towards price-based allocation mechanisms. We demonstrate this effect both for consumer evaluations of the total collective health outcome of an allocation mechanism (i.e., the total health gain obtained by implementing the allocation mechanism) and the distributional collective health outcome (i.e., the distribution of health gains across individuals due to the allocation mechanism).

Second, we also investigate if the relative importance of total versus distributional collective health outcome evaluations on consumer attitude towards allocation mechanisms is moderated by the health impact of a health care treatment (i.e., life saving vs. life improving). In particular, we hypothesize that for treatments with less severe consequences, the relative importance of distributional health outcomes is reduced in favor of total health outcomes. We base this expectation on research on differences in consumer allocation preferences between luxury vs. necessity products that suggests that consumers' collective distribution considerations are stronger for necessity products (Kemp, 1998).

Finally, we investigate if a potential mechanism to overcome the anticipated negative effect of price-based priority access allocation mechanisms on consumers' collective health outcome evaluations is to expand a hospital's regular service schedule. More specifically, we expect that if treatments to patients paying for priority access are given outside of regular hospital working hours, consumers perceive a positive effect of price-based allocation mechanisms on the total collective health outcome, even though they still perceive a negative effect of price-based allocation on the distributional collective health outcome.

We test the proposed relationships empirically using two online panel surveys in which respondents were asked to evaluate both price-based and non-price-based health care allocation mechanisms in the context of hospital treatment. Study 1 used a North American sample from a volunteer consumer panel (N=590) and Study 2 used a sample from a Dutch marketing research consumer panel (N=1464) which was representative of the population in terms of age and gender. We find that our results generalize across these two samples drawn from very different health care market settings.

2.2 Consumers and Price-Based Priority Access Allocation in Health Care

In recent years, price-based mechanisms have received growing attention from policy makers and managers as a way to allocate (semi-) public services to consumers because it is seen as a potentially powerful approach to promote economic efficiency and welfare gains (Brouwer & Hermans, 1999; Carlton, 1991). In particular, providing consumers with the opportunity to pay for priority access has been suggested as a way to more efficiently allocate access in domains such as health care (Brouwer & Hermans, 1999; Brouwer & Schut, 1999), recreation (Sandrey, Buccola, & Brown, 1983), and transportation (Newbery, 1988; Newbery, 1994). Different pricing allocation mechanisms have been proposed across these different applications and they include auctions, congestion-based flexible prices, and relatively fixed tariff schemes.

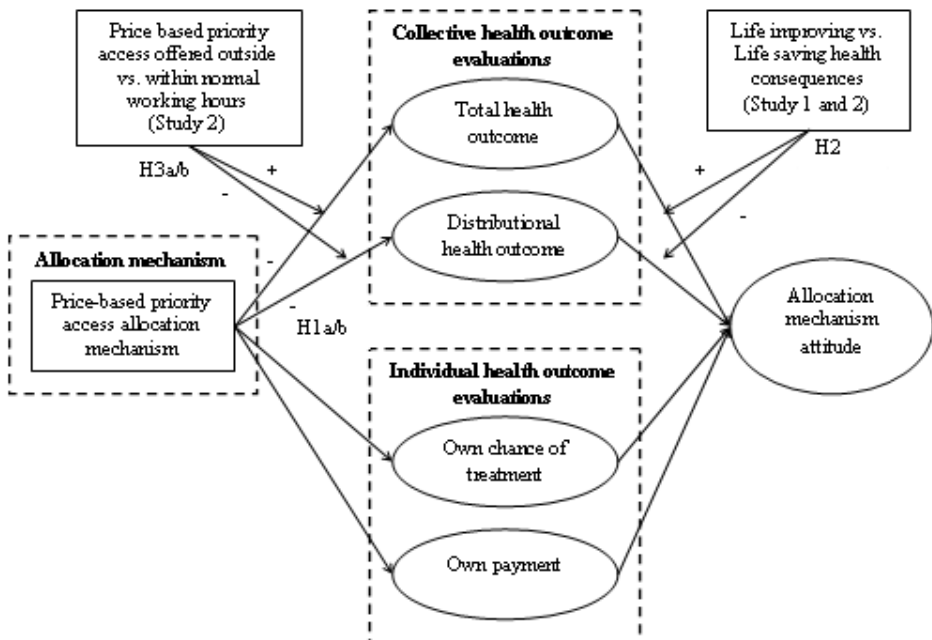
We investigate consumers' evaluations of such price-based priority access allocation mechanisms. Economic theory suggests that consumers' evaluations of their own personal costs and benefits associated with an allocation mechanism should drive their attitude towards the mechanism (Becker, 1976; Frey, 1999; Lazear, 2000). However, there is also increasing evidence that consumers take into account the collective interests of other consumers when evaluating different ways to allocate resources (e.g., Fehr & Fischbacher, 2002; Fehr & Schmidt, 2006; Kahneman et al., 1986). This effect is also likely to be relevant for health care (Jacobsson et al., 2005).

2.2.1 Consumers' collective health outcome evaluations

To describe consumers' collective health outcome evaluations of allocation mechanisms we distinguish between two key collective concerns that drive individuals' evaluations: 1. *Total collective health outcome* expresses the expected total gain in health that results from the application of an allocation mechanism (i.e., the efficiency of the allocation mechanism) and 2. *Distributional collective health outcome* expresses how equally the health outcome resulting from the allocation mechanism is distributed among individuals (i.e., the equity of the allocation mechanism) (Dolan & Robinson, 2001; Nord, Pinto, Richardson, Menzel, & Ubel, 1999; Wagstaff, 1991).

Research findings in health care demonstrate that individuals are often willing to sacrifice some part of the total collective health outcome (typically expressed in terms of total Quality of Adjusted Life Years (QALYs) saved) in return for a better distributional collective health outcome (a more equitable distribution of QALYs) (Andersson & Lyttkens, 1999; Johannesson & Gerdtham, 1996; Ratcliffe, 2000; Schwappach, 2003). These findings underline that individuals' evaluations of both total and distributional collective health outcomes are likely to play a substantial role when consumers evaluate allocation mechanisms (see Figure 2).

Figure 2: Conceptual model and hypotheses



Price-based priority access allocation mechanisms are likely to influence consumers' collective health outcome evaluations. Recently, hospitals have experimented with such allocation mechanisms by charging a fixed amount for priority access to treatment at certain reserved time slots in the week (den Exter, 2010). Thus, these mechanisms offer individuals the opportunity to advance their medical treatment by paying an extra fee. The resulting shifts in treatment priority access are likely to influence collective health outcomes. The reason is that compared to non-price-based allocation mechanisms (i.e., expert-based allocation or first-come-first-served principles) price-based priority

access allocation mechanisms assign patients also on the basis of their willingness to pay for faster access to health care. Thus, in price-based priority access allocation mechanisms medical urgency is a relatively less important determinant of speed of access to health care. For example, high income patients may have a higher willingness-to-pay for priority access than low income patients and therefore priority access pricing is likely to result in faster average access to health care for high income patients compared to low income patients, which in turn affects collective health outcomes.

We expect that consumers also take the existence of such additional (i.e., non-medical urgency based) drivers of willingness-to-pay into account when evaluating the expected collective health outcomes of price-based priority access allocation mechanisms. More specifically, we expect that consumers anticipate that allowing for price-based priority access has a negative impact on total collective health outcomes compared to non-price-based allocation mechanisms because non-medical urgency based criteria become more important in determining the final outcome. We also expect that distributional collective health outcome evaluations are negatively affected, because non-medical urgency criteria are likely to increase the differences between relatively healthy and relatively less healthy individuals, as less healthy individuals are somewhat less likely to receive treatment fast (e.g., because they tend to have lower incomes).

H₁: A price-based priority access allocation mechanism for a fixed number of health care time slots negatively affects consumers' evaluation of (a) total collective health outcomes and (b) distributional collective health outcomes compared to a non-price-based access allocation mechanism.

2.2.2 *The moderating role of health care impact*

Previous research shows that individuals' preferences for the allocation of health care resources differ depending on the nature of the medical condition for which the decisions are made (Furnham, Thomson, & McClelland, 2002; Johri, Damschroder, Zikmund-Fisher, & Ubel, 2005; Furnham, Ariffin, & McClelland, 2007). In this study we specifically focus on the role of the health impact of a treatment on the importance individuals' attach to different criteria when evaluating allocation mechanisms. In particular we hypothesize that

there are differences depending on whether a treatment is life saving or life enhancing. Furnham, Thomson, and McClelland (2002), for example, found that – although allocations towards lower aged, lower income, and non-smoking patients are preferred for both a cosmetic and a heart transplantation treatment – the effect of patient income level on respondents’ priority ranking of hypothetical patients was much higher for a cosmetic (i.e., life enhancing) treatment in contrast to a heart transplantation (i.e., life saving) treatment. This suggests that health consequences play an important role in how individuals evaluate different allocation criteria, in particular income.

We propose that these observed differences in preferences for allocations due to the health consequence of a treatment (i.e., life improving vs. life saving) can be explained by differences in the importance consumers attach to total and distributional collective health outcomes for different health consequences. We expect that consumers place more weight on distributional health outcomes for a treatment with life saving consequences relative to a treatment with life improving consequences, due to the difference in emphasis that consumers place on the total vs. distributional collective outcomes in decisions for luxury vs. necessity goods (Kemp & Bolle, 1999).

In general, individuals prefer that the distribution of luxuries should be left to the market, while the distribution of scarce necessities should be regulated (Berry, 1994; Kemp, 1996; Kemp, 1998; Mahoney, Kemp, & Webley, 2005). We expect that compared to a treatment with life saving consequences, consumers consider a treatment with only life improving consequences to be less of a necessity and a more luxury type of good (Kemp, 1998). This is also reflected in the fact that consumers are likely to find life improving treatments less important compared to life saving treatments (Kemp & Bolle, 1999). Based on these considerations we hypothesize that for life improving health care treatments consumers attach relatively less weight to distributional collective health outcomes compared to total collective health outcomes than in the case of life saving health care treatments.

H₂: The relative impact of distributional collective health outcome evaluations (compared to total collective health outcome evaluations) on consumers’ attitude towards an access allocation mechanism is lower for health care treatments that have life improving vs. life saving consequences.

2.3 Study 1: North American Sample

In Study 1 we use North American data to empirically test H_{1a} , H_{1b} , and H_2 .

2.3.1 Method

Sample

We obtained data by means of an online questionnaire that was sent to members of a North American online consumer panel. Participants received \$5 for their participation. 590 completed surveys were obtained, of which data of 13 respondents were deleted because of missing or incorrect responses. Thus, a total of 577 completed questionnaires were used in the final data analysis. The average age of respondents was 40.63 years (ranging from 18 to 75 years), 73 % of the respondents were female, and all respondents lived in the U.S. Moreover, the average duration time of the survey was about 23 minutes.

Procedure

The questionnaire started with an introduction about the structure of the study. Respondents were asked to consider possible scenarios in which hospitals were exploring new health care allocation policies. Then, respondents were randomly assigned to one of four hypothetical health care scenarios in which they were presented with hypothetical hospitals. These hospitals were identical in all respects except for the health care allocation mechanisms they used. All allocation mechanisms were explained in detail to the respondents (see experimental conditions section below) and it was tested if participants understood the information presented to them before they could continue.

Respondents answered questions on three (of seven possible) policies of the hospitals in question (see measures section below). All hospital policies were the same across scenarios and the selection of the three hospital policies per respondent was systematically rotated across respondents per scenario (in seven different ways) to average across possible order effects. This resulted in 28 versions of the questionnaire (i.e., four health care scenarios each with the seven rotations of three different hospital policies) that were randomly assigned to respondents. The questionnaire ended with several socio-demographic questions.

Experimental conditions

A 2*2 between subjects design was used to create the health care scenarios. The first experimental scenario variable described the health consequence of treatment (a life improving ear correction treatment vs. a life saving liver transplantation treatment) and was used to test H₂. The second experimental variable described the funding structure of the hospital (public vs. private). This second variable was included to control for respondents beliefs about the type of hospital which could also affect their sensitivity for total vs. distributional collective health outcomes. However, no significant main or interaction effects of this second variable were found in the analysis and therefore its experimental conditions were collapsed in the data analysis reported in the chapter.

The health care allocation mechanisms were described using a 2*3 full factorial design of price-based vs. non-price-based allocation for three different types of allocation processes (i.e., lottery, waiting list, and expert-based selection procedure). The price-based allocation mechanisms were described to respondents as pricing mechanisms in which the hospitals offered two rates for each treatment; a priority access price and a fixed price. The priority price was described as being 10 % higher than the fixed price, and provided patients with a 10 % higher chance of being admitted to treatment at any given moment in time (compared to regular patients, with identical medical needs). The non-price-based allocation mechanisms were described as allocation mechanisms in which there was only one price for treatment for all patients. Finally, as an additional (price-based) allocation mechanism, an auction mechanism was also included that inherently combines pricing and the allocation of care by allowing consumers to bid on priority access. The different allocation mechanisms are summarized in Table 2.

Table 2: Attributes and attribute levels of allocation mechanisms for Study 1

| <i>Attributes</i> | <i>Attribute levels</i> | <i>Description of attribute levels</i> |
|--------------------|----------------------------------|---|
| Pricing | Price-based | Hospitals offer two rates for each treatment, a regular price and a priority access price. The priority access price is 10% higher than the regular price and provides patients with a 10% higher chance of being admitted to treatment at any given moment in time compared to other patients with identical medical needs, that have chosen to pay the regular price. |
| | Non-price-based | Hospitals always ask the same price for a treatment. |
| Allocation process | Waiting list | The longer a patient is waiting for the treatment the earlier he/she will be treated. |
| | Lottery | Patients are randomly selected for treatment with equal probability. |
| | Expert-based selection procedure | Patients are ranked for treatment access based on a measure that takes into account the degree of illness, life style and the expected total number of quality adjusted life years (QALYs) gained after treatment. This measure is a product of gains in quality and length of life. |
| | Auction | Patients are able to bid an amount they would like to pay for priority access status. Multiple bids per person are possible (ascending auction). The patients with the highest bids receive priority access. |

Measures

We measured attitude towards the allocation mechanism by four items based on Dabholkar (1996). Collective health outcome evaluations are measured separately for total and distributional health outcomes. These self-created multi-item measures are based on previous research on efficiency and equity of health care interventions (Nord et al., 1999; Wagstaff, 1991) in accordance with our earlier definitions of total and distributional health outcomes.

All outcome constructs were initially measured using three items. After testing one item was deleted from each construct to improve measurement performance (see Appendix A). The control variables for individual outcomes are measured by a respondent's evaluation of the own chance of treatment and own payment amount. Finally,

we also measured respondents' perceived control as a process measure of the allocation mechanism using three items adapted and extended from Dabholkar (1996). The control construct is later used as marker variable to test for common method bias in our analysis.

Confirmatory Factor Analysis was used to verify the factor structure of the different measures. We used data of each respondent of one randomly selected hospital policy to prevent potential repeated measures bias (i.e., 577 observations). We analyzed several measures of fit which all indicate a good to acceptable model fit: Chi-Square/Df ratio is 1.82, RMSEA is .04, and high scores for measures GFI: .99, and CFI: .99. To test for discriminant validity we compared the average variance extracted within factors with the square of the bivariate correlations between factors (Fornell & Larker, 1981). For the four constructs of interest the variance extracted was .84 for the total collective health outcome, .83 for the distributional collective health outcome, .87 for the own chance of treatment, and .89 for the own payment construct. The squares of the correlations between the factors varied between .13 and .42. Thus, the average variance extracted (AVE) for each construct was greater than the absolute value of the standardized squared correlation which shows discriminant validity.

Common method variance

We follow Lindell and Whitney's (2001) recommendations to check for common method variance (CMV). To do so we use the control construct, which is theoretically unrelated to at least one of our focal constructs, as a marker variable. We take the correlation of the control construct with attitude ($r = .07$) as a base-line measure for CMV. After re-estimating the model including the marker variable to partial out this base-line correlation with the marker variable we find that none of the relationships are affected (see Appendix B). This indicates that CMV is not a concern in our data.

Analytical Model

Our data have a panel structure because respondents answered questions for three different hospital policies. To reflect this structure, we estimate random coefficient regression models for our three dependent variables: total collective health outcome evaluation ($TOTAL_{ijt}$), distributional collective health outcome evaluation ($DISTRIBUTIONAL_{ijt}$), and attitude ($ATTITUDE_{ijt}$). The first two models are specified in equations 1 and 2. The allocation mechanisms waiting list (X_j^{WL}), lottery (X_j^{LOT}), and doctor's selection (X_j^{SEL}) are dummy variables coded one if they were the hospital's policy and zero otherwise. The auction is used as a base category and coded

zero. In case the waiting list, lottery, or doctor's selection procedure are price-based, the price-based dummy (X_j^{PRICE}) is coded one, when they are non-price-based this dummy is coded minus one. All parameters for the independent variables are estimated as random coefficients ($\beta_i = \beta + v_i$).

$$\begin{aligned} TOTAL_{ijt} = & \alpha_{THO} + \beta_{iPRICE_T} X_j^{PRICE} + \beta_{iLOT_T} X_j^{LOT} \\ & + \beta_{iWL_T} X_j^{WL} + \beta_{iSEL_T} X_j^{SEL} + \varepsilon_{ijt}^{TOTAL} \end{aligned} \quad (1)$$

$$\begin{aligned} DISTRIBUTIONAL_{ijt} = & \alpha_{DHO} + \beta_{iPRICE_D} X_j^{PRICE} + \beta_{iLOT_D} X_j^{LOT} \\ & + \beta_{iWL_D} X_j^{WL} + \beta_{iSEL_D} X_j^{SEL} + \varepsilon_{ijt}^{DISTRIBUTIONAL} \end{aligned} \quad (2)$$

Next, we estimate the attitude model which is specified in equation 3. The allocation mechanisms (X_j^{WL} , X_j^{LOT} , X_j^{SEL}) and price-based dummy (X_j^{PRICE}) are defined as before. The total collective health outcome evaluation (X_j^{TOTAL}) and distributional collective health outcome evaluation ($X_j^{DISTRIBUTIONAL}$) are independent variables in this model and were mean centered in the analyses. We also include health consequence of treatment ($X_j^{LIFEIMPROVING}$) and its interactions with total and distributional collective health outcome evaluations ($X_j^{TOTAL \times LIFEIMPROVING}$, $X_j^{DISTRIBUTIONAL \times LIFEIMPROVING}$). Health consequence of treatment (i.e., life improving vs. life saving) is a dummy variable coded one if the health consequence of the treatment is life improving and zero if the health consequence of the treatment is life saving. We control for (mean centered) individual outcome benefit evaluations of the own chance of treatment ($X_j^{OWNCHANCE}$) and the expected own payment ($X_j^{OWNPAYMENT}$). All main effects are estimated as random coefficients ($\beta_i = \beta + v_i$)³.

³ We also estimated the same model but controlling for age, gender, annual household income (high vs. low), education (high vs. low), hospital type (public vs. private), and the interactions of these variables with distributional and total collective outcome evaluations. Including these control variables did not change our conclusions.

$$\begin{aligned}
ATTITUDE_{ijt} = & \alpha_{ATT} + \beta_{iPRICE_A} X_j^{PRICE} + \beta_{iLOT_A} X_j^{LOT} + \\
& \beta_{iWL_A} X_j^{WL} + \beta_{iSEL_A} X_j^{SEL} + \beta_{iTOTAL_A} X_j^{TOTAL} + \\
& \beta_{iDISTRIBUTIONAL_A} X_j^{DISTRIBUTIONAL} + \beta_{iOWNCHANCE_A} X_j^{OWNCHANCE} + \\
& \beta_{iOWNPAYMENT_A} X_j^{OWNPAYMENT} + \beta_{iLIFEIMPROVING_A} X_j^{LIFEIMPROVING} + \\
& \beta_{iTOTAL \times LIFEIMPROVING_A} X_j^{TOTAL \times LIFEIMPROVING} + \\
& \beta_{iDISTRIBUTIONAL \times LIFEIMPROVING_A} X_j^{DISTRIBUTIONAL \times LIFEIMPROVING} + \\
& \varepsilon_{ijt}^{ATTITUDE}
\end{aligned} \tag{3}$$

2.3.2 Results

The results are reported in Table 3. They show that as expected price-based priority access allocation mechanisms have a negative effect on total and distributional collective health outcome evaluations, this provides support for H_{1a} and H_{1b} (Table 3 - Models 1 and 2).

We also find support for H₂. The interaction of a life improving health consequence with the total health outcome and the interaction of a life improving health consequence with the distributional health outcome (Table 3 - Model 3) show that health care treatments with life improving consequences increase the effect of total collective health outcome evaluations, and decrease the effect of distributional collective health outcome evaluations on consumer attitude towards the allocation mechanism compared to treatments with life saving consequences.

Table 3: Results of Study 1

| Dependent variable | Model 1 | | Model 2 | | Model 3 | |
|--|-------------|-----------|----------------|-----------|-------------|-----------|
| | Total | | Distributional | | Allocation | |
| | Mean | St. dev. | Mean | St. dev. | Mean | St. dev. |
| | (β) | (ν) | (β) | (ν) | (β) | (ν) |
| Constant (α) | -71** | .51** | -1.22** | .00 | 3.48** | .44** |
| Price-based (H1a and H1b) | | | | | | |
| (β_{iPRICE}) | | | | | | |
| Lottery | .22** | .59** | .87** | .62** | .42** | .27** |
| (β_{iLOT}) | | | | | | |
| Waiting list | .93** | .40** | 1.58** | .76** | .71** | .28** |
| (β_{iWL}) | | | | | | |
| Selection | 1.34** | .46** | 1.82** | .94** | .45** | .29** |
| (β_{iSEL}) | | | | | | |
| Total health outcome | | | | | .25** | .08 |
| (β_{iTOTAL}) | | | | | | |
| Distributional health outcome | | | | | .26** | .16** |
| ($\beta_{iDISTRIBUTIONAL}$) | | | | | | |
| Own chance of treatment | | | | | .34** | .17** |
| ($\beta_{iOWNCHANCE}$) | | | | | | |
| Own payment | | | | | .12** | .16** |
| ($\beta_{iOWNPAYMENT}$) | | | | | | |
| Life improving health consequence | | | | | .01 | .11** |
| ($\beta_{iLIFEIMPROVING}$) | | | | | | |
| Total health outcome x Life improving health consequence (H2) | | | | | .16** | |
| ($\beta_{iTOTAL \times LIFEIMPROVING}$) | | | | | | |
| Distributional health outcome x Life improving health consequence (H2) | | | | | -.11** | |
| ($\beta_{iDISTRIBUTIONAL \times LIFEIMPROVING}$) | | | | | | |

* $p < .05$ ** $p < .01$

2.3.3 Conclusion and discussion

In this first study we provide evidence for our hypotheses. There is a negative effect of priority access pricing on total and distributional collective health outcome evaluations (H_{1a-b}). Also, the effect of distributional collective health outcome evaluations on consumer attitude decreases compared to that of total collective health outcome evaluations in case of a health care treatment with life improving consequences vs. a treatment with life saving consequences (H_2). This finding is interesting because it indicates that in health care allocation decisions in which lives are at stake (i.e., with life saving consequences) distributional aspects have a stronger effect on allocation mechanism attitude than if life improvement is the main goal. Hospital managers should take this into account when they consider the different allocation policies they may implement. Allocation mechanisms that lead to a more equal distribution of (quality adjusted) life years saved among individuals are more dominant in consumers' evaluations for treatments with life saving consequences than for treatments with life improving consequences. We investigate further details about this effect in Study 2.

2.4 Study 2: Dutch Sample

The purpose of Study 2 was threefold. First, respondents in Study 1 recognized that price-based priority access allocation mechanisms – although economically more efficient – may increase the probability that patients that are less in need of treatment are treated faster. This lowered their total collective health outcome evaluations, and it is worthwhile to investigate if this negative impact of price-based allocation mechanisms on total collective health outcome evaluations could be overcome by offering health care operations that are less restricted in terms of supply (i.e., by offering more flexible hours of operation). To do so, Study 2 introduces an additional allocation mechanism condition. This condition describes a price-based allocation of priority access to care that is available only for treatment outside regular working hours of the hospital. In this new condition, patients that pay extra for priority access are treated outside the regular working hours of the hospital, which eliminates disadvantages for total health outcomes because treatment for regular patients is not delayed by the priority access policy.

We expect that consumers recognize this distinction and adjust their evaluation of total health outcomes accordingly (see Figure 2). However, at the same time the new policy should only increase consumers' evaluations of *total* collective health outcomes (which can increase with additional supply) but not *distributional* collective health outcomes because the latter still remains relatively more unequal across patients (compared

to non-price-based allocation policies) because of differences in patients' willingness and ability to use price-based access to care. This leads us to formulate the following hypothesis:

H₃: A price-based priority access allocation mechanism in which patients that pay for faster access are treated outside of regular working hours has (a) a positive effect on consumers' evaluations of the total collective health outcome and (b) a negative effect on consumers' distributional collective health outcome evaluations compared to a non-price-based allocation mechanism.

The second objective of Study 2 is to provide more detailed process-level support for the proposed mechanism underlying the observed moderating effect of health consequences. We drew on luxury/necessity theory to anticipate that individuals prefer that the distribution of luxuries should be left to the market, while the distribution of scarce necessities should be regulated (Berry, 1994; Kemp, 1996; Kemp, 1998; Mahoney et al., 2005). Therefore, given the observed moderating effects in Study 1, we expect that a treatment with life improving consequences should be perceived as more of a luxury good while a treatment with life saving consequences should be seen as a necessity good by consumers. In Study 2 we explicitly measure consumer's evaluations of the aspects that reflect Kemp's theoretical distinction between necessities and luxury goods (i.e., luxury perception and perceived importance).

To further strengthen this explanation, we also rule out an alternative explanation for our findings by controlling for a potential shift in the perceived fairness of the allocation mechanism for different health consequences. In recent years experimental economists have gathered evidence that suggests that individuals are strongly motivated by concerns for fairness (Fehr & Schmidt, 2006). Consumers' fairness evaluations of allocation mechanisms are therefore likely to also affect their attitude towards allocation mechanisms and are now controlled for in the analysis.

The third objective of Study 2 is to test if our findings generalize to consumers in a very different health care market than the US health care market. Therefore we collect data from a different market setting. In particular we analyze data from a general population sample in the Netherlands.

2.4.1 Method

Sample

We obtained data by means of an online questionnaire that was sent to members of a Dutch online consumer panel. Participants were randomly assigned to one of the two versions of the questionnaire and received €5 for participation. 1464 completed surveys were obtained, of which data of 18 respondents were deleted because of missing or incorrect responses. Thus, a total of 1446 completed questionnaires were used in the final data analysis. The sample was drawn from a large online pool of participants to be representative for the Dutch population based on age and gender. The average age was 46.11 years (ranging from 18-83 years) and 51.7 % of the respondents were female. The average duration for completing the questionnaire was 11 minutes.

Procedure

Respondents started the questionnaire with a short introduction about the structure of the study and were presented with one out of two hypothetical health care scenarios (life saving vs. life improving). They were asked to consider possible scenarios in which hospitals were exploring new health care allocation policies. Then they were presented three different hypothetical hospitals. These were identical in all respects except for the health care allocation mechanisms they used. Respondents answered questions about all three hospitals' allocation policies (see measures section below). After this task they also answered some questions to measure the luxury-necessity degree of the two treatment type manipulations (i.e., life saving (liver transplantation treatment) vs. life improving (ear correction treatment)) and the perceived fairness of the allocation policies. The survey ended with several socio-demographic questions.

Experimental conditions

A 2*3 between and within subjects design was used. The two levels described the health consequence of treatment (a life improving ear correction treatment vs. a life saving liver transplantation treatment) and were used to test H_2 in the different health market setting. The three levels were a within subject manipulation of health care allocation mechanisms. These were described as: non-price-based allocation, price-based allocation within the regular working hours of the hospital, and price-based allocation outside of the hospitals' regular working hours. Only one type of allocation process was used in Study 2. The non-price-based allocation mechanism was a mechanism that uses a waiting list with an average waiting time of eight months in which there is no option to pay for earlier treatment and fully covered costs of treatment. The price-based allocation mechanisms

were identical to the non-price-based allocation mechanism except for the fact that they offered patients the option to be treated earlier (i.e., within 1 month instead of 8 months) when they paid €900 extra out of their own pocket (not covered by health insurance). The price-based allocation mechanisms were used to test H_{1a}, H_{1b}, H_{3a}, and H_{3b}. The survey specified that in case of a price-based allocation mechanism in which treatment takes place outside the regular working hours of the hospital other patients on the waiting list did not have to wait longer for treatment. In case of a price-based allocation mechanism in which treatment takes place within the regular working hours of the hospital, respondents were told other patients did have to wait longer.

Measures

We measured attitude towards the allocation mechanism by four items based on Dabholkar (1996). Collective health outcome evaluations are measured separately for total and distributional health outcomes (Nord et al., 1999; Wagstaff, 1991). Each construct was measured by three-item scales (see Appendix C). The control variables for individual outcomes are measured by a respondent's evaluation of the own chance of treatment and own payment amount and also consist of three-item scales. To measure consumer's evaluations of the aspects that reflect Kemp's theoretical distinction between necessities and luxury goods we included two additional questions to measure (Kemp & Bolle, 1999): (1) to what extent the respondents thought that an ear correction treatment (or a liver transplantation treatment) was a necessary vs. luxury type of care, and (2) how important they thought this kind of treatment was in general. We also measured respondents' perceived fairness of the policy, which is used as additional control variable, with three items (see Appendix C). This construct was based on a scale that measures price fairness (Darke & Dahl, 2003; Haws & Bearden, 2006) and adjusted to reflect the perceived fairness of a policy. Finally, we measured respondents' perceived control as a process measure of the allocation mechanism using three items as used in Study 1 (Dabholkar, 1996). This is used as a marker variable to test for common method bias.

Confirmatory factor analysis was used to verify the factor structure of the different measures. We used data of one randomly selected hospital policy for each respondent. We analyzed several measures of fit which all indicate a good to acceptable model fit: Chi-Square/Df ratio is 7.11, RMSEA is .07, and high scores for GFI: .95, and CFI: .98.

To test for discriminant validity we compared the average variance extracted within factors with the square of the bivariate correlations between factors (Fornell & Larker, 1981). For the five constructs of interest the variance extracted was .80

for the total health outcome, .79 for the distributional health outcome, .87 for the own chance of treatment, .91 for the own payment, and .88 for the fairness construct. The squares of the correlations between the factors varied between .06 and .65. Thus, the average variance extracted (AVE) for each construct was greater than the absolute value of the standardized squared correlation which shows discriminant validity.

Common method variance

We again follow Lindell and Whitney's (2001) recommendations to check for CMV. We use the control construct. In Study 2 control did not have a significant correlation with any of our focal constructs; therefore there was no reason to expect problems of common method bias. We still estimated the model including control and found that none of the relationships are affected (see Appendix D). Thus, CMV is not of concern in Study 2.

Analytical model

Our data have a panel structure because respondents answered questions for three different hospital policies. To reflect this structure, we estimate random coefficient regression models for our three dependent variables: total collective health outcome evaluation ($TOTAL_{ijt}$), distributional collective health outcome evaluation ($DISTRIBUTIONAL_{ijt}$), and attitude ($ATTITUDE_{ijt}$). The first two models are specified in equation 4 and 5. The price-based allocation mechanisms in which treatment takes place within and outside the regular working hours of the hospital ($X_j^{PRICE-IN}$, $X_j^{PRICE-OUT}$) are dummy variables coded one if they were the hospital's policy and zero otherwise. The non-price-based mechanism is used as a base category and coded zero. All main effects are estimated as random coefficients ($\beta_i = \beta + v_i$).

$$TOTAL_{ijt} = \alpha_{THO} + \beta_{iPRICE-IN_T} X_j^{PRICE-IN} + \beta_{iPRICE-OUT_T} X_j^{PRICE-OUT} + \epsilon_{ijt}^{TOTAL} \quad (4)$$

$$DISTRIBUTIONAL_{ijt} = \alpha_{DHO} + \beta_{iPRICE-IN_T} X_j^{PRICE-IN} + \beta_{iPRICE-OUT_T} X_j^{PRICE-OUT} + \epsilon_{ijt}^{DISTRIBUTIONAL} \quad (5)$$

Next, we estimate the attitude model which is specified in equation 6. The price-based allocation mechanisms ($X_j^{PRICE-IN}$, $X_j^{PRICE-OUT}$) are defined as before. The total collective health outcome evaluation (X_j^{TOTAL}) and the distributional collective health outcome evaluation ($X_j^{DISTRIBUTIONAL}$) are independent variables in this model and are mean centered in the estimation. We also include the health consequence of treatment ($X_j^{LIFEIMPROVING}$) and its interactions with total and distributional collective health outcome evaluations ($X_j^{TOTAL \times LIFEIMPROVING}$, $X_j^{DISTRIBUTIONAL \times LIFEIMPROVING}$). Health consequence of a treatment (i.e., life improving vs. life saving) is a dummy variable coded one if the health consequence of the treatment is life improving and zero if the health consequence of the treatment is life saving. We control for (mean centered) individual outcome benefit evaluations of the own chance of treatment ($X_j^{OWNCHANCE}$), the expected own payment ($X_j^{OWNPAYMENT}$), and fairness ($X_j^{FAIRNESS}$). All main effects are estimated as random coefficients ($\beta_i = \beta + v_i$)⁴.

$$\begin{aligned}
 ATTITUDE_{ijt} = & \alpha_{ATT} + \beta_{iPRICE-IN_A} X_j^{PRICE-IN} + \\
 & \beta_{iPRICE-OUT_A} X_j^{PRICE-OUT} + \beta_{iFAIRNESS_A} X_j^{FAIRNESS} + \\
 & \beta_{iTOTAL_A} X_j^{TOTAL} + \beta_{iDISTRIBUTIONAL_A} X_j^{DISTRIBUTIONAL} + \\
 & \beta_{iOWNCHANCE_A} X_j^{OWNCHANCE} + \beta_{iOWNPAYMENT} X_j^{OWNPAYMENT} + \\
 & \beta_{iLIFEIMPROVING_A} X_j^{LIFEIMPROVING} + \\
 & \beta_{iTOTAL \times LIFEIMPROVING_A} X_j^{TOTAL \times LIFEIMPROVING} + \\
 & \beta_{iDISTRIBUTIONAL \times LIFEIMPROVING_A} X_j^{DISTRIBUTIONAL \times LIFEIMPROVING} + \\
 & \mathcal{E}_{ijt}^{ATTITUDE}
 \end{aligned} \tag{6}$$

⁴ As in Study 1 we also estimated a model that included age, gender, income (high vs. low), education (high vs. low), and the interaction effects of these variables with the two key benefit evaluations of the collective health outcome as control variables. Including these control variables again did not change our conclusions.

2.4.2 Results

The results are reported in Table 4. Like in Study 1, we find a negative main effect of price-based priority access on consumers' evaluations of total and distributional collective health outcomes when treatment takes place within the regular working hours of the hospital (Table 4 - Models 1 and 2). This provides further support for H_{1a} and H_{1b}. We also find a significant interaction of consumers' distributional collective health outcome evaluations with health consequence of treatment and with the expected sign (Table 4 - Model 3). The interactions of a life improving health consequence with total and distributional health outcome show that health care treatments with life improving consequences do not affect the impact of total collective health outcome evaluations, and decrease the impact of distributional collective health outcome evaluations on consumer attitude towards the allocation mechanism compared to treatments with life saving consequences. This provides further support for H₂.

In addition, we also find support for H_{3a} and H_{3b}. The results demonstrate that a price-based priority access allocation mechanism, in which patients that pay extra for priority treatment are treated outside of regular hospital working hours, positively affects consumers' evaluations of the total collective health outcome compared to a non-price-based allocation mechanism (Table 4 - Model 1). We also find that this allocation mechanism negatively affects consumers' distributional collective health outcome evaluations compared to a non-price-based allocation mechanism (Table 4 - Model 2).

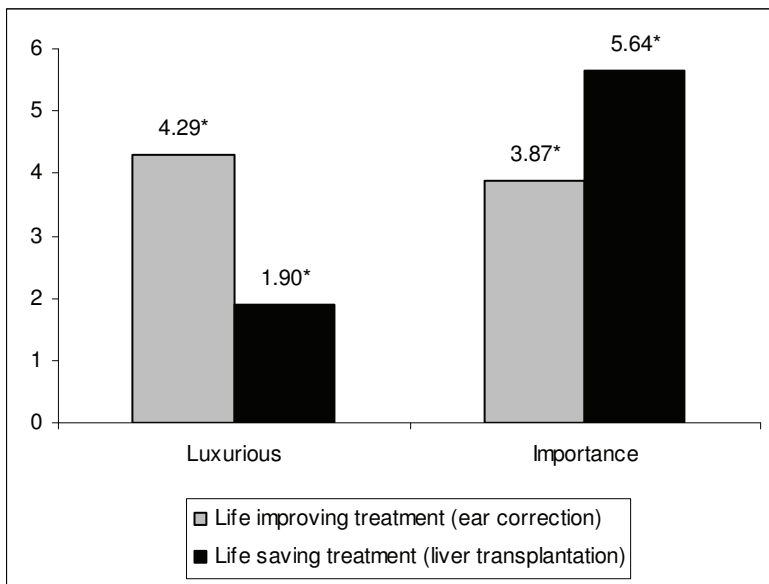
Table 4: Results of Study 2

| <i>Model</i> | <i>Model 1</i> | | <i>Model 2</i> | | <i>Model 3</i> | |
|---|-----------------------------|-----------------|--------------------------------------|-----------------|--------------------------------------|-----------------|
| <i>Dependent variable</i> | <i>Total health outcome</i> | | <i>Distributional health outcome</i> | | <i>Allocation mechanism attitude</i> | |
| | <i>Mean</i> | <i>St. dev.</i> | <i>Mean</i> | <i>St. dev.</i> | <i>Mean</i> | <i>St. dev.</i> |
| | (β) | (ν) | (β) | (ν) | (β) | (ν) |
| Constant (α) | .17** | .79** | .54** | .66** | 3.39** | .15** |
| Price-based within opening hours (H1a and H1b) $(\beta_{iPRICE-IN})$ | -.75** | .61** | -1.42** | .22** | -.33** | .01 |
| Price-based outside opening hours (H3a and H3b) $(\beta_{iPRICE-OUT})$ | .27** | .32** | -.20** | .01 | .49** | .03 |
| Fairness $(\beta_{iFAIRNESS})$ | | | | | .47** | .11** |
| Total health outcome (β_{iTOTAL}) | | | | | .05* | .02 |
| Distributional health outcome $(\beta_{iDISTRIBUTIONAL})$ | | | | | .12** | .06** |
| Own chance of treatment $(\beta_{iOWNCHANCE})$ | | | | | .19** | .11** |
| Own payment $(\beta_{iOWNPAYMENT})$ | | | | | .05** | .09** |
| Life improving health consequence $(\beta_{iLIFEIMPROVING})$ | | | | | .06* | .13** |
| Total health outcome x Life improving health consequence (H2) $(\beta_{iTOTAL \times LIFEIMPROVING})$ | | | | | .06 | |
| Distributional health outcome x life improving health consequence (H2) $(\beta_{iDISTRIBUTIONAL \times LIFEIMPROVING})$ | | | | | -.09** | |

* $p < .05$. ** $p < .01$

In Study 1 we explained the effect for H_2 from the assumption that treatment with a life improving health consequence is perceived as more luxurious and treatment with a life saving health consequence is perceived as more of a necessity. In Study 2 we are able to test this assumption and find that ear corrections are indeed perceived as significantly more luxurious than liver transplantations, which supports our proposed process explanation for H_2 (see Figure 3). Furthermore, the lower importance connected to an ear correction treatment is also typical of a luxury good and further underlines that an ear correction treatment is perceived more as a luxury than a necessity type of care. Given these findings we conclude that luxury/necessity theory (Kemp, 1998) offers a valid explanation for why a treatment with life improving health consequences, compared to a treatment with life saving health consequences, decreases the effect consumer evaluations of the distributional health outcome have on the consumer attitude towards allocation mechanisms relative to the effect of the total health outcome.

Figure 3: Process level checks of experimental treatment manipulation



* The differences between life improving vs. life saving treatments are significant at $p < 0.01$ for both checks (i.e., luxurious and importance).

2.4.3 Conclusion and discussion

The results of Study 2 provide further support for H_{1a} , H_{1b} and H_2 . Furthermore, we find support for H_{3a} and H_{3b} . After the implementation of a price-based allocation policy in which paying patients are treated outside regular hospital working hours, hospitals can expect a positive effect on consumer attitude towards the allocation mechanism via the positive effect of consumers' evaluations of the total collective health outcome. Such an implementation, however, also influences consumer attitude towards the allocation mechanism negatively via consumer evaluations of the distributional collective health outcome.

Interestingly, the results of Study 2 demonstrate that price-based allocation mechanisms do not always have a negative effect on collective health outcome evaluations. The introduction of a price-based allocation mechanism in which treatment takes place outside of regular opening hours is one example of this.

Study 2 also shows that luxury-necessity theory is an effective way to explain why consumers' evaluations of distributional collective health outcomes, compared to total collective health outcomes, have less impact on consumers' attitude towards allocation mechanisms when lives are not at stake (i.e., for treatments with a life improving health consequence that are regarded as being more a luxury than a necessity type of good).

2.5 Discussion

2.5.1 Conclusion

We found support for H_{1a} , H_{1b} and H_2 in both studies. In general, price-based allocation mechanisms have a negative effect on consumer evaluations of both the total and distributional collective health outcome compared to non-price-based allocation mechanisms. Furthermore, health care treatments with life improving consequences decrease the effect of distributional collective health outcome evaluations relative to the effect of total collective health outcome evaluations on consumer attitude towards the allocation mechanism compared to treatments with life saving consequences. Study 2 provided further support that this effect can be explained by luxury/necessity theory (Kemp, 1998). Health care treatments with life improving consequences are seen as more luxury goods than life saving treatments which are more a necessity. For luxury goods the consumers prefer a market mechanism to allocate scarce goods, whereas for necessity goods regulation is preferred (Kemp & Bolle, 1999), which is closely related to the goal of

reaching a more efficient versus a more equal distribution of scarce resources among consumers.

In Study 2 we also found support for H_{3a} and H_{3b} . Price-based allocation mechanisms in which patients are treated outside the regular working hours of the hospital have a positive effect on consumer evaluations of the total collective health outcome and a negative effect on consumer evaluations of the distributional collective health outcome compared to non-price-based allocation mechanisms. This is an interesting finding because it shows that price-based allocation mechanisms do not necessarily have a negative effect on consumers' collective health outcome evaluations.

2.5.2 Theoretical implications

Although there is a large body of literature that demonstrates that people do not only care about their individual outcome when evaluating allocation mechanisms (e.g., Fehr & Fischbacher, 2002; Fehr & Schmidt, 2006; Kahneman et al., 1986), the specific role of collective outcomes in the consumer allocation mechanism evaluation process is still relatively unexplored. With this chapter we begin to investigate some important aspects of how consumers evaluate outcomes for others in the context of allocation mechanisms. A main contribution to the literature lies in the finding that the collective health outcome allocation mechanism attitude relationship is moderated by the health consequence of a treatment.

We also find different effects on total health outcome evaluations for price-based allocation of care offered outside versus within normal hospital working hours. This second aspect is theoretically interesting, because it demonstrates that consumers are quite rational in how they integrate allocation policy details in their overall evaluations, despite the relative complexity of some of the policies that were evaluated.

Finally, a third theoretically relevant implication of our research is that we found very similar results in terms of how individuals evaluate collective health outcomes for two different (health) market settings (i.e., the United States and the Netherlands). A priori one might have expected that, based on cultural or management practice differences, evaluations could have been more different. This result further supports the robustness of our findings.

2.5.3 *Managerial implications*

Our findings are valuable for health care managers that consider implementing new price-based allocation mechanisms because they provide guidance in deciding which allocation mechanism to implement in different contexts. We address several important issues that provide helpful insights for hospitals when choosing between the implementation of different allocation mechanisms. First, we show that the consumer attitude towards allocation mechanisms is not only influenced by individual outcomes that result from the allocation, but that collective outcomes (both total and distributional) play an important role too (e.g., the R^2 of the model in equation three is .62, without collective outcomes the R^2 is .55). Second, we show that the use of price-based priority access allocation mechanisms can influence consumer allocation mechanism attitude in health care positively via collective health outcome evaluations when treatment takes place outside the regular working hours of the hospital due to the additional supply that is offered. Third, this research demonstrates that the distributional health outcome becomes less important, relative to the total health outcome, when the health consequence of treatment is life improving rather than life saving.

Our conclusion is that, from an attitude based consumer perspective, hospitals in the United States and the Netherlands should be hesitant to advocate price-based allocation mechanisms when treatment takes place within the regular working hours of the hospital. The reason is that such policies may harm patient satisfaction and gather low public support. However, when treatment takes place outside the regular working hours of the hospital price-based allocation mechanisms seem to be very attractive and should definitely be taken into consideration for implementation in the future.

2.5.4 *Limitations and further research*

There are some issues that could be addressed in future research. First, we distinguished between treatments with life saving and life improving consequences by respectively using liver transplantation treatment and ear correction treatment manipulations to test H_2 . Although we found support for this hypothesis in both studies we were not able to test our results across a wider range of health applications. It would be interesting to do so in future research.

Another related aspect is that the results we present are based on general population samples. It would be relevant for hospital managers and health care researchers to investigate if the use of patient data would lead to the same or different results, for example because patients may be more strongly focused on their own health outcomes and

less on collective health outcomes for others. We hope to address this question in future research.

Finally, price-based allocation mechanisms were operationalized by a pricing mechanism that offers the option to pay either a fixed price for treatment in general or a priority access price for being admitted to treatment earlier. In Study 1 we described the priority access price as a price which is 10% higher than the regular price that provides patients with a 10% higher chance of being admitted to treatment at any given moment in time compared to other patients with identical medical needs that have chosen to pay the regular price. In Study 2 we described the priority access price as an additional payment of €900. It would be interesting to investigate the case in which this price is much higher. Such a high price would more clearly reflect the possibility of generating substantial additional income for the hospital that in turn could be used to benefit all patients. This option may decrease otherwise negative evaluations because the benefits to society of providing high-price priority access are more evident. In conclusion, we hope that the insights generated in this chapter trigger future researchers to further investigate these and related questions in this important research domain at the crossroads of health care and marketing.

Chapter 3. Collective Health Outcomes and Psychological Distance⁵

ABSTRACT

To deal with the scarcity of service resources, managers implement allocation policies to assign service access to consumers. Oftentimes, such allocation policies create conflicts between different interests: collective vs. individual, and - within the collective outcomes - efficiency (total) vs. equity (distributional) outcomes. In this study, we propose that consumers mentally represent these allocation outcomes at different levels of abstraction. We hypothesize that allocation policy evaluations are more positive if there is congruency between the social distance of the allocation policy outcome and the psychological distance that is inherently present in many service allocation decision contexts (e.g., an implementation of a temporally and/or physically distant policy). We also propose that consumers' personal interests may overrule these expected congruency effects. Two experiments in health care confirm our expectations, and we find attenuating effects of consumers' recent experience when individual interests are at stake.

3.1 Introduction

The scarcity of service resources in public domains such as health, recreation, and education often demands that explicit allocation policies are implemented to assign service access to consumers (Kahneman, Knetsch, & Thaler, 1986; Persad, Wertheimer, & Emanuel, 2009). For example, doctors may use urgency measures to decide on the order in which patients are treated, music fans may be asked to wait in line to get access to tickets for special events, and aptitude test scores may be used to allow students access to educational programs. When evaluating these allocation policies, consumers are likely to consider both their own individual outcomes and the collective outcomes resulting from the allocation policy's mechanism (e.g., Fehr & Fischbacher, 2002; Fehr & Schmidt, 2006; Kahneman et al., 1986). Oftentimes, allocation policy decisions create conflicts between collective interests vs. interests of different individuals. Thus, consumers' evaluation of allocation policies may be influenced by service providers' achievement of and consumers'

⁵ Based on Benning, Breugelmans, and Dellaert (2010).

focus on each of these outcomes. In this study, we propose that consumers mentally represent individual and collective outcomes at different levels of abstraction. Pronin (2008), for instance, has shown that different processes are involved between how we see ourselves and how we see others. Construal level theory (CLT) predicates that psychological distance to the object of evaluation influences consumers' construal of information: increased psychological (temporal, social, spatial or hypothetical) distance enhances the abstractness and gives rise to a high-level construal mindset (Liberman & Trope, 1998; Trope & Liberman, 2003). In this perspective, it is shown that the outcome for other people is construed as more abstract and at a higher level than one's own outcome (Trope, Liberman, & Wakslak, 2007; Zhao & Xie, 2010). Therefore, we expect that collective outcomes in an allocation policy are construed at a more abstract level while individual outcomes are construed at a more concrete level.

We further investigate how consumers' evaluations of these individual vs. collective allocation policy outcomes are affected by the psychological distance that is inherently present in the allocation policy's decision context. For example, temporal distance in the decision context is caused by the timing of the allocation policy's launch (close vs. far future), while spatial distance is influenced by the closeness of the service venue (close vs. far vicinity). Recent research has shown that congruency between consumer's mental representation and the construal level caused by the decision context results in greater processing fluency (Kim, Rao, & Lee, 2008; White, MacDonnell, & Dahl 2010) and enhanced evaluations (Köhler, Breugelmans, & Dellaert, 2010; Reber, Winkielman, & Schwarz, 1998; Sanna, Lundberg, Parks, & Chang, 2010; Zhao & Xie, 2010). Specifically, we hypothesize that consumers place greater emphasis on the collective (individual) outcomes of an allocation policy in a more (less) psychologically distant context.

In addition, when considering the collective outcomes of an allocation policy, consumers tend to cognitively balance two different goals that may result from the application of an allocation policy mechanism: 1) policies can improve the total collective outcomes (reflecting the efficiency of the allocation policy) and 2) policies can ensure good distributional collective outcomes (reflecting the equity of the allocation policy) (e.g., Dolan & Robinson, 2001; Nord, Pinto, Richardson, Menzel, & Ubel, 1999; Wagstaff, 1991). Individuals are often willing to sacrifice some part of the total collective outcomes in return for better distributional collective outcomes because the latter seems more morally correct (Andersson & Lyttkens, 1999; Johannesson & Gerdtham, 1996; Ratcliffe, 2000; Schwappach, 2003). Given that prior research (Eyal & Liberman 2010; Stephan, Liberman, & Trope, 2010) has shown that moral rules reflect social distance, and may

produce an abstract, high-level mental representation, it is also important to investigate if and how consumers' evaluations of equity vs. efficiency collective outcomes are influenced by a psychologically distant vs. close decision context. We hypothesize that consumers place greater emphasis on equity (efficiency) collective outcomes of an allocation policy in a more (less) psychologically distant context.

Lastly, we explore whether there is a boundary effect that may overrule expected congruency effects between the psychological distance inherent in the decision context and the focus on collective vs. individual outcomes, or equity vs. efficiency collective outcomes. More specifically, we expect that consumers' strong personal interests in a service may interfere with expected congruency effects. For instance, prior research by Agerström and Björklund (2009a) has shown that individual differences, such as the importance individuals attach to moral values in a moral dilemma, influence their mental representations across psychological distances. In this research, we investigate if and how a consumer's personal interest with the service provider's allocation policy (captured by recent experience with the service provider) increases a more concrete and ego-centric orientation that may moderate consumers' allocation policy evaluations. We test our hypotheses via two hypothetical experiments in the domain of health care where increasingly new care allocation policies are introduced (e.g., market-based priority access pricing) that can have strong health implications at both the collective and the individual outcome level (Cutler, 2002; Den Exter, 2010) or that differ in their focus on efficiency vs. equity collective outcomes (Dolan & Robinson, 2001; Nord et al., 1999; Wagstaff, 1991). In the first experiment, we focus on the impact of psychological distance in the decision context on the evaluation of individual vs. collective allocation policy outcomes. In the second experiment, we focus on the psychological distance's impact on the evaluation of efficiency vs. equity collective allocation policy outcomes. In both experiments, we evaluate the moderating effect of consumers' personal interest.

3.2 Evaluations of Allocation Policy Outcomes

3.2.1 Individual vs. collective allocation policy outcomes

Management decisions on how to allocate service resources to consumers may create conflicts between collective interests and interests of different individuals. These conflicts are well recognized and have been studied in a managerial and policy context (Lewin, 1991). Not only companies, but also individual consumers actively take into account the interests of others, along with their own self-interest (Agerström & Björklund, 2009a/b),

when evaluating allocation policy decisions. At this moment, it is unknown how individuals exactly evaluate such conflicting allocation policies.

In the current study, we hypothesize that consumers' evaluation of an allocation policy depends on their psychological distance to the outcomes presented in the policy. Based on construal level theory (CLT) that argues that consumers focus on different types of information depending on their psychological distance to the object of evaluation (Kardes, Cronley, & Kim, 2006; Liberman, Trope, & Wakslak, 2007), we expect that consumers mentally represent collective and their own individual outcomes at different levels of abstraction. CLT posits that individuals focus on more concrete, low-level construals when the psychological distance is close whereas focus is placed on more abstract, high-level construals when the psychological distance is far (Trope & Liberman, 2003). Low-level construals represent information that is concrete and subordinate, and highlight the 'how' aspects of an object/action, while high-level construals represent abstract and superordinate information and highlight the 'why' aspects of an object/action (Trope & Liberman, 2003; Trope et al., 2007).

Although CLT originated with the temporal distance perspective (near vs. distant future; Liberman & Trope, 1998), it has been extended to other dimensions such as spatial, hypothetical, or social distance as well (Trope & Liberman, 2010; Trope et al., 2007). The latter (social distance) is especially relevant in the context of selfish hedonistic (individual) vs. altruistic moral (collective) targets, where prior research has shown that distal social targets (e.g., others) are represented on a more abstract level than proximal social targets (e.g., self) (Kim, Zhang, & Li, 2008; Liviatan, Trope, & Liberman, 2008; Trope et al., 2007; Zhao & Xie, 2010). As a consequence, we expect that when evaluating an allocation policy that mainly benefits individual (selfish) outcomes, individuals tend to have a more concrete mental representation and put more weight on low-level aspects of the decision. In contrast, when evaluating an allocation policy that mainly benefits collective (altruistic) outcomes, consumers' mental representation tends to be more abstract and focused on the high-level aspects of the decision. We propose that consumers' evaluations of allocation policy outcomes are further dependent on the psychological distance that is inherently connected to the decision context (e.g., a decision that is implemented for the distant vs. near future, or for a place in the far vs. close vicinity). Prior research has shown that a mental representation match (congruency) between the decision context and the information presented on the focal object has positive effects on the evaluation of the object (Kim, Rao, & Lee, 2008; Köhler et al., 2010; Sanna et al., 2010; Zhao & Xie, 2010). The positive effect of congruency can be explained by the value of fit (Zhao & Xie, 2010) which increases processing fluency and ease of comprehension (Kim, Rao, & Lee, 2008;

Novemsky, Dhar, Schwarz, & Simonson, 2007; White et al., 2010) and positively affects evaluation outcomes like attitude and preference (Köhler et al., 2010; Reber et al., 1998; Sanna et al., 2010). For instance, Kim, Zhang and Li (2008) show that responses to a concrete (low-level) vs. abstract (high-level) campaign of a fictional political candidate are more favored when respondents are told that the campaign would launch one week from now (near future) vs. six months from now (distant future), respectively. Zhao and Xie (2010) find that a recommendation from others is more persuasive when people make decisions for a distant vs. near future consumption. Köhler, Breugelmans and Dellaert (2010) show that congruency between the distance inherently connected to the use of an interactive decision aid (immediate vs. distant consumption, or immediate vs. delayed delivery of recommendations) and the decision aid's communication design (communicating in concrete vs. abstract terms, respectively) increases the likelihood to accept the decision aid's advice. Finally, Agerström and Björklund (2009a/b) find that altruistic, moral behaviors are perceived as more important with greater temporal distance from the moral dilemma, while concrete, selfish temptations take on more weight when the temporal distance from the moral dilemma is near.

Based on these considerations, we expect that an allocation policy implemented in a psychologically distant context (e.g., distant future - ten years from now, or far vicinity - somewhere in the country) triggers people to become concerned with altruistic or collective outcomes, whereas an allocation policy implemented in a psychologically close context (e.g., near future - within one year, or close vicinity - within the neighborhood) triggers people to become concerned with selfish or individual outcomes (Agerström & Björklund, 2009a/b; Eyal & Liberman, 2010). Consequently, we expect that congruency between a collective vs. individual outcome based allocation policy and a psychologically distant vs. close decision context, respectively results in a more positive evaluation of the allocation policy. Hence:

- H_{1a}: In psychologically more distant situations (e.g., when considering the distant future or far vicinity), the evaluation of an allocation policy that has greater collective outcomes increases.
- H_{1b}: In psychologically closer situations (e.g., when considering the proximal future or close vicinity), the evaluation of an allocation policy that has greater individual outcomes increases.

3.2.2 *Efficiency vs. equity collective allocation policy outcomes*

Next to a collective vs. individual interest trade-off, allocation policy makers as well as individual consumers also recognize the tension between efficiency vs. equity collective outcomes, and consider both how the policy affects the total outcome (e.g., the total number of life years saved; efficiency) as well as the distribution of these outcomes across consumers (e.g., the distribution of the life years saved; equity) (Lindholm, Emmelin, & Rosen, 1997). The health care literature has extensively studied how to measure and compare total collective health outcomes and the distribution of these outcomes (e.g., Culyer & Wagstaff, 1993; Nord et al., 1999). Regarding policy evaluations, prior research has concluded that the majority of (Swedish) politicians are prepared to sacrifice some degree of total collective health outcomes to allow for increased equity in its distribution (Lindholm, Emmelin, & Rosen, 1997), and also individuals seem to be willing to sacrifice some part of the total collective health outcome in return for a better distributional one (Andersson & Lyttkens, 1999; Johannesson & Gerdtham, 1996; Ratcliffe, 2000; Schwappach, 2003).

An important reason seems to be that people care about equity and equality, even when it comes at the cost of the total outcome (e.g., total number of life years saved). Within the health sector, it has been found that health maximization does not appear to be the only concern when asked about health care priorities (Andersson & Lyttkens, 1999). A concept that is often used to calculate the total health improvement resulting from an allocation policy is the concept QALYs (Quality of Adjusted Life Years) which is the product of gains in quality and length of life (Jacobsson, Carstensen, & Borgquist, 2005; Wagstaff, 1991). People may perceive an allocation policy with an unequal distribution but higher total number of QALYs saved among patients (treat 100 patients, of which 50 will live 20 years and the other 50 will live 5 years longer in full health; total number of QALYs saved = $50 \times 20 + 50 \times 5 = 1250$) as less morally correct than an allocation policy with an equal distribution but lower total number of QALYs saved among patients (treat 100 patients, all of which live 10 years longer in full health; total number of QALYs saved = $100 \times 10 = 1000$) (Andersson & Lyttkens, 1999; Johannesson & Gerdtham, 1996).

Although both efficiency and equity allocation policy outcomes focus on the collective interest, we expect that consumers perceive equity outcomes as more abstract than efficiency outcomes for the following reasons. First, Eyal and Liberman (2010) show that moral rules reflect social distance and may produce an abstract, high-level mental representation. Given that moral concerns are more imperative for equity than efficiency

outcomes, we expect that the former induces a higher-level construal than the latter. Second, while favoring an efficiency based allocation policy outcome is more rational from an economic point of view (striving for the largest possible health outcome) and for that reason may trigger a concrete, low-level mental representation, favoring an equity based allocation policy outcome seems more morally correct and polite from an emotional point of view (striving for an equal health distribution) and may for that reason trigger an abstract, high-level mental representation (Stephan et al., 2010). Thus, based on these reasons, we expect that when evaluating an allocation policy that mainly benefits equity collective outcomes, individuals tend to have a more abstract mental representation than when evaluating an allocation policy that mainly benefits efficiency collective outcomes.

Based on the congruency effect and the value of fit described above, we expect that consumers' evaluations of efficiency vs. equity collective outcomes are also influenced by the psychological distance in the decision context. A match between the social distance of an allocation policy's focus (efficiency vs. equity outcomes) and the psychological distance in the decision context (close vs. far, respectively) results in greater processing fluency (Kim, Rao, & Lee, 2008; White et al., 2010) and enhanced evaluations (Köhler et al., 2010; Reber et al., 1998). So:

- H_{2a}: In psychologically more distant situations (e.g., when considering the distant future or far vicinity), the evaluation of an allocation policy that has greater equity collective outcomes increases.
- H_{2b}: In psychologically closer situations (e.g., when considering the proximal future or close vicinity), the evaluation of an allocation policy that has greater efficiency collective outcomes increases.

3.3 Consumers' Personal Interests

In the previous discussion, we assumed that the social distance of the outcome highlighted in the allocation policy as well as the psychological distance present in the decision context may shape a consumer's mindset and may influence the focus on a particular kind of information (low- vs. high-level) and can even impede the usage of other information (Foerster, Friedman, & Liberman, 2004). Prior research, however, has shown that also consumers' personal traits may shape internal mindsets and may strengthen situationally

induced mindsets (Agerström & Björklund, 2009a). For instance, Agerström and Björklund (2009a) find that, within a moral dilemma, moral concerns (as compared to selfish concerns) receive a higher weight for temporally distant situations – as would be predicted by CLT – *mainly among* individuals who view moral values as more important than hedonistic ones. It is also found that an individual can be either a low-level agent (i.e., someone who operates in the world primarily at the level of details) or a high-level agent (i.e., someone who routinely views his or her action in terms of causal effects, social meanings, and self descriptive implications), and that this internal mindset may determine consumers' way of thinking (Vallacher & Wegner, 1989). Furthermore, Lee, Keller and Sternthal (2010) find that prevention focused individuals tend to construe information at a low level while promotion focused individuals are more inclined to construe information at a high level, and indicate that external stimuli that fit the internal mindset of the consumer have the greatest impact (cf. regulatory fit theory; Higgins, 2000).

In this research, we investigate if consumers' own mindsets may also *override* situationally induced mindsets. An important aspect in this context is consumers' personal interest with the object of evaluation (e.g., Vallacher & Wegner, 1989). We expect that consumers that have recent experiences related to the object of evaluation are less prone to mindset changes that are induced by the decision context, and tend to have more stable (personally induced) internal mindsets. Recent experiences represent an immediate instead of distant past, and CLT predicates a more concrete versus abstract mindset because recent experiences make concrete thoughts more accessible (Trope & Liberman, 2010). Second, a more concrete mindset induced by consumers' personal interest may trigger an ego-centric, selfish orientation (Agerström & Björklund, 2009a). The activation of such an internal mindset may interfere with well-established and general CLT expectations. We therefore expect that an individual with recent hospital experiences activates a more concrete and ego-centric mindset, irrespective of the psychological distance inherent in the decision context, that diminishes the predicted congruency effect as suggested by the theory leading to H_{1a-b} and H_{2a-b} . Hence:

H₃: A consumers' personal experience with the object of evaluation activates a concrete mindset that diminishes the effect of the mindset activated by the psychological distance in the decision situation.

We test H_{1a-b} via a hypothetical experiment where we manipulate collective vs. individual beneficial outcomes highlighted in the allocation policy, and H_{2a-b} via a hypothetical experiment where we manipulate efficiency vs. equity collective beneficial outcomes highlighted in the allocation policy. In both experiments, we also manipulate the psychological distance inherent in the decision context (close vs. far psychological distance), and measure consumers' personal experience to test H_3 .

3.4 Experiment 1

3.4.1 Method

Design

Experiment one had a 2 (individual vs. collective outcome based policy) by 2 (close vs. far psychological distance) between-subjects factorial design to test whether people evaluate a collective outcome based policy more (less) favorably than an individual outcome based policy in a psychological distant (close) situation. To manipulate the focal outcome of the allocation policy, we use the QALYs (Quality of Adjusted Life Years) concept. A collective outcome based policy is one where the total number of QALYs saved in society is relatively high (while the total number of QALYs saved for one's own is relatively low). In contrast, an individual outcome based policy is one where the total number of QALYs saved for one's own is relatively high (while the total number of QALYs saved in society is relatively low). To manipulate the psychological distance in the decision context, we use a joint spatial and temporal distance manipulation for stronger effects, and told participants that the current allocation system of hospitals [in the neighborhood/in the country] became out of date and that therefore a new policy [is going to be implemented within one year/will be implemented in ten years from now], capturing respectively a close vs. far psychological distance⁶.

Participants

A total of 713 panel members of a Dutch research company, representative for the Dutch population in terms of gender and age, were asked to complete a short online questionnaire about the evaluation of a new allocation policy in the health care sector. Thirty-five participants were classified as outlier because they completed the task in an unusual low or high amount of time, resulting in a total of 678 participants that were used for data

⁶ See Appendix E for a scenario example.

analyses. The average age of the participants was 47.54 years within a range of 18-83 years and 47.6 % were males.

Procedure

Participants received an email invitation to fill out an online questionnaire. After reading the introductory text and after providing a clarification of health care terms (like QALYs), that was required knowledge to successfully participate in the questionnaire, participants were randomly assigned to one of the four experimental conditions. After seeing the psychologically close or far decision context, they were asked to evaluate an individual or collective outcome based allocation policy. Next, participants received questions related to the construal level of the policy's individual and collective outcomes, and were asked whether they or a close family member had been to a hospital for treatment in the past five years to capture recent hospital experience. Finally, respondents were asked to answer some additional questions (e.g., demographics, etc.), and thanked for their participation. The survey took on average about 6.5 minutes to complete.

Measures

To measure the main dependent variable, attitude toward the allocation policy, participants answered an adapted version of the validated five-item seven-point semantic differential scale of Dabholkar (1996) (very bad/very good; very unpleasant/very pleasant; very harmful/very beneficial; very unfavorable/very favorable; very unsatisfactory/very satisfactory). The five items loaded on the same factor in an exploratory factor analysis (eigenvalue = 4.059, 81% of variance explained, loadings ranging from .87 to .93, Cronbach's $\alpha = .94$). To measure the construal level of the allocation policy outcomes, participants received five seven-point Likert scale questions concerning each aspect (collective/high-level vs. individual/low-level outcome) and were asked to assess whether it was a/an (a) primary, (b) essential, (c) critical, (d) central, or (e) goal-relevant attribute for the evaluation of a new allocation policy. The measures were adapted from Fujita, Trope, and Liberman (2006), and Kim, Zhang and Li (2008) and were highly reliable (Cronbach's $\alpha = .95$ and $.96$ for the collective vs. individual outcomes respectively).

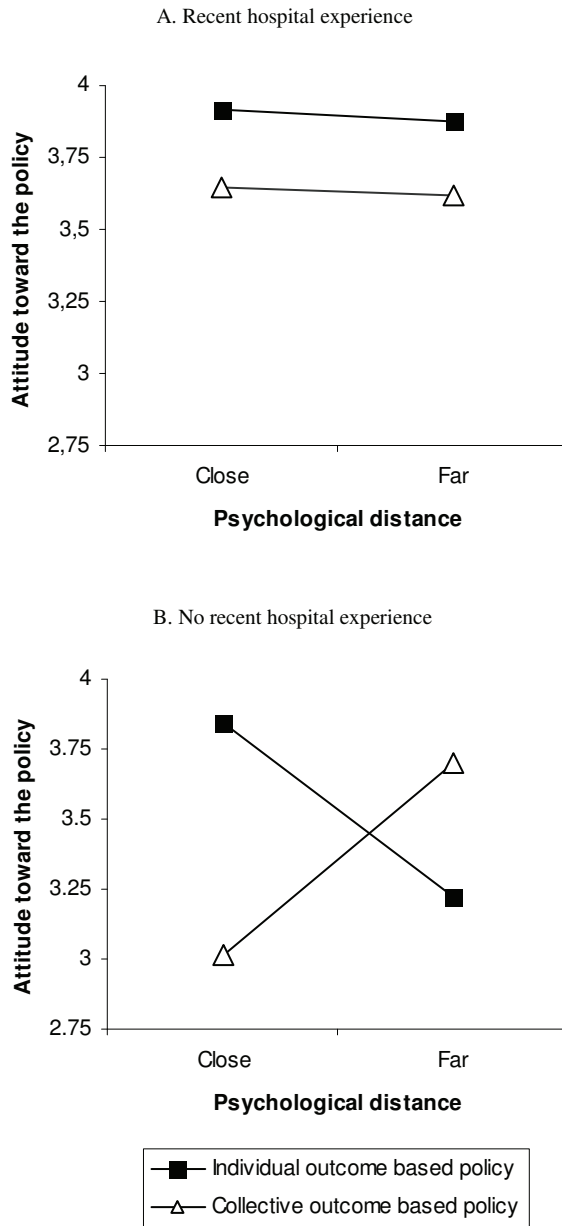
3.4.2 Results and discussion

To check whether the construal levels of our collective vs. individual allocation policy outcomes were perceived as expected, we tested whether participants perceived the total number of QALYs saved in society as a higher-level construal than the total number of QALYs saved for a participant personally. The paired samples t-test revealed that indeed,

as expected, the collective outcomes were perceived as more abstract than the individual outcomes ($\mu_{\text{COLLECTIVE}} = 4.33$ vs. $\mu_{\text{INDIVIDUAL}} = 4.13$; $t(677) = 3.11, p < .01$).

Next, we conducted an ANOVA, with attitude toward the allocation policy as dependent variable, and policy type (individual vs. collective outcome based policy), psychological distance (close vs. far psychological distance), hospital experience (recent – own or a family member’s hospitalization in the past five years – vs. no recent experience) and all the two- and three-way interactions as independent variables. We found a main effect of policy type ($F(1, 670) = 6.52, p < .05$), as well as a main effect of hospital experience ($F(1, 670) = 3.96, p < .05$), pointing out that respondents evaluate the individual outcome based policy more positively than the collective outcome based policy ($\mu_{\text{INDIVIDUAL}} = 3.85$ vs. $\mu_{\text{COLLECTIVE}} = 3.62$), and that those with recent experience have more positive allocation policy evaluations than those without recent experience ($\mu_{\text{RECENT_EXP}} = 3.76$ vs. $\mu_{\text{NO_RECENT_EXP}} = 3.48$). No significant effects emerge for any of the other main and two-way interaction effects, except for the three-way interaction between psychological distance, policy type and hospital experience ($F(1, 670) = 4.07, p < .05$). Figure 4 shows this significant three-way interaction effect in a graphical format. For participants with recent hospital experience (panel A), the individual outcome based policy is not only evaluated more positively in the psychologically close but also in the psychologically far situation (overruling effect of the internal, concrete and ego-centric, mindset). In contrast, for participants without recent hospital experience (panel B), the individual outcome based policy is evaluated more positively in the psychologically close situation, while the collective outcome based policy is evaluated more positively in the psychologically far situation, as is predicted by CLT. Hence, we find support for H_3 and can only confirm H_{1a-b} for participants without recent hospital experience.

Figure 4: Results Experiment 1⁷



⁷ A separate analysis with planned comparisons is provided in Appendices F and G.

Our findings suggest that individuals with recent hospital experience activate a more concrete, ego-centric mindset compared to individuals without recent hospital experience. The activation of such an internal mindset diminishes the effect psychological distance of the decision context has on how individuals evaluate an allocation policy. Consequently, we show that individuals' personal interest can affect general CLT expectations and may constitute an important factor researchers should control for. Only after controlling for recent hospital experience, we were able to confirm CLT predictions in that a collective outcome based policy is more (less) positively evaluated in a psychologically far (close) decision context while an individual outcome based policy is more (less) positively evaluated in a psychologically close (far) decision context.

3.5 Experiment 2

Next to a collective vs. individual interest trade-off, allocation policy makers also need to trade off efficiency collective outcomes (the total number of life years saved) vs. equity collective outcomes (the distribution of life years saved). A collective outcome is efficient when it maximizes the total number of QALYs saved in the society, and is equal when the number of QALYs saved among patients has a similar distribution from patient to patient. Although both efficiency and equity foci concentrate on the collective interest and thus induce a more abstract mental construal, they may differ on their *level of abstraction* (equity being more abstract than efficiency; see theory leading up to $H2_{a-b}$). The purpose of investigating allocation policy evaluations for efficiency vs. equity collective outcomes is to test whether the boundary (overruling) effect of recent hospital experience still holds for collective outcomes that have a different level of abstraction.

3.5.1 Method

Design

Experiment two had a 2 (efficiency vs. equity based allocation policy) by 2 (close vs. far psychological distance) between-subjects factorial design to test whether people evaluate equity based policies more (less) favorably than efficiency based policies in a psychological distant (close) situation. To manipulate the focal outcome of the allocation policy, we again use the concept of QALYs (Quality of Adjusted Life Years). An efficiency based allocation policy is one in which the total number of QALYs saved in society is relatively high (while the distribution of QALYs saved in society is relatively

unequal). An equity based allocation policy is one in which the distribution of QALYs saved in society is relatively equal (while the total number of QALYs saved in society is relatively low). To manipulate the psychological distance in the decision context, we use the same manipulation as for Experiment 1. Specifically, the close psychological distance situation focused on an allocation policy implementation for a hospital in the neighborhood that is going to implement a new policy within one year, whereas the far psychological distance situation focused on a hospital in the country that will implement a new policy ten years from now⁸.

Participants

A total of 710 panel members of a Dutch research company, representative for the Dutch population in terms of gender and age, completed a short online questionnaire about the evaluation of a new allocation policy in the health care sector. Thirty-two respondents were classified as outlier because they completed the questionnaire in an unusual low or high amount of time, leading to a total of 678 participants used for data analyses. The average age of the participants was 46.75 years within a range of 18-82 years and 49.7% of the respondents were male.

Procedure

Similar as for Experiment 1, we introduced participants in the topic and clarified several health care terms to make sure that participants had the required knowledge to successfully participate in the questionnaire. Next, we randomly assigned respondents to one of the two psychologically distant decision situations (close/far) and told them that the current allocation system of hospitals [in their neighborhood/in the Netherlands] became out of date and that therefore a new policy [is going to be implemented within one year/will be implemented in ten years from now]. Next, they were shown and asked to evaluate one of the two health care allocation policies (either the efficiency based or the equity based one). Furthermore, we asked respondents how fair they perceived the specific policy to be. Fairness is an important construct that is frequently mentioned in the literature on efficiency vs. equity allocation policies (Andersson & Lyttkens, 1999; Evans, Vossler, & Flores 2009; Goncalo & Kim, 2010). We expect that fairness is especially important in this experiment where consumers' personal attitude (e.g., political preference) can influence which of the two policy outcomes are considered as fair and is less important in Experiment 1 where collective outcomes are considered as more fair by the general

⁸ See Appendix E for a scenario example.

population⁹. We therefore consider fairness as an important covariate that should be controlled for in the analyses. After the evaluation and fairness tasks, we asked participants to answer questions related to the construal level of the efficiency and equity collective outcomes. Finally, we asked participants to answer some additional questions (e.g., hospital experience, demographics, etc.), and thanked them. The survey took on average about 7.5 minutes to complete.

Measures

We used the same measures as the ones of Experiment 1 for the main dependent variable, attitude toward the allocation policy, as well as for the questions to test the construal level of the allocation policy outcomes. These measures were highly reliable (exploratory factor analysis for attitude toward the allocation policy: eigenvalue = 4.166, 83% of variance explained, loadings ranging from .90 to .93, Cronbach's $\alpha = .95$; Cronbach's $\alpha = .94$ and .96 for the efficiency vs. equity outcomes respectively). To measure perceived policy fairness, we adapted one statement of the (price) fairness scale of Darke and Dahl (2003), and asked respondents to assess the perceived fairness of the allocation policy on a seven-point Likert scale.

3.5.2 Results and discussion

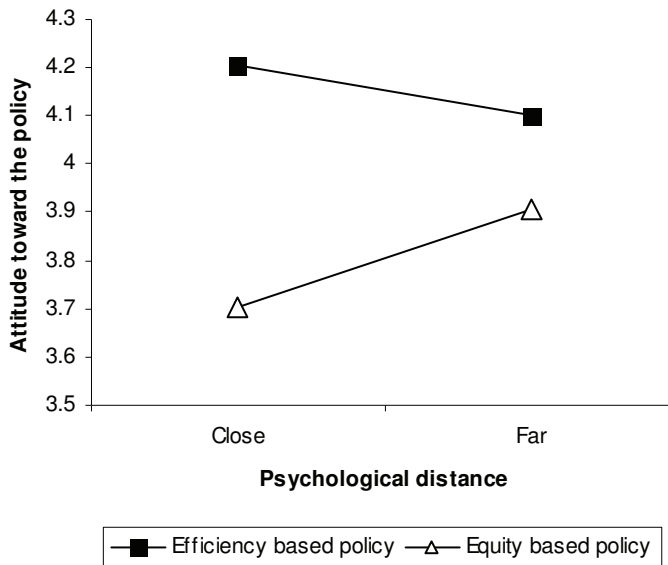
To check whether the construal levels of our efficiency vs. equity collective outcomes were perceived as expected, we tested whether participants perceived the distribution of QALYs saved in society as a higher-level construal than the total number of QALYs saved in society. The paired samples t-test revealed that indeed the equity collective outcomes were perceived as more abstract than the efficiency collective outcomes ($\mu_{\text{EQUITY}} = 4.45$ vs. $\mu_{\text{EFFICIENCY}} = 4.32$; $t(677) = 2.38$, $p < .05$).

We conducted an ANOVA with attitude toward the allocation policy as dependent variable, and policy type (efficiency vs. equity based policy), psychological distance (close vs. far psychological distance), hospital experience (recent – own or a family member's hospitalization in the past five years – vs. no recent experience) and all their two- and three-way interactions as independent variables. We also control for the covariate fairness, which has, as expected, a highly significant positive effect ($F(1, 669) = 363.67$, $p < .001$). In contrast to Experiment 1, we find no significant effect of the three-way interaction between psychological distance, policy type and hospital experience ($F(1, 669) = 2.43$, $p =$

⁹ Explicitly including fairness as covariate in Experiment 1 indeed confirmed that it did not change the substantive results.

.120), pointing out that for this experiment no overruling effect can be found for a consumer's personal interest (no support for H_3). The main effects of psychological distance and hospital experience, and the other two-way interactions, are not significant either. We do find a significant effect of policy type ($F(1, 669) = 15.07, p < .001$) and a significant interaction effect between policy type and psychological distance ($F(1, 669) = 5.85, p < .05$). Figure 5 portrays this significant interaction effect in a graphical way. In line with H_{2a-b} , we confirm that the equity based policy is evaluated more positively in the psychologically far situation, while the efficiency based policy is evaluated more positively in the psychologically close situation, as is predicted by CLT.

Figure 5: Results Experiment 2¹⁰



In contrast to Experiment 1, we do not find support for the overruling effect of hospital experience on expected congruency effects in this experiment. It seems that a consumer's personal interest can only exert a significant effect when consumers are comparing individual with collective outcome based policies and not when they are comparing two collective outcome based policies. Concrete and ego-centric thoughts triggered by a recent hospital experience are thus not strong enough to overrule situationally induced mindsets triggered by the decision context when considering two collective outcome based policies.

¹⁰ A separate analysis with planned comparisons is provided in Appendices F and G.

Irrespective of recent hospital experience, we find confirmation of CLT expectations in that consumers evaluate equity based policies relatively more (less) favorably than efficiency based policies in a psychological distant (close) situation.

3.6 General Discussion

Investigating if, and if so how, the psychological distance in a decision context has an influence on the focus placed on outcomes in allocation policy evaluations as well as investigating if, and if so to what extent, these effects are weakened by a consumer's personal interest has important academic and managerial implications. In Experiment 1, we find that collective outcomes are perceived as more abstract than individual outcomes, and are evaluated more positively when the social distance of the focal outcome in an allocation policy is congruent with the psychological distance inherent in the decision context (a collective outcome based allocation policy and a far psychological distance, as well as an individual outcome based allocation policy and a close psychological distance, respectively). Yet, this confirmation of CLT expectations connected with the congruency or value of fit effect is only true for individuals that did not have recent hospital experience. For those that did have recent hospital experience, a concrete, ego-centric internal mindset is activated that diminishes the effect of the situationally induced mindset and leads to a more positive evaluation of the individual outcome based allocation policy in both a close and far psychological distance. In Experiment 2, we find that equity collective outcomes are perceived as more abstract than efficiency collective outcomes, and are evaluated more positively when the social distance of the focal outcome in an allocation policy is congruent with the psychological distance inherent in the decision context (an equity based allocation policy and a far psychological distance, as well as an efficiency based allocation policy and a close psychological distance, respectively). In this experiment, we do not find an overruling effect of consumers' recent hospital experience.

3.6.1 Academic contributions

These findings add to the literature of allocation policy theory by showing that a consumer's evaluation of an allocation policy may depend on the interaction of the outcomes presented and the temporal and/or spatial frame of the decision context. Psychological distance is thus an important element that needs to be considered by organizations in their decisions on when and how to communicate about the allocation policy decision announcement. To the best of our knowledge, this is the first study that

investigates the effect of psychological distance in the decision context on consumers' evaluation of an allocation policy.

We also add to prior CLT work by studying to what extent psychological distance can change consumers' preferences for different allocation policy outcomes, and by proposing an interaction effect between the psychological distance inherent in the decision context and the social distance of the allocation policy's outcomes. Our finding that allocation policy outcomes are perceived differently based on their abstractness with collective outcomes being perceived as more abstract than individual outcomes and equity collective outcomes being perceived as more abstract than efficiency collective outcomes contributes to the CLT literature because it is a new and useful insight that helps to explain many practical issues related to resource allocation in public domains such as health, recreation, and education. Also the finding of the positive effects of congruency between the psychological distance and the social distance of outcomes in the context of allocation policy implementations is an important contribution because it focuses on a relatively unexplored field of research that is of paramount importance for the entire society. Trope (2004), for instance, observed that, although the societal implications of CLT are substantial, CLT has not often been tested with socially meaningful stimuli.

Finally, we add to CLT literature by showing that a consumer's personal interest may be an important factor that should not be neglected and that may interfere with well-established and general CLT expectations. Our research shows that consumers' personal interest only diminishes the activation of the situationally induced mindset when consumers are considering an outcome that has direct consequences for one's own personal life. So, concrete thoughts from hospital experience seem to become more accessible in a situation where one's own individual outcomes are at stake than in a situation where individuals solely trade off collective outcomes. This is in line with a 'not-in-my-backyard' mindset where individuals prefer the policy with the highest personal benefits and avoid those with collective outcomes. The finding that personal interest may activate a mindset that diminishes the effect of a situationally induced mindset is a very novel contribution to the CLT literature. We advice future CLT researchers to control for an individual's internal mindset, next to taking into account situationally induced mindsets triggered by the psychological distance inherent in the decision context.

3.6.2 *Managerial implications*

Recognizing that individuals weigh collective vs. individual outcomes or efficiency vs. equity collective outcomes differently depending on the distance present in the decision

context can have large ramifications for society and social welfare. Our research shows that allocation policies that focus on collective outcomes, or on equity collective outcomes benefit most when they are introduced in a far psychological distance context, e.g., with a more distant temporal timing (e.g., announcing the policy quite some time before its launch), for a more remote location (e.g., announcing the policy for a provider that is located in a vicinity far away), using a more hypothetical situation (e.g., announcing the policy with an imaginary example) and/or for more socially distant others (e.g., announcing the policy with an example that describes strangers). In contrast, allocation policies that focus on individual outcomes, or on efficiency collective outcomes benefit most when they are introduced in a close psychological distance context, e.g., with a close temporal timing (e.g., announcing the policy just before its launch), for a close location (e.g., announcing the policy for a provider that is located in the close vicinity), using a less hypothetical situation (e.g., announcing the policy with a real example) and/or for less socially distant others (e.g., announcing the policy with an example that describes friends). Depending on the launch time of the allocation policy and the service provider's location, policy makers should (or should not) highlight the temporal or spatial distance inherently connected to the decision context. If the temporal or spatial frame is incongruent with the social distance of the focal outcome of the allocation policy, they could use any of the other suggested distance manipulations.

As was shown by Experiment 1, a boundary effect is found for those consumers that have recent experience and that consider collective vs. individual outcome based allocation policies. Here, policy makers should be aware of the strong (concrete and ego-centric) mindset that is triggered by consumers' recent experiences and that may overrule situationally induced mindsets. Future research may investigate what tactics can be used to lessen the impact of such an internal mindset, when considering outcomes that may have an important own personal effect.

3.6.3 Limitations and avenues for further research

Some limitations of our study are worth noting and open up avenues for possible further research. First, our respondents were shown a hypothetical allocation policy situation, which did not have direct consequences for them. It would be interesting to investigate allocation policy evaluations for real allocation policy implementations. Second, respondents were asked to evaluate allocation policy implementations in a health care setting. Although we believe that our results are relevant for a wide range of contexts, it would be interesting to extend our research for other domains that are confronted with a

scarcity of service resources which is often the case in recreation, and education industries. Third, both collective and individual outcomes as well as equity and efficiency collective outcomes were described on a rather vague level in our hypothetical situation (e.g., a low or high number of life years saved). It might be interesting to investigate how consumers evaluate allocation policies when more precise specifications are used (e.g., two or twelve life years saved).

Chapter 4. Collective Costs and Benefit Evaluations of Customized Care¹¹

ABSTRACT

Despite growing recognition in medical decision making of the importance of non-health-related aspects of care (e.g., waiting times, contact modes, etc.), they are generally not taken into account in mainstream economic evaluations informing health care management decisions. In particular, for non-health-related aspects of care there is no Quality Adjusted Life Years (QALY) based guidance to decide what is best for each patient. Therefore patient preferences rather than QALYs become of more central concern when comparing treatments or interventions in which health related aspects of care play a minor role. From the patient perspective full customization of care according to patient preferences would be optimal in such cases. Yet, there is little guidance about how the costs and benefits of non-health-related aspects of customized care can be measured and used in medical decision making. In this study we propose and test a discrete choice experiment (DCE) based approach to evaluate these costs and benefits. The approach is illustrated for post-treatment breast cancer care. We demonstrate that, for this case, offering (fully) customized care is cost-effective compared to current practice in which typically only one type of follow-up is recommended for all patients.

4.1 Introduction

In medical decision making, the decision whether to implement a certain health care program is usually supported by an economic evaluation in which the costs and the health benefits of the program are compared to those of other possible programs (Sendi, Gafni, & Birch, 2002). The benefits are generally presented in incremental life years or Quality Adjusted Life Years (QALYs) gained as a result from implementing each program. The QALY measure is the preferred outcome measure for economic evaluations (Dolan, Shaw, Tsuchiya, & Williams, 2005; Earnshaw & Lewis, 2008; Mason & Drummond, 1995) and takes into account the societal preferences for different health outcomes. However, the

¹¹ Based on Benning, Kimman, Dirksen, Boersma and Dellaert (2010).

measure ignores individual-specific preferences of patients for different care programs (Smith, Drummond, & Brixner, 2009). This is especially restrictive when there are only minor differences in health outcomes of health care programs, because in those cases QALY differences cannot clearly guide health policy or health care allocation decisions. Besides cost-differences between health care programs patient preferences for non-health-related aspects of care (e.g., health care provider and contact mode) can also be decisive in these cases (Ryan, Major, & Skatun, 2005).

Discrete choice experiments (DCEs) are increasingly used as a tool to measure patient preferences for non-health-related aspects of care (Ryan & Hughes, 1997; Ryan, 1999; Sculpher et al., 2004). The question how to use the information from such DCEs to support hospitals (and policy makers) in their decision of implementing health care programs, however, is largely unanswered in the health care literature. Therefore, we demonstrate how costs and DCE-based preference information for non-health-related aspects of care can be used to support medical decision making. In particular, we exploit the fact that DCEs can take into account heterogeneity in patient preferences. Especially in view of the rising importance of individualized (i.e., customized) care the introduction of such an approach is both relevant and topical (Cribb & Owens, 2010).

We illustrate our approach by means of a case of follow-up after breast cancer treatment. Patients were found to have heterogeneous preferences for this type of care with no known differences in health benefits between care programs (Kimman et al., 2010). We base our analysis on the non-health-related aspects of follow-up and the costs associated with several follow-up strategies recently reported in the MaCare trial performed in the Netherlands (Kimman et al., 2007). The MaCare trial was a multicenter trial in which 320 breast cancer patients were randomized into one of four follow-up strategies. We use DCE estimates (Kimman, 2010) to demonstrate how individual-specific DCE estimates can be incorporated in economic evaluations. This allows us to investigate if offering patients the option to choose among a flexible set of breast cancer treatment follow-up programs (i.e., customized care) can be cost-effective compared to standard care and to specific other follow-up programs that offer no individual flexibility.

The remainder of this chapter is structured as follows. First, we provide a brief overview of customized care and the use of discrete choice experiments in health care. This is followed by the random utility model we use and a description of how to combine individual-specific DCE estimates and costs to inform health care decision making. Next, we describe the application that we study in terms of the DCE experiment estimates and their corresponding cost structure. This allows us to illustrate our approach for the case of follow-up after breast cancer treatment. Finally, we present analyses of the cost-utility

structure of different follow-up programs as well as a (fully) customized care program. We close with a discussion of our findings and suggestions for future research.

4.2 Individual-Level DCE Estimates and Cost Evaluations

4.2.1 Customized care

Different individuals have their own specific preferences and this heterogeneity in taste is also prominent in health care. For example, there is significant variation in preferences between individuals with regard to treatment programs (Owens & Nease, 1997; Sculper & Gafni, 2001). The rise of consumerism and the available information through the Internet have raised patients' expectations about care and increasingly patients demand care that is in line with their preferences (Frank & Zeckhauser, 2007). These factors, together with the increasing importance of non-health-related aspects of care (Ryan & Shackley, 1995; Ryan, 2004), have led to a growing recognition that preference heterogeneity should be taken into account in health care policy evaluations by using a more individualized approach of cost-effectiveness analysis (Basu & Meltzer, 2007). Traditionally, the focus of cost-effectiveness analysis has lain on identifying average costs and benefits in the population. Basu & Meltzer (2007), however, indicated that it is valuable to identify cost-effectiveness on the individual level, because most health care interventions are cost-effective only for a subset of people in society. Introducing more individualized (customized) health care programs that better serve the preferences of individuals by allowing them to select the attribute levels to match their preferred treatment procedure (i.e., contact mode, frequency of visits, etc.) might be a solution. For the purpose of this chapter we confine our analysis of customized care to health care programs that offer patients the possibility to choose between several attribute levels for non-health-related aspects of care. The proposed principles can, however, be extended relatively easily to also include patient preference for program aspects that have clear health consequences (e.g., treatment method).

4.2.2 Using DCEs to discover individual health care preferences

A discrete choice experiment (DCE) is a method based on stated preferences in which respondents are asked to choose between hypothetical alternatives that are constructed on the basis of an experimental design. A large number of DCE applications can be found in the health economics literature, ranging from preferences with regard to miscarriage

management (Ryan & Hughes, 1997), liver transplantations (Ratcliffe & Buxton, 1999), in vitro fertilization (Ryan, 1999), and prostate cancer (Sculpher et al., 2004). Thus, DCEs have become a standard tool for health economics research (Viney, Lancsar, & Louviere, 2002). DCEs are used to elicit patient preferences, and to quantify trade-offs between alternative treatments (e.g., Ratcliffe & Buxton, 1999; Ryan, 1999; McIntosh & Ryan, 2002; Lancsar & Savage, 2004). Although there is growing recognition that DCEs have the potential to contribute more directly to outcome measurement for use in economic evaluations (Lancsar & Louviere, 2008), the question how DCE data can be used to inform health policy (Bryan & Dolan, 2004) is still relatively unexplored. McIntosh (2006) proposed an initial framework for cost benefit analysis using DCEs. McCormack et al. (2005) review different types of benefit measures that can be analyzed to support health policy decisions including DCE derived welfare estimates as one of the options. However, an empirical analysis that combines (individual-specific) DCE estimates and costs is still missing in the health care literature. Yet, policy decision makers could use combined cost and (individual-specific) DCE information as a valuable tool in deciding which health policy to implement and whether to allow for a customized format of the policy or not. Therefore, in the next section we describe an approach that can be used to inform health care decision making by making use of an individual-level preference model combined with cost data.

4.2.3 The individual-level preference model

When individual-specific preferences for non-health-related aspects of care are ignored this can lead to biased welfare measures and erroneous policy evaluations (Persson, 2002; Flynn, 2010). Therefore it is important for health policy makers to take these individual preferences into account. A way to explicitly measure individual preferences is by using DCEs in combination with an analysis of respondents' preferences using a random parameter logit (RPL) model (Hensher, Rose, & Green, 2005). Though it is also possible to use a multinomial logit (MNL) model and to create interaction terms (e.g., with socio-demographic characteristics) to represent preference heterogeneity, this latter method requires systematic effects of individual characteristics on preferences and is a relatively crude way to capture heterogeneity compared to the estimation of a RPL model (Colombo, Hanley, & Louviere, 2008). As described above, individual preferences can be easily incorporated in the assessment of several health care programs by estimating an RPL model based on DCE data. Below we outline the characteristics of such an individual-level preference model.

The model is based on random utility theory which assumes that an individual n 's utility for choice alternative j in observation t (U_{njt}), consists of a systematic utility component (V_{nj}) and a random component (ε_{njt}).

$$U_{njt} = V_{nj} + \varepsilon_{njt} \quad (1)$$

The probability that alternative j is chosen, given that a respondent has to choose between alternatives j and i , is specified as:

$$P_{njt} = \Pr(U_{njt} > U_{nit}) = \Pr(V_{nj} + \varepsilon_{njt} > V_{ni} + \varepsilon_{nit}) = \Pr(V_{nj} - V_{ni} > \varepsilon_{nit} - \varepsilon_{njt}) \quad (2)$$

If we assume that the error terms (i.e., ε_{njt} , ε_{nit}) are identically and independently Gumbel distributed this results in the standard binary logit specification for a given individual n :

$$P_{nj} = \exp(V_{nj}) / (\exp(V_{nj}) + \exp(V_{ni})) \quad (3)$$

To further specify the individual-level differences in preferences, the model is extended by explicitly allowing for individual-specific variations in taste:

$$\begin{aligned} U_{njt} &= \beta_n' \mathbf{x}_j + \varepsilon_{njt} \\ \beta_n &= \beta + \mathbf{v}_n \end{aligned} \quad (4)$$

Here the utility component is described in terms of the vector of observed attributes for the health care program (\mathbf{x}_j) and an individual-specific vector of preference coefficients (β_n). The preference vector is separated in a mean preference component shared by all individuals (β) and an individual-specific error component that captures differences in individuals' taste (\mathbf{v}_n). The individual-specific error components are assumed to be independently normally distributed and are allowed to have different variances. In this way the RPL model takes into account variations in respondents' taste (i.e., preference heterogeneity).

4.2.4 *Combining individual-specific DCE estimates and costs*

One of the advantages of the RPL model is that it is possible to obtain posterior estimates for each individual's preference parameters for the attributes of a health care program based on the individual's observed choices and the distribution estimates (Hole, 2008; Train, 2003). This is different from, for example, the standard conditional logit model that estimates average population parameters for the attributes of a health care program. By using the individual-specific parameters from a RPL model a more precise total utility measure can be calculated for each specific health care program by adding all individual-specific utility estimates for the individuals in the sample for the attributes of this specific health care program. Offering patients health care programs that better suit their preferences leads to a higher total gain in utility. This utility can be combined with health care cost data for the specific program j provided to individual n (C_{nj}) to allow for comparisons across programs (see section 4.3.3). A cost-utility comparison with other health care programs can also be made to analyze whether offering a customized program leads to greater utility and/or lower costs for the total sample. If a sufficiently large number of patients choose a less costly program in the customization process, this leads to both higher total utility and lower costs. The reason is that patients tend to choose less expensive programs from which they derive a higher utility in such cases.

4.3 The Case of Customized Breast Cancer Follow-Up

In this section we provide an empirical application of how DCE estimates can be combined with cost data to inform health care decision makers. The application is based on preference data for follow-up after breast cancer treatment. We start with the description of the discrete choice experiment. Then, cost calculations with regard to the DCE scenarios are provided. This is followed by an illustration of how these costs are combined with estimates of DCEs to help health care decision makers choose between implementing different (customized versus non-customized) health care programs.

4.3.1 *The discrete choice experiment (DCE)*

Experimental design, survey, and data

Since details of the DCE are described elsewhere (Kimman et al., 2010), we provide only a brief overview. Attributes and attribute levels (Table 5) were based on a review of the

literature (Kimman et al., 2007), new local policy initiatives (Kimman et al., 2007), and expert opinions (Coast & Horrocks, 2007). An orthogonal fractional factorial design with 32 hypothetical choice tasks was created from the full factorial (256 scenarios). Two surveys, each presenting 16 choice tasks to a patient, were used. All respondents were randomly assigned to one of the two surveys. The survey started with a short introduction of the purpose and effectiveness of follow-up after breast cancer treatment followed by a description of the attributes and their levels and the choice tasks. The data collection took place between May and July 2008. In total 331 patients (from five hospitals) completed the DCE (response rate of 59%). Their average age was 58 years (ranging from 34 to 83 years) and the mean time since finalizing breast cancer treatment was 14 months (ranging from 2 to 24 months).

Table 5: Attributes and attribute levels

| Attributes | Levels | Explanations |
|---|--|--|
| Attendance at educational group program (EGP) | Yes | The educational group program consists of two group meetings of two hours, led by a breast care nurse and health care psychologist, in which patients (and their partners) are informed of the physical and psychosocial consequences of the disease and its treatment, and possible signs of recurrence. |
| | No | |
| Frequency of visits | Every 3 months | The frequency of visits determines whether a patient has scheduled follow-up visits every 3, 4, 6, or 12 months. Regardless of the frequency, patients can always make additional appointments whenever they feel the need. |
| | Every 6 months | |
| | Every 9 months | |
| | Every 12 months | |
| Waiting time in minutes | 5 | This is the time a patient has to wait after the set time of the appointment. This can thus be at the hospital or general practitioner's office (face-to-face contact) or at home (telephone contact). |
| | 30 | |
| | 60 | |
| | 90 | |
| Contact mode | Face to face | A visit (face-to-face) to a health care provider consists of a short physical examination and open discussion about general wellbeing and the recovery process. A telephone follow-up consists of an open discussion about general wellbeing and the recovery process only. If the patient or health care provider feels the need, an additional appointment (face-to-face) can be made. |
| | Telephone | |
| Healthcare provider | Medical specialist | The medical specialist is (preferably) the patient's surgeon, oncologist or radiotherapist. They may alternate. The breast care nurse is a nurse specialized in breast cancer; a nurse practitioner is a nurse with advanced medical training (master's level). They are both referred to as breast care nurse in the survey. In all cases the last contact with the health care provider is with a medical specialist to conduct a mammography. |
| | Breast care nurse/ nurse practitioner | |
| | General practitioner | |
| | Breast care nurse and medical specialist | |

Model

We analyzed the DCE data by estimating the proposed RPL model in NLOGIT 3.0 (Econometric Software Inc.). The utility function of our model is specified as follows:

$$\begin{aligned}
 U_{njt} = & (\beta_1 + v_{1n})EGP_j + (\beta_2 + v_{2n})FREQ_j + (\beta_3 + v_{3n})(FREQ_j)^2 + \\
 & (\beta_4 + v_{4n})WT_j + (\beta_5 + v_{5n})TEL_j + (\beta_6 + v_{6n})BCN_j + \\
 & (\beta_7 + v_{7n})GP_j + (\beta_8 + v_{8n})MS / BCN_j + \varepsilon_{njt}
 \end{aligned} \quad (5)$$

where:

U_{njt} is individual n 's utility associated with a specific follow-up scenario j in choice observation t ,

$\beta_1 - \beta_8$ are the mean parameter estimates of the model that indicate the preference for each attribute as it occurs in follow-up scenario j .

$v_{1n} - v_{8n}$ correspond to the individual-specific error terms for every preference parameter.

EGP is a dummy variable for educational group program attendance or not.

$FREQ$ and $FREQ^2$ represent the frequency and squared frequency respectively of follow-up visits in a year.

WT represents waiting time during follow-up interaction with the hospital.

TEL is a dummy variable for telephone vs. face-to-face contact,

BCN (breast care nurse), GP (general practioner), and MS / BCN (i.e., alternating between medical specialist and breast care nurse) are dummy variables reflecting the different health care providers of follow-up, with medical specialist only visits as a base level. The base levels reflect current practice levels in the Netherlands,

and ε_{njt} is an error term which captures any remaining unobserved error.

4.3.2 Results

Model estimates

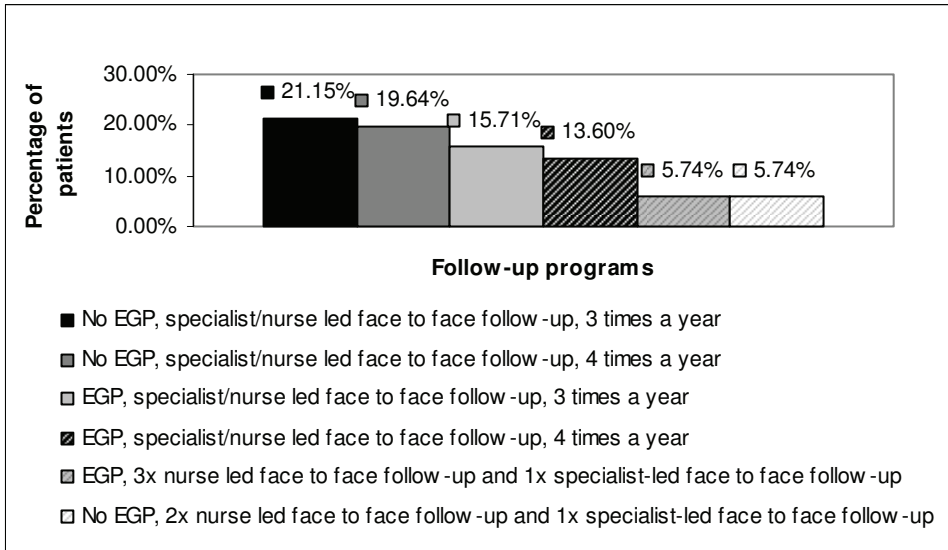
The model estimation results show significant mean preference parameters for all but two of the attributes and with signs as expected. Patients prefer personal contact, no EGP,

shorter waiting times, more frequent visits, and being helped by a medical specialist and breast care nurse (MS/BCN). We also find that there is significant preference heterogeneity for the attributes of follow-up programs after breast cancer treatment (Table 6). This is evidenced by the significant estimates for the standard deviations for the individual-specific error terms (V_n) for all but two of the preference parameters ($FREQ^2$ and MS/BCN). The estimates show that the size of the preference heterogeneity component is relatively large. This results in the fact that several different programs have the highest preference for different patients, which is illustrated in Figure 6. Therefore it is especially relevant to investigate whether offering customized care is cost-effective compared to standard practice and other follow-up strategies.

Table 6: Random parameter model estimations

| Variable | Random parameters (β_n) | | | Heterogeneity component (V_n) | | |
|----------|---------------------------------|--------|-------|-----------------------------------|--------|-------|
| | β | St.Er. | Sign. | V | St.Er. | Sign. |
| TEL | -2.15 | .12 | .00 | 1.62 | .12 | .00 |
| EGP | -.14 | .08 | .08 | 1.20 | .10 | .00 |
| WT | -.01 | .00 | .00 | .01 | .00 | .00 |
| $FREQ$ | 1.56 | .19 | .00 | .45 | .05 | .00 |
| $FREQ^2$ | -.22 | .04 | .00 | .01 | .02 | .47 |
| BCN | -.47 | .10 | .00 | 1.08 | .12 | .00 |
| GP | -2.24 | .16 | .00 | 1.83 | .15 | .00 |
| MS/BCN | .13 | .09 | .16 | .31 | .20 | .12 |

Figure 6: Patients' highest utility programs with full customization



Costs

The costs of alternative follow-up strategies were calculated with hospital management decision makers in mind. Thus, we use a narrow health care perspective, and only include those costs related to the attributes used in the DCE that are relevant in cases where managers wish to evaluate whether or not to offer customized care for breast cancer follow-up programs in their own hospital. Costs for follow-up related resource use were primarily obtained from the Dutch governmental manual for health care cost analysis (Oostenbrink, Bouwmans, Koopmanschap, & Rutten, 2004). Costs for hospital visits were based on cost prices for academic hospitals. All cost prices were converted to 2008 Euros by means of price index numbers (CBS statline).

The cost price for a telephone follow-up by a nurse was calculated by multiplying the hourly wage of a specialized nurse with the average length of a telephone follow-up as reported in the MaCare trial (20 minutes). The hourly wage was calculated by using the gross monthly salary of a highly qualified nurse and a nurse's average yearly working hours (Oostenbrink et al., 2004). Furthermore, 39% for employer's contributions and 45% overhead costs were added which is in line with common practice. The cost calculation for a hospital follow-up visit with the breast care nurse is almost identical to telephone follow-up for this type of health care provider, the only difference is that 41 Euros were

added for material and direct personnel costs (Oostenbrink et al., 2004). Face to face and telephone follow-up performed by a medical specialist were calculated in a similar way. The hourly wage of a medical specialist was based on the average annual salary divided by the hours of patient time (Oostenbrink et al., 2004). We added 35% employer's contributions (due to the higher salaries for a medical specialist a maximum contribution is reached) and again 45% overhead (Oostenbrink et al., 2004). Based on data from a clinical trial we assumed that the follow-up contact was 5 minutes shorter when performed by a medical specialist instead of a nurse (15 instead of 20 minutes) (Beaver et al., 2009).

Given these calculations, the cost prices of nurse led telephone follow-up, nurse led face to face follow-up, specialist led telephone follow-up, and specialist led face to face follow-up are respectively €20.51, €64.92, €37.54, and €81.94.

Following guidelines for breast cancer follow-up, patients have an annual mammography. The medical specialist usually discusses the results of the mammography with the patient during a hospital visit. For these reasons we assume the last follow-up of the sequence to be specialist-led and face to face follow-up. The costs for the mammography (€79.75) are based on the wage of a radiologist and the cost price of a mammography. Costs for the EGP included the hourly wages of a health care psychologist and breast care nurse, the costs of using facilities as well as costs of an information booklet. The MaCare-trial showed that the average cost per patient for the EGP was €119 (based on 7 patients and 3 to 4 partners per session).

Using the cost prices we were able to calculate the costs for all possible follow-up strategies. For example, the total costs to the hospital for a follow-up strategy in which a patient has four face to face visits per year with the medical specialist as the health care provider, and participation in the EGP is calculated as follows: 4×81.94 (four times specialist based face to face follow-up) + 119 (EGP) + 79.75 (mammography) = €526.51.

4.3.3 Policy evaluation

Utility calculations

The individual-specific preference parameter estimates from the RPL model can be used to calculate the utility for a specific follow-up program for each individual, but also for the calculation of the total utility for the sample of a given follow-up program. This can be done by simply adding all the individual-specific utilities of a follow-up program for all individuals in the sample (an illustration of these calculations for ten patients of our sample can be found in Appendix H). Note that it is also possible to calculate the total utility for

all patients in the sample when patients are offered the option to choose between several follow-up programs (i.e., customized care). Calculating the total utility for such a customized follow-up program can be done by first determining what the most preferred program is for each patient, and subsequently adding the utilities of all patients for these programs. Finally, for a cost-effectiveness analysis for the sample the total costs of such a customized approach can be calculated by adding the per patient costs of all preferred programs. The utility and cost averages of a (customized) follow-up program can be obtained by dividing the total utility and total costs by the number of patients in the sample. In the next section we conduct such an analysis and investigate the question whether offering customized programs can be cost-effective in the case of breast cancer follow-up care.

Follow-up program evaluations

To inform health care decision makers about the cost-effectiveness of customized care, the average utility estimate of each follow-up strategy and its average costs have to be compared to the average utilities and costs of other strategies or current practice to decide which strategy to implement. In Figure 7 we show the evaluation results for several follow-up programs relative to the current standard program (“S”)¹²: These programs represent two “best in class” alternative programs and programs that were evaluated in the MaCare trial. They are: 1. A single alternative program that leads to much lower average costs than the standard program and an approximately equal average utility level (“A”), 2. The least expensive single alternative program (“C”), 3. A strategy in which patients receive their preferred follow-up program from the four programs that were evaluated in the MaCare trial (“4M”), 4. A strategy in which patients receive their preferred follow-up program from the four programs of the MaCare trial and a reduced version of these programs with the option to get one follow-up visit less (“4M-”), and 5. A fully customized program in which all patients receive their preferred (highest utility) follow-up program (“FC”). Table 7 provides a summary description of the programs and indicates if a program’s cost and utility values are strictly dominated by other programs or not. Note that in the cost-utility analysis for which multiple programs are available we assume that patients are assigned by hospital management to the patient’s own specific highest utility program.

¹² Waiting time is assumed to be constant across programs and was set at 5 minutes in the evaluations.

Table 7: Cost-utility comparisons of follow-up programs

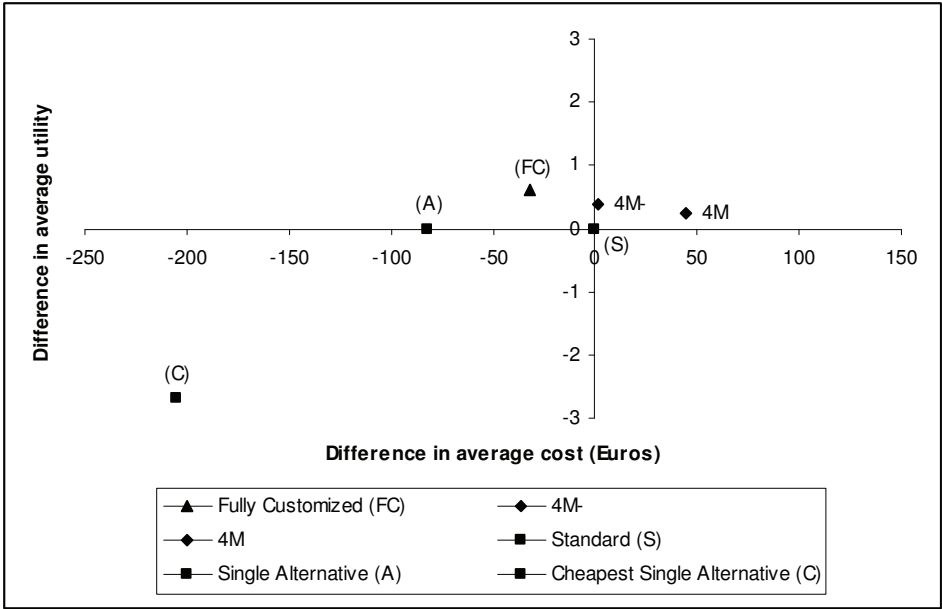
| Follow-up program label | Follow-up program description | Average utility difference* | Average cost difference* | Dominated |
|---|--|-----------------------------|--------------------------|-----------------------|
| Cheapest Single Alternative ("C") | 2 x nurse-led telephone follow-up and 1 specialist-led face to face visit, no EGP | -2.69 | -€204.80 | Non-dominated |
| Single Alternative ("A") | 3 specialist-led face to face visits, no EGP | -0.01 | -€81.94 | Non-dominated |
| Standard ("S") | 4 specialist-led face to face visits, no EGP | 0 | €0 | Dominated by FC |
| Choice from MaCare programs ("4M") | A choice of the MaCare programs: 4 specialist-led face to face visits, no EGP 3 x nurse-led telephone follow-up and 1 specialist-led face to face visit, no EGP 4 specialist-led face to face visits, EGP 3 x nurse-led telephone follow-up and 1 specialist-led face to face visit, EGP | 0.25 | €44.53 | Dominated by FC & 4M- |
| Choice from MaCare programs and MaCare programs with one visit less ("4M-") | A choice of the MaCare programs + the option to have one visit less | 0.37 | €1.77 | Dominated by FC |
| Fully Customized ("FC") | Customized program for all patients based on individual patient preferences - includes all program attributes | 0.61 | -€32.07 | Non-dominated |

* The current standard program is taken as a basis for comparison

The results demonstrate that full customization of care according to patients' preferences would be a very good option. The average utility of such a strategy is higher than that of all alternative programs, while its average costs are below the current standard, and also lower than programs 4M and 4M-. Thus, the fully customized program (FC) dominates programs S, 4M, and 4M- (Table 7). The single alternatives A and C are not dominated by FC because they have lower average costs, and in some instances hospital managers may be willing to trade off higher utility against lower costs.

Since full customization may not be practical in all settings, it is also interesting to investigate alternative follow-up programs that offer less choice. In these alternative strategies patients can choose between several programs that are offered by the hospital. For instance, in program “4M-” patients have a choice between programs with a frequency of three or four visits, nurse-led telephone follow-up or specialist-led face to face follow-up, and an EGP or not. Assigning patients to these eight follow-up programs leads to a higher average utility level and higher average costs than the “standard” follow-up program (Figure 7). In summary, our analysis indicates that, in the case of follow-up after breast cancer treatment, customized programs can be cost-effective alternatives to a one-strategy-for-all approach, especially when current cost levels are acceptable to hospital management.

Figure 7: Cost-utility comparisons of FU programs with current standard practice



4.4 Discussion

In this study we propose and test a DCE-based approach to evaluate the costs and benefits of (non-health-related aspects of) care. We offer a stepwise illustration of the approach in the context of breast cancer follow-up programs. The results of the use of our approach in the post-treatment breast cancer care case indicate that offering customized follow-up

programs to patients can benefit both patients and hospitals in cases where patients have heterogeneous preferences.

The strength of a DCE lies in the fact that it is grounded in economic theory and because patients are forced to make trade-offs, DCEs provide more reliable estimates of utilities than traditional satisfaction-based questionnaires. Furthermore, a DCE provides relevant information on the strength of preferences of patients for (non-health aspects of) care and can therefore assist hospitals and policy makers in determining what aspects of care will guide the patient's preferences. Moreover, DCEs allow for the evaluation of currently non-available alternatives when hospitals wish to change their policies.

While this approach is new to the health care literature and potentially relevant in many areas of medical decision making there are some issues that could be addressed in future research. First, the cost calculations in this chapter are based on a health care management perspective, only including costs of the proposed follow-up strategy to the hospital itself. For the purpose of illustrating the DCE-based approach we felt this was appropriate. However, for policy makers there will often be other (health care costs) related to the health care program that they may wish to incorporate (e.g., visits to other health care professionals, diagnostic tests, productivity losses). Hence, the cost calculations used in this chapter provided a hospital management oriented approach, but in other health care cases these costs may be extended to also cover total costs to society.

Second, in clinical practice, it may be challenging to offer customized care since it may lead to loss of economies of scale or it may require substantial implementation costs. In the case of breast cancer follow-up, there needs to be sufficient capacity and skills levels need to be such that the staff is able to provide both telephone follow-up and the EGP for example. Customized care also requires careful documentation of the proposed strategy and good communication among patient, doctors, nurses and other care providers involved. Hospitals should take this aspect into account when they consider offering customized health care programs.

Third, decisions on what type of care to offer to patients have to be made before a health program is implemented in clinical practice. In this study DCE estimates were measured in a sample of women who had been treated for breast cancer and who were between six months and two years in follow-up. An advantage of using these respondents was that they provided informed preferences for most attributes. Preference measurements for relatively unknown characteristics of a follow-up would have to rely on patient information provided in the survey and may be more uncertain (Salkeld, Ryan, & Short, 2000). However, a disadvantage of using an experienced sample, such as in the current study, may be that the preference for the follow-up program with which respondents have

experience may be stronger than for other programs, for example, due to endowment effects or status quo bias (Samuelson & Zeckhauser, 1988; Salkeld, Ryan, & Short, 2000). Hence, when conducting a DCE it is extremely important to carefully design the survey instrument and select an appropriate sample, possibly including a wide range of patients, with and without experience with the proposed health care program.

Fourth, the utility levels in a choice model are dependent on the selected reference points in the model (e.g., the standard follow-up program) as well as on the overall scale of the error term in the model (Flynn, 2010). Therefore, comparison of cost-utility trade-offs between different studies is problematic. This is aggravated in cases such as ours in which no prices are charged to patients and therefore WTP-measures cannot be calculated to resolve part of the scaling problem. Furthermore, while for QALY-based cost evaluations clear guidelines are established that describe the value of a QALY in Euros or Dollars to make program comparisons possible, for utility-based evaluations such guidelines do not exist. The managerial implication of this model structure is that for utility-based cost evaluation models hospitals and policy makers need to make case by case decisions on whether or not a certain utility improvement (or cost reduction) is cost-effective. This is straightforward in case a program dominates another program (e.g., full customization vs. the current standard program), but becomes more difficult for non-dominated program comparisons (e.g., the least expensive alternative program vs. the current standard program).

In summary, we have provided the reader with a step by step illustration of the use of DCEs to evaluate health care program costs and benefits that provides insight in how to compare (and combine) health care programs for which patients have heterogeneous preferences. While the emphasis of our approach lies on preference measurement for non-health-related aspects of care, this approach could also be applied to investigate the relationship between patient preferences for differences in QALYs between health care programs. Many DCEs also incorporate health outcomes (e.g., life years gained by the program or improved quality of life) and patients may wish to trade-off some health benefits for a better process of care. We plan to study this integration in future research. However, given the strong dominance of health outcomes in medical decision making we believe that the present approach may be particularly useful when health care decision makers are presented with different options to offer care to the patient, that are not expected to directly influence health outcomes, but that are likely to affect patient satisfaction and have financial implications.

Chapter 5. Discussion

5.1 Conclusion

In chapter two we showed that collective health outcomes play an important role in the consumer allocation policy evaluation process. One of the main findings of this chapter is that distributional collective health outcome evaluations (compared to total collective health outcome evaluations) have a relatively lower impact on consumers' attitude towards an allocation policy for health care treatments that have life improving consequences than for treatments with life saving consequences. We find support for the explanation that these differences are caused by the difference in emphasis that consumers place on total versus distributional collective outcomes depending on whether their decisions are made for luxury or necessity goods. In line with earlier research we find that individuals prefer the distribution of treatments with life improving consequences (relative luxuries) to be left to the market, while they prefer the distribution of treatments with life saving consequences (relatively scarce necessities) to be regulated (Berry, 1994; Kemp, 1996; Kemp, 1998; Mahoney, Kemp, & Webley, 2005). Indeed we find that compared to a treatment with life saving consequences, a treatment with life improving consequences is considered as more a luxury than a necessity type of good.

The second important finding of chapter two is that price-based priority access allocation policies for which treatment takes place within the regular working hours of the hospital have a negative effect on total and distributional collective health outcome evaluations, but that in case of treatment outside of the regular working hours of the hospital these effects turn out to be positive for total collective health outcome evaluations and negative for distributional collective health outcome evaluations. Interestingly, consumers appear to recognize the fact that treatment of patients outside regular working hours of the hospital offers additional supply and therefore increases the total collective health outcomes. For distributional collective health outcome evaluations, however, the effect of price-based priority access allocation policies is also negative when patients are treated outside of regular working hours. This is likely to be the case because even when offered outside of regular working hours, price-based priority access allocation policies still lead to inequalities.

In chapter three (Experiment 1) we found that collective outcomes are perceived as more abstract than individual outcomes, and are evaluated more positively when the social distance of the focal outcome in an allocation policy is congruent with the psychological distance inherent in the decision context (a collective outcome based policy and a far psychological distance, and an individual outcome based policy and a close psychological distance, respectively). This confirmation of CLT expectations connected with the congruency or value of fit effect is found only for individuals that did *not* have recent hospital experience. However, for those individuals with recent hospital experience, a concrete, ego-centric internal mindset is activated that diminishes the effect of the situationally induced mindset and leads to a more positive evaluation of the individual outcome based allocation policy in both a close and far psychological distance. In Experiment 2, we found that equity collective outcomes are perceived as more abstract than efficiency collective outcomes, and evaluated more positively when the social distance of the focal outcome in an allocation policy is congruent with the psychological distance inherent in the decision context (an equity based allocation policy and a far psychological distance, as well as an efficiency based allocation policy and a close psychological distance, respectively). We have not found an overruling effect of consumers' recent hospital experience in this experiment because here the focus is on collective outcomes only and the trade-off with individual outcomes does not play a role.

In chapter four we demonstrated how the collective costs and benefits of customized health care programs can be evaluated and used to support management and policy decisions for customized care. Follow-up after breast cancer was studied as a very relevant example. We showed that, in the case of follow-up care after breast cancer, offering patients fully customized programs is cost-effective and also preferred by patients. Theoretically, this chapter demonstrates how non-health-related aspects of care (i.e., patient preferences for contact modes, waiting times, etc.) can be incorporated into economic evaluations informing health care management decisions.

5.2 Managerial Implications

The research presented in this dissertation provides various relevant insights for managers. In chapter two we found that health care treatments with life improving consequences decrease the impact of distributional collective health outcome evaluations (compared to total collective health outcome evaluations) on consumer attitude towards the allocation policy relative to treatments with life saving consequences. This finding suggests that people put relatively less weight on distributional aspects when lives are not at stake. It can

be used as input in allocation policy decision situations for different kind of health care treatments. For instance, policy makers could decide to implement an allocation policy that is likely to lead to a less equal distribution (and a relatively higher total number) of quality adjusted life years (QALYs) saved, but only in case the allocation policy is meant for a treatment with life improving consequences.

We also found that the negative impact of price-based allocation policies on total collective health outcome evaluations can be overcome by offering more flexible hours of operation (i.e., treatment outside the regular working hours). In practice, hospitals could use this finding by offering patients the option to pay for priority access only in case treatment takes place outside the regular working hours of the hospital. In this way hospitals might also be able to generate extra revenues that could eventually be used to increase supply by building new hospital units, for example.

In chapter three we showed that allocation policies that focus on collective outcomes, or on equity collective outcomes, benefit most when they are introduced in a far psychological distance context, e.g., with a more distant temporal timing (e.g., announcing the policy quite some time before its launch), and for a more remote location (e.g., announcing the policy for a provider that is located in a vicinity far away). In contrast, allocation policies that focus on individual outcomes, or on efficiency collective outcomes, benefit most when they are introduced in a close psychological distance context, e.g., with a close temporal timing (e.g., announcing the policy just before its launch), and for a close location (e.g., announcing the policy for a provider that is located in the close vicinity). Depending on the launch time of the allocation policy and the service provider's location, policy makers should (or should not) highlight the temporal or spatial distance inherently connected to the decision context. As was shown by Experiment 1, a boundary effect is found for those consumers that have recent experience and that consider collective vs. individual outcome based allocation policies. Here, policy makers should be aware of the existence of a strong (concrete and ego-centric) mindset that is triggered by consumers' recent experiences and that may overrule situationally induced mindsets.

In chapter four we demonstrated how individual-specific discrete choice experiment (DCE) estimates and cost data can be used to inform medical decision making using follow-up after breast cancer as an example. In practice, hospitals can use the presented approach to decide on the question which health care program to implement given all (possible) programs.

5.3 Limitations and Avenues for Future Research

One of the questions that are answered in this dissertation is how consumers evaluate price-based priority access allocation policies (with a special focus on the role of individual and collective outcomes). The reason why we investigate consumer evaluations of such policies is that consumer evaluations are a critical consideration for policy makers and other decision makers when they face the decision to implement a certain policy. Low consumer evaluations can be used as indication of low public support and can lead policy makers to decide not to implement the policy because of public dissatisfaction. The existence of detailed information about consumer evaluations of health care policies could also be used by governments in their choice of implementing a specific policy.

A good way to capture consumer opinions is to measure how consumers evaluate a policy by means of their attitude towards the policy (as has been done in chapters two and three). One could argue that other metrics like consumer willingness-to-pay or consumer choice are also appropriate, but this is only the case if they could be more useful for hospitals and policy makers in practice, for example in future scenarios in which patients could actually choose between hospital policies. The main reason for using attitude measurements in this dissertation is because of our goal to better understand the consumer evaluation of flexible health care policies that, in contrast to the regular policies, might harm ethical norms. We are highly interested in how consumers think about policies that deviate drastically from the standard policies offered. Currently, asking respondents about their attitudes towards a policy (i.e., how bad-good, unpleasant-pleasant, harmful-beneficial, and unfavorable-favorable they perceive a policy to be) gives better insights into the “acceptability” of a policy than asking them to choose between policies. One should keep in mind that this dissertation is a first step in evaluating new flexible health care allocation policies. For future research it might be interesting to let respondents choose between new allocation policies and ask them, for example, how much they would like to pay for the policy when it will be implemented in real life. This would offer hospital managers practically useful information.

Besides the use of other metrics to measure consumer evaluations there are other limitations and avenues for future research that should be mentioned. First, in chapter two we used liver transplantation treatment and ear correction treatment manipulations to distinguish between treatments with life saving and life improving consequences respectively. It would be interesting to investigate if our results also hold across a wider range of health applications by testing whether distributional collective health outcome evaluations (compared to total collective health outcome evaluations) still have a relatively lower impact on consumers’ attitude towards an allocation policy when other types of

treatments with life improving (and life saving) health consequences are used in the treatment type manipulations.

Second, in the same chapter, we also used different types of price-based allocation policies, but we did not investigate a price-based allocation policy in which the price to get priority access to health care treatment is much higher. Using such a high price could lead to substantial additional income for the hospital that could be used to benefit all patients by building new hospital units that increase supply, for example. It might be interesting to test how consumers evaluate this type of price-based allocation.

Third, in Figure 4 (chapter three) we show that, in a close psychological distance, the individual outcome based policy is more positively evaluated than the collective outcome based policy for respondents with recent hospital experience (panel A), as well as for respondents without recent hospital experience (panel B). The significance of these findings is confirmed by the planned comparisons for Experiment 1 in Appendix F (i.e., ($F(1, 602) = 3.396; p < .10$), and ($F(1, 68) = 3.327; p < .10$) respectively). These findings are in line with our CLT expectation that individual outcome based policies are more positively evaluated than collective outcome based policies in a psychologically close decision context.

We also see in Figure 4 that, in a far psychological distance, the individual outcome based policy is more positively evaluated than the collective outcome based policy for respondents with recent hospital experience (panel A). This is confirmed by the planned comparison ($F(1, 602) = 3.083; p < .10$) in Appendix F. We explained this finding by the activation of a concrete, ego-centric mindset that overrules the situationally induced mindset due to recent hospital experience. In Figure 4 we also show that, in a far psychological distance, the collective outcome based policy is more positively evaluated than the individual outcome based policy in case respondents do not have recent hospital experience (panel B). This is in line with our CLT expectations. However, the planned comparisons in Appendix F indicate that the mean evaluation of an individual outcome based policy does not differ significantly from the mean evaluation of a collective outcome based policy in a psychologically far decision context for respondents without recent hospital experience ($F(1, 68) = 1.640; p = .205$).

We also did another planned comparison for Experiment 1 (Appendix G) to actually confirm the interaction-effect of hospital experience. This planned comparison indicates that, in a psychologically far situation, the individual outcome based policy is significantly higher evaluated than the collective outcome based policy in case respondents have recent hospital experience ($F(1, 340) = 3.164; p < .10$), as was found before. Furthermore, this planned comparison shows that, in a psychologically far situation, the

individual outcome based policy is significantly higher evaluated by respondents with recent hospital experience than by respondents without recent hospital experience ($F(1, 340) = 5.311; p < .05$). This indicates that the interaction-effect based on hospital experience mainly comes from a significant difference in evaluation of the individual outcome based policy for respondents with hospital experience versus respondents without hospital experience (in a psychologically far decision context).

A reason that could explain why the difference in evaluation of the collective outcome based policy versus the individual outcome based policy, in a far psychological decision context, for respondents without recent hospital experience, is not significant ($F(1, 340) = 1.561; p = .212$) (Appendix G), is probably the small number of respondents in the group that does not have recent hospital experience ($N = 606$ for recent hospital experience, and $N = 72$ for no recent hospital experience in Experiment 1). This imbalance in group size can be seen as a clear disadvantage of the analysis in chapter three. Maybe future researchers can take this into account and base their research on a balanced sample that consists of an equal number of experienced and non-experienced respondents.

In chapter three we showed that hospital experience can be a boundary condition for CLT to hold. Another interesting question to address in future research is whether other boundary conditions like familiarity with the object of evaluation and other types of experiences also affect general CLT expectations (due to the activation of a more concrete, ego-centric mindset that overrules general CLT expectations).

Fourth, in chapter four we described an approach that can help hospitals to decide on the question which (customized) health care program to implement. However, when using this approach, a comparison of cost-utility-trade offs between different studies is problematic because of the fact that the utility levels in a choice model are dependent on the selected reference points (here the standard follow-up program). The managerial implication is that for utility-based cost evaluation models case by case decisions should be made to decide on the question whether a certain utility improvement is cost-effective. This can be regarded as a disadvantage of the proposed approach.

Fifth, although we made use of a patient sample in chapter four, chapters two and three are based on general population samples. It would be relevant to know if the use of patient data for the analysis in chapters two and three would lead to the same or different results, for example, because patients may be less focused towards health outcomes for others. On the other hand, a disadvantage of using patient data (i.e., an experienced sample) in chapter four is the possible higher preference for the follow-up program respondents have experience with due to endowment effects or status quo bias (Samuelson & Zeckhauser, 1988; Salkeld, Ryan & Short, 2000).

Sixth, in both chapters two and three respondents were shown hypothetical allocation policy situations which did not have real-life consequences for them. It would be interesting to investigate allocation policy evaluations for allocation policies that are on the agenda to be implemented, because respondents' evaluations might be different in case of real-life consequences. Future research could address this question by means of a real-life experiment. This would be especially interesting in the context of CLT.

Finally, it might also be interesting to investigate whether our results can be replicated in other domains that are confronted with scarcity of service resources like recreation and education.

The findings of this dissertation are both theoretically as well as practically relevant and can be helpful for future real-life policy implementation decisions in health care. It is very well possible that we see more flexible health care policies in the future. Our analysis shows that both priority access pricing when treatment takes place outside the regular working hours of the hospital (Table 4 - Model 3) and customized care (Table 7) seem particularly attractive to the general public. We hope that the insights generated in this dissertation trigger future research that further investigates these and related questions in the important domain at the crossroads of health care and marketing.

Appendix

Appendix A. Construct descriptions and measurements (Study 1)

| <i>Constructs</i> | <i>Item Descriptions</i> | <i>Factor Loadings</i> | <i>Construct Reliability</i> |
|--------------------------------|--|--------------------------|------------------------------|
| Allocation mechanism attitude* | How would you describe your feelings toward the policy of hospital X? 1. Very bad - Very good 2. Very unpleasant - Very pleasant 3. Very harmful - Very beneficial 4. Very unfavorable - Very favorable | .94 .93 .90 .93 | .96 |
| Total health outcome | 1. The policy of hospital X probably leads to a relatively high total number of quality adjusted life years gained. 2. The expected total number of quality adjusted life years gained that the policy of hospital X probably leads to is acceptable. 3. The total number of quality adjusted life years gained that probably results from the policy of hospital X does not satisfy me.** | .75 .94 | .83 |
| Distributional health outcome | 1. The policy of hospital X probably results in an unreasonable distribution of quality adjusted life years among patients. 2. The distribution of quality adjusted life years among patients that probably results from the policy of hospital X does not satisfy me. 3. The policy of hospital X probably leads to a fair distribution of quality adjusted life years among patients.** | .76 .95 | .83 |
| Own chance of treatment | 1. Given the policy of hospital X there is a relatively high probability that I will be treated this year. 2. Given the policy of hospital X the chance that I will be treated this year satisfies me. 3. The chance that I will be treated in this year based on the policy of hospital X does not please me.** | .88 .96 | .91 |
| Own payment | 1. The payment I have to make for a treatment given the policy of hospital X is probably too high. 2. The price I probably have to pay for a treatment given the policy of hospital X is unacceptable. 3. I am pleased with the payment I have to make to get a treatment based on the policy of hospital X.** | .87 .91 | .88 |

* Except allocation mechanism attitude, which is a 7 point semantic-differential scale, all scales are 7 point likert scales with endpoints totally disagree - totally agree.

** Deleted to improve measurement performance

Appendix B. Testing for common method variance (Study 1)

| <i>Model</i> | <i>Model 3 + Control</i> | |
|--|--------------------------------------|---------------------|
| <i>Dependent variable</i> | <i>Allocation mechanism attitude</i> | |
| | Mean (β) | St. dev. (v) |
| Constant (α) | 3.50** | .43** |
| Price-based allocation mechanism (β_{iPRICE}) | -.15** | .02 |
| Lottery (β_{iLOT}) | .41** | .24** |
| Waiting list (β_{iWL}) | .71** | .19** |
| Selection (β_{iSEL}) | .45** | .29* |
| Total health outcome (β_{iTOTAL}) | .27** | .08** |
| Distributional health outcome ($\beta_{iDISTRIBUTIONAL}$) | .24** | .16** |
| Own chance of treatment ($\beta_{iOWNCHANCE}$) | .35** | .13** |
| Own payment ($\beta_{iOWNPAYMENT}$) | .11** | .20** |
| Life improving health consequence ($\beta_{iLIFEIMPROVING}$) | -.01 | .07* |
| Total health outcome x Life improving health consequence ($\beta_{iTOTAL \times LIFEIMPROVING}$) | .15** | |
| Distributional health outcome x Life improving health consequence ($\beta_{iDISTRIBUTIONAL \times LIFEIMPROVING}$) | -.10** | |
| Control ($\beta_{iCONTROL}$) | -.01 | .08** |

* $p < .05$ ** $p < .01$.

Appendix C. Construct descriptions and measurements (Study 2)

| <i>Constructs</i> | <i>Item Descriptions*</i> | <i>Factor Loadings</i> | <i>Construct Reliability</i> |
|---------------------------------|--|--------------------------|------------------------------|
| Allocation mechanism attitude** | How would you evaluate the policy of hospital X? 1. Very bad -Very good 2. Very unpleasant - Very pleasant 3. Very harmful - Very beneficial 4. Very unfavorable - very favorable | .91 .92 .93 .93 | .96 |
| Total health outcome | 1. The expected total number of life years saved satisfies me. 2. The expected total number of life years saved is high. 3. The expected total number of life years saved is acceptable. | .91 .92 .94 | .95 |
| Distributional health outcome | 1. The expected distribution of life years saved among patients satisfies me. 2. The expected distribution of life years saved among patients is good. 3. The expected distribution of life years saved among patients is acceptable . | .95 .96 .96 | .97 |
| Own chance of treatment | 1. My chance of being treated fast satisfies me. 2. My chance of receiving treatment fast is high. 3. My chance of receiving treatment fast is acceptable. | .90 .86 .92 | .92 |
| Own payment | 1. The price I have to pay for treatment satisfies me. 2. The price I have to pay for treatment is good. 3. The price I have to pay for treatment is acceptable. | .96 .98 .96 | .98 |
| Fairness | 1. The policy is fair. 2. The policy is justifiable. 3 The policy is just. | .91 .92 .91 | .94 |

* Translated from Dutch

** Except allocation mechanism attitude, which is a 7 point semantic-differential scale, all scales are 7 point likert scales with endpoints totally disagree - totally agree.

Appendix D. Testing for common method variance (Study 2)

| <i>Model</i> | <i>Model 3 + Control</i> | |
|--|--------------------------------------|-----------------------|
| <i>Dependent variable</i> | <i>Allocation mechanism attitude</i> | |
| | Mean (β) | St. dev. (ν) |
| Constant (α) | 3.40** | .12** |
| Price-based within ($\beta_{iPRICE-IN}$) | -.34** | .03 |
| Price-based outside ($\beta_{iPRICE-OUT}$) | .49** | .03 |
| Fairness ($\beta_{iFAIRNESS}$) | .47** | .12** |
| Total health outcome (β_{iTOTAL}) | .05* | .05** |
| Distributional health outcome ($\beta_{iDISTRIBUTIONAL}$) | .12** | .04** |
| Own chance of treatment ($\beta_{iOWNCHANCE}$) | .19** | .12** |
| Own payment ($\beta_{iOWNPAYMENT}$) | .06** | .07** |
| Life improving health consequence ($\beta_{iLIFEIMPROVING}$) | .06* | .08** |
| Total health outcome x Life improving health consequence ($\beta_{iTOTAL \times LIFEIMPROVING}$) | .06 | |
| Distributional health outcome x Life improving health consequence ($\beta_{iDISTRIBUTIONAL \times LIFEIMPROVING}$) | -.10** | |
| Control ($\beta_{iCONTROL}$) | -.02 | .10** |

* p < .05 ** p < .01.

Appendix E. Scenario descriptions*

Scenario for Experiment 1

The current patient allocation system of hospitals [*in the neighborhood/in the country*] became out of date. Therefore, a new policy [*is going to be implemented within one year/will be implemented in ten years from now*]. The expected outcomes of this policy, compared to the current situation, are described below. As you can see the policy outcome consists of two parts.

Part 1: The total number of QALYs saved in society is relatively [*high/low*]

Part 2: The total number of QALYs saved for one's own is relatively [*low/high*]

Scenario for Experiment 2

The current patient allocation system of hospitals [*in the neighborhood/in the country*] became out of date. Therefore, a new policy [*is going to be implemented within one year/will be implemented in ten years from now*]. The expected outcomes of this policy, compared to the current situation, are described below. As you can see the policy outcome consists of two parts.

Part 1: The total number of QALYs saved in society is relatively [*high/low*]

Part 2: The distribution of QALYs saved in society is relatively [*unequal/equal*]

* Translated from Dutch

Appendix F. Planned comparisons Experiments 1 and 2

Experiment 1

Planned comparisons based on Figure 4 A: Recent hospital experience.

| | |
|---|-----------------------------------|
| IOBP ¹³ close ¹⁴ vs. COBP ¹⁵ close | ($F(1, 602) = 3.396; p < .10$) |
| IOBP far ¹⁶ vs. COBP far | ($F(1, 602) = 3.083; p < .10$) |
| IOBP close vs. IOBP far | ($F(1, 602) = 0.080; p = .777$) |
| COBP close vs. COBP far | ($F(1, 602) = 0.041; p = .839$) |

Planned comparisons based on Figure 4 B: No recent hospital experience.

| | |
|---------------------------|----------------------------------|
| IOBP close vs. COBP close | ($F(1, 68) = 3.327; p < .10$) |
| IOBP far vs. COBP far | ($F(1, 68) = 1.640; p = .205$) |
| IOBP close vs. IOBP far | ($F(1, 68) = 2.618; p = .110$) |
| COBP close vs. COBP far | ($F(1, 68) = 2.362; p = .129$) |

Experiment 2

Planned comparisons based on Figure 5.

| | |
|---|------------------------------------|
| EFBP ¹⁷ close vs. EQBP ¹⁸ close | ($F(1, 669) = 21.462; p < .001$) |
| EFBP far vs. EQBP far | ($F(1, 669) = 3.252; p < .10$) |
| EFBP close vs. EFBP far | ($F(1, 669) = 0.902; p = .343$) |
| EQBP close vs. EQBP far | ($F(1, 669) = 3.558; p < .10$) |

¹³ IOBP = Individual outcome based policy

¹⁴ Close = Close psychological distance

¹⁵ COBP = Collective outcome based policy

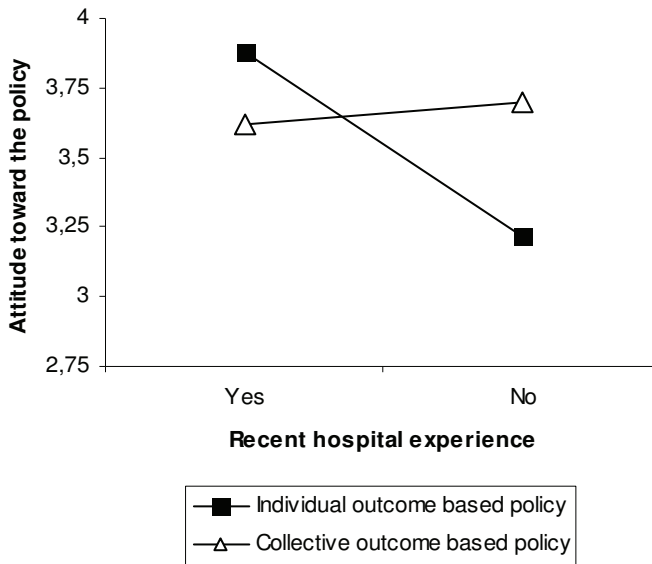
¹⁶ Far = Far psychological distance

¹⁷ EFBP = Efficiency based policy

¹⁸ EQBP = Equity based policy

Appendix G. Additional planned comparison Experiment 1

Planned comparison for Experiment 1 (based on a far psychological distance).



IOBP experience¹⁹ vs. COBP experience

($F(1, 340) = 3.164; p < .10$)

IOBP no experience vs. COBP no experience

($F(1, 340) = 1.561; p = .212$)

IOBP experience vs. IOBP no experience

($F(1, 340) = 5.311; p < .05$)

COBP experience vs. COBP no experience

($F(1, 340) = 0.073; p = .787$)

¹⁹ Experience = Recent hospital experience

Appendix H. Utility calculations*

| Resp. | EGP | Code | WT | Code | Tel | Code | Freq | Code | Freq ² | Code | Utility***** |
|-------|--------|------|--------|------|--------|------|-------|------|-------------------|------|--------------|
| 1 | -0.239 | 0 | -0.012 | 5 | -1.398 | 0 | 1.275 | 4 | -0.217 | 16 | 1.568** |
| 2 | -0.708 | 0 | -0.015 | 5 | -0.945 | 0 | 1.725 | 4 | -0.220 | 16 | 3.305 |
| 3 | -2.419 | 0 | -0.002 | 5 | -0.621 | 0 | 1.334 | 4 | -0.222 | 16 | 1.774 |
| 4 | -1.176 | 0 | -0.012 | 5 | 0.335 | 0 | 1.557 | 4 | -0.237 | 16 | 2.376 |
| 5 | -0.152 | 0 | -0.007 | 5 | -4.463 | 0 | 1.492 | 4 | -0.222 | 16 | 2.381 |
| 6 | -2.393 | 0 | -0.004 | 5 | -1.351 | 0 | 1.537 | 4 | -0.225 | 16 | 2.528 |
| 7 | -1.091 | 0 | -0.003 | 5 | -0.122 | 0 | 1.331 | 4 | -0.228 | 16 | 1.661 |
| 8 | -1.402 | 0 | -0.009 | 5 | -2.731 | 0 | 1.948 | 4 | -0.220 | 16 | 4.227 |
| 9 | -1.850 | 0 | -0.007 | 5 | -2.772 | 0 | 1.763 | 4 | -0.220 | 16 | 3.497 |
| 10*** | -1.138 | 0 | -0.000 | 5 | -3.077 | 0 | 1.394 | 4 | -0.221 | 16 | 2.04 |
| | | | | | | | | | | | 25.357**** |

* For specialist-led face to face follow-up (4 times a year) and no EGP based on individual level DCE estimates.

** Total utility of respondent 1: $((-0.239 \times 0) + (-0.012 \times 5) + (-1.398 \times 0) + (1.275 \times 4) + (-0.217 \times 16)) = 1.568$.

*** For practical reasons calculations for only 10 respondents are illustrated in this table.

**** The total utility is calculated by summing the utilities of all individuals (i.e., $1.568 + 3.305 + \dots + \dots = 25.357$).

***** Medical specialist is used as reference category in our calculations, therefore the health care provider is not shown.

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Summary (English)

The rise of consumerism and the increasing availability of information through the Internet have increased patients' demand for care that is more in line with their preferences. Because of this trend the expectation that hospitals act according to each individual patient's preferences is becoming even more prominent. Hospitals could respond by implementing flexible health care policies that offer patients more choice.

In this dissertation we explore two types of flexible health care policies from the consumer perspective: priority access pricing and customized care. We do this by (1) investigating how consumers evaluate price-based priority access allocation policies (i.e., allocation policies in which patients are offered the option to pay extra for faster health care access), and by (2) demonstrating how the collective costs and benefits of customized health care policies (i.e., policies that offer individuals the possibility to "create" their own health care program) can be used to evaluate customized care. Throughout, special attention is given to the role of collective health outcomes.

Besides our scientific conclusions, our findings are also relevant for hospitals and policy makers that consider implementing new allocation policies. They can be used to provide assistance in future health care decision making.

Samenvatting (Nederlands)

De stijgende drang om te consumeren en de steeds groter wordende hoeveelheid informatie die beschikbaar is via Internet heeft de vraag naar zorg die voldoet aan de voorkeuren van de patiënt sterk vergroot. Hierdoor is de verwachting dat ziekenhuizen zich gedragen naar gelang de voorkeuren van iedere patiënt steeds duidelijker aanwezig. Ziekenhuizen kunnen hierop reageren door het invoeren van flexibele beleidsvormen in de gezondheidszorg die patiënten meer keuze bieden.

In dit proefschrift verdiepen we ons in twee verschillende soorten van flexibel beleid in de gezondheidszorg vanuit het perspectief van de consument: betaalde snellere toegang en maatwerk in de zorg. Dit doen we door te onderzoeken hoe de consument een allocatiebeleid van betaalde snellere toegang tot zorg (d.w.z. een allocatiebeleid waarin patiënten de optie wordt geboden extra te betalen om snellere toegang tot gezondheidszorg te krijgen) evalueert, en door te demonstreren hoe de collectieve kosten en opbrengsten van een beleid dat maatwerk gezondheidszorg aanbiedt (d.w.z. het aanbieden van zorgprogramma's die individuen de mogelijkheid bieden om hun eigen zorgvariant samen te stellen), gebruikt kunnen worden om maatwerk in de zorg te evalueren. In dit proefschrift wordt daarbij speciale aandacht gegeven aan de rol van collectieve gezondheidsuitkomsten in de evaluatie door consumenten.

Naast onze wetenschappelijke inzichten, zijn onze bevindingen ook relevant voor ziekenhuizen en beleidsmakers die overwegen een nieuw allocatiebeleid in te voeren. Ze kunnen worden gebruikt om ondersteuning te bieden bij toekomstige besluitvormingsprocessen in de gezondheidszorg.

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Tim Benning was born in Dordrecht on 1 July 1983. He obtained his VWO diploma from Develsteincollege in 2001. From 2001 to 2006 he studied Economics and Business at the Erasmus University Rotterdam. He obtained his Master's degree in 2006. In January 2007 he started as a PhD-student at the department of marketing at the Erasmus School of Economics (ESE) and Erasmus Research Institute of Management (ERIM) at the Erasmus University Rotterdam. During his Phd-track he presented his research at several international conferences (Paris and Cologne). After his Phd, he started as a post-doctoral researcher at the institute of Health Care Policy and Management (iBMG) of the Erasmus University Rotterdam.

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A CONSUMER PERSPECTIVE ON FLEXIBILITY IN HEALTH CARE PRIORITY ACCESS PRICING AND CUSTOMIZED CARE

The rise of consumerism and the increasing availability of information through the Internet have increased patients' demand for care that is more in line with their preferences. Because of this trend the expectation that hospitals act according to each individual patient's preferences is becoming even more prominent. Hospitals could respond by implementing flexible health care policies that offer patients more choice.

In this dissertation we explore two types of flexible health care policies from the consumer perspective: priority access pricing and customized care. We do this by (1) investigating how consumers evaluate price-based priority access allocation policies (i.e., allocation policies in which patients are offered the option to pay extra for faster health care access), and by (2) demonstrating how the collective costs and benefits of customized health care policies (i.e., policies that offer individuals the possibility to "create" their own health care program) can be used to evaluate customized care. Throughout, special attention is given to the role of collective health outcomes.

Besides our scientific conclusions, our findings are also relevant for hospitals and policy makers that consider implementing new allocation policies. They can be used to provide assistance in future health care decision making.

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