Designing Better Policies:

Three Applications of Behavioral Economics to Health and Development Policies

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an important intervention with real tangible impact. It was an incredibly rewarding experience. I am deeply impressed by the work Emily is doing with Reemi in Bangladesh and humbled by the opportunity to have been a part of it.

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Clarissa Mang

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INTRODUCTION

To "whisper in the ear of princes" (Roth, 1986) is the ambition of many an economist: to provide data-driven insights to men and women in charge in order to support optimal evidence-based policymaking is the goal of many economic studies, especially in Behavioral Economics. This approach is gaining traction: policymakers in various fields with widespread social implications, such as Education, Public Health, Environmental Policies, Economic Development and Organizational Economics, are increasingly relying on experimental and data-driven methods to evaluate policies before large-scale implementation (Schimmelpfennig and Muthukrishna, 2023; van Veenstra and Kotterink, 2017; Brennan, 2018; van Ooijen et al., 2019).

Behavioral Economics, and its applications to policymaking, originated in the 1970s and 1980s. It was largely driven by the work of 2002 Nobel Prize Winner Daniel Kahneman and Amos Tversky, who recognized the importance of incorporating psychological factors, such as cognitive limitations and biases, into models of economic agents' behavior and decision making (Brennan, 2018). The work by 2017 Nobel Prize Winner Richard Thaler and Cass Sunstein on using *nudges* to change behavior in a morally or socially desired direction has contributed to the rise of behavioral insight units, often dubbed "nudge units", in many governments (e.g. in Germany, the UK, Canada, and Singapore).[1] The ground-breaking contributions by the 2019 Nobel Prize Winners Esther Duflo, Abhijit Banerjee and Michael Kremer have added randomized control trials (RCTs) to the standard toolkit of policymakers, especially in Development Economics. Today, RCTs are often considered the "gold standard" of evidence collection and program evaluation. The establishment of the World Bank's eMBeD unit (the Mind, Behavior and Development Unit) is a further testimony to the increasing influence of behavioral insights on policymaking in the context of development aid provision.

Drawing on the existing body of experimental Behavioral Economics literature allows policymakers to anticipate common behavioral patterns and directly exploit them. For example,

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[1] Afif, Zeina (2017): ""Nudge units" – where they came from and what they can do". *World Bank Blog*, 25. October 2017. Last accessed on 23.02.2023 at: https://blogs.worldbank.org/developmenttalk/nudge-units-where-they-came-and-what-they-can-do

small behavioral nudges, such as changing the default of a decision problem without altering the available choice set or providing regular reminders close to an impeding decision deadline, has allowed governments to increase saving rates through pension scheme enrollments (Beshears et al., 2009), affect the sign-up rates of potential organ donors (Johnson and Goldstein, 2004), and increase cord blood donations (Grieco et al., 2018). Similarly, sending out energy bills containing comparisons of energy consumption to a reference group has been shown to successfully encourage a reduction in energy consumption (Ayres et al., 2013). In these cases, the existing literature showed how behavioral patterns of humans differ from the calculating profit- and utility-maximizing behavior of fully rational agents often associated with economic models. Using these insights helped policymakers design more effective policies.

While some behavioral patterns, such as loss aversion or the existence of social image concerns, have been found to emerge consistently and reliably in the laboratory across several participant pools and contexts, it turns out that making use of these behavioral patterns in practice may nevertheless pose challenges (Larkin et al., 2021; Pierce et al., 2020). In the real world, many confounding factors may act upon an agent at the same time and several mechanisms may be at play simultaneously. This waters down the effect of a specific behavioral pattern the policymaker may seek to exploit. To help policymakers ensure that their measures will have the desired effect, it may be wise to test a new policy in a small sample first, before implementing it on a large scale, even if it is based on solid evidence from laboratory experiments in the literature. This is where the standard experimental method of using laboratory experiments in Behavioral Economics can be complemented by field experiments to help policymakers ensure that a policy will have the desired effect.

Randomized field experiments allow for the testing of a planned intervention in a smaller sample under real-world conditions. The benefits of using RCTs to test the (intended and unintended) effects of a policy before its large-scale roll-out are numerous. RCTs can provide information about the cost-benefit ratio of programs and allow the comparison of effect sizes of different programs with similar aims. They do not rely on assumptions about the preferences of perfectly informed and rational decision-makers or even decision-makers with bounded rationality subject to known biases and behavioral patterns. They allow the direct observation of revealed preferences in the real world, where confounding mechanisms may be present. And they reveal unintended and unanticipated side effects or general equilibrium effects, be they negative or positive. At the same time, a major draw-back of field studies is that they do not easily reveal

the mechanisms at work. Unlike lab experiments, they do not allow pinpointing which aspect of a program is driving its success or failure. Moreover, field experiments are often expensive and may not be feasible for many other practical, logistical, or ethical reasons. In sum, field experiments have the potential to provide very rich and detailed insights into the effectiveness of a policy on a given population, but without understanding the underlying mechanisms they might face limited external validity. It may be difficult to transfer the findings to a context that differs in population characteristics and external circumstances, or to design the most cost-effective policy restricted only to the factors of a program that were causally driving the outcomes.

To make the most of the tools and insights provided by Behavioral Economics, field and laboratory experiments need to be combined to identify, design, and implement the most successful policies. In my thesis, I apply both methodological approaches to study effective policy design in the areas of health and economic development. In addition, I combine the perspectives on both, the beneficiaries as well as the policymakers. While it is standard practice to pay close attention to the reactions and behaviors of the beneficiaries of a policy, it is also paramount to take into account the behavior of the policymakers themselves. Policymakers are often modelled as omniscient and benevolent social planners, but they, too, can be subject to biases or psychological constraints and will respond to incentives. In this thesis, I explore three facets of behavior affecting the design and implementation of health and development policies: social constraints on the group level (Chapter 1), psychological factors on the individual level (Chapter 2) and behavioral biases of the policymaker (Chapter 3).

In **chapter 1**, my co-author Silvia Castro (LMU Munich) and I use a field experiment with 476 female garment factory workers in Bangladesh to explore how addressing group dynamics, in particular social norms and stigma, can improve the adoption of health- and productivity-enhancing technologies. We find that a facilitated group discussion about the stigma and social constraints around menstruation can increase the take-up of an anti-bacterial reusable menstrual underwear. This demonstrates that successful health policies need to consider group behavior and socio-cultural factors in their design. The study presented in this chapter generated such overwhelmingly positive feedback from study participants that it allowed our project partner and provider of the menstrual underwear, a New Zealand-based NGO called Reemi, to successfully expand access to its product to all 6,000 garment factory workers in the factory where our field experiment was run, and even to some of their subsidiaries in other countries.

In **chapter 2**, I use a laboratory experiment with a sample of 474 university students to

evaluate if purposefully fostering a feeling of psychological ownership toward a project can increase project commitment. I show that stronger perceptions of participation in the initial stages of a project and corresponding stronger feelings of psychological ownership do improve project commitment, but manipulating the level of perceived participation and psychological ownership proves to be difficult. This demonstrates that findings of isolated behavioral mechanisms in laboratories may not always be easily transferable to the field and further underscores the need to combine findings from the lab with field experiments.

Finally, **chapter 3** turns towards the policymakers themselves. My co-author Klaus Schmidt (LMU Munich) and I use observational data on 1,647 German hospitals eligible to receive state aid after the financial crisis in 2009 to study the extent to which the state is biased in its decisions to hand out government money to public compared to private entities. We find that public hospitals received substantially more aid than comparable private hospitals. This provides lessons about unintended effects that can arise from behavioral biases present in the policymaker and emphasizes the need to take these into account when designing policies.

Using the proposed mix of experimental and empirical methods, and applying different behavioral theories to policies in the areas of health and economic development, this thesis demonstrates how Behavioral Economics can inform and enrich policymaking. This thesis therefore contributes to a deeper understanding of how to design better and more effective policies.

1. BREAKING THE SILENCE - GROUP DISCUSSIONS, SOCIAL PRESSURE, AND THE ADOPTION OF HEALTH TECHNOLOGIES

Social pressure and stigma can hinder the adoption of available technologies, especially in the context of sensitive health issues. We run a field experiment on the take-up of menstrual products in Bangladesh and test a discussion-based intervention. We vary participation in group discussions designed to break the silence around menstruation, where participants share their personal experiences. We find positive effects on the willingness to pay for a known menstrual product (sanitary pads) and on the adoption of a new technology (anti-bacterial menstrual underwear). Our results show changes in restrictive social norms around purchasing the products and lower perceived stigma around menstruation in general.[1]

1.1 Introduction

Social pressure and stigma can pose an insurmountable obstacle to the adoption of health- and productivity-enhancing technologies and practices, even if they are readily available and affordable. For example, stigma and fear of negative social repercussions can influence an individual's decision of accessing contraception (Håkansson et al., 2018), getting tested for sexually transmitted diseases such as HIV (Yang et al., 2023), seeking help for substance addiction or mental health issues (Shidhaye and Kermode, 2013), or even wearing a face mask during a global pandemic (Kwon, 2022). These effects can be more acute in developing countries, where a lack of education and misinformation may exacerbate prejudices and the stigmatization of certain health conditions.

One condition subject to especially strong levels of stigmatization and strict taboos is female menstruation.[2] In most developing countries, the adoption rates of modern menstrual products

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[1] This chapter is based on joint work with Silvia Fernandez Castro, LMU Munich. It received ethics approval from the Ethics Commission, Department of Economics, University of Munich (Project 2020-02) on 11.03.2020. The study was pre-registered as AEARCTR-0007163. A working paper version of this chapter is available on SSRN (Castro and Mang, 2022)

[2] This is not just true for developing countries, taboos around publicly discussing menstruation exist in many Western countries, too (Grandey et al., 2020). An example from the popular media for the extent of this taboo

remains low despite their widespread availability on the market. Many women continue to use traditional methods and rely on inadequate materials such as old cloth, cotton wool, leaves or ash to manage their menstrual flow (Sumpter and Torondel, 2013; Van Eijk et al., 2016; Kuhlmann et al., 2017). Perceived social constraints might play an important role in hindering access to the now available alternatives. These constraints can take various forms. The taboo around the topic exacerbates misinformation and prejudices, preventing public discussions and knowledge sharing, limiting discussions in classrooms and even at home within families.[3] Moreover, access to pads could be restricted through social image concerns and the fear of being stigmatized, if women worry about other customers being present and observing them when buying pads in a convenience store or pharmacy. Such stores and pharmacies are operated almost exclusively by men in most settings and talking with someone of a different gender about menstrual products might conflict with prevalent social norms. Therefore, women might be facing a trade-off between accessing modern menstrual products and experiencing a large social cost, where they fear stigmatization, experience discomfort about mentioning a taboo topic, or worry about conflicts with the prevalent social norms.

In this study, we test for the existence and the implications of this trade-off using a randomized control trial with female participants in a garment factory in Bangladesh. Bangladesh is a natural place to study this trade-off. Over the last ten years, there have been numerous efforts by public and private practitioners to improve menstrual hygiene and to increase the availability of sanitary pads in local stores. Thanks to these efforts, pads are widely available[4] and women are aware of their existence and potential use. However, usage rates have barely increased[5] and unhygienic menstrual management still abounds.[6] We argue that perceived social constraints (rather than availability or affordability constraints) are the key obstacle to the widespread

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is the public debate sparked in 2022 by the release of the Pixar movie "Turning Red", which mentions a 13-year-old girl's start of her period and her need for sanitary pads. This resulted in several public complaints deeming the movie inappropriate for children (Moyer, Melinda W. (2022): ""Turning Red" Is a Good Conversation Starter - And Not Just for Girls." *The New York Times*, 16.03.2022. Accessed on 31.03.2022 at: https://www.nytimes.com/2022/03/16/well/family/turning-red-periods-discussion.html).

[3] According to the Bangladesh National Hygiene Baseline Survey (Unicomb et al., 2014), in Bangladesh only 30% of women hear about menstruation before reaching menarche. In our sample, 19.6% of the women did not know about menstruation at all before they experienced their first period. Less than half learned about it from their mother and only 2.3% learned about menstruation at school.

[4] In our sample, 79% of the women report to have a store close to home where sanitary pads are sold.

[5] The Bangladesh National Hygiene Baseline Survey (Unicomb et al., 2014) documents that in 2013-2014, around 33% of women in urban areas used sanitary pads. The latest wave of the survey in 2018 shows some improvement among adolescent girls, but hardly any changes for adult women, of whom 64% used cloth for menstrual hygiene management (Alam and Abbas, 2020).

[6] According to the Bangladesh National Hygiene Survey 2018 (Alam and Abbas, 2020), less than one-third of the women were able to hygienically wash and clean the menstrual cloth that they use, 40% of them directly stored it after washing (without drying it) to avoid any display of menstrual cloth.

adoption of the available new products and practices.

We first provide observational evidence that women are affected by social concerns when considering to acquire sanitary pads. We conducted a survey asking women who use menstrual cloth as their only absorbent about the main reason to not switch to pads. The vast majority (85%) report the presence of men in the store as reason. Second, we measure the current social norms related to the purchase of the product. The majority of women (60%) believe that it is perceived by their peer group as socially inappropriate to purchase pads from a male shopkeeper. We hypothesize that addressing these social beliefs directly will increase the women's valuation (i.e. their willingness to pay) as well as their take-up rates of modern menstrual products, even if the products have to be obtained from a male shopkeeper in a publicly observable location.

To test this hypothesis, we implement a discussion-based intervention, following recent literature such as Dhar et al. (2022) and Ghosal et al. (2022). The women randomly allocated to our treatment group participate in a one-hour discussion session with the aim to "break the silence" around menstruation. They come together in groups of 15-20 women and are encouraged by two trained facilitators to openly share and discuss their personal experiences with their menstruation and with menstrual health management. The discussion allows the participants to update both their beliefs about the social norms upheld by their peers, as well as their personal attitudes towards the stigma and taboos associated with menstruation. As our primary outcomes, we use an incentivized willingness to pay exercise to measure the women's valuation of sanitary pads and register their collection rates of a novel menstrual product, an antibacterial reusable menstrual underwear. We compare the outcomes to the willingness to pay and collection rates of a control group, who did not participate in any discussion sessions. To mimic market conditions, the products need to be picked up from a male shopkeeper in a convenience store on the factory premises, where other customers may be present.

We find that participating in the discussion groups significantly increases the valuation of sanitary pads and the take-up rates of the menstrual underwear. The women's willingness to pay for sanitary pads increases by more than 25% compared to the control group's average valuation at 90 BDT (∼ 1 USD). This increase corresponds to about 50% of the market price of pads (around 40-60 BDT). The take-up rate of the menstrual underwear increases by 14% for the treatment group when compared to a 71% adoption rate of the control group.

To explore the potential mechanisms underlying our results and understand the effect of the group discussions on perceived social constraints, we collected several additional secondary

measures. First, using a discrete choice experiment (DCE), we document that there are no differences between the control and treatment group in the perceived value-for-money of the products. Rather, the groups differ in how much they are affected by the circumstances under which the products are collected (gender of the shopkeeper and location). The women in the treatment group are less concerned by both the male gender of the shopkeeper and low levels of anonymity when making the purchase on factory premises. The respondents who did not participate in the discussion groups, are willing to pay on average 23% (2.4 BDT) more to avoid purchasing pads from a male shopkeeper. Similarly, they are willing to pay 62% (2.2 BDT) more than the treatment group to avoid acquiring the pads on the factory premises, where their peers might see them. Therefore, we do not attribute the differences in our outcome measures to changes in the perceived material value of the sanitary pads, or purely to a social learning effect in the discussion groups.

In a further analysis, we compare changes in explicit measures of perceived stigma, taboos and second-order beliefs about the prevailing social norms across the treatment and control group. We define stigma as the shame and fear of being "found out" that a woman experiences when menstruating, and taboo as the discomfort a woman feels when menstruation is discussed in a conversation she is a part of. We refer to social norms as the (unwritten) rules one expects everyone else to consider "the right thing to do", i.e. injunctive norms (Bicchieri, 2016). We expect our treatment to directly affect the social constraints in two ways: it allows the women to update their second-order beliefs about the other women's perceptions of the social norms, and it reduces the perceived stigma and taboo through a positive experience of discussing menstruation openly and safely without fear of judgement or social repercussions. We find large and statistically significant changes in our metrics for the described constructs. Using a difference-in-differences (diff-in-diff) regression, we observe a significant reduction in the strength of the perceived stigma and taboo around the topic. We also document changes in the majority's reported beliefs about how society around them perceives purchasing pads from a male shopkeeper, the modal answer switches from *socially inappropriate* to *socially appropriate*. These changes are persistent six months after the intervention.

With this field experiment, we contribute to the growing body of literature on three separate but closely intertwined approaches to advance health- and productivity-enhancing behavior, especially of women in low-income contexts. First, many papers have sought to directly affect the perception of social norms. This literature on social norms builds on the seminal works

by Bicchieri and Dimant (2022) and Krupka and Weber (2013), who have shaped the debate by providing concise and actionable definitions and ways to measure social norms. Addressing the perception of social norms usually takes one of two forms, a norm correction strategy or a norm transformation strategy (Cislaghi and Berkowitz, 2021). Researchers using the first strategy correct misperceptions by providing factual information about others' actual behaviors and beliefs about various social norms, for example regarding female labor force participation (Bursztyn et al., 2020), savings decisions (Dur et al., 2021), energy consumption (Allcott, 2011), and salary disclosure (Cullen and Perez-Truglia, 2022, 2018). On the other hand, projects applying a norm transformation strategy often use media such as TV shows (Banerjee et al., 2019; La Ferrara et al., 2012; Jensen and Oster, 2009; Green et al., 2020) and radio shows (Paluck, 2009; Arias, 2019) to influence the perception of social norms. Second, a range of interventions has sought to directly address personal attitudes toward certain (health) practices and behaviors, such as open defecation (Gauri et al., 2020) and intimate partner violence (Gupta et al., 2013; Abramsky et al., 2014; Pulerwitz et al., 2015). These studies usually use a mixture of information campaigns, direct education, and group discussions to achieve the change in personal attitudes. To address attitudes on gender equality in particular, some studies have shown that exposure to women in male-dominated areas, such as the military (Dahl et al., 2020) or local politics (Beaman et al., 2009) can successfully change attitudes toward gender equality rooted in traditional gender norms. Third, our study builds on work done seeking to empower women, which has usually taken the form of educating young women and school girls directly on health-related issues, teaching them specific negotiation, self-efficacy or general life skills (Ashraf et al., 2020; Bandiera et al., 2020; Duflo et al., 2015; Buchmann et al., 2018), and exposing them to successful female role models (Porter and Serra, 2020).

Our study incorporates elements from all these strands of literature and is most closely related to the work by Ghosal et al. (2022) and Dhar et al. (2022). Ghosal et al. (2022) use a discussion-based intervention with sex workers in Kolkata to re-shape the women's self-image and reduce their self-stigma. They find that this has positive effects on both their savings behavior and their preventive health behavior, increasing the number of doctor visits for routine health checks. Dhar et al. (2022) run a discussion-based intervention with high school students to directly address their gender attitudes and reduce their support for restrictive gender norms. They show that the intervention increases attitudes supportive of gender equality, promotes (self-reported) gender-equal behavior and raises the number of girls submitting a college application.

Similarly to these papers, we use discussion-based interventions to promote endogenous changes in social norm perceptions, personal attitudes and empowerment, without relying on the external provision of any additional skills or knowledge, to achieve productivity- and health-enhancing behavior.

Lastly, we add to the literature on female (menstrual) health as an important aspect of public health provision and an important contributing factor in female labor force participation, productivity and human capital accumulation. We build on the previous literature that focuses on improving the affordability of and access to pads, including Garikipati and Boudot (2017); Czura et al. (2020); Krenz and Strulik (2019), and to alternative products like menstrual cups, such as Oster and Thornton (2011). We extend this literature by directly addressing the role that social constraints play in hindering access to improved menstrual products, which has limited the success of many previous projects without having been explicitly addressed.

This chapter is structured as follows: in section 1.2 we describe the background of the study and present survey evidence for the important role of social restrictions in hindering access to advanced menstrual products. In section 1.3 we detail the experiment design and our empirical strategy. In section 1.4 we present and discuss the results. Section 1.5 concludes.

1.2   Background: Menstrual Hygiene in Bangladesh

Good menstrual hygiene is an important contributor to the physical, mental and emotional well-being of women (Benshaul-Tolonen et al., 2021; Torondel et al., 2018), and can improve their economic prospects by reducing obstacles to school and work attendance and productivity during menstruation (Benshaul-Tolonen et al., 2021; Krenz and Strulik, 2019; Czura et al., 2020). Given that around half the world's population is affected by menstruation throughout most of their adult lives, and improvements in menstrual hygiene can create benefits in both economic and humanitarian terms, it is not surprising that better menstrual hygiene management is increasingly addressed at the forefront of international development concerns. It is included in the Millennium Development Goals and the Sustainable Development Goals (Garikipati and Boudot, 2017) and a growing body of literature seeks to understand and improve poor menstrual hygiene (Van Eijk et al., 2016). Yet, maintaining menstrual hygiene continues to be a challenge in many developing countries (Garg et al., 2012; Garikipati and Boudot, 2017; UNICEF, 2019; Czura et al., 2020). One large impediment to achieving sustainable improvements in menstrual health practices are potentially restrictive social constraints - stigma, taboos and social norms

- around menstruation.

The main material used as a menstrual absorbent in developing countries is cloth. In Bangladesh, around 65% of adult women use old cloth, re-purposed from an old saree or similar material (Alam and Abbas, 2020). Women frequently do not have access to private sanitation facilities to change the cloth regularly, especially at work. They also often lack access to clean water or privacy to wash used cloth properly with soap, and use facilities that are private but unhygienic such as the floor of public toilets (Sumpter and Torondel, 2013). Many women store their washed menstrual cloth immediately without drying it, either under their mattress or in cupboards. These practices can have direct health consequences in the form of urinary tract infections (UTI) and inflammations (Sumpter and Torondel, 2013; Torondel et al., 2018).

Public and private campaigns to address these practices facilitated the introduction of modern products, such as disposable sanitary pads, in many developing countries including Bangladesh. Disposable pads do not need to be washed or dried, eliminating the potential health risks from improper washing and drying. Despite the current wide availability of disposable pads in Bangladesh, take-up rates remain low, with only around 29% of adult women (and 43% of adolescents younger than 19) reporting using pads regularly (Alam and Abbas, 2020).

Many initiatives have been launched to improve access, increasing the availability of pads in local markets and subsidizing them. These strategies often overlook the relevance of the social norms and cultural perceptions of the target population. In our sample, 40.5% of the women do not use pads as main absorbent. Availability is, however, not a major reason cited for the lack of adoption, with 79% indicating that there is a store selling pads near their home. Moreover, although affordability of pads is named as a concern by around three quarters of women, research studying budget constraints as an obstacle for pad uptake in a study population similar to ours (Bangladeshi garment factory workers) did not find budget to generally be a binding constraint (Czura et al., 2020).[7] Rather than availability and affordability, social image concerns, shame, and stigma around acquiring the product in the market are named most frequently as the greatest obstacle to using pads regularly. More than 80% of women report feeling uncomfortable going to a store to purchase pads due to the lack of privacy and the risk of being seen, and because they have to buy them from a male shopkeeper (Table 1.1).[8] The respondents that reported

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[7] In our setting, the cost of a pack of pads constitutes only around 0.6% of the workers' monthly (gross) wage. The women in our sample earn around 10,000 BDT per month (equivalent to around 115 USD, and slightly higher than the minimum wage of 8,000 BDT per month) and a pack of pads costs around 40-60 BDT. While affordability may thus continue to be a concern and initiatives to subsidize pads can be helpful, pads are not so prohibitively costly as to explain the lack of take-up by around 40% of the women in our sample.

[8] Figure A1 in the appendix illustrates the typical set-up of a pharmacy, where women can purchase pads, and

using pads also express fear of being stigmatized when accessing the products. Table 1.1 shows that 52% of the respondents who purchase pads regularly cover their face while doing so to avoid being recognized.

The evidence presented in this section suggests that social pressure and stigma may restrict women's access to improved menstrual products. In this case, focusing on availability or affordability does not suffice as a strategy to improve menstrual health. In our study, we therefore test an intervention designed specifically to address the social constraints, to reduce the perceived stigma and break the taboo around menstruation.

One key feature of our design is the use of two different types of menstrual products: one well-known and already available (pads) and one completely new and with impending entry in the market (reusable menstrual underwear). The menstrual underwear used in this study, designed and provided by our project partner Reemi[9], is a culturally appropriate and modern alternative to cloth or sanitary pads that circumvents many of the cultural, social and health concerns posed by the currently available methods. The main advantage is that it is more absorbent than sanitary pads or cloth and does not need to be changed as frequently during the day. Moreover, it does not need to be purchased regularly: it is a one-off purchase that can be re-used for many years. Although the underwear also needs to be washed with soap and dried, which often constitutes a challenge, it is made from a fast-drying and anti-bacterial material that is easy to wash and dry and reduces the risk of infection. The menstrual underwear is a new product that has not been previously available in Bangladesh and that the women are unfamiliar with. Nevertheless, since its design has been tailored to women like our study participants, the underwear constitutes a beneficial and desirable alternative for the women and we expected demand to be high for this product at baseline.

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demonstrates the lack of privacy when doing so.

[9] Reemi is a New Zealand-based non-profit organization founded in 2018. They designed a reusable anti-bacterial menstrual underwear and seek to make it available to women everywhere. They focus especially on improving access in developing countries and refugee camps and combine the distribution of the product with education on menstrual health. In order to understand possible (cultural) barriers to take-up of their product and maximize the success of introducing the underwear in new markets, Reemi collaborated with us on this academic study in Bangladesh and used their existing contacts in the garment production industry to provide the setting for this study.

Table 1.1: Descriptive statistics

	(1)	(2)	(3)	(4)
		Mean		Difference
	Full Sample	Control	Treatment	T-C
Age	26.48	26.60	26.34	-0.25
	(4.68)	(4.63)	(4.75)	(0.43)
Muslim religion	0.98	0.98	0.98	-0.00
	(0.13)	(0.12)	(0.13)	(0.01)
Married	0.85	0.87	0.82	-0.05
	(0.35)	(0.33)	(0.38)	(0.03)
Total number of children	1.01	1.04	0.98	-0.07
	(0.84)	(0.87)	(0.80)	(0.08)
Years of education	7.11	7.05	7.17	0.11
	(2.87)	(2.92)	(2.82)	(0.26)
Non-pregnant	0.97	0.96	0.98	0.02
	(0.18)	(0.20)	(0.15)	(0.02)
Menstrual absorbent				
Using cloth or fabric	0.48	0.49	0.48	-0.01
	(0.50)	(0.50)	(0.50)	(0.05)
Using disposable pads	0.60	0.60	0.59	-0.01
	(0.49)	(0.49)	(0.49)	(0.05)
Reasons to not take up pads				
Uncomfortable in a store due to a lack of privacy	0.85	0.86	0.83	-0.03
	(0.36)	(0.34)	(0.38)	(0.05)
There is no store nearby	0.21	0.22	0.20	-0.01
	(0.41)	(0.41)	(0.40)	(0.06)
Behavior when buying pads				
Cover face for anonymity	0.52	0.48	0.57	0.10
	(0.50)	(0.50)	(0.50)	(0.09)
Visit store far away to avoid recognition	0.16	0.15	0.18	0.02
	(0.37)	(0.36)	(0.38)	(0.07)
Discomfort if men present in store	0.74	0.71	0.79	0.08
	(0.44)	(0.46)	(0.41)	(0.08)
Discomfort if women present in store	0.03	0.02	0.04	0.02
	(0.16)	(0.12)	(0.20)	(0.03)
Husband buys the pads	0.47	0.46	0.47	-0.01
	(0.50)	(0.50)	(0.50)	(0.06)

Note: Baseline summary statistics of participant characteristics. For columns (1), (2), and (3) the standard deviation is reported in parentheses. Column (4) reporting the difference shows the coefficient of a simple regression of the variable on a treatment group dummy with robust standard errors. Stars indicate whether the difference is significant. As can be seen in column (4), none of the differences are statistically significant at conventional levels. All variables except age, total number of children and years of education, are coded from 0 to 1 and can thus be interpreted as share of study participants.

1.3 Experiment Design

1.3.1 Sample

We ran our field experiment in a large garment factory in Tongi, a town north of Dhaka in Bangladesh. We randomly selected 600 female employees out of all 6,000 workers from a list provided by the factory as participants for our study. The participants were called after work hours on their mobile phones by trained enumerators. After receiving consent from the participants, we administered the baseline survey. We continued to call workers until we reached 485 women who agreed to be part of our study and reported having experienced their menstruation regularly in the past six months (16 women who reported to be pregnant were also included in the study). The baseline surveys were run in March and April 2021. Each participant received 40 BDT in phone credits as compensation for their participation (around 0.50 USD, corresponding approximately to the hourly wage rate). All enumerators conducting the phone survey were female to reduce the participants' discomfort when discussing menstruation.

Upon completing the baseline survey, each participant was randomly allocated into either the treatment or control group. Treatment started to be administered after the first 100 baseline surveys were completed. This prevented large time dispersion between the baseline survey and the participation in the discussion for the treatment group and simplified the logistics. 227 women were randomized into the treatment group (100% attended the treatment sessions) and 258 into the control group.

After the treatment, all workers were called again for the endline survey. This survey was run in April and May 2021. Attrition rates were very small and similar across groups, at 1.8% in the treatment group (4 out of 227 women) and 1.9% in the control group (5 out of 258 women). The reason for attrition was that some phones were turned off or not answered when they were called for the endline survey. Our final sample size for the main analysis is 476 women, 223 in the treatment group and 253 in the control group.

Finally, around half a year after the treatment, we re-surveyed 339 women from our original sample (182 from the control group, 157 from the treatment group) in November and December 2021 to measure persistence of the effects. Figure 1.1 summarizes the timeline of the data collection, as well as which measures were collected at each stage.

Table 1.1 reports the means and standard deviations for the demographic characteristics of the final sample of women in the two groups. It shows that our randomization was successful in

Figure 1.1: Data collection timeline
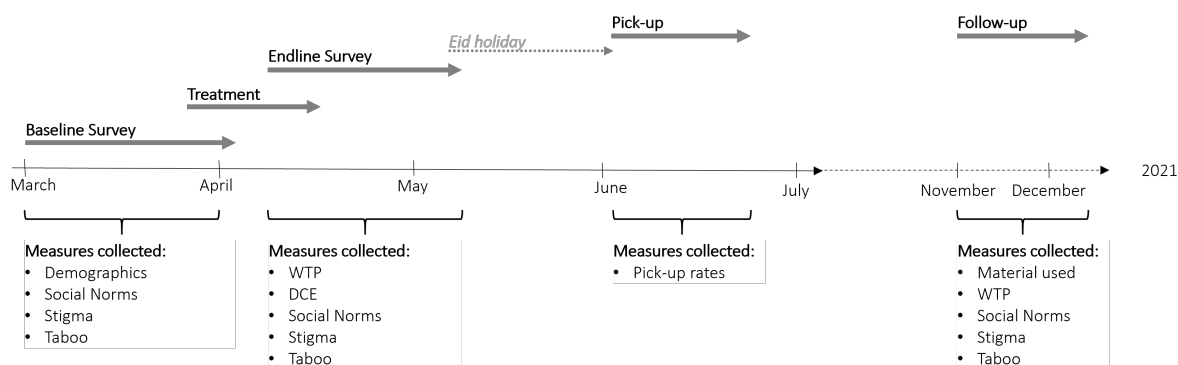
achieving balanced samples in observables. Our sample consists of women who are on average 26 years old. The large majority are married and have (at least) one child. The participants are slightly more educated than the national average. They have had seven years of education on average, around one and a half years more than the national average for women (United Nations Development Program, 2022). This is not surprising, given that jobs in garment factories are seen as relatively good prospects for young women in Bangladesh and a recent trend has actually seen women staying in school longer to qualify for these jobs and provide for their families (Asadullah et al., 2021). The women in our sample thus represent the new and growing group of better educated female garment workers.

A relatively young age and high levels of education are positively correlated with pad use[10] and may explain why 60% of our sample report using pads frequently at baseline, which is above the national average of 29% for adult women (Alam and Abbas, 2020).[11] Nevertheless, half of the women still report using cloth frequently as well, indicating that some women use both (for example using pads for days with heavier flow and cloth for days with less heavy flow) and many women still are not using pads at all.

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[10] Pearson's correlation coefficient between age and cloth use: 0.18, p-value: 0.00 and between age and pad use: -0.19, p-value: 0.00; younger women (especially younger than 25) tend to use pads more, older women (especially older than 25) tend to use cloth more. Pearson's correlation coefficient between education and pad use: 0.19, p-value: 0.00 and between education and cloth use: -0.23, p-value: 0.00; more educated women (especially with more than six years of education) tend to use pads more, less educated women (especially with less than six years of education) tend to use cloth more. See Figure A2 in the appendix for a graphical analysis of these trends.

[11] The implications for external validity are not clear. On the one hand, our results could be a lower bound if our participants react less to the treatment, because they are already quite open and face fewer restrictive norms and less stigma to begin with. On the other hand, it could be an upper bound if the lower stigma allows them to adjust their behavior more than women in rural areas could, for example, since they face stricter norms. We cannot make any claims about the effect size in the full Bangladeshi population.

Our simple discussion group intervention is the main novelty of this research project. Until now, interventions in Economics seeking to change behavior through social norms have mainly used what Cislaghi and Berkowitz (2021) call norm correction strategies, providing individuals with factual information about what others are doing or what they approve or disapprove of, to correct misperceptions and motivate them to do the same (Allcott, 2011; Bursztyn et al., 2020; Dur et al., 2021). However, social psychology understands social norms not as static beliefs, but as part of an ongoing group process (Prentice and Paluck, 2020). Individuals process social norm information in a dynamic group environment, performing reality checks by looking to other group members. They observe whether other group members express agreement with a message in their words or actions. Many of the interventions implemented in Economics until now (Allcott, 2011; Bursztyn et al., 2020; Dur et al., 2021), have sought to change an individual's beliefs about a group norm individual by individual, without allowing for the real-time reality check of the information provided by the researchers.

Our intervention was designed to recognize the dynamic dimension of the belief updating process. We used a group setting, a light-touch and simple treatment allowing for discussion and real-time belief updating. In this, our approach is similar to that of Dhar et al. (2022) and Ghosal et al. (2022), who use group discussions to directly address the participants' personal attitudes and perceived (self-)stigma. The goal of our intervention was to combine the updating of second-order beliefs about prevalent social norms with a change in personal attitudes and an increase in the level of confidence, reducing the perceived (self-)stigma and taboo.

The treatment consisted of a one hour discussion, where participants were encouraged to share their thoughts on and experiences with menstruation and to talk openly about issues surrounding menstruation. The discussions were moderated by two trained female facilitators.[12] The sessions were explicitly designed to not be education or training sessions, unlike previous studies aiming to empower young women and girls through the external provision of improved information or specific life skills (Ashraf et al., 2020; Bandiera et al., 2020; Duflo et al., 2015; Buchmann et al., 2018). Instead, it focused on sharing personal experiences and experiencing the opportunity to talk openly about the topic. Our intervention therefore goes beyond the information-provision or education treatments that externally correct the women's mispercep-

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[12] We discussed the inclusion of male facilitators with our implementation partner, but this was considered culturally inappropriate and would have caused great discomfort to the discussion group participants.

tions or incorrect beliefs. Instead, we let the group feedback endogenously affect the women's perceptions and let the women update their second-order beliefs and personal attitudes based on the verbal and non-verbal feedback they receive from the other women in the group, without external feedback on the truth of the updated beliefs from the experimenters. By providing the women with a positive experience of discussing menstruation without any social repercussions, the discussions were also intended to boost the women's confidence to talk about the topic, reduce the taboo and lessen the stigma associated with menstruation.

The control group, in contrast, did not participate in any discussions and did not have the opportunity to discuss menstruation openly. Except for the baseline and the endline survey, there was no further interaction with the control group.[13]

The sessions took place during work hours in a conference room at the factory. They were moderated by two facilitators from the implementation partner Change Associates Ltd.[14] The sessions were run in March and April 2021. A total of 15 sessions were run with an average of 15 participants per session (min: 11 and max: 21). Each session lasted for one hour. The sessions were conducted in a hybrid format, with the factory workers being present physically in the conference room and the facilitators joining remotely via Google Meet. At the end of each session, the moderators completed a short survey to report any incidents such as technical difficulties, as well as the main topics discussed, main questions that came up and the overall atmosphere and level of participation. This allowed us to ensure that the format and content of all sessions were comparable.[15]

All 15 sessions were reported by the moderators to have covered very similar topics, including the first experiences with menstruation (15), issues or problems during the menstruation (15), feeling uncomfortable during menstruation (15), whether and how to discuss menstruation with children (15), and the availability and pros and cons of different menstrual products (14), particularly pads (14). While the sessions covered these same basic topics, there was some variation in which of these topics was discussed the most. The most discussed topics included menstrual

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[13] We considered and decided against placebo discussions for the control group, because we do not consider the discussion *per se* to be a plausible channel for our observed effect. The women in the factory regularly talk to each other and discussing topics other than menstruation does not appear to us a likely candidate for influencing our very product-specific outcomes of willingness to pay for and pick-up of a menstrual product. In light of this and given strong COVID-related safety concerns and logistical challenges, we deemed the risks from additional placebo group discussions to outweigh the potential benefits to this research study.

[14] A women-led organization in Bangladesh frequently delivering training on topics of health and family planning in Bangladeshi garment factories: http://www.change-bd.org/

[15] The remote format also enabled the researchers to join a few sessions - with the camera and microphone turned off and displaying the name of the implementation partner as screen name - to ensure that all sessions were conducted in a comparable fashion and to confirm that the sessions were interactive and took place in a relaxed and positive atmosphere.

products in general (4), pads in particular (4) and how to discuss menstruation with children (3). The women attending the discussions exchanged personal experiences and the group *collectively* did not receive any new information, but current knowledge and experiences were shared within the group.

The post-session surveys indicate that there were no major technical difficulties (only in 2 out of 15 sessions did technical difficulties arise - mainly sound issues - but they were swiftly resolved). All facilitators reported that the women were not constrained by the remote format and they unanimously agreed that the women were eager to share their experiences. Moreover, it was reported that in all but one session all women engaged in the discussion equally. We are thus confident that the treatment was implemented as intended.

1.3.3 Outcome Variables

Primary outcome variables

The first experimental outcome is the women's willingness to pay (WTP) for a modern menstrual product that they know well: disposable sanitary pads. In our experiment, we measure the WTP for pads when obtaining them from a male shopkeeper in a small store on the factory premises. The male gender of the shopkeeper is an important design element of our study as this mirrors the real world, since practically all shopkeepers in Bangladesh are male. This may prevent women from adopting advanced menstrual products, because of the discomfort associated with buying products from a male shopkeeper. A second dimension is that the product needs to be picked up at the factory store, a rather public place where the women might be observed by their colleagues.

We measure the willingness to pay using a price list (Anderson et al., 2007). The enumerators first describe the conditions under which the sanitary pads can be picked up at the factory. They then offer the women a choice between receiving an amount of money (in phone credits) or receiving a pack of pads for free. The first monetary amount offered is 0 BDT, so the women first choose between receiving 0 BDT or getting a pack of pads for free. Conditional on the women selecting to receive the pads, the offered price is then increased in fixed intervals and the participants are asked to make the choice again between the higher amount of money and the pads. This was done in steps of 20 BDT up to 140 BDT and then a jump to a maximum price of 200 BDT (around 2 EUR, or four times the market price of pads). The jump in the interval enabled us to check a very high WTP, while keeping the number of questions asked

to a minimum to limit complexity. The WTP is thus recorded as an interval between a lower bound (last choice where the product was chosen) and an upper bound (first choice where the money was chosen). It was assumed that preferences are monotonically increasing with a single switching point, such that once a woman had decided to take the money rather than the product, no additional choices with higher monetary amounts were offered. The women knew in advance that they would face several choices between an amount of money and the product, but did not know how many choices there would be in total or the increment of each subsequent offer.

The second primary outcome of interest is the rate of take-up of a novel product not available before: reusable menstrual underwear. The use of a new absorbent makes it possible to measure take-up of a completely new technology that is not otherwise available.[16] The characteristics of the product were explained to the participants during the endline survey call and they were informed that the underwear would be available to collect on the factory premises, at the factory store (from a male shopkeeper) as soon as the surveys would be completed. To frame this question, we kept the same structure as for the previous one and elicited their WTP for the underwear first, in the same way as for the pads.[17]

The WTP elicitations for the sanitary pads and the underwear were incentivized together, so one of the choices from either the WTP exercise for the pads or the WTP exercise for the underwear was randomly selected to be pay-off relevant for each woman. The woman then received whatever her choice had been in the randomly selected scenario, i.e. either an amount of money or the opportunity to collect the product. The participants could only receive either the pads or the underwear, but not both. The women knew that only one of the choices they made between money and either of the products would be payoff-relevant. Since we are mainly interested in the women's adoption of a new technology, we skewed the randomization of the payoff-relevant outcome in such a way that for 95% of the women, the choice between 0 BDT and the underwear was selected to be payoff-relevant.[18] This way we ensured that the vast majority of women with a non-zero willingness to pay for the underwear were actually eligible to pick it up and so we could maximize the power for this outcome. For seven women, a different pay-off

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[16] The menstrual underwear was developed and produced by our project partner Reemi. The underwear consists of several leak-proof layers on the outside and an anti-bacterial absorbent layer on the inside. At the date of the study, reusable menstrual underwear was not available in Bangladesh.

[17] This way, we received some additional information about the distribution of the valuation of this product. However, the WTP for this product is a very noisy measure, as the women had never seen the product and it is not discussed in the discussion sessions. We present the results of the willingness to pay measure for the underwear in Table A1 in the appendix.

[18] The women were only informed that one of their decisions across both WTP exercises would be pay-off relevant, but no specific claims about how this pay-off relevant scenario was to be chosen were made.

relevant scenario was randomly selected, so they received either an amount of money or a pack of pads. Ultimately, 469 women were eligible to collect the underwear for free. The underwear was made available to collect in June 2021.

<center>*Secondary outcome variables*</center>

To understand the mechanisms underlying our results, we carried out a discrete choice experiment (DCE). The DCE allows us to address two design concerns. First, it helps us to disentangle whether the treatment is affecting the attitudes toward collecting the product from a man or a social image concern for being observed by peers while collecting the menstrual product. Second, it helps us to measure any changes in the perception of the value-for-money attributed to the menstrual absorbents, potentially arising from a social learning channel. We can thus disentangle how the discussion session affected the perception of restrictive social constraints preventing access to menstrual products from changes in the material value the women assign to the menstrual products after discussing them with their peers. The choices made in the DCE are hypothetical and are completely distinct from the WTP exercise.

A DCE is normally used to disentangle the value customers place on different product features. This is achieved by presenting customers with a series of hypothetical choices between two different sets of characteristics of a product (e.g. price, color, size, etc.). We use this same mechanism to disentangle not the value of product characteristics, but the importance of different aspects of the conditions under which the product is obtained. Specifically, we present women with several options for how to obtain a pack of sanitary pads. The dimensions included in the discrete choice experiment are the location of purchase (at the factory/in an external shop), price levels (30BDT, 40BDT, 50BDT, 60BDT), and gender of the shopkeeper (purchasing it from a male shopkeeper/from a female shopkeeper). The women are presented with consecutive choices, always between two bundles of these dimensions and are asked which they would prefer. Their answers are then used to determine the relative utility derived from each characteristic and the willingness to pay to have one or the other.[19] The price attribute gives us an estimate of the differences in material valuation of the product, the location gives us an estimate of the preference for a more public (at the factory) or more anonymous (outside the factory) location and the sex of the shopkeeper measures the relevance of having a male shopkeeper.

In addition to the DCE, we obtained detailed measures of perceived social norms, stigma

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[19] See Appendix 4.4 for details on the method and how the choice sets were constructed.

<center>20</center>

and taboos to determine their role in driving the changes observed in the primary outcomes.

Social norms are the informal rules that indicate which actions are socially acceptable. They consist of both empirical expectations (what I expect others to do, descriptive norms) and normative expectations (what I expect others to approve of or to think one ought to do, injunctive norms) (Bicchieri and Dimant, 2022). We elicit the injunctive social norms around the use and purchase of different menstrual products. To capture not the internal feeling toward the norm but the societal perspective, we measure norms using vignette studies. We give the respondents a vignette of a woman like themselves who is menstruating and ask them about the expected response of that woman's neighbors to certain actions (such as discussing menstruation with her son or daughter or buying pads). For each scenario, the respondents could say whether they expect the neighbors would find a certain behavior very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate. In the baseline survey, all participants were asked to judge 11 such vignettes. To reduce the length of the survey as much as possible and limit cognitive fatigue of the participants, we repeated the norm elicitation in the endline survey for only seven questions. Five of those seven questions were the same for all participants, while the remaining two were randomly selected.[20]

We also measure changes in perceived stigma and taboos. Apart from affecting second-order beliefs, we expect the discussions to have a direct effect on perceived secrecy (taboos) and feelings of shame and embarrassment (stigma) around the topic. We included questions to measure changes in such perceptions. To measure the perceived stigma, we asked the participants how many statements from a list of four they agree with, with the statements expressing fear of stigmatization (e.g. "If someone knew that I am menstruating they might treat me or look at me differently").[21] To encourage truthful replies, we did not ask about their agreement with each individual statement, but only for the total number of statements they agree with. Our scale from 0-4 measures the number of statements agreed with, with higher values reflecting stronger perceived stigma. Taboos were measured in the same way with the four statements expressing a reluctance to discuss menstruation (e.g. "I would feel embarrassed to talk about menstruation with my family"). We randomized the order of the social norms, taboos and stigma measures to avoid any anchoring or internal consistency effects.

In addition to the main outcomes of interest, we collected demographic variables to serve

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[20] The probabilities of the randomized social norm being asked again were not the same for all questions, so they were not asked the same number of times. The number of full-panel observations therefore varies across social norms.

[21] These statements were adapted from a variety of surveys presented in Hennegan et al. (2020).

as control variables. These included age, religion, marriage status, number of children, and menstrual products used frequently (for two or more days each period) at baseline.

1.3.4   Hypotheses

Our main question of interest is whether the discussion sessions described above had an effect on the willingness to pay for modern menstrual absorbents, if they had to be picked up from a man on the factory premises. The expectation is that the willingness to pay captures not just the valuation of the product itself, but also of the conditions under which the product is acquired. We expect the women to factor in that they have to collect the product from a man and that there might be peers nearby, when declaring their willingness to pay. The participants in the treatment group are expected to have updated their beliefs about how other women in the factory feel about purchasing menstrual absorbents in this situation, as a part of the sample does purchase these products regularly. We therefore expect them to be less restrained by perceived social pressure and stigma. Our first hypothesis is:

Hypothesis 1 *Participating in discussion sessions about menstruation increases the willingness to pay for sanitary pads which have to be obtained from a male shopkeeper on the factory premises.*

We estimate the effect of the intervention on the WTP for pads by regressing WTP on the binary treatment variable using a standard ordinary least squares (OLS) regression.

Second, we are interested in the pick-up rates of the anti-bacterial menstrual underwear. Once the new product becomes available, we also expect the women in the treatment group to be more willing to actually go and collect it. After the discussion with their peers and seeing how other women also access modern sanitary products on a regular basis, their beliefs about the level of appropriateness and the feeling of shame associated with collecting the products might have changed. The next hypothesis is:

Hypothesis 2 *Participating in discussion sessions about menstruation increases the probability of collecting the free menstrual underwear from a male shopkeeper on the factory premises.*

We estimate the causal effect of the treatment on collection of the underwear using a linear probability model. We also run a probit model to compare the coefficients on the marginal

effects obtained from the probit with the estimations obtained from the linear OLS regression.

Turning to our secondary outcomes, we expect to see a change in the perceived stigma, taboos and strictness of some social norms. The discussions are intended to break the silence around the subject of menstruation, and also allow participants to observe the attitudes and experiences of their peers about menstrual hygiene management. We expect that women will feel less uncomfortable and embarrassed about the topic if we offer them a positive experience discussing it openly with other women. Moreover, we expect the social attitudes towards menstruation to be less restrictive than what the women believed, as the ability to test what the social group thinks about the topic is usually hampered by taboos. Women do not often discuss the topic, therefore, they infer more restrictive social attitudes from the lack of discussion than actually exist. After the intervention, they are expected to hold an updated view of what their reference group thinks about the topic. Our third hypothesis is:

Hypothesis 3 *Participating in discussions about menstruation reduces the perceived strictness of the social norms, stigma and taboos surrounding menstruation.*

To test this last hypothesis we use a difference-in-differences estimation.

1.4   Results

1.4.1   Main Results

Willingness to Pay

We first test Hypothesis 1 and evaluate whether the group discussions had an effect on the participants' valuation of sanitary pads when collected from a man on the factory premises. To do this, we run an interval regression of the willingness to pay for pads on the intervention dummy. Table 1.2 shows the regression results.

Column (1) shows the effect of the treatment without any controls. Column (2) adds demographic controls, which does not affect the magnitude of the point estimates or the level of significance. On average, the women in the control group were willing to pay around 91 BDT for a pack of 4 sanitary pads. The treatment group was willing to pay on average around 23 BDT more. This constitutes an increase of more than 25% evaluated at the control mean. This difference is significant at the 5% level and substantial in size.[22]

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[22] All of our results use robust standard errors for calculating the level of significance, clustered at the individual

Table 1.2: Willingness to pay for disposable pads

	(1)	(2)
	WTP Disposable Pads (in BDT)	
Intervention	22.982**	22.760**
	(8.98)	(9.34)
Control mean	90.620	90.620
Demographic controls	No	Yes
Observations	476	460

Notes: Interval regression of the willingness to pay (in BDT) for disposable menstrual pads collected from a male shopkeeper at the factory store on a treatment dummy. Robust standard errors reported in parentheses. *Control mean* refers to the average value of the dependent variable for the control group at baseline. Demographic controls in column (2) include age, years of education, marital status, number of children and baseline use of pads and cloth (as dummies). Column (2) does not include 16 pregnant women, since the demographic control variables of baseline use of pads and cloth are not available for them. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The market value of a pack of pads is around 40-60 BDT. This suggests that the treatment effect is quite substantial, increasing the WTP for a pack of pads by around half the market price. At the same time, this shows that our sample has an unusually high baseline WTP that is around 50-100% higher than the market price of pads. This is most likely driven by a combination of factors. First, women may have held the biased belief that pads provided by Western researchers may be of a better quality than average pads available in the market. Second, the framing of our WTP elicitation may have played a role. We ask women to forfeit a future monetary gain as opposed to having to give away money they already own, so it could be that loss aversion causes a lower WTP in the market compared to our experiment. Lastly, control over the household budget in Bangladesh typically lies with the husband, who had no control over the money offered to the women in our experiment. It could therefore well be that women would have a higher willingness to pay for sanitary pads also in the market, but cannot express this because they do not have full control over the household budget. In our experiment, the money constituted a windfall gain to the household income that the woman had full control over, which could explain their higher WTP for pads than is seen in the market.

The average increase in WTP of more than 20 BDT suggests that, on average, the WTP in the treatment group shifted up to the next interval. Looking at the distribution of the WTP, we can compare women in each interval of the WTP exercise to determine if they responded differently and we can also compare whether women with a valuation above the market price responded differently to women with a WTP below the market price. The cumulative distribution function

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level. We are not clustering standard errors on the group level, because random assignment to the treatment group occurred on the individual level. To ensure that our results are not driven by anything specific to particular discussion groups, we discuss treatment effects by group in detail in section 1.4.4.

in Figure 1.2 shows that the effects were similar across the whole distribution: for each value of the lower bound of the WTP (the last value at which a woman preferred the pads over the money), the cumulative distribution function of the treatment lies below the control group. The distribution of the WTP of the treatment group first order stochastically dominates the distribution of the control group. For most discrete steps up until 80-100 BDT, the jump in the control group is larger, indicating that there is a larger share of women in the control group for each interval below 80-100 BDT. There is no clear difference between women with a valuation of the pads above or below the market price.

Figure 1.2: Cumulative distribution function of the willingness to pay
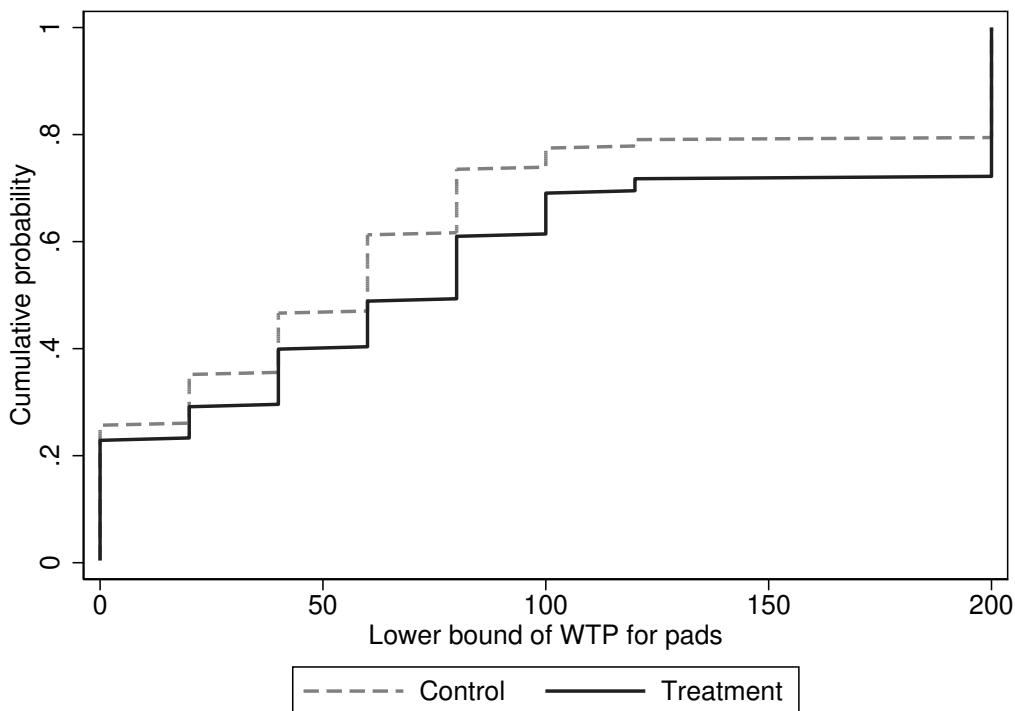
Notes: Cumulative distribution function of the share of participants reporting a given lower bound (last monetary amount at which the product was preferred over the money) for the willingness to pay for the sanitary pads. WTP was elicited in intervals of 20 BDT between 0 and 120 BDT and at 200 BDT.

This result provides significant evidence for Hypothesis 1 and shows that this type of intervention can increase women's valuation of modern menstrual products when they are supplied by a male shopkeeper at a fairly public location.

New technology adoption rates

The second hypothesis we test is that the intervention leads to a higher take-up of a completely new technology, reusable menstrual underwear. To do this, we regress pick-up of the

menstrual underwear on the intervention dummy, using a linear probability model and a probit model. In Table 1.3 we provide the estimates of the effect of the treatment on the rate of collection of the anti-bacterial menstrual underwear. We can observe that the discussion led to an increase in the rates at which women collected the new product of 14%, evaluated at the control mean. While around 71% of women from the control group picked up the underwear, this rose to around 81% for women in the treatment group. The results are large and significant at the 5% level. Columns (2) and (4) add demographic controls to the regression.

*Table 1.3:* Take-up rates of the menstrual underwear

	(1)	(2)	(3)	(4)
	OLS		Probit *(marginal effects)*	
Intervention	0.099**	0.089**	0.099**	0.086**
	(0.04)	(0.04)	(0.04)	(0.04)
Control mean	0.713	0.713	0.713	0.713
Demographic controls	No	Yes	No	Yes
Observations	469	454	469	454

Notes: Column (1) and (2) report the linear probability model regression (OLS) of the collection of the underwear at the factory store from a male shopkeeper. Columns (3) and (4) report the marginal effects from a probit regression. Robust standard errors reported in parentheses. *Control mean* refers to the average value of the dependent variable for the control group at baseline. The differences in the number of observations between WTP and collection rates are due to seven participants winning money or pads in the WTP lottery instead of the underwear. Columns (2) and (4) do not include 15 pregnant women, since the demographic control variables of baseline use of pads and cloth are not available for them. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1.3 depicts graphically the share of women in the treatment and control group who collected the underwear. Half of the women went to pick it up within the first 3 days. It can be seen that the share of women in the control group collecting the underwear remains consistently below the share in the treatment group, so the function for the treatment group again first order stochastically dominates the function for the control group. By the end of the collection period, 71% of the participants in the control group and 81% of the participants in the treatment group had collected the product.

Similarly to the high WTP for sanitary pads in the control group, we also observe that the control group already has a very high baseline propensity to collect the underwear. One reason could be that the women have never seen the underwear and may just be curious to see and try this new product. More importantly, however, as described above, the underwear does address several of the women's needs, such as providing a comfortable method that does not need to be changed frequently and reduces the risk of infections. A relatively high baseline demand for the product was therefore expected.

Figure 1.3: Take-up of the menstrual underwear over time
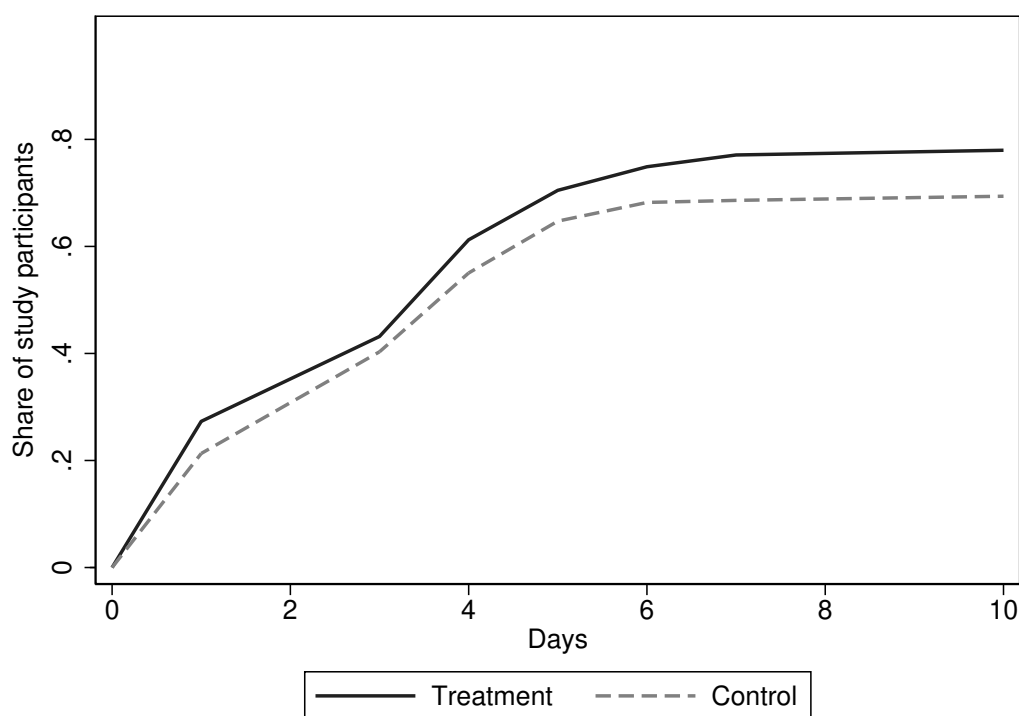
Notes: This graph plots the share of participants in the treatment and control group who picked up the menstrual underwear at the factory store from a male shopkeeper. The product was available from the 10th-19th of June 2021.

Overall, our results strongly support Hypotheses 1 and 2 and show that the one-hour discussion on menstruation led to an increase in the women's valuation of the menstrual products and increased their take-up of the novel hygienic menstrual underwear.

1.4.2 Mechanisms

To better understand the mechanisms that might be driving the effect of our intervention, we first provide the results from a discrete choice experiment, and then we provide measures for social norms, stigma and taboos.

Discrete Choice Experiment

Our results have shown that women who were part of the discussion groups were willing to pay more for modern menstrual products and took up a new product at a higher rate. The discrete choice experiment can help us disentangle to what extent these results are driven by changes in the women's attitude toward collecting the underwear from a male shopkeeper as opposed to their attitude toward potentially being observed by peers when doing so. Moreover,

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it allows us to determine whether the intervention is changing the value-for-money attributed to the product by the women.

Table 1.4 shows the results of the conditional logit estimation. While the magnitudes of the coefficients do not lend themselves to direct interpretation, we can draw conclusions from their signs and relative sizes. The negative sign of all coefficients in column (1) indicates that disutility is derived on average from each of these characteristics. A higher price, purchasing from a male instead of a female shopkeeper, and collecting the product at a location inside the factory (where there is less anonymity) produce disutility. The coefficient on the gender of the shopkeeper is the largest, carrying the highest disutility. Column (2) introduces interaction effects of each characteristic with the treatment. As hypothesized, the coefficients on the interaction effects are positive, so picking up the underwear from a man or in the less anonymous location creates less disutility for the treatment group. Lastly, we observe that the intervention has no effect on the price that the participants associate with the product, as there is no difference in the valuation of this attribute between control and treatment group.[23] Therefore, we conclude that, at endline, our treatment and control groups differ in their concerns about picking up the product at a public location, and from a male shopkeeper, but they do not differ in how they perceive the value of the product.

Table 1.4: Discrete choice experiment - conditional logit model

	(1)	(2)
	Utility Level	
Location inside	-0.384***	-0.592***
	(0.09)	(0.14)
Male shopkeeper	-1.452***	-1.753***
	(0.07)	(0.10)
Price	-0.154***	-0.168***
	(0.01)	(0.01)
Intervention × location inside		0.396**
		(0.18)
Intervention × male shopkeeper		0.590***
		(0.14)
Intervention × price		0.023
		(0.02)
Observations	476	476

Note: Dependent variable: utility of sanitary pads. The coefficients from the conditional logit regression show changes in utility with changes in the different attributes of the pads collection process: location inside the factory vs. a local store, male vs. female shopkeeper, and increasing price (from 30 to 60 BDT) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We interpret this as suggestive evidence that the main channel driving the results is not

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[23] In Table A7 in the appendix, we show that these results do not vary by demographic variables.

pure information transmission or a social learning mechanism. It could have been argued that the women have not changed their perceptions of the social norms or stigma at all, but simply received new information about pads, such as learning about their existence for the first time or receiving new factual information about the cost-benefit-ratio of using pads. In that case, we would have expected the treatment to alter the perceived value-for-money of the products. However, we observe differences only in the attitudes towards the collection of the product. Taken together with the large and significant increase in the pick-up rate of the menstrual underwear, which was not mentioned in the discussion sessions at all and so cannot have been subject to a pure social learning mechanism, this shows that our treatment worked through a different channel than a pure information treatment.

To interpret the size of the effect in monetary terms, we construct the marginal willingness to pay for each characteristic from our data (Lancsar et al., 2017). Table 1.5 shows the willingness to pay calculated from the coefficients for the treatment and control groups. Women in the control group are on average willing to pay 10.4 BDT more to avoid having a male shopkeeper. This is reduced by around 23% to 8 BDT for the treatment group. Women in the control group would also be willing to pay 3.5 BDT more to avoid collecting the pads inside the factory. This is reduced by around 62% to 1.3 BDT in the treatment group. A two-tailed t-test comparing the control group's and the treatment group's average WTP for both the female shopkeeper and the outside location of collection reveals that the differences between treatment and control group are statistically significant at the 5% level ($p = 0.02$ in each case). This shows that the treatment reduced the women's concerns about collecting the menstrual products from a male shopkeeper and their concern about being seen by co-workers when doing so.

This also shows that it was not a shift in the women's attitude toward the specific male shopkeeper from whom they had to collect the underwear. The women might have expected the male shopkeeper to be aware of the study taking place in the factory or to have been briefed by the experimenters when they deposited the menstrual underwear in his store to make it available for collection. In this case, the women could just have felt less uncomfortable having to collect the underwear from this specific man, rather than male shopkeepers in general. However, the DCE with its hypothetical scenarios clearly identified the utility of not having to collect the product from any man, combining the male gender also with the scenario of collection outside the factory. Given that the effects of the DCE were observed for the male gender in general, this worry is removed.

Table 1.5: Discrete choice experiment - willingness to pay

	Willingness to pay to avoid the attribute (in BDT)
Location inside	
- Control	3.523***
	(0.63)
- Treatment	1.349*
	(0.72)
Male shopkeeper	
- Control	10.442***
	(0.73)
-Treatment	8.024***
	(0.82)
Observations	476

Notes: The values show the WTP in BDT for avoiding the location being inside the factory (as opposed to an external corner store) and for avoiding a male shopkeeper (as opposed to a female one) for the treatment and control group. Assuming a linear utility function, the WTP is obtained from dividing the regression coefficients of the independent variables *Location inside* and *Male shopkeeper* by the regression coefficient of the independent variable *price*. Robust standard errors are reported in parentheses. The levels of significance indicated by the stars show whether the WTP is significantly different from zero. The significance of the difference in WTP between the treatment and control group is reported in the main text. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Social norms, stigma and taboos

Social norms

The social norms surrounding menstruation were elicited before and after the treatment. Figure 1.4 shows the share of participants rating each behavior on a 4-point Likert scale ranging from *very socially inappropriate* (1) to *very socially appropriate* (4). We depict the appropriateness of using different products and of purchasing them from female or male shopkeepers. The menstrual methods commonly used during menstruation (namely pads and cloth) were directly discussed in the discussion sessions.

We focus on the modal response, the answer the majority of participants give. At baseline, using disposable pads is perceived by the participants as very socially appropriate in their social group. Therefore, in this setting, we do not observe a norm restricting the use of modern menstrual technologies as such. However, when we look at norms related to the collection of the product, we can see that purchasing pads from a male shopkeeper is seen as socially inappropriate by the majority. As almost all convenience stores and pharmacies are run by men in Bangladesh, this indicates that there is a behavioral rule restricting the take-up of menstrual products.

When looking at the results after the intervention, we observe one switch in modal response: purchasing sanitary pads from a male shopkeeper updates from being viewed as *socially inap-*

Figure 1.4: Social norms around menstrual products
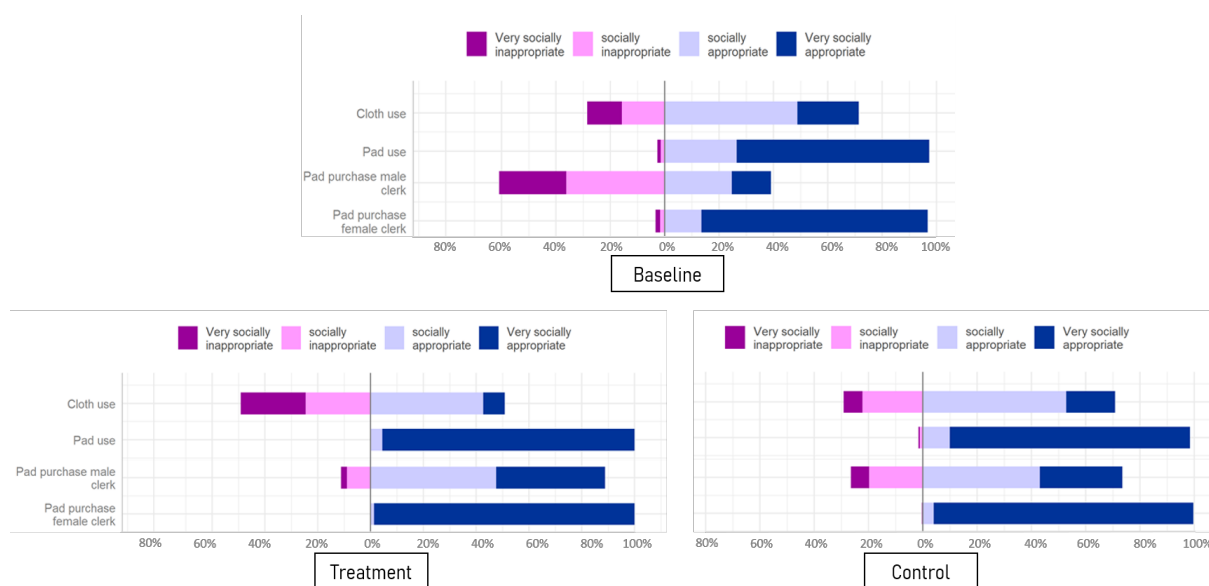
Notes: The figure depicts the elicitation of the social norms before and after the intervention with answers provided on a 4-point Likert scale (*very socially appropriate, socially appropriate, socially inappropriate, very socially inappropriate*). The top panel depicts the baseline levels, pooling all participants together. The bottom left panel depicts the endline results for the treatment group and the bottom right panel depicts the endline results for the control group. Each bar represents the percentage share of participants choosing each answer.

propriate to *socially appropriate* by the majority. The switch is of a large magnitude for the treatment group. It seems that the discussion allows participants to update their belief about the current social perceptions around the topic. We can observe a similar change also in the control group, though of a much smaller magnitude. This might partly explain why such a high share of participants from the control group picked up the product. This finding suggests that some changes occurred also in the control group and possibly points towards the existence of spillover effects. We discuss possible explanations and implications of this finding in detail in Section 1.4.3. We do not observe further strong changes in the modal responses.

In Table 1.6 we provide regression results showing the mean ratings for the same social norm measures. The dependent variables have been normalized, such that 0 corresponds to the lowest and 1 to the highest level of social appropriateness. As indicated by Figure 1.4, we observe a large change in the perceived social appropriateness of purchasing pads from a male shopkeeper for both the control and treatment group, with the change being 15% larger for the treatment group. The discussion did not change beliefs about how appropriate it is to use pads or to acquire them from a woman, both of which were considered very socially appropriate by the majority already at baseline; but it does negatively alter their reported belief about the appropriateness

of using menstrual cloth.[24]

Table 1.6: Social norms around menstrual products

	(1)	(2)	(3)	(4)
	Use as absorbent		*Purchase pads from*	
	Cloth	Disposable pads	Male shop-clerk	Female shop-clerk
Endline	-0.01	0.07***	0.23***	0.05***
	(0.04)	(0.01)	(0.02)	(0.01)
Intervention	-0.00	0.00	0.01	-0.00
	(0.06)	(0.02)	(0.03)	(0.02)
Endline × intervention	-0.15**	0.03	0.10***	0.02
	(0.07)	(0.02)	(0.03)	(0.02)
Control mean	0.61	0.89	0.43	0.93
Observations	132	475	475	475

Notes: Difference-in-differences estimation (OLS) of the treatment effect on average perceived social norms regarding absorbent use and pad purchase. Dependent variables are the beliefs about social norms on 1) using reusable cloth as an absorbent during menstruation, 2) using disposable pads as an absorbent during menstruation 3) buying pads from a male shopkeeper, and 4) buying pads from a female shopkeeper. Beliefs were elicited on a 4-point Likert scale (*very socially appropriate, socially appropriate, socially inappropriate, very socially inappropriate*). The dependent variables are normalized to a range between 0 and 1, with 0 being the lowest level of social appropriateness. *Control mean* refers to the average value of the dependent variable for the control group at baseline. *Endline* is a dummy equal to 0 for measures elicited in the baseline survey and 1 in the endline survey. *Intervention* is a dummy equal to 0 if the respondent belongs to the control group and 1 if she belongs to the treatment group. In column (1) the number of observations is lower as some social norms were only elicited from a randomly selected subset of respondents to reduce the length of the survey. Clustered standard errors at the individual level are reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Stigma and Taboos

In addition to the effects on second-order beliefs about social norms, we expect the intervention to also have affected personal attitudes towards the stigma and taboo, as women had positive experiences of discussing menstruation confidently with each other without negative social repercussions. In Table 1.7, we provide the regression results from our measures of stigma and taboo. We use a difference-in-differences regression framework. The results show that the intervention reduces the perceived stigma and taboos associated with menstruation to a large extent. While women agreed on average to 1.8 out of 4 stigma-related statements and to 1.6 out of 4 taboo-related statements at baseline, women in the treatment group only agree to about 0.9 and 0.8 of these statements after the treatment, respectively (results are significant at the 1% level). However, we also observe an effect on the perceived levels of stigma and taboo for the control group, with women in the control group agreeing to around 1.3 and 1.2 statements in

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[24] To account for the potential non-linearity in the reported social norms, we run the regression using an ordered logit model as a robustness check in Table A6 in the appendix.

the endline survey, respectively. This again suggests that changes occurred in the control group as well, possibly reflecting spillover effects. This is discussed in the next section.

Table 1.7: Perceived stigma and taboos

	(1)	(2)	(3)	(4)
	Stigma		Taboo	
Endline	-0.493***	-0.498***	-0.394***	-0.385***
	(0.09)	(0.09)	(0.08)	(0.08)
Intervention	0.008	-0.006	0.086	0.060
	(0.11)	(0.12)	(0.12)	(0.12)
Endline × intervention	-0.394***	-0.408***	-0.434***	-0.446***
	(0.13)	(0.14)	(0.12)	(0.12)
Control mean	1.758	1.758	1.567	1.567
Demographic controls	No	Yes	No	Yes
Observations	475	459	475	459

Notes: Difference-in-differences estimation (OLS) of the treatment effect on perceived stigma and taboo. Dependent variables are measured as the number of statements expressing stigma and taboo that a woman agrees to, out of a total of 4 statements. Dependent variables thus range from 0-4. Columns (1) and (3) report the regression without controls, columns (2) and (4) add demographic controls (age, years of education, marital status, number of children and reported use at baseline of sanitary pads and cloth). *Control mean* refers to the average value of the dependent variable for the control group at baseline. *Endline* is a dummy equal to 0 for measures elicited in the baseline survey and 1 in the endline survey. *Intervention* is a dummy equal to 0 if the respondent belongs to the control group and 1 if she belongs to the treatment group. Standard errors clustered at the individual level are reported in parentheses. Columns (2) and (4) do not include 16 pregnant women, since the demographic control variables of baseline use of pads and cloth are not available for them. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

1.4.3 Spillover Effects

The difference-in-differences analyses of the stigma, taboos and norms revealed not only significant changes in the treatment group compared to the control group, but also changes over time in the control group. In this section, we discuss possible explanations and implications of this outcome.

One possibility is the existence of experimenter demand effects, which occur when the participants change their answers to match what they believe the enumerators or experimenters would consider to be the appropriate answer. We sought to minimize this effect with our experiment design. First, for the stigma and taboo measures, the participants were not asked to indicate their agreement with each of the four statements, but rather to indicate with how many statements in total they agreed. Second, we did not ask about their own perceptions of the social norms, but their second-order beliefs about others' (the neighbors') perceptions. Third, the surveys were carried out via phone, reducing the exposure to the enumerators.[25]

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[25] To ensure that there are no systematic differences by enumerator, we re-run our main regressions with enumerator fixed effects as a robustness check in the appendix, see Table A4. The coefficients of interest remain very similar in terms of magnitude and identical in terms of statistical significance.

Lastly, if experimenter demand effects were present, we would expect the respondents to update their answers already at baseline according to what they believe the enumerator would consider appropriate. Overall, we therefore do not expect experimenter demand effects to impact the control group differently from the treatment group or to be the most plausible explanation for the changes observed at endline compared to baseline in the control group.

Another reason for the observed effects on the control group could be unintended treatment effects resulting from the phone surveys as well as a perceived implicit endorsement of menstrual health as important issue by the factory through our experiment. Our treatment intervention largely consists of providing the participants with a safe space to talk about menstruation and to update their beliefs about how others perceive the topic. To some extent, the interviews with the enumerators fulfill a similar function, as they also provide women with the opportunity to talk with someone about menstruation openly without fear of social repercussions. This might explain observed effects for the control group in the same direction, but of a lower magnitude than our treatment effect. Moreover, as discussed by Tankard and Paluck (2016), institutional signals provide an important source of information about social norms. The women in our study were aware that the factory had approved our research, which may have served as an institutional signal about the social acceptance of menstruation as important health concern. Thus, participation in the experiment may have had a similar, albeit smaller, effect as our intervention. This would indicate that the current *status quo*, in which the silence and taboos around menstruation restrict women, is weak and that even providing women with short opportunities to exchange experiences with one other person (e.g. the enumerator) and an official sanctioning of menstruation as important health topic by relevant institutions can already have large effects. We take this as encouraging sign for a large potential for scaling up our intervention.

Finally, another possible explanation is the existence of spillover effects from the treatment to the control group. These spillovers arise when the women in the treatment group discuss the topic of menstruation and share what they discussed in the treatment sessions with the women from the control group. To test for spillover effects, we first check whether the changes in perceived social norms in the control group occur only for those social norms explicitly discussed in the treatment groups or along the whole spectrum of related social norms. Second, we asked the women directly about the extent to which they discussed the menstrual underwear and the study with their co-workers six months after the treatment.

In Table 1.8 we provide additional measures of social norms elicited at endline and baseline.

We observe that there are no statistically significant changes for the control group in the average perceptions of the two norms related to hygienic drying and washing of cloth in columns (1) and (2). This is a topic that was not discussed in the treatment sessions directly. However, we do observe significantly different answers in the average perception of norms on intergenerational communication about menstruation in columns (3), (4) and (5). This was one of the most discussed topics in the discussion sessions. This points towards spillover effects from the treatment group to the control group, since the changes occurred only for topics explicitly discussed in the discussion sessions.

Table 1.8: Spillovers of social norms

	(1)	(2)	(3)	(4)	(5)	(6)
	Using Cloth as main absorbent		*Menstruation is explained*			
	Washing	Drying	to daughter by...		to son by...	
	in laundry facilities	in sunlight	Father	Mother	Father	Mother
Endline	-0.03	0.05	0.05**	0.04***	-0.05**	0.03
	(0.02)	(0.05)	(0.02)	(0.01)	(0.02)	(0.02)
Intervention	0.00	-0.05	0.03	-0.05***	0.05	0.04
	(0.03)	(0.05)	(0.03)	(0.02)	(0.04)	(0.02)
Endline × intervention	0.07*	0.23***	0.11***	0.05***	0.07*	0.15***
	(0.04)	(0.07)	(0.04)	(0.02)	(0.04)	(0.03)
Control mean	0.11	0.28	0.07	0.95	0.17	0.18
Observations	125	125	218	475	218	475

Note: Difference-in-differences estimation (OLS) of the treatment effect on average perceived social norms regarding washing and drying menstrual cloth and intergenerational discussion of menstruation. Dependent variables are the beliefs about social norms on 1) washing menstrual cloth outside (in the communal laundry area or in a pond) 2) drying menstrual cloth outside in direct sunlight 3) the father discussing menstruation with his daughter 4) the mother discussing menstruation with her daughter and 5) and 6) are the equivalent for sons. Beliefs were elicited on a 4-point Likert scale (*very socially appropriate, socially appropriate, socially inappropriate, very socially inappropriate*). The dependent variables are normalized to a range between 0 and 1, with 0 being the lowest level of social appropriateness. *Control mean* refers to the average value of the dependent variable for the control group at baseline. *Endline* is a dummy equal to 0 for measures elicited in the baseline survey and 1 in the endline survey. *Intervention* is a dummy equal to 0 if the respondent belongs to the control group and 1 if she belongs to the treatment group. The number of observations for columns (1), (2) (3) and (5) is lower as those social norms were only elicited from a randomly selected subset of respondents. Clustered standard errors at the individual level in parentheses for the coefficients.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

To measure the extent of spillovers more directly, we re-surveyed 339 of the women in our study six months after the intervention[26], and asked them directly about their (self-reported) behavior in terms of discussing the underwear with their co-workers. Table 1.9 shows that, among the women from the treatment and control group who collected the underwear after

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[26] Not all study participants could be reached by phone for the follow-up survey. The follow-up sample includes 182 women from the control and 157 from the treatment group. Moreover, this includes a subsample of 291 women who did collect the underwear and 48 women who did not collect the underwear, because they either had a zero WTP for the underwear or won money or pads as part of the WTP lottery.

the experiment, 82% from the control group and 87% from the treatment group report having discussed the menstrual underwear with others, mostly with their co-workers (97-98%). In addition, of those women who did not themselves collect the underwear, almost everyone knows someone who did pick it up (91-94%) and 59% of women in the control group and 88% of women in the treatment group had a co-worker share their experiences with the underwear with them.

Table 1.9: Spillovers of knowledge about the experiment

	(1) Control	(2) Treatment	(3) Difference T-C
Participants that collected underwear			
Discussed menstrual underwear with others	0.83	0.87	0.05
	(0.38)	(0.33)	(0.04)
... with co-workers	0.97	0.98	0.01
	(0.17)	(0.13)	(0.02)
...with female relative	0.40	0.46	0.06
	(0.49)	(0.50)	(0.06)
... with husband	0.18	0.22	0.04
	(0.38)	(0.42)	(0.05)
Participants that did not collect underwear			
Know someone who picked up product	0.91	0.94	0.03
	(0.30)	(0.25)	(0.08)
Co-worker shared experience with product	0.59	0.88	0.28**
	(0.50)	(0.34)	(0.12)

Note: Self-reported behavior regarding the discussion of the menstrual underwear among the study participants. Based on a follow-up survey six months after the intervention. The full follow-up sample consists of 339 women, 182 in the control group, 157 in the treatment group. The upper panel includes responses from 291 women (150 in the treatment and 141 in the control group) who were eligible to collect the underwear after the experiment and did so. The bottom panel includes responses from 48 women (16 in the treatment and 32 in the control group) who were not eligible to collect the underwear after the experiment, because they had a zero WTP (preferred receiving 0 BDT to collecting the underwear) or won money or pads in the WTP lottery. For columns (1) and (2), standard deviations are reported in parentheses. Column (3) reports the coefficient of a simple regression of the variable on the treatment status, with robust standard errors reported in parentheses. Stars indicate whether the difference between the treatment and control group is significant. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We also surveyed 59 workers who had not previously participated in the surveys at all, and asked them about their level of knowledge about the study and the menstrual underwear. Table 1.10 reports their answers. Even though these women had not been part of the study and had not been eligible to pick up the menstrual underwear themselves, 72% report being aware that the study had happened and 63% report knowing someone who went to collect the menstrual underwear. Moreover, more than half of the women report having discussed the topic of menstruation with at least one co-worker since the experiment. These high rates of discussion between women in the treatment and control groups, as well as with women not part of the study, indicate that many of the women shared their experiences of the study and

the menstrual products they received with each other. This makes it very plausible that our outcome measures picked up some spillover effects from the treatment to the control group. For the purpose of our intervention, this is reassuring. It indicates that the women felt more confident to discuss menstruation after the treatment and that providing opportunities to freely talk about menstruation and making new and advanced menstrual products available can have significant knock-on effects for women who are not directly involved. If this interpretation is correct, we may be underestimating the overall effectiveness of our treatment.

Table 1.10: Spillovers to the pure control group

	Share of women in pure control
Know about the study	0.72
	(0.45)
Know someone who picked up the underwear	0.63
	(0.49)
Discussed menstruation with co-workers	0.54
	(0.50)

Note: Self-reported knowledge of the experiment and level of discussion with other co-workers about menstruation for the pure control group. This sample consists of 59 women surveyed at the six month follow-up who were not previously involved in the study. Standard deviations are reported in parentheses.

1.4.4 Discussion Group Composition

To learn more about how the discussions affected the women in the treatment group, we explore the treatment effect for each discussion group separately. This allows us to ensure that the treatment worked in a similar manner for all women in all treatment groups and to rule out effects driven by outliers. Second, we can conduct some exploratory analyses of the relationship between the size of the treatment effect and specific discussion group characteristics. We look at differences in group size, the share of pad users and cloth users, the average age and education level, and the average stigma and taboo levels at baseline for each group. This allows us to examine if any characteristics of the discussion groups are more predictive of success than others to provide lessons for designing discussion groups in future studies or program implementations. There were 15 treatment groups in total. Table 1.11 provides a general overview of the average characteristics of each treatment group in comparison to each other and the control group.

To determine the effect by treatment group, we first regress the WTP for sanitary pads and the probability of product collection on a set of 15 dummy variables, one for each of the 15 discussion groups. The base category consists of the women in the control group. Figure 1.5 plots the regression coefficients by group for the WTP for sanitary pads (left) and the probability of

Table 1.11: Group summary statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Size	Cloth users	Pad users	Age	Education	Stigma	Taboo
Control	258	0.50	0.61	26.59	7.06	1.74	1.55
Group 1	16	0.69	0.38	24.75	6.56	1.56	1.63
Group 2	15	0.67	0.53	27.13	6.60	2.21	1.60
Group 3	14	0.57	0.43	30.07	5.00	1.21	1.50
Group 4	21	0.43	0.71	27.71	7.23	2.14	1.67
Group 5	13	0.23	0.92	25.08	8.69	1.92	2.07
Group 6	16	0.63	0.50	25.94	7.43	1.63	1.75
Group 7	12	0.50	0.50	26.92	8.50	1.50	1.25
Group 8	11	0.64	0.45	25.81	5.91	2.00	2.09
Group 9	14	0.43	0.50	24.71	9.64	1.43	1.36
Group 10	14	0.57	0.50	26.56	6.14	1.29	1.14
Group 11	17	0.41	0.65	27.41	5.88	2.06	1.59
Group 12	15	0.60	0.40	28.60	7.07	1.87	1.87
Group 13	14	0.21	0.86	23.64	8.64	2.36	2.07
Group 14	13	0.42	0.50	25.85	7.15	1.69	1.54
Group 15	20	0.13	1.00	24.40	8.00	1.55	1.55
Total Average	144.95	0.48	0.60	26.47	7.13	1.75	1.59

Notes: Arithmetic mean and proportions of group characteristics for different demographic and survey measures at baseline. *Size* includes the number of participants in the specified group. *Cloth users* and *Pad users* reports the proportion of respondents that reported to use said absorbent at baseline, *Age* reports the average age, *Education* reports the average years of schooling, *Stigma* and *Taboo* report the group averages on perceived stigma and taboo, measured on a scale from 0-4.

product collection (right). The figure shows a positive treatment effect on WTP in the majority of treatment groups (though given the small sample sizes of around 15 participants per group, the confidence intervals are wide and the treatment effects not statistically significant for each individual group). The effect of the treatment on the collection of the menstrual underwear is more consistently positive, with most groups showing a higher average collection rate than the control group. Figure 1.5 also shows that two groups experienced a very large treatment effect on the WTP, groups 11 and 15. To ensure that our results are not only driven by these two groups, we re-run our main regression excluding these groups as a robustness check in Table A5 in the appendix. This does not affect the interpretation of our results.

Looking at the composition of groups 15 and 11, it is interesting to note that both groups were among the largest groups, with 20 and 17 participants, respectively. Moreover, in group 15 all women were using pads already at baseline (not counting 4 pregnant women also included in this group). To determine if this and other factors of the group composition played a role, we regress the average WTP for sanitary pads of each discussion group (average lower bound) and the average probability of product collection of each discussion group on some of the group characteristics. Given the small number of groups, this analysis lacks statistical power and should be interpreted as only indicative of directional effects.

Figure 1.5: Treatment effects by discussion group
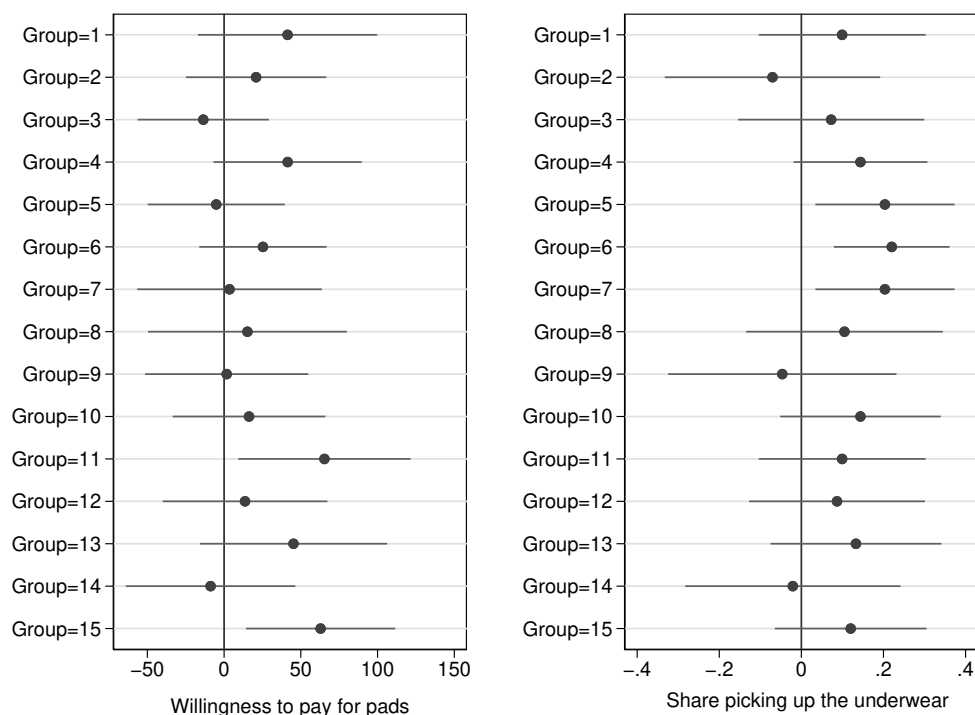
Notes: The left panel plots the regression coefficients obtained from the interval regression of the WTP for sanitary pads on a set of 15 dummy variables indicating participation in the discussion groups (including demographic controls). The right panel plots the regression coefficients obtained from the linear probability regression of the collection probability on the same set of dummy variables (and demographic controls). The dots represent the mean effect of being assigned to a given discussion group on the WTP (left) and product collection (right). The bars represent 95% confidence intervals. The base category is the control group.

The results are shown in Table 1.12. Being in a discussion group with a higher share of cloth users appears to have a negative effect on the WTP, a more negative effect than being in a group with a higher share of pad users. Neither share has an effect on collection rates. Second, being in larger groups with on average younger colleagues seems to increase WTP, though these coefficients are of a very low magnitude. Moreover, the WTP of women in a discussion group with a higher average level of perceived stigma at baseline is higher after the treatment, while those groups with a stricter perception of the taboo at baseline have a lower WTP. This could indicate that the treatment is effective in the face of higher stigma levels and has more bite when women are initially constrained. However, effectiveness of the treatment is hindered by a strong perceived taboo, because the women may be less likely to open up and share their experiences. For the probability of product collection, in contrast, there seems to be no difference between having many cloth users or many pad users in the group. Group size, age and education also

have no effect.[27]

Overall, these results suggest that the exact group composition and characteristics of the discussion groups do not play a decisive role in determining the treatment effectiveness. We will need to leave it to future research to explore the marginal benefits of further design elements of the discussion groups, such as reducing or extending the time of the discussion or varying the exact content.

Table 1.12: Group composition effects

	(1) WTP for pads	(2) Pickup of underwear
Share cloth users in group	-34.610	0.422
	(73.11)	(0.64)
Share pad users in group	-19.245	0.539
	(66.00)	(0.53)
Number of group members	4.388**	-0.002
	(1.71)	(0.01)
Average age	-6.319**	0.009
	(2.66)	(0.02)
Average education	-5.999	0.011
	(4.47)	(0.03)
Average stigma at baseline	23.876	-0.136
	(16.56)	(0.14)
Average taboo at baseline	-11.522	0.097
	(17.60)	(0.18)
Constant	235.687	0.085
	(150.69)	(0.80)
Observations	15	15

Notes: Column (1) reports results from the regression of the average (lower bound of the) willingness to pay for pads per group on the different group characteristics. Column (2) reports results from the regression of the average underwear pick-up rate per group on the group characteristics. Standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

1.4.5 Heterogeneity Analysis

In this section, we conduct exploratory analyses to understand if some individual characteristics of participants correlate with the effectiveness of treatment, or if the intervention affects different subgroups of the sample in different ways. To do this, we split our sample into several subgroups. We investigate whether the treatment differs by material used at baseline, age, education and level of perceived stigma at baseline.[28]

Material used at baseline To determine the effect by material used at baseline, we split

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[27] Figures A3 and A4 in the appendix show these relationships in more detail in a scatter plot. They suggest that, if anything, there is a weakly positive relationship between the share of pad users and WTP and a weakly negative relationship between the share of cloth users and WTP and a weakly positive relationship between average stigma levels at baseline and WTP. However, these trends are not very strong and there is a lot of dispersion in the effects by group characteristics.

[28] In this section, we are splitting the sample according to observables that were not conditioned on in the treatment randomization. We cannot be confident that the randomization has fully balanced the unobservables along these strata. The analysis is, therefore, descriptive and results should be interpreted with caution.

our sample into three groups and look at our main outcome measures, willingness to pay for pads and the pick-up rates of the underwear. Table 1.13 shows that the intervention increases the valuation of pads mainly for those women who were already using pads but would not purchase them themselves at the store. In contrast, the intervention has a limited effect on those women already purchasing the product themselves, and only a marginally significant effect on those women not using pads at all. This aligns with the hypothesis of the existence of a binding social constraint. The intervention had no effect on the valuation of the product for those women previously not affected by the social constraint (as they were already purchasing pads themselves or were not using the product). In contrast, those women who relied on others (mostly their husbands) to have access to pads have a more than 45% higher valuation after the intervention compared to the control group.

Table 1.13: Heterogeneity by material used at baseline

	(1)	(2)	(3)	(4)	(5)	(6)
		WTP pads			Pick-up Underwear	
	Cloth Users	*Pad Users*		*Cloth Users*	*Pad Users*	
		Do Not Buy	Buy		Do Not Buy	Buy
Intervention	26.22*	41.24***	5.38	0.11**	-0.00	0.06
	(15.04)	(15.91)	(20.42)	(0.05)	(0.05)	(0.07)
Control mean	84.55	90.80	107.51	0.82	0.92	0.80
Observations	168	157	112	146	140	100

Notes: Column (1) - (3) report the interval regression coefficients of the willingness to pay (in BDT) for disposable menstrual pads from a male shopkeeper at the factory. Columns (4) - (6) report the linear probability model (OLS) results for the collection of the underwear. The sample is split in three: *Cloth Users* includes the respondents that only used cloth as an absorbent at baseline, *Pad Users: Do Not Buy* includes the respondents that report to use pads but do not purchase them themselves, *Pad Users: Buy* includes the respondents that report to use pads and report to buy them at the store. *Control mean* refers to the average value of the dependent variable for the control group at baseline. Robust standard errors are reported in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Regarding take-up of the new menstrual underwear, the intervention has the largest effect for women who were exclusively using cloth at baseline. For pad users, especially those who do not buy the pads themselves, we observe a precisely estimated null effect of the treatment. However, pick-up rates in this demographic group are already very high in the control group (above 80%). We could speculate here that the intervention is particularly useful for those participants who switch from traditional to modern products and who need to go to a store to collect a menstrual product from a male shopkeeper for first time in their life.

Age As mentioned previously in section section 1.3.1, material use at baseline correlates with age, with women older than 25 being more likely to use cloth and women younger than 25 being more likely to use pads. We therefore examine whether differential treatment effects

occurred in these age brackets. As Table 1.14 shows, the results are mostly driven by the younger women, for whom the treatment has a much stronger effect on both the willingness to pay and the probability of collecting the menstrual underwear. The treatment effect on the WTP for women older than 25 is only about one quarter of the effect for women younger than 25 (and is not statistically significantly different from 0).

Table 1.14: Heterogeneity by age

	(1)	(2)	(3)	(4)
	WTP for pads		Pickup of underwear	
	> 25 years	≤ 25 years	> 25 years	≤ 25 years
Intervention	8.940	37.094***	0.052	0.148***
	(12.83)	(12.48)	(0.05)	(0.06)
Control mean	96.582	84.110	0.737	0.686
Observations	244	232	242	227

Notes: Column (1) and (2) report the interval regression coefficients of the willingness to pay (in BDT) for disposable menstrual pads. Columns (3) and (4) report the linear probability model (OLS) results for the collection of the underwear. The sample is split by age into those women older than 25 in columns (1) and (3) and those 25 or younger in columns (2) and (4). *Control mean* refers to the average value of the dependent variable for the control group at baseline. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Education Similarly to age, education is also correlated with material use at baseline, with those women having more than six years of education being more likely to use pads and those women with six or fewer years of education being more likely to use cloth at baseline. We therefore test whether a similar difference is observable in the effectiveness of the treatment. As Table 1.15 shows, it is mainly the more educated women who respond to the treatment, with the treatment effect on the willingness to pay being around three times greater for women with more than six years of education than for those women with fewer than six years of education. The differences are much less pronounced for the pick-up rates. While there is a small difference in the level of significance, the coefficients for both groups have a very similar magnitude (though the level of pick-up in the control group is already somewhat higher for women with more than six years of education).

Stigma levels at baseline Lastly, we look at the effect of stigma measures at baseline to determine if those women already more open and engaged with the topic at baseline respond more, or if the treatment is more effective for those women previously holding a more restrictive view. As can be seen in Table 1.16, it is those with higher levels of baseline stigma who respond most to the treatment. The treatment effect on the willingness to pay is around twice as high for women who previously agreed to more statements about feeling uncomfortable when

Table 1.15: Heterogeneity by education

	(1)	(2)	(3)	(4)
	WTP for pads		Pickup of underwear	
	> 6 years of education	≤ 6 years of education	> 6 years of education	≤ 6 years of education
Intervention	30.605***	11.161	0.095*	0.103
	(11.37)	(14.54)	(0.05)	(0.07)
Control mean	87.208	95.635	0.740	0.673
Observations	285	191	283	186

Notes: Columns (1) and (2) report the interval regression coefficients of the willingness to pay (in BDT) for disposable menstrual pads. Columns (3) and (4) report the linear probability model (OLS) results for the collection of the underwear. The sample is split by level of education into those women with more than six years of schooling in columns (1) and (3) and those with six or fewer years of schooling in columns (2) and (4). *Control mean* refers to the average value of the dependent variable for the control group at baseline. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

buying pads, or feeling like they are being stigmatized or judged if someone notices they are menstruating. Regarding the probability of collecting the underwear, there is no difference in magnitude or significance of the treatment coefficients based on stigma levels.

Table 1.16: Heterogeneity by stigma levels at baseline

	(1)	(2)	(3)	(4)
	WTP for Pads		Pickup of Underwear	
Stigma level:	Above median	Below median	Sbove median	Below median
Intervention	28.535**	15.511	0.094*	0.107*
	(11.65)	(14.04)	(0.05)	(0.06)
Control mean	84.253	99.147	0.706	0.722
Observations	277	199	273	196

Notes: Columns (1) and (2) report the interval regression coefficients of the willingness to pay (in BDT) for disposable menstrual pads. Columns (3) and (4) report the linear probability model (OLS) results for the collection of the underwear. The sample is split by level of stigma measured at baseline, into those women with more than the median level of perceived stigma at baseline in columns (1) and (3) and those with the median or a lower level of perceived stigma at baseline in columns (2) and (4). *Control mean* refers to the average value of the dependent variable for the control group at baseline. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Overall, the heterogeneity analysis paints a consistent picture of the target group most likely to benefit from the discussion group intervention: product valuation responds most for younger and more educated women, who are already willing to use pads to begin with, but are constrained in doing so because of a high level of perceived stigma (and therefore often do not buy the pads themselves). These women benefit the most from the treatment, because these are also the women most constrained by the restrictive social attitudes.

When it comes to trying out and adopting the new technology of menstrual underwear, on the other hand, there are fewer differences between the different subgroups of women. Cloth users and younger women are more willing to test this new method, but overall we found that all women were keen on this new technology.

Our results have shown that the discussion sessions changed the perceptions and behavior of the treatment group shortly after the intervention. The remaining question is how these changes develop over time. Since we also observed changes in the control group (due to spillovers and effects of participation in the experiment itself), we investigate to what extent the observed changes in behavior and perceptions of norms, stigma and taboos spread and persist across the treatment and control group six months after the intervention. Specifically, we first look at the product use and WTP for pads in the treatment and control group, conditional on having actually collected the underwear. This shows us to what extent providing a new menstrual product as part of a study affects product use and valuation. Second, we compare the perceptions of the norms, stigma and taboos between the treatment and control groups, for both women with and without access the the new menstrual product, to determine if the changes in perceptions persisted and to what extent they spread to the control group.

To do this, we again use the sample of 339 women from our original sample who were re-surveyed six months after treatment, including 182 from the control group and 157 from the treatment group. 291 women across both groups had access to the underwear and had collected it after the experiment. 48 did not have access to the underwear (they either had a zero WTP or won pads or money in the WTP lottery). In addition, we surveyed 59 women who had not previously been part of the study at all and therefore did not have access to the underwear ("pure control"). The workers in the pure control group were selected randomly from a full list of the remaining factory workers. The follow-up surveys were conducted in November and December 2021.

Material used and valuation of pads after six months

We first evaluate whether collecting new menstrual underwear had a lasting impact on the materials women use frequently (for two days or more during a period) to manage their menstruation. Table 1.17 shows that receiving the free menstrual underwear had a lasting impact on the material used. In the pure control group, 49% of women report using cloth and 61% of women report using pads (in line with the percentages observed for our full sample at baseline of 48% and 60%, respectively, see Table 1.1). In contrast, only 23% of our study participants with access to the menstrual underwear reported still using cloth, both in the treatment and control group, a reduction by half. Pad use increased by around 13%. 79-82% of women report

frequently using the menstrual underwear they had collected. There is no difference between the material used by the treatment and the control group after six months. This suggests that being given access to a modern menstrual underwear and participation in the study itself led to persistent changes in material use.

Table 1.17: Material used at six-month follow-up

	(1)	(2)	(3)	(4)	(5)
		Sample *(Share)*		Difference	
	Pure control	Control	Treatment	T-PC	T-C
Cloth or fabric	0.49	0.23	0.23	-0.26***	0.00
	(0.50)	(0.42)	(0.42)	(0.07)	(0.05)
Disposable pads	0.61	0.69	0.69	0.08	0.00
	(0.49)	(0.47)	(0.46)	(0.07)	(0.05)
Menstrual underwear		0.79	0.82		0.02
		(0.41)	(0.39)		(0.05)
Observations	59	150	141		

Note: Share of women reporting to use each material frequently at the six-month follow-up, conditional on having collected the product. For the pure control group, the menstrual underwear had not been made available. For columns (1), (2), and (3), standard deviations are reported in parentheses. Columns (4) and (5) reports the coefficient of a simple regression of the variable on the treatment status comparing the treatment group to both control groups, the pure control group and the experiment control group. Robust standard errors reported in parentheses. Stars indicate whether the difference between the treatment and control group is significant. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We next evaluate whether the intervention had persistent effects on the valuation of sanitary pads for those women having collected the menstrual underwear.[29] Table 1.18 reports the regression results. The average WTP in the control group is much higher than it was right after the intervention, with an average WTP of 123 BDT for a pack of four pads (compared to 91 BDT at the endline survey). This is likely driven by the spillover effects described above. Women in the treatment group have a lower willingness to pay for the pads than the women in the control group. We could speculate that women in the treatment group are now more likely than women in the control group to obtain their pads elsewhere, such as a corner store or pharmacy. In absolute terms, however, the WTP for the treatment group is very similar to what it was in the endline survey (110 BDT at the six-months follow-up compared to 113 BDT at the endline). Overall, receiving the free menstrual underwear and participating in the study thus had persistent effects on the valuation and use of modern menstrual products.

Stigma, Taboo and Norms

Lastly, we determine whether the intervention had a lasting effect on the perceived stigma, taboo, and the social norm on purchasing pads from a male shopkeeper. As before, stigma and

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[29] For completeness, we also include the WTP for the menstrual underwear in Appendix Table A2.

Table 1.18: Willingness to pay at six-month follow-up

	(1)	(2)
	WTP for pads (in BDT)	
Intervention	-13.423	-17.469**
	(8.40)	(8.16)
Control mean	122.910	122.910
Demographic Controls	No	Yes
Observations	339	339

Note: Interval regression of the willingness to pay (in BDT) for disposable menstrual pads to be collected from a male shopkeeper at the factory store for the subset of women who collected the available menstrual underwear. *Control mean* refers to the average value of the dependent variable for the control group at the six-month follow-up. Robust standard errors reported in parentheses. Demographic controls in column (2) include age, years of education, marital status, number of children and use of pads, cloth and menstrual underwear at the six-month follow-up (as dummies). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

taboo are measured as the average number of statements agreed to by the women expressing stigma and taboo, respectively. This is a value between 0 and 4. The social norm is measured as the average perception of appropriateness of purchasing pads from a male shopkeeper (normalized to a value between 0 and 1). Figure 1.6 shows that the effects are indeed persistent over six months, and average levels of stigma and taboo are significantly lower at the six-month follow-up than they were at baseline (top panels of Figure 1.6). Similarly, the action of purchasing pads from a male shopkeeper is seen as substantially more socially appropriate at the six-month follow-up compared to the baseline (bottom panel of Figure 1.6). It also shows that the difference between the treatment and control group observed directly after the intervention diminishes over time. After six months, there is no difference between the two groups that took part in the experiment, in line with the effects on product use and valuation. This is most likely driven by spillover effects, as well as effects from having participated in the experiment and discussed menstruation with an enumerator and experiencing an implicit institutional endorsement by the factory, as discussed in section 1.4.3.

This allows us to rule out that the changes observed in the control group reflect a time trend independent of our intervention by looking at the pure control group. As the dashed bars in each panel of Figure 1.6 show, the values of stigma, taboo and social norms measured for the pure control group are very similar to the original baseline values of our study participants. This means there was no general reduction in social constraints outside of the experiment. Table A3 in the Appendix formally confirms the results visible in Figure 1.6 by showing that there is a significant reduction in average stigma and taboo and a significant increase in the average perceived appropriateness of buying pads from a male shopkeeper in the follow-up survey compared to the baseline survey, but there is no statistically significant difference between the

Figure 1.6: Perceived social constraints at six-month follow-up
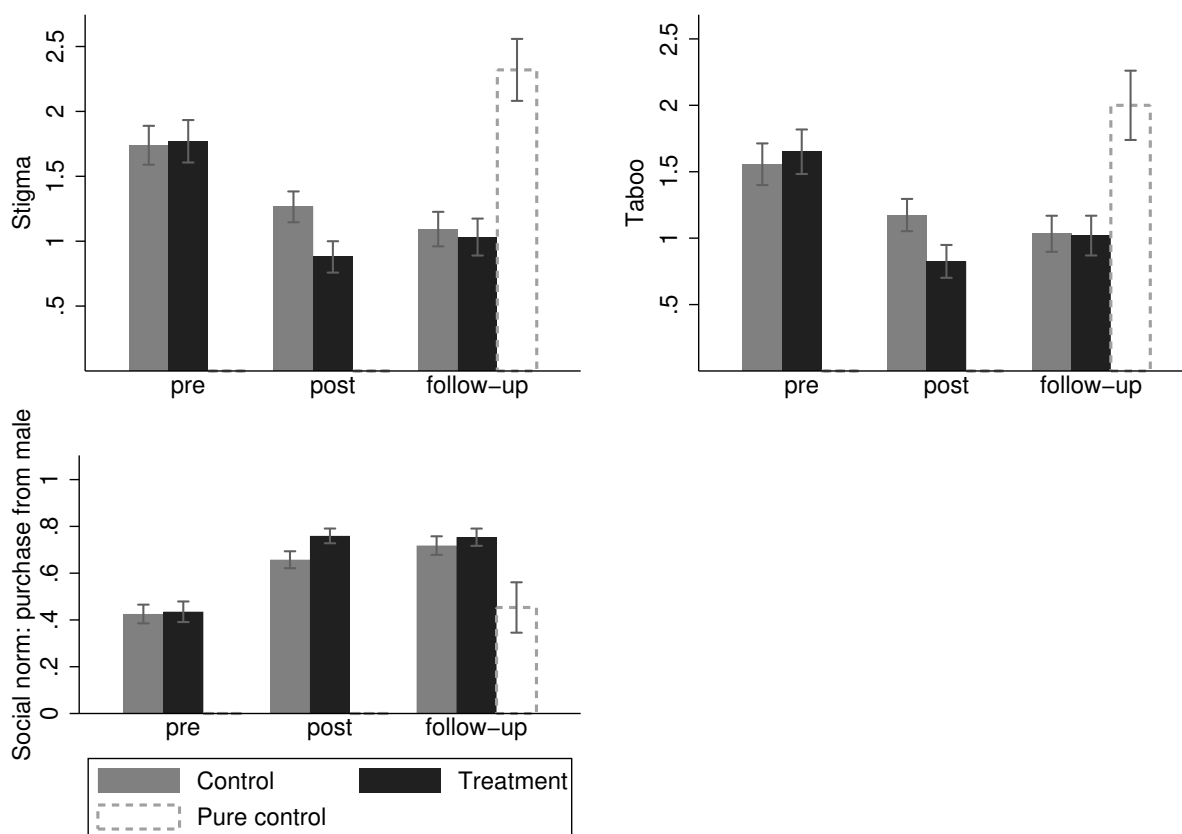
Notes: The top left panel shows the average stigma level for the treatment and control group and a pure control group (not previously part of the study) at baseline, endline and the 6-month follow-up. The top right panel shows the same for the taboo level. In both cases, higher values mean higher levels of perceived stigma and taboo and it is measured on a scale from 0-4. The bottom panel shows the average level of social appropriateness assigned to purchasing pads from a male shopkeeper (normalized to a value between 0 and 1). Higher values mean the purchase of pads from male shopkeepers is considered more socially appropriate. Error bars represent 95% confidence intervals. The sample includes 339 original study participants who were re-surveyed (182 in the control group, 157 in the treatment group; 291 with access to the menstrual underwear and who collected it, 48 without access to the menstrual underwear) and 59 women in the "pure control" group.

treatment and control group at the follow-up.

Overall, this supports the idea that participation in the study itself has started to "break the silence", encouraging discussions between the women and spillovers across the treatment and control group, leading to substantial and lasting effects on the perceived social constraints of stigma, taboos and social norms even six months after the intervention.

1.5   Conclusion

In this chapter, we present results from a field experiment with 476 women in a Bangladeshi garment factory and show that open discussions about the stigmatized topic of menstruation increases the valuation and take-up of both known and novel menstrual products: sanitary pads and reusable menstrual underwear. Participating in discussions that break the silence surrounding menstruation increased the willingness to pay for sanitary pads that had to be collected from a male shopkeeper on factory premises by more than 25% (from around 91 BDT to around 113 BDT), and take-up rates of a novel menstrual underwear by around 14% (from around 71% to around 81%).

We also shed some light on the potential underlying mechanisms. We hypothesize that social pressure, arising from social norms, stigma, and taboos, might play a role in preventing the adoption of these affordable and available health-enhancing technologies and that our intervention directly addresses them. Using a discrete choice experiment, we show that the intervention did not modify the value-for-money that study participants attribute to the modern absorbents, but rather that barriers related to shopkeeper gender and social image concerns were reduced. After the discussion, women were less concerned about obtaining the menstrual material from a male shopkeeper and of being seen accessing the new products in the factory. We see that open discussion reduces the perceived restrictiveness of social norms directly related to the collection of products in the store, as well as affecting personal attitudes towards the stigma and taboos around menstruation in general. These effects are still visible after six months.

With this study we provide important insights for policymakers. We propose a very light-touch intervention, which relies on an endogenous process of updating second-order beliefs regarding the prevalent social norms and a reduction in perceived stigma and taboo. It builds on the women's own knowledge and own exchange of ideas and experiences without the need for external skill or knowledge provision. We encountered great interest and eagerness from the women to actively engage in these discussions and to share their personal experiences with each other, resulting in persistent changes in the perceptions of norms, stigma and taboo and continued discussions among the women. Taken together with the observation that the perceived stigma, taboo and norms also shifted in the control group due to spillovers and the discussions with the enumerators having a similar effect to our treatment, this suggests that the sub-optimal equilibrium limiting women's opportunity to discuss menstruation is weak and can be altered.

We take this as encouraging sign of the potential of a large-scale implementation of such an intervention, which would not need to involve every single worker in a formal discussion group. Nudges to discuss this topic openly and the provision of a safe space to do so may already be sufficient and have large and positive effects on the adoption of health- and productivity-enhancing technologies. Alternatively, as the results point towards the male gender of the shopkeeper as one of the main obstacles, alternative distribution channels that circumvent this constraint could be very effective, such as vending machines in women's restrooms or selling menstrual products in the factory's health center (a more private location, often staffed by mainly female nurses).

Several important questions to address the remaining obstacles to the achievement of widespread optimal menstrual hygiene management need to be left to future research. One unexplored avenue is the role of men. Since men are often in charge of the household budget and are often sent by their wives to purchase the pads for them, addressing the men's perception of restrictive social constraints provides a promising avenue for future research, as demonstrated also in Bursztyn et al. (2020). Moreover, given our findings about the existence of spillovers, future research could identify whether there are any particular change makers or opinion leaders that should be targeted to achieve an optimal spread through the women's network. Yet, our study has shown that a crucial step toward providing all women with hygienic menstrual health technologies lies in supporting women to openly engage with the topic and thus overcome the social pressure and stigma otherwise limiting their access to affordable and available health technologies.

2. AN ONLINE EXPERIMENT ON THE ROLE OF PSYCHOLOGICAL OWNERSHIP IN FOSTERING PROJECT COMMITMENT

Many policies are based on the assumption that participation in an early phase of project design leads to increased commitment to continuing with the project later on, driven by a stronger feeling of psychological ownership or personal responsibility. I run an online experiment to test this assumption. I examine the effects of participation, i.e. having decision power and investing personal resources, on project commitment and the mediating role of psychological ownership. I find a positive relationship between psychological ownership and the preference for contributing personally to a project. However, psychological ownership levels in my setting do not respond to the exogenous treatment variation in participation. My data suggest that this is due to a discrepancy between actual and perceived participation, caused by an illusion of control and a reduction in perceived effort costs with decision power. This study provides valuable learnings for policymakers about the challenges of using participation to directly influence levels of psychological ownership as a means to increase project commitment.[1]

2.1   Introduction

In a wide variety of contexts, policies are based on the idea that participating in project design, having some decision power over its design and investing personal resources into its creation, will increase project commitment. For example, many companies advocate an "ownership culture" and seek to improve employee motivation and retention by giving them autonomy over their daily work (Bartling et al., 2013; Mellizo et al., 2017; Chaudhry and Klinowski, 2016; Liu et al., 2012). Many firms also involve their customers in product design, letting them customize their products, give feedback and make design recommendations, in an attempt to increase their loyalty and willingness to pay (Fuchs et al., 2010). Similarly, one fundamental premise of a democracy is that the involvement of the people in the political discourse and decision-making

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[1] The laboratory experiment described in this chapter received ethics approval from the Ethics Commission, Department of Economics, University of Munich (Project 2020-08) on 15.09.2020. It was pre-registered as AEARCTR-0006803.

process legitimizes decisions and increases voters' willingness to accept them, even if they personally don't agree with them (Dal Bó et al., 2010; Grillos, 2022). Even in schools, children are often encouraged to participate in the design of classroom rules in the hope that they will then be more willing to uphold them. And in development economics, a common form of aid programs called community-driven development seeks to improve the sustainability of aid programs by requiring project beneficiaries to participate in the project design and to contribute personal resources such as labor to their construction and maintenance (Aga et al., 2018; Casey, 2018; Wong and Guggenheim, 2018; Mansuri and Rao, 2012).

There are many potential mechanisms that could cause engagement with a project in this way to lead to more project commitment. The most straightforward mechanism is that, when someone has the power to design and contribute to a project, the outcome will be more in line with their preferences. They obtain a greater utility from the result and are thus more willing to contribute to it. There could also be information advantages when the end-consumer of a product or the beneficiary of a project knows more about the local conditions than the policymaker and can use this information to design more fitting products or projects. Moreover, a variety of social concerns, such as social image concerns, social monitoring or social learning, might play a role: someone might, for example, be less likely to break a rule they helped create for fear of being viewed as a hypocrite.

These mechanisms, which rely on the existence of some external constraint (e.g. information asymmetries, preference misalignment, social constraints), have received some attention in the economics literature. However, policymakers often also invoke a different kind of mechanism to justify participatory policymaking: a psychological effect on the individual level, directly impacting preferences. The idea is that engaging with a project, participating in the decision-making process, spending time and energy on it and putting in effort to design and create it, leads to a stronger emotional bond, or an increased feeling of psychological ownership (i.e. a feeling of being in charge of, or the "owner" of, a project without any formal claims to legal ownership). This psychological ownership is, in turn, hypothesized to affect the preferences, increasing the valuation of the outcome and the feeling of personal responsibility, leading to more commitment to personally maintain the project outcome.

In this chapter, I test this mechanism and answer two research questions: first, does participation, i.e. having decision power and having invested effort in the initial stage of a project, increase project commitment, i.e. project valuation and personal contribution? And second,

does psychological ownership play a mediating role in this relationship? The relationships investigated are illustrated in Figure 2.1 below.

Figure 2.1: Hypothesized relationships
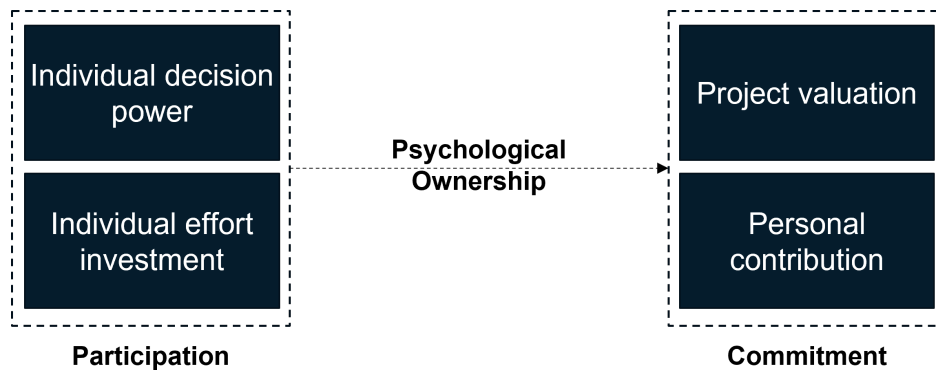
I first provide some real-world context through a case study from development economics. I look at the work of a non-governmental organization (NGO) supporting infrastructure projects in rural Nepal.[2] This NGO explicitly subscribes to the idea of community-driven development. Using a field survey of some of the project beneficiaries, I explore the (correlational) relationship between the amount of decision power villagers feel they had in the design as well as the amount of effort they feel they put into the construction of the project, and how much they value the project outcome as well as contribute to its maintenance. I find a positive relationship between perceived participation (i.e. self-reported decision power and effort) and project valuation. I then address the question of the underlying mechanism in an online experiment.

In the online experiment, 474 participants generate a donation to a charity. This donation is at risk of being destroyed and participants can commit to a number of real effort tasks to prevent this from happening (mirroring project maintenance). There are four treatment groups, following a 2x2 treatment design. Half of the participants have decision power, so they can decide which charity their donation will go to. The other half does not have decision power, so the charity is randomly selected for them by a computer. This is cross-randomized with a treatment condition where participants either need to invest effort to generate the donation or they receive the donation amount as a windfall gain. I measure the effect of the treatment on two outcomes: first, the valuation of the donation, elicited as willingness to pay (in terms of real effort tasks) for maintaining the donation. Second, the preference for personally contributing to maintain the donation as opposed to delegating this effort (costlessly) to another study participant.

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[2] For data protection reasons, the NGO prefers to remain anonymous. More information is available upon request.

I find that higher levels of psychological ownership are associated with increased personal contribution on average. Moreover, individuals already at the higher end of the personal contribution distribution are more likely to contribute the maximum amount themselves if they have both decision power and invested effort. However, exogenously varying the levels of participation to induce higher levels of psychological ownership proves ineffective: psychological ownership does not respond to the different treatment arms in my setting. Instead, it responds to *perceived* (i.e. self-reported) decision power and *perceived* (i.e. self-reported) effort invested, but there is a discrepancy between perceived and actual treatment in my experiment. The data suggest two explanations: first, participants are subject to an illusion of control. They feel like they had decision power if the outcome is in line with their preferences, even if they had no decision power at all. Second, having decision power decreases the cost of effort, so for the same task participants with decision power feel like they put in less effort compared to participants without decision power.

My work is related to three strands of literature. I explore the role that psychological ownership plays in the relationship between participatory project design and project commitment. As such, my research is first of all rooted in the Psychology literature on the concept of psychological ownership, which was established mainly through the seminal contribution by Pierce et al. (2001). They describe psychological ownership as "the feeling of possessiveness and of being psychologically tied to an object" (Pierce et al. (2001), p.299). It is rooted in three innate human needs, namely the need for efficacy (a desire to feel in control of your own life and actions), for self-identity (defining yourself and displaying your identity to others through interactions with your possessions), and for belonging (possessing and marking objects as belonging to your territory, thus feeling comfortable and at home). The feeling of psychological ownership arises in order to satisfy these needs via three routes. These are control, self-investment and intimate knowledge (Pierce et al., 2001; Campbell Pickford et al., 2016). My study focuses on two of these routes, control and self-investment, which are often used as tools in policy design.[3] Based on the Psychology literature, one would expect that increasing control and self-investment should increase psychological ownership.

Second, this project relates to a range of field experiments evaluating the effectiveness of programs with participatory designs. These have been conducted mainly in development economics and in organizational economics. In development economics, the idea of participatory project

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[3] I exclude the third, intimate knowledge, as I want to rule out effects due to differences in knowledge or information asymmetries.

design is the centerpiece of the so called community-driven development (CDD) approach, which has enjoyed sustained popularity over the past 20 years. However, the available evidence on its effectiveness has been mixed (Casey, 2018). CDD projects have been shown to deliver public goods, especially infrastructure projects, more effectively than centralized (government) programs (Casey, 2018). They also increase satisfaction with the project (Wong and Guggenheim, 2018) and can reach more remote areas (White et al., 2018). At the same time, there is no evidence for improved health, education or welfare from CDD projects (White et al., 2018), no increase in social cohesion or pro-social behavior (White et al., 2018) and CDD projects often fail to reach the poorest and most vulnerable, mainly benefiting the already better off (Mansuri and Rao, 2012). While these studies show that participatory design improves project outcomes in some cases, they do not provide clear evidence on the underlying mechanism or explain which aspects of a CDD project make it likely to succeed or fail. In organizational economics, the role of psychological ownership as a mechanism has been more explicitly researched in programs to improve employee satisfaction, retention rates, and identification with the firm (Han et al., 2010; Liu et al., 2012; Wang et al., 2019). These papers generally find a positive relationship between participatory management styles and firm identification, job satisfaction and performance (Han et al., 2010; Liu et al., 2012), though also increased territorial behavior and less knowledge sharing (Brown et al., 2014; Wang et al., 2019). In almost all of these studies, however, established relationships are based on observational and survey data and there is no exogenous variation and no attempt to directly manipulate the level of psychological ownership.

The final related strand of literature consists of laboratory experiments to determine the effects of autonomy, often in the context of work environments. This experimental literature has various facets. Most studies use a standard principal-agent model, where the principal can either impose a certain framework or delegate decisions about it to the agent. The frameworks include decisions about the payment scheme (Mellizo et al., 2017), the effort level provided (Bartling et al., 2013), the mission (Fehrler and Kosfeld, 2014; Cassar, 2019) or whether the work environment is ethical or not (Stein and Untertrifaller, 2020). Similar lab experiments have been conducted in the realm of political economy, where studies have focused on the results of different kinds of voting schemes or the effects of having a say about the voting scheme itself (Dal Bó et al., 2010; Grillos, 2022). Kleine et al. (2017) show that it may be enough to have "voice" rather than "choice", i.e. the opportunity to voice your opinion may be valued regardless of outcomes. They show that there is less retaliation toward a decision-making authority in a

dictator game if one had the opportunity to voice one's opinion, even if actual control over outcomes has not changed. Another facet of the experimental literature deals with public good games, showing that discussing and agreeing on the rules of the game and having more autonomy in providing contributions leads to higher contributions (Cadsby and Maynes, 1999; Kesternich et al., 2018; Alger et al., 2023).

The main caveat of all of these studies is that it is difficult to disentangle different mechanisms. In the field studies, information asymmetries, social image concerns, opportunity costs, and selection effects likely play a role. Similarly, the existing lab experiments can usually not distinguish the role of decision power from getting the most preferred outcome. Moreover, they usually involve interactions with other players or a principal, introducing social image concerns, reciprocity, belief updating and learning. Moreover, the field studies generally measure the effect of programs on the project level, e.g. whether a CDD project outperformed a centralized approach. This does not reveal whether participation can foster psychological ownership and improve project commitment on the *individual* level. In contrast to the field experimental literature in organizational economics, the lab experiments also rarely explicitly investigate psychological ownership as channel.

I contribute to the existing literature in three ways. First, I provide clean evidence from an online laboratory setting to pin down the role of psychological ownership, ruling out by design any alternative explanations usually also at play in other field and lab experiments. My experiment design allows me to shut down any social interaction, information or preference channels. It is an individual decision experiment without external observers or interactions with other participants. All individuals have exactly the same information. I also control for preferences across available charities, comparing only individuals who received their most preferred charity, either by chance or by choice. Second, I clearly separate the channels of effort provision and decision power, which are usually subsumed under a vague term of participation. This can bias results because, as previous literature has shown, effort provision is endogenous to decision power (Fehr et al., 2013). By clearly separating them from each other, these endogeneity concerns are removed. Third, I look not only at the value attributed to the project outcome, but also the willingness to personally contribute as opposed to letting someone else do the work. This allows me to distinguish between a generally increased utility derived from a project one participated in, and a feeling of responsibility for the project outcome. While the first measure has been studied in the previous literature, the second constitutes a novel feature of

my experiment design.

The rest of this chapter is structured as follows: Section 2.2 presents a real-world case study on a community-driven development project in Nepal as motivation for the online experiment. Section 2.3 describes the experiment design and the hypotheses. Section 2.4 presents the results and section 2.5 discusses some caveats. Section 2.6 concludes.

2.2   Case Study

Community-driven development is one of the most prominent applications of the assumption that participatory project design fosters psychological ownership and increases project commitment. The case study in this section provides a real-world example and some (correlational) evidence for this mechanism.

2.2.1   Background

The number of CDD projects has been increasing around the world over the past few decades. The World Bank alone supports 400 such projects in 94 countries and invests billions of dollars into them each year, totaling over 85 billion in the past decade (Mansuri and Rao, 2012; Casey, 2018). Many NGOs have adopted community-driven approaches in an endeavor to generate the most impact and ensure sustainable and long-lasting project outcomes. One such organization is an NGO providing development aid to remote rural communities in Eastern Nepal. They focus on projects related to income generation, public infrastructure, education, health, and cultural preservation and have reached more than 44,000 people across 13 communities to date.[4]

The organization's key mission statement is to promote what it refers to as "deep development", a concept that is equivalent to community-driven development. There are two defining aspects of this approach. "First, communities select projects each year based on their greatest needs and their shared vision for the future. By trusting in the wisdom of the communities, each project is highly valued and desired by all community members."[5] Second, "community members contribute labor and materials to each project."[6] In other words, the community members are actively involved in the decision-making process about the kind of project, and they are encouraged (and even required) to invest personal resources, in terms of money, labor, time, and effort, into the construction of the project.

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[4] More information and source available upon request.

[5] More information and source available upon request.

[6] More information and source available upon request.

The underlying assumption is that this fosters a greater commitment of the community members to the project, thereby enhancing its impact and its long-term sustainability. A program evaluation report from 2020 states that by using the deep development model "the community feels ownership, contributes to the project, and commits to maintaining and sustaining projects after they are completed" (Zook and Ryall (2020), p.13). Moreover, they expect that "Community contribution benefits the projects in several ways including advancing community buy-in, mitigating a 'handout' mentality, encouraging local ownership, and ultimately improve project sustainability" (Zook and Ryall (2020), p.15). This clearly demonstrates the fundamental assumption upon which the NGO's philosophy - and community-driven development more generally - is based: having been involved in the decision-making process regarding a project and having invested personal resources should lead to more successful and longer-lasting project outcomes through more psychological ownership.

To validate this assumption, the NGO ran a field survey to determine, on the individual level, the relationship between participation (feeling involved in the decision-making process and having invested personal effort) and project commitment (the valuation of the project outcome and continued contributions into its maintenance). This provides rare insights into the individual-level effects of participatory project design on the project success and sustainability.

2.2.2 Field Survey Design

The field survey was developed and administered by an external agency called InformEd International[7] and conducted from January to March 2020.[8] In total, 401 individuals from three different communities were surveyed. The three communities were selected based on the maturity level of the cooperation with the NGO, one community had been working with them for 13 years, one for six years and one for two years. In each community, different projects had been implemented, including the installation of sanitary facilities and clean drinking water systems, the construction of schools and setting up of parent-teacher meetings and the construction of farmland irrigation systems.

Table 2.1 provides descriptive statistics of the sample. Although the surveyed communities are some of the poorest in Nepal, essential facilities such as electricity, a toilet, a private cook stove and a mobile phone were available to the large majority of households. This was largely

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[7] https://www.informedinternational.org/
[8] The resulting proprietary data set was kindly shared with me for the purpose of this case study (Zook and Ryall, 2020), more information is available upon request.

the result of the NGO having provided them in earlier years.

Table 2.1: Summary statistics of the field sample

	(1) Mean	(2) Std. dev.	(3) Min	(4) Max	(5) Observations
Share of women	.559	.497	0	1	401
Average years of education	3.032	1.76	1	6	401
Number of adults in the household	1.793	.818	1	3	401
Number of children under 5 in the household	.598	.883	0	6	398
Number of children 5 to 17 in the household	1.358	1.319	0	10	399
Distance to village center (on foot, in min)	153.372	76.849	2	420	401
Share with electricity in the home	.823	.383	0	1	400
Share with toilet in the home	.990	.100	0	1	400
Share with cook stove in the home	.835	.372	0	1	400
Share with a mobile phone available	.948	.223	0	1	400

Notes: Summary statistics for the sample of 401 individuals surveyed by InformEd as part of the program evaluation.

The field survey included a wide variety of variables to evaluate the project impact. Two independent and two outcome variables are of interest for the research question at hand. The independent variables are the (perceived/self-reported) amount of decision power an individual had in the planning of the project and the (perceived/self-reported) level of effort invested into the construction of the project. The outcome variables of interest are the reported importance that the project is maintained (valuation) and the contribution to the maintenance of the project outcome.

The amount of decision power experienced by each individual is measured through a set of 18 questions. In each question, participants rated on a Likert scale from 1-4 their agreement with a statement about the inclusiveness and transparency of the decision-making process and their influence on the process (e.g. "I feel that I can influence decisions made by [the NGO]").[9] A single variable of decision power is constructed from these 18 questions using principal component analysis. The factor analysis reveals one latent factor strongly related to each of the 18 questions, suggesting that they indeed capture one underlying notion of "decision power". The measure of "decision power" is constructed by regressing the underlying latent factor on each survey item. Cronbach's alpha is very high, at 0.98, suggesting that some of the survey items may have been redundant, but nevertheless indicating that all items measure the same underlying concept. For each surveyed individual, there is thus one data point reflecting their perceived decision power

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[9] See Appendix 5.5 for the full list of statements. All questions refer to the (perceived) influence on the decision-making process, in which the community decides on the next project. This decision is made via a process called "dream mapping", where each individual formulates the dreams they have for their community and what is needed to achieve them. This activity is led by the NGO and usually around 40-50 community members attend (Zook and Ryall, 2020). In this meeting, the community decides on the next project. The exact method of decision is the responsibility of the community.

across all projects they were involved in.

Effort invested into the construction of a project is measured as the self-reported effort on a Likert scale from 1-4, elicited separately for each project someone was involved in.[10] The measure of effort is standardized on the project level, such that for each project, the effort measure reflects deviations from the mean effort level for each project. These standardized effort scores are averaged across all projects for each participant. For each surveyed individual, there is thus one value of average effort invested across all projects.

For the first outcome variable, the valuation of the project outcome, participants were asked how important it is to them that the outcome of the project is maintained. This is measured on a 4-point Likert scale and is standardized and averaged across all projects for each individual.

The second outcome variable is contribution to maintenance. The survey records if individuals contributed to maintenance of a project in one of four ways: project design, manual labor, providing construction materials, providing money. For each type of contribution, the survey records a binary measure whether the type of contribution occurred. The number of ways in which someone contributed to maintenance are aggregated to obtain a measure for contribution with a value between 0 and 4. This measure is again standardized and averaged across all projects for each individual. Appendix 5.5 provides a tabular summary of all the variables and how they were measured.

It should be noted that all measures are self-reported and may include biases such as experimenter demand effects and consistency biases. This is indicated by the overwhelming majority of participants selecting only values of 3 and 4 on Likert scales when asked about their satisfaction, effort provided, and perceived benefits.[11] Second, since involvement in the decision-making process is voluntary, those selecting to get involved most likely differ from those who do not, i.e. the independent variables are not randomly varied but are subject to selection effects. To understand the selection effect better, Table 2.2 shows the influence of demographic factors on participation, i.e. which characteristics make it more likely that individuals actually (perceive to) have decision power and invest initial effort. The first row of Table 2.2 shows that decision power and effort provided in the initial construction are correlated. Those with one more standard deviation of perceived decision power also provide higher effort in construction by 0.17 standard deviations. This could either be causal, as previous literature has shown that having

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[10] This means that for each individual, there are between zero and four data points for effort, depending on the number of projects each individual was involved in (min: 0, max: 4).

[11] This is also the reason why the data is standardized, to capture that the Likert scales are most likely non-linear.

autonomy makes participants willing to supply more immediate effort (Fehr et al., 2013) or it could be due to selection effects, if those willing to participate in the decision process are also willing to provide more effort. In general, the amount of participation seems to be largely driven by the extent to which individuals identify with the community.

Three control variables measure identification with the community. They were identified using principal component analysis as three latent factors from a set of 24 questions on community involvement.[12] They are Belonging[13], Usefulness[14] and Familiarity[15]. Identification with the community across all three dimensions is significantly positively related to participation. None of the other demographic variables are particularly predictive of participation. I attempt to mitigate distortions from this non-random assignment of participation by controlling for community identification in the analyses below.

2.2.3 Results

The key result of the case study is that, on the individual level, higher levels of (perceived) decision power and (perceived) effort investment indeed correlate with a higher valuation of a project. This provides some tentative evidence that more participation correlates with a greater importance assigned to the project. However, no significant positive effect on the levels of contribution are observed. In this field setting, though, this may be due to other external, non-psychological constraints such as resource constraints and high opportunity costs.

Figure 2.2 graphically shows the positive relationships between perceived decision-power (top) and perceived effort invested (bottom) and the two outcomes, valuation (left) and contribution (right). These relationships are not very strong and there is a wide dispersion across individuals, yet a positive trend is visible. The effect of participation on the valuation of the project outcome, i.e. how important it is to an individual that the project outcome is maintained, appears stronger, with the data points being clustered more closely around the regression line of best fit in the left-hand panels.

The positive relationships seen in the graphical representation are partially statistically significant, as seen in Table 2.3. Without any controls in Column (1), the effects of both higher perceived decision power and higher perceived effort invested are highly statistically significant

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[12] These 24 questions are part of "The Sense of Community Index" developed by Community Science (see https://senseofcommunity.com/soc-index/) and were used by InformEd with the permission of Community Science in their evaluation. See Appendix 5.5 for the full list of statements.

[13] e.g. "Being a member of this community is part of my identity"

[14] e.g. "I get important needs of mine met because I am part of this community"

[15] e.g. "I can recognize most of the members of this community"

	(1) Decision power	(2) Level of effort
Decision power		0.171*
		(0.10)
Female	-0.097	-0.124
	(0.07)	(0.10)
Years of education	0.032	-0.017
	(0.02)	(0.03)
Work outside the home	-0.122*	-0.111
	(0.07)	(0.10)
Number of adults in the household	-0.090**	-0.092*
	(0.04)	(0.06)
Number of children under 5 in the household	-0.004	0.057
	(0.04)	(0.05)
Number of children 5 to 17 in the household	-0.012	0.015
	(0.02)	(0.04)
Distance mid	-0.227	-0.093
	(0.19)	(0.24)
Distance far	-0.188	-0.185
	(0.18)	(0.223)
Belonging to community	0.419***	0.381***
	(0.04)	(0.07)
Usefulness of community	0.642***	0.307***
	(0.04)	(0.08)
Familiarity with community	0.105***	0.089
	(0.04)	(0.06)
Constant	0.383*	0.171
	(0.21)	(0.10)
$Adj.R^2$	0.602	0.484
Observations	373	246

Notes: OLS regression of the self-reported decision power and effort investment variables on demographic explanatory variables. *Work outside the home* is a dummy variable equal to 1 if the respondent has a job outside the home (not including agriculture on private land) and 0 otherwise. *Distance mid* is a dummy variable equal to 1 if it takes the respondent between 31 and 120 minutes to walk to the town center, *Distance far* is a dummy variable equal to 1 if it takes the respondent more than 120 minutes to walk to the town center. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

and explain around 25% of the variation in valuation. Including demographic controls and community fixed effects in Column (2) reduces the significance, but both coefficients remain significant at the 10% level. The valuation of the project outcome does not depend on how often someone uses the facility or how satisfied they are with it. It is also independent of community identification. This suggests that there is a mechanism on the individual level linking participation to project valuation.

On the other hand, contribution to maintenance is not affected by participation, as seen in Columns (3) and (4) of Table 2.3. While without controls, effort does significantly affect the level of contribution (3), this is absorbed by other controls in Column (4). Contribution thus responds differently to participation than valuation. In fact, there is hardly any positive correlation between the valuation and the actual contribution to maintenance, the correlation coefficient is 0.09. This demonstrates that it is interesting to look at these two outcomes separately because

Figure 2.2: Relationships between participation and commitment
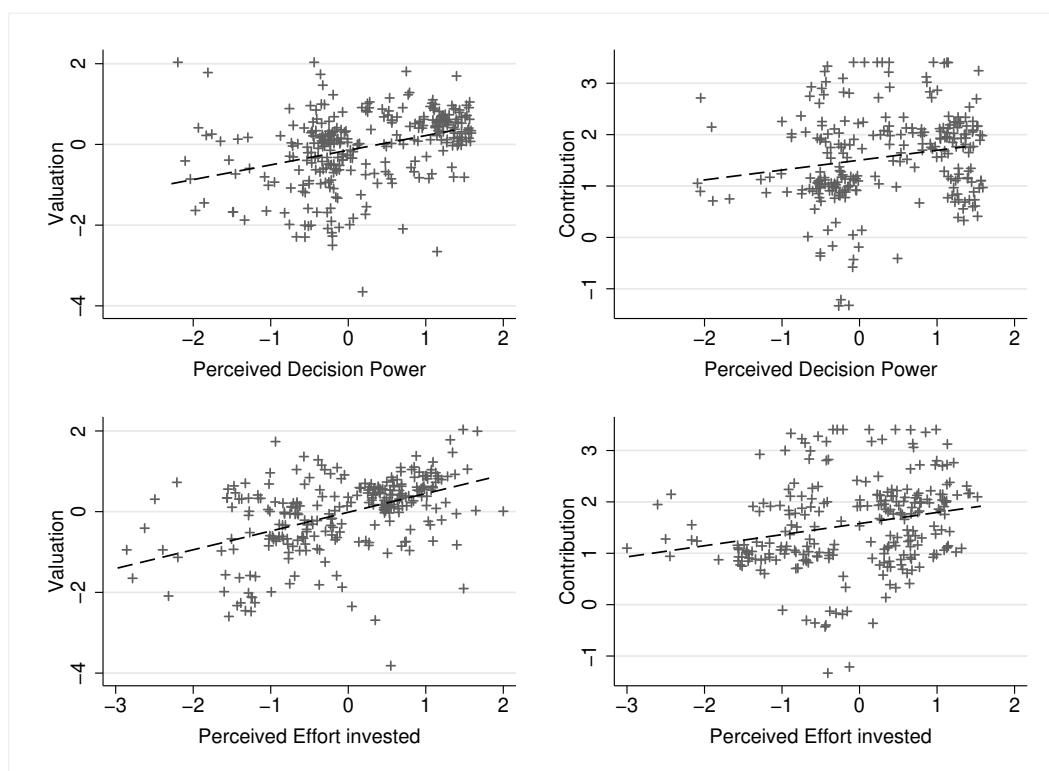
Notes: These scatter plots depict the relationships between the self-reported levels of decision power (top panels) and effort invested (bottom panels) with the outcome variable of valuation (left-hand side panels) and contribution (right-hand side panels). Each cross represents one individual, with variables averaged across all projects an individual was involved in. Outcome measures are standardized on the project level. A linear line of best fit is drawn through each scatter plot.

they do not trivially measure the same thing. The online experiment therefore includes both as outcome measures, as described in section 2.3.

The observed lack of responsiveness of contribution may possibly be explained by external constraints keeping individuals from contributing more to project maintenance. Especially those valuing the project highly might be the poorest and most vulnerable members of the community, thus the least able to provide long-term maintenance contributions. An indication for this is the significant negative effect of *Use frequency* on contribution in Column (4) of Table 2.3. It suggests that those who use the facilities provided by the NGO most are the least able to contribute to their maintenance. Moreover, a strong sense of community identification has a highly positive effect on contribution. This is in line with the information obtained from qualitative interviews with some of the community members, who reported that community members are helping each other out, covering each others' contribution requirements when someone cannot contribute for health or family reasons (see Zook and Ryall (2020), p.3). Those feeling most strongly connected to the community might be the ones stepping in to cover more vulnerable community members'

Table 2.3: Valuation and contribution

	(1)	(2)	(3)	(4)
	Valuation		Contribution	
Decision power	0.197***	0.196*	0.048	0.035
	(0.07)	(0.10)	(0.08)	(0.11)
Effort invested	0.344***	0.158*	0.189***	0.075
	(0.08)	(0.08)	(0.06)	(0.10)
Belonging to community		0.002		0.301**
		(0.09)		(0.12)
Usefulness of community		-0.118		0.060
		(0.09)		(0.12)
Familiarity with community		0.088		-0.075
		(0.06)		(0.08)
Satisfaction		0.171		0.196
		(0.14)		(0.17)
Perceived benefit		0.268*		0.078
		(0.15)		(0.15)
Use frequency		0.081		-0.206**
		(0.07)		(0.08)
Constant	-0.081	-0.049	1.585***	0.629
	(0.06)	(0.30)	(0.07)	(0.48)
Demographic controls	No	Yes	No	Yes
Village fixed effects	No	Yes	No	Yes
$Adj.R^2$	0.248	0.354	0.049	0.278
Observations	257	204	247	194

Notes: OLS regression of the valuation and contribution on perceived decision power and effort invested. *Demographic controls* include gender (a female dummy), years of education, a dummy for working outside the home, number of adults in the household, number of kids below 5, number of kids between 5-17, distance to town center in minutes when walking on foot. *Satisfaction*, *Perceived benefit* and *Use frequency* are measured on a 4-point Likert scale and are standardized and averaged across projects for each participant (in the same manner as the effort variable). Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

contributions, rather than those valuing the project the most or having participated most in its design.

This finding presents an important learning for policymakers. One reason for the limited effectiveness of some CDD projects might be that they are targeted at giving a voice to the most vulnerable, who may be facing large external constraints and high opportunity costs of participating and contributing (Grillos, 2022; Aga et al., 2018). While the involvement in decision-making and effort investments may have positive effects, those with little means at their disposal do not have the ability to substantially increase their contributions to maintenance. Those contributing most to the maintenance and those most valuing a project may not be the same people. The lab experiment described in the next section can help understand the effect of participation in the absence of such constraints.

2.3.1   Sample

The online experiment was run with 474 participants from the student subject pool at the "Munich Experimental Laboratory for Economic and Social Sciences" (MELESSA) in February and March 2021. It took each participant 30-40min to complete the experiment. Participants received a fixed participation fee of 10 EUR and could earn an additional 6 EUR throughout the experiment. Table 2.4 shows some descriptive statistics for the sample. The demographic characteristics are balanced across treatment groups (see Table B1 in the appendix for a full balance table). The experiment was run in 13 sessions. In each session, between 34 and 39 individuals participated. Only three participants did not complete the experiment. Each of these participants had been assigned to a different treatment group, so biased attrition can be ruled out.

Table 2.4: Summary statistics of the lab sample

	Mean	Std. dev.	Min	Max	Observations
Age	24.825	5.853	18	65	474
Share of women	.678	.219	0	1	466
Student	.814	.389	0	1	474
Economics student	.124	.330	0	1	474
Highest degree: High school	.494	.500	0	1	474
Highest degree: Bachelor	.297	.458	0	1	474
Highest degree: Master	.154	.361	0	1	474
Donating regularly	2.23	.877	1	4	474

Notes: Summary statistics for the sample of 474 participants of the lab experiment. *Share of women* does not include eight participants preferring not to disclose their gender.

2.3.2   Treatment

After entering the experiment from their home computers and providing consent, study participants are first introduced to two real effort tasks, the "slider task" and the "summation task". In the slider task, participants are presented with a slider set to a random number between 1 and 100 and have to move the slider to match another number that is presented as target above the slider. In the summation task, participants face a 3x3 grid with a number with one decimal in each cell and have to identify the two numbers in the grid that sum to 10.0 exactly. Of each task, participants perform 3 practice rounds in order to get familiar with the tasks.

In the next step, participants learn that they generate a donation to one of three charities,

the Against Malaria Foundation[16], Cool Earth[17] or GiveDirectly[18]. They receive some general information about each charity, including short promotional videos. Subsequently, they rank the charities by personal preference, allocating a total of 6 points between them, so that more preferred charities receive more points.[19]

At this point, participants are divided into treatment groups. Randomization into the treatment groups occurs on the individual level. There are four treatment groups, using a 2x2 treatment design. After having ranked the charities, half of the participants are explicitly asked to decide which of the three charities their donation should go to ("decision power"). They do so by selecting the charity they want to donate to from a dropdown menu. The other half is randomly allocated to one of the three charities ("no decision power"). This random allocation is skewed in such a way that each participant is allocated to their highest ranked charity with 90% probability. Participants are not aware of the probabilities assigned to each charity and are only told that the charity is selected randomly by a computer. This skewed probability limits the number of participants with misaligned preferences and thus ensures that preference matching is not the observed mechanism. To keep the number of clicks constant across groups, participants in the "no decision power" group click on a button that says "get random charity" and the randomly selected charity name is then displayed on the screen. In order to re-emphasize how the charity was selected, throughout the rest of the instructions the charity is always referred to as "your chosen charity" or "the randomly selected charity".

This treatment dimension is cross-randomized with whether participants need to subsequently solve 20 slider tasks in order to earn the money that makes up their donation ("effort") or receive the full monetary amount as a windfall gain ("no effort"). For participants in the effort treatment, 20 sliders are presented and it says "+ 5 points" in green bold letters next to each slider, to emphasize that each slider they solve earns them money. Participants in the no effort group instead see a screen informing them of their total endowment of 100 points. They also have to complete 20 sliders later on in the study, as a 'placebo effort', however it is made clear that this has no effect on the donation earned and the green text is omitted. For the effort group, the donation amount is referred to as "100 points earned" throughout the remaining instructions, whereas it is referred to as "100 points received" for the no effort group. The

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[16] Funding the provision of insecticide-treated bed nets to reduce Malaria in several African countries.
[17] Protecting endangered rainforests by supporting local indigenous communities.
[18] Providing direct and unconditional cash payments to individuals in need.
[19] Section 5.3 in the appendix provides some details on how participants ranked the charities and the strength of their preference ordering.

number of effort tasks and the total donation amount is fixed for all participants at 100 points (equivalent to 4 EUR) to avoid any endogeneity in the initial level of effort provided. Figure 2.3 illustrates the four treatment groups.

Figure 2.3: Treatment groups
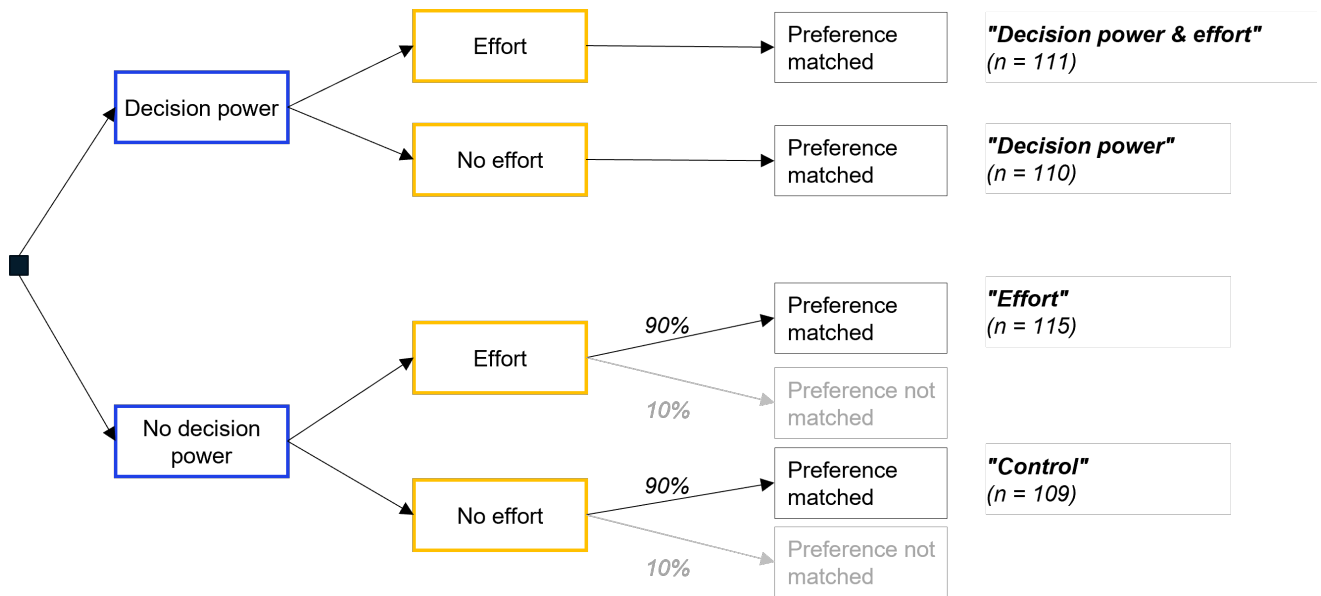
2.3.3 Outcome Variables

Participants then answer several questions about their usual donation behavior. This provides a measure of baseline pro-social preferences (proxied by whether they donate regularly). They then receive the information that half of the donation they have accumulated up to this point is at risk of being destroyed. To prevent this from happening and to save the donation, they can commit to solving a certain number of summation tasks. There are two different states of the world ("scenarios") they could be in and they have to make a choice about how many summation tasks to commit to in each scenario in order to try and save the donation. The two scenarios provide the two primary outcome measures.

The first scenario is called the "one-person scenario" and the primary outcome variable measured is the participants' valuation of the project outcome (i.e. how much they value their donation to charity). This is measured as the participants' willingness to pay for preventing half of the donation from being destroyed. The willingness to pay is measured in terms of real effort tasks they are at maximum willing to commit to. This measure is elicited using a Becker-

DeGroot-Marschak (BDM) mechanism: the participants indicate how many summation tasks, between 0 and 30, they are at maximum willing to perform to save the donation ("WTP"). They indicate this using a slider from 0 to 30 and placing it at the maximum number of tasks they are willing to commit to. A number between 1 and 30 is randomly selected from a uniform distribution by a computer to indicate the required number of summation tasks ("required investment"), so each number has the same probability of being selected. If the WTP exceeds or equals the required investment, participants have to perform the number of summation tasks determined by the computer and the full donation is saved. If the WTP is less than the required investment, participants do not perform any summation tasks and part of the donation is destroyed. This outcome measure is thus a number between 0 and 30.

The second scenario is called the "two-person scenario" and the primary outcome variable measured is the participants' preference for personally contributing (i.e. exerting the effort needed to save the donation) over someone else providing the same contribution. In this scenario, the price of saving the donation is fixed at 35 summation tasks. Participants can split the 35 summation tasks between themselves and another study participant. The participants indicate their choice by typing the number of tasks they want to perform themselves into a box, which creates a pie chart displaying the proposed split in terms of percentages, highlighting the share they assign to themselves. This pie chart also indicates how much of the donation they would thereby save themselves. While the outcome is thus always the same for the charity (full donation saved), it is made salient to the participants that they personally only save that share of points corresponding to the share of tasks they allocate to themselves.

The other study participants, to whom the tasks can be delegated, are randomly selected from a separate sample, recruited specifically to perform the delegated real effort tasks.[20] There is no way in which they can shirk their delegated tasks: If someone drops out from this sample before completing the tasks, they are replaced by another randomly chosen subject to complete all the delegated summation tasks. Thus, the tasks are completed for sure and participants are explicitly made aware of this (to prevent any confounding trust issues about others' reliability). This outcome measure is thus a number between 0 and 35.

Using the strategy method, both outcomes are elicited for all participants. One scenario is randomly selected to be payoff-relevant. To avoid any anchoring or internal consistency concerns,

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[20] The sample for this was recruited on Prolific. The Prolific workers are randomly paired with one study participant and are presented with the total number of summation tasks their partner has delegated. Once they have completed the summation tasks, they are done. This took 5-10min on average and they were paid a fixed amount of 1.25GBP. This part of the study was run on 31.05.2021

the order of the two scenarios is randomized.

Participants then answer a questionnaire to measure the secondary outcome measure, the level of psychological ownership. This is measured using a validated survey-instrument from the field of psychology (Van Dyne and Pierce, 2004). The survey measure is adjusted – following e.g. Baer and Brown (2012) and Brown et al. (2014) – to remove any questions concerning collective ownership, as the focus is on individual decision behavior. The final survey consists of four statements and asks about the participant's level of agreement on a 7-point Likert scale. The statements are (using the charity Cool Earth as example):

1. "This is MY donation to Cool Earth"

2. "It is hard for me to think of this donation to Cool Earth as MINE" (scored in reverse)

3. "I feel a very high degree of personal ownership for this donation to Cool Earth"

4. "I sense that this is MY donation to Cool Earth"

The final psychological ownership score is calculated as the average across the 4 questions (whereby the score of item 2 is measured as 8 minus the selected score). This outcome measure is thus a number between 1 and 7. Cronbach's alpha is relatively high at 0.86, increasing the confidence that the four questions capture a single underlying concept of psychological ownership.

Afterwards, participants learn which scenario they were in and whether their choice was sufficient to save the donation. If applicable, they complete the number of summation tasks they had committed to and are notified of the final donation to the charity. They then complete a questionnaire to measure their proneness to the sunk cost effect, taken from Ronayne et al. (2021). This consists of eight hypothetical scenarios in which participants select on a scale from 1 to 6 how much they tend toward restarting a project once they receive new information (1) or keep going with it (6). Higher values are interpreted as an individual being more prone to the sunk cost effect. This measure is included as control in the main analysis to rule out a competing mechanism to higher psychological ownership: the sunk cost effect. It could be argued that individuals particularly prone to the sunk cost effect commit to providing more effort, simply because they have already provided effort before and do not want to see this effort wasted. A positive relationship between initial effort and project commitment could then be driven by the sunk cost effect. The measure of proneness to the sunk cost effect is therefore

included to control for this channel. In the final step, the participants answer a few demographic background questions.

The full experiment instructions are included in Appendix 5.6. The experiment was run using oTree (Chen et al., 2016). Figure 2.4 summarizes the procedure. Grey dots indicate the elicitation of control variables, black dots the treatment assignment and outcome measurements.[21]

Figure 2.4: Experiment procedure
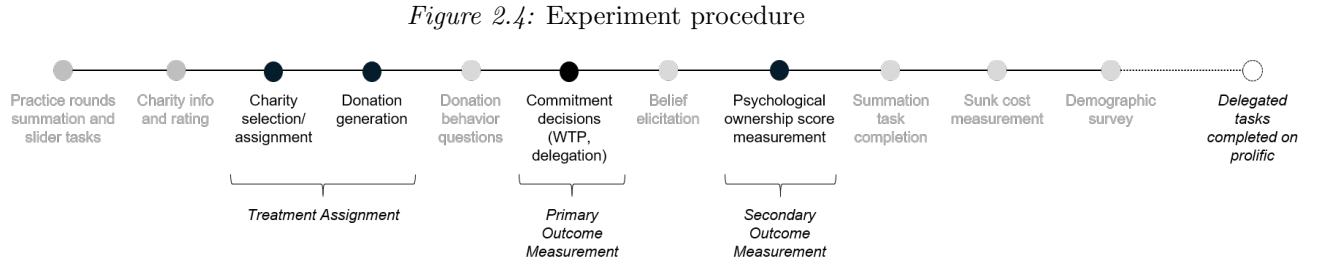
2.3.4 Hypotheses

The main results of this study are estimated using a simple OLS regression framework, where the two primary outcomes and one secondary outcome are regressed on the treatment indicators using the following specification:

$$y_i = \beta_0 + \beta_1 D_i + \beta_2 E_i + \gamma X_i + \epsilon_i \tag{2.1}$$

Here, y_i refers to the valuation or contribution (primary outcomes), or psychological ownership score (secondary outcome), D_i is a treatment dummy equal to 1 if the individual i had decision power and 0 otherwise, E_i is a treatment dummy equal to 1 if the individual i had to invest effort to earn the donation and 0 otherwise. X_i is a vector of controls including age, gender, student status, subject studied, usual donation behavior, and an indicator for proneness to the sunk cost effect, taken from Ronayne et al. (2021). ϵ_i is the error term.

Hypotheses 1a to 1c refer to the first research question, whether having decision power and investing effort has an effect on the primary and secondary outcomes.

Hypothesis 1a *Having decision power compared to not having decision power increases the valuation, personal contribution and level of psychological ownership ($\beta_1 > 0$).*

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[21] Section 5.3 provides further explanations for some of the design choices.

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Hypothesis 1b *Investing initial effort compared to not investing initial effort increases the valuation, personal contribution and level of psychological ownership ($\beta_2 > 0$).*

An interaction term is then introduced to determine the interdependence between the two treatment conditions, using the following specification:

$$y_i = \beta_0 + \beta_1 D_i + \beta_2 E_i + \beta_3 (D_i \times E_i) + \gamma X_i + \epsilon_i \tag{2.2}$$

Hypothesis 1c *The effect of having decision power on the valuation, personal contribution and level of psychological ownership depends on whether effort was invested, and vice versa ($\beta_3 \neq 0$).*

Hypothesis 2 relates to the second research question, on the role of psychological ownership as mediator. Following Baron and Kenny (1986), this is done using a set of three sequential regressions: "first, regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator." (Baron and Kenny (1986). p.1177). The first step uses the results of equation 2.2 with psychological ownership as y_i. The second step uses the results of equation 2.2 with valuation and contribution as y_i. It thus remains as third step to re-run equation 2.2 including psychological ownership as additional regressor, see equation 2.3. For psychological ownership to be a mediator of the effect of participation on project commitment, including the mediator as regressor should capture part (incomplete mediation) or all (complete mediation) of the effect of the treatment on the outcomes.

$$y_i = \beta_0 + \beta_1 D_i + \beta_2 E_i + \beta_3 (D_i \times E_i) + \gamma X_i + \beta_4 PO_i + \epsilon_i \tag{2.3}$$

This specification, including the variable of psychological ownership score PO_i as regressor, allows testing the final hypothesis.

Hypothesis 2 *Psychological ownership is a mediator for the effect of the treatment conditions on the primary outcomes ($\beta_4 > 0$).*

2.4 Results

2.4.1 Main Results

The three bar graphs in Figure 2.5 plot the means of the valuation, contribution and psychological ownership for each treatment group. From left to right these are the control group (no decision power, no effort), the group with decision power only, effort only, and both decision power and effort. As can be seen from Figure 2.5, the expected result is not visible. There is no difference between the means of any of the treatment groups across any of the outcomes.

Figure 2.5: Average valuation, contribution and psychological ownership across treatments
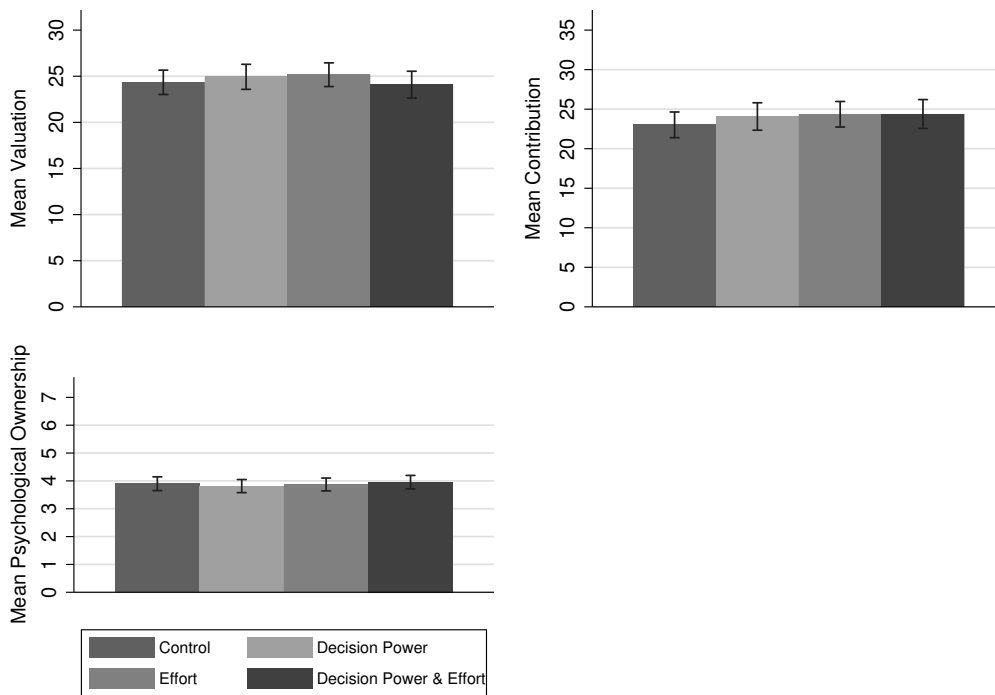
Notes: These bar graphs plot the average values for the primary outcomes *valuation* (top left) and *contribution* (top right) and the secondary outcome *psychological ownership* (bottom left) across all individuals (conditional on matched preferences) in each treatment group. From left to right, the bars represent the treatment groups with i) no decision power and no effort (control group), ii) decision power only, iii) effort only and iv) both decision power and effort. Error bars represent the 95% confidence intervals.

The same result can be seen when running the regressions according to specifications 2.1 and 2.2 described above. Table 2.6 shows the coefficients of regressing the three outcomes on the treatment dummies, without interaction terms in Columns (1), (3), and (5) and with interaction terms in Columns (2), (4), and (6). None of the coefficients on the decision power and effort treatments nor the interaction effects are significantly different from 0. In fact, all coefficients reveal tightly estimated null effects.

Table 2.5: Valuation, contribution and psychological ownership across treatments

	(1)	(2)	(3)	(4)	(5)	(6)
	Valuation		Contribution		Psychological Ownership	
Decision power	-0.368	0.614	0.701	1.296	-0.003	-0.082
	(0.69)	(0.95)	(0.86)	(1.18)	(0.12)	(0.17)
Effort	-0.036	0.941	0.743	1.336	0.002	-0.077
	(0.67)	(0.96)	(0.86)	(1.19)	(0.12)	(0.17)
Effort × decision power		-1.954		-1.185		0.157
		(1.37)		(1.75)		(0.24)
Constant	27.801***	27.108***	21.685***	21.265***	2.688***	2.744***
	(2.49)	(2.57)	(3.30)	(3.37)	(0.41)	(0.43)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
$Adj.R^2$	0.045	0.048	0.024	0.023	0.029	0.027
Observations	439	439	439	439	439	439

Notes: OLS regression of the primary outcomes *valuation* (Columns (1) and (2)), *contribution* (Columns (3) and (4)) and *psychological ownership* (Columns (5) and (6)) on the treatment dimensions. Odd columns show the effect of having decision power and effort separately, even columns add the interaction term of both treatment dimensions. Controls include age, gender, student status (dummy), being an economics student (dummy), usual donation behavior (self-reported frequency of donations on a 4-point Likert scale), and an indicator for proneness to the sunk cost effect. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Looking at the distributions of the outcome variables, a difference can be observed when focusing on the upper range of the contribution variable. On average, 1.4 more tasks are allocated to oneself when both decision power and effort are present (24.4 compared to 23.0 in the control group), though as shown above this difference is not statistically significant. Comparing the distributions reveals that those participants already in the upper end of the distribution, i.e. those who would have allocated at least 20 of the tasks to themselves anyway, are more likely to allocate more and particularly all 35 tasks to themselves when they had both decision power and invested effort. Figure 2.6 shows the distributions comparing those with both decision power and effort and those in the control group. It can be seen that some mass shifts from allocating anywhere between 20 and 34 to allocating all 35 tasks to oneself instead.

A linear probability model to estimate the effect of having both decision power and effort on the probability of an individual assigning all tasks to themselves shows that this probability is higher by 12.8 percentage points, or more than 50% (from a baseline of 22%). This difference is statistically significant at the 5% level (p-value = 0.042).

There are no further differences in the distributions of the outcomes between the treatment groups. A Kolmogorov-Smirnov test comparing the distributions of the valuation and psychological ownership for the control group and the treatment group with both decision power and effort cannot reject the null hypothesis that the distributions are identical (combined p-values: 0.981 for valuation and 0.812 for psychological ownership). The distribution of psychological owner-ship scores does not vary by treatment group, it remains approximately normally distributed

Figure 2.6: Distribution of the personal contribution
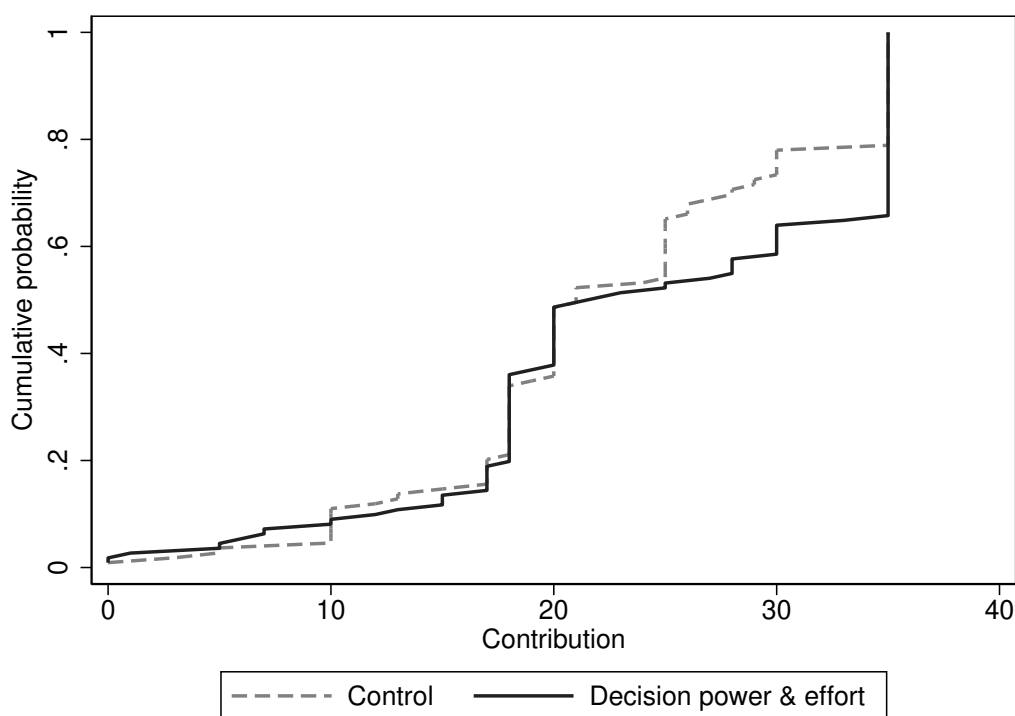
across all treatment groups.[22]

The results of specification 2.3, regressing the primary outcomes on both the treatment condition and the proposed mediator, psychological ownership, are presented in Table 2.6. The level of psychological ownership is significantly related to the contribution. A one point increase in psychological ownership score (on a scale from 1 to 7) leads to one more task being allocated to oneself rather than delegated. The overall valuation of the project, on the other hand, is not affected by the psychological ownership score. This suggests that if participants could be made to feel a higher degree of psychological ownership, their willingness to perform more tasks themselves might increase as well. However, the exogenous treatment variation in participation does not affect psychological ownership scores.

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[22] A graphical illustration of the distribution of the psychological ownership scores by treatment group is included in Figure B1 in the appendix. In three of the four groups (all except the treatment group with both decision power and effort), both a kurtosis skewness test and a Shapiro-Wilk test of normality failed to reject the null hypothesis of a normally distributed psychological ownership score. Only in the treatment group with both decision power and effort was normality rejected with a p-value for the skewness kurtosis test of 0.01 and a p-value for the Shapiro-Wilk test of 0.09.

Table 2.6: Effect of the mediator on the valuation and contribution

	(1) Valuation	(2) Contribution
Decision power	0.641	1.380
	(0.95)	(1.17)
Effort	0.966	1.414
	(0.96)	(1.18)
Effort × decision power	-2.006	-1.345
	(1.37)	(1.73)
Psychological ownership score	0.335	1.019***
	(0.27)	(0.37)
Constant	26.189***	18.470***
	(2.65)	(3.39)
Controls	Yes	Yes
$Adj.R^2$	0.049	0.041
Observations	439	439

Notes: OLS regression of the primary outcomes *valuation* and *contribution* on the treatment dimensions and on the mediator *psychological ownership*. Controls include age, gender, student status (dummy), being an economics student (dummy), usual donation behavior (self-reported frequency of donations on a 4-point Likert scale), and an indicator for proneness to the sunk cost effect. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

2.4.2 Perceived Decision Power and Effort

While the actual treatment variation in decision power and effort invested does not affect psychological ownership scores, *perceived* decision power and *perceived* effort invested, as self-reported by the participants, appear to have an effect. There is thus a discrepancy between actual and perceived (i.e. self-reported) treatment in my experiment.

Perceived decision power is measured as average of three questions[23], asking participants to rate their perceived control over the donation generating process on a 7-point Likert scale. Perceived effort is measured by asking participants about how much effort they feel they put into generating the donation, also on a 7-point Likert scale. Column (1) of Table 2.7 shows the results from regressing psychological ownership scores on perceived decision power and perceived effort invested. The results in Column (1) of Table 2.7 suggest that there is a positive correlation between perceived participation and psychological ownership. Moreover, perceived decision power and perceived effort invested also significantly affect the primary outcomes, as can be seen in Columns (2) and (3) of Table 2.7. Perceived effort, in particular, plays a large role in affecting valuation and contribution, while perceived decision power affects valuation only. This suggests that feeling like you have decision power and feeling like you invested effort increases psychological ownership and project commitment. This is also in line with the findings from

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[23] These questions were designed to resemble some of the questions measuring decision power in the field study described in 2.2. The list of questions can be found in the full experiment instructions in Appendix 5.6. Cronbach's alpha is 0.64.

the case study described in section 2.2.3, which suggested effects of perceived (i.e. self-reported) decision power and effort on valuation in particular.

Table 2.7: Effect of perceived decision power and effort on the primary and secondary outcomes

	(1) Psychological Ownership	(2) Valuation	(3) Contribution
Perceived decision power	0.173**	0.858**	-0.472
	(0.07)	(0.39)	(0.50)
Perceived effort	0.203***	0.866***	1.354***
	(0.04)	(0.23)	(0.32)
Psychological ownership score		-0.108	0.594
		(0.28)	(0.38)
Constant	0.922*	19.671***	18.031***
	(0.54)	(3.19)	(4.14)
Controls	Yes	Yes	Yes
Adj. R^2	0.123	0.097	0.085
Observations	439	439	439

Notes: OLS regression of the *psychological ownership* in Column (1) and the primary outcomes *valuation* in Column (2) and *contribution* in Column (3) on the perceived decision power and effort. *Perceived Decision Power* and *Perceived Effort* are both measured on a scale from 1-7, whereby *Perceived Decision Power* is the average across three questions each separately measured on a scale from 1-7. Controls include age, gender, student status (dummy), being an economics student (dummy), usual donation behavior (self-reported frequency of donations on a 4-point Likert scale), and an indicator for proneness to the sunk cost effect. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The interesting question this raises is why the treatments failed to affect perceived decision power and perceived effort in the way that was intended. One explanation is, of course, that the treatment was just not strong enough. However, the treatment was similar in strength and design to previous lab experiments (such as Folse et al. (2012); Bartling et al. (2013); Fehr et al. (2013); Aga et al. (2018)), except that it cleanly removed any competing mechanisms (such as social interactions). Moreover, it is not the case that the treatment had no effect. Instead, the treatment did affect perceived decision power and effort[24], just not in the way that was anticipated. In particular, the data suggest two effects that distorted how participants responded to treatments: an illusion of control and a change in the cost of effort.

2.4.3 Illusion of Control

The illusion of control refers to a finding in the prior literature that participants tend to attribute random outcomes that are in line with their preferences to their own actions (Sloof and von Siemens, 2017). In this study, something similar can be observed as well, illustrated in Figure 2.7. Comparing the perceived decision power of those in treatment groups with decision power (who chose the charity themselves, on the right in Figure 2.7) to those without decision power (random assignment, on the left in Figure 2.7), and splitting this by who received their

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[24] See Table B2 for a formal regression of perceived on actual treatments.

preferred charity provides interesting insights. Those who received their preferred charity by chance (left light gray bar in Figure 2.7) have a stronger feeling of having had decision power than those who did not receive their preferred charity by chance (left dark gray bar), even though both were subject to the same random choice process and had no influence over the outcome. This difference is statistically significant (p-value = 0.005).[25] In fact, those receiving their preferred charity by chance have the same amount of perceived decision power as those who could actually choose (compare both light grey bars in Figure 2.7). This indicates an illusion of control. This illusion of control interferes with the treatment assignment and explains why there was no observed difference between the outcomes for groups with and without decision power. The large majority of those in the treatment groups without decision power did not feel like they had any less decision power than those who could choose, because with a 90% probability they received their preferred outcome, which led them to fall for the illusion of control.

Figure 2.7: The illusion of control
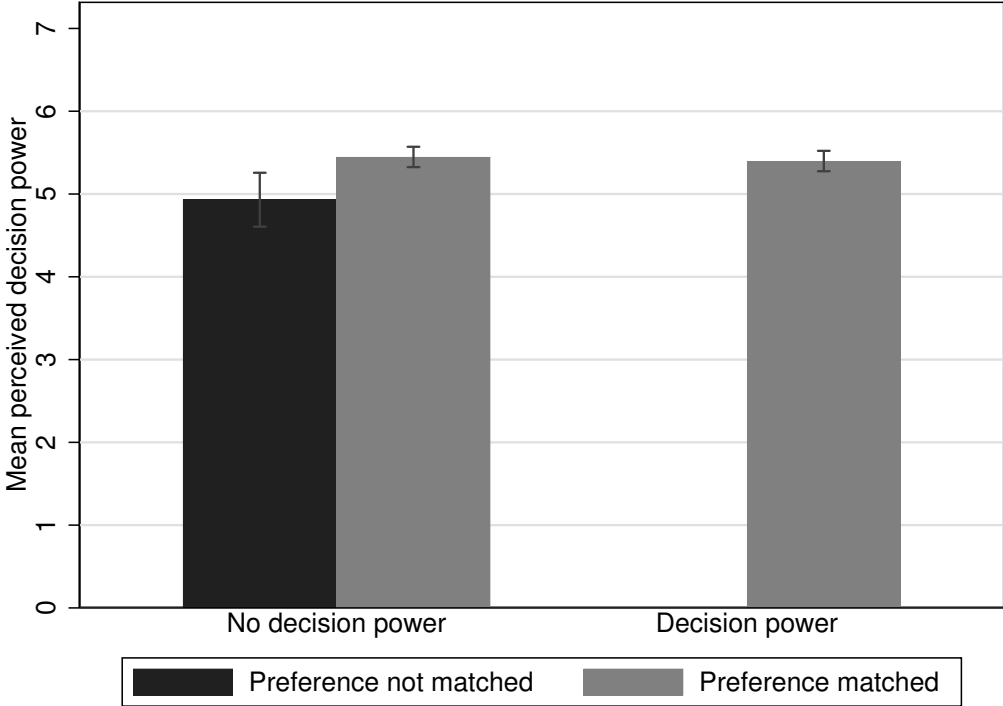
Notes: This bar graph represents the average perceived decision power by different subject groups, split by whether they were in a treatment with decision power (right) or without (left) and whether they donated to their preferred charity (light grey) or not (dark grey). Error bars represent 95% confidence intervals. The group of individuals not having their preference matched is small, with n=29, so confidence intervals are wider on the leftmost bar.

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[25] This also translated into a lower project valuation for those who did not get their preferred charity by chance compared to those who did get their preferred charity by chance (WTP of 20.8 compared to 24.8, p-value = 0.0054). See Figure B2 in the appendix.

2.4.4 Change in Effort Costs

A second finding explaining the discrepancy between actual and perceived treatment is that the perceived amount of effort invested was affected by the actual decision power. Participants did not feel like they put in any more effort when they had to work for their endowment as opposed to receiving it as windfall gain. However, they did feel like they put in substantially less effort when they could select their charity than when they were randomly assigned to it. Figure 2.8 illustrates that those who could choose the charity felt like they put in significantly less effort than those receiving their preferred charity by chance, regardless of the effort treatment.

Figure 2.8: Perceived effort across treatment groups
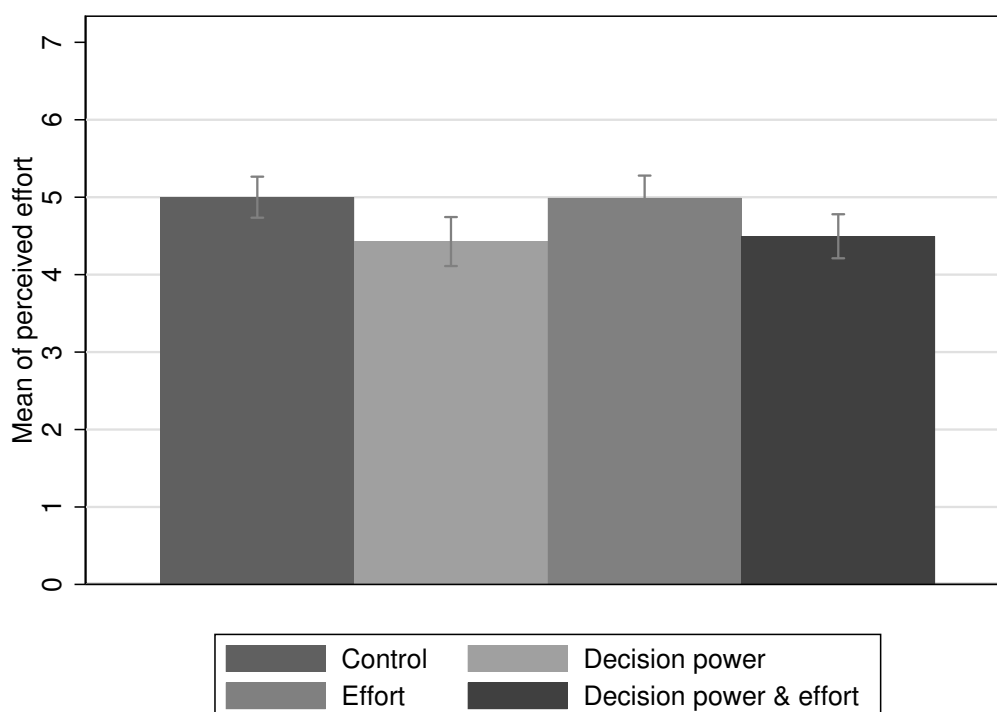
Notes: This bar graph represents the average perceived effort invested by treatment groups. From left to right, the bars represent the treatment groups with i) no decision power and no effort (control group), ii) decision power only, iii) effort only and iv) both decision power and effort. Error bars represent the 95% confidence intervals.

In Figure 2.8, it would have been expected that the two rightmost bars would be highest, as participants in these treatments had to exert effort to obtain the donation. Instead, effort varies with decision power. The perceived effort of the two groups with decision power (the second and fourth bar) are substantially lower than the perceived effort of the control group (leftmost bar) or the treatment group with effort only (third bar). A two-tailed t-test of equality of the pooled means of those with decision power (mean = 4.46, std. dev. 1.61) and those without

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decision power (mean = 5.00, std. dev. = 1.49) yields a p-value of 0.0003.[26]

This change in effort costs is in line with findings from previous experiments, such as Falk and Kosfeld (2006), who show that choice autonomy increases participants' intrinsic motivation to exert effort. Moreover, as shown by Ariely et al. (2008), individuals tend to accept a lower pay for work they consider meaningful. Thus, a possible speculative explanation for the observed change in effort costs could be that those able to choose their preferred charity in this setting and experiencing greater choice autonomy may have attributed more meaning to the tasks they performed, thus feeling like the effort was less costly.

This reduction in effort costs may have had a counterproductive effect. Had effort been endogenously determined, a reduction in effort cost would have most likely translated into more effort being provided, in line with findings from Fehr et al. (2013) and Falk and Kosfeld (2006). However, in this study, initial effort levels were exogenously fixed across all treatment groups, so there was no margin for participants to let the reduced effort costs translate into more initial effort investments. As can be seen in Table 2.7, higher perceived effort invested is actually conducive to higher levels of psychological ownership and project commitment. So if decision power reduces the cost of effort and thus reduces perceived effort investments - given a fixed effort level - this may have inadvertently reduced psychological ownership and commitment levels.

2.5   Caveats

Given that the treatments did not work as intended, the causal interpretation of the results described above are limited. Since psychological ownership did not vary with the exogenously assigned treatment, it could be the case that there is some underlying endogenous factor (e.g. some character trait) that simultaneously determines psychological ownership, project commitment and perhaps even perceived effort and decision power. I tried to address this by controlling for many such demographic factors and character traits (including proneness to the sunk cost effect and pro-social preferences) in the analyses described above. Future research should continue to explore the drivers of psychological ownership, and might yet discover a way to reliably increase project commitment through exogenously manipulating the levels of psychological ownership.

Besides fostering psychological ownership, participatory programs have two further advantages that render them useful, even if their impact on psychological ownership is limited. First,

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[26] See also Table B2 in the Appendix.

involving project beneficiaries in the design process ensures that information asymmetries are reduced and preferences met. Grillos (2022) shows that preference alignment is an important driver of project success. In this study, donating to the preferred charity (whether by chance or by choice) also resulted in higher project commitment than donating to a less preferred charity.[27] While it will usually be preferable to allow the beneficiaries of a project a say in the design and increase their decision power, this can provide some solace to projects where this is not possible. The opportunity cost for some of the most vulnerable and poorest members of communities are often extremely high Grillos (2022); Aga et al. (2018), such that participation in decision-making processes might be very costly for them. In addition, it may often not be feasible to involve a large number of beneficiaries in the decision-making processes due to logistical and practical constraints. If the preferred outcome can be determined through focus groups or prior interviews with a small sub-group of beneficiaries, it might not be necessary to involve everyone in the decision-making process for the participatory nature of a project to be beneficial.

Second, participatory projects usually rely on some social or collective process of decision-making. While this channel was explicitly excluded in this study, this social dimension will most likely have a large impact, as previous literature has shown that group decision-making tends to differ from individual decision-making (He and Villeval, 2017; Kocher et al., 2018; Grillos, 2022). For example, social image concerns might have large effects when one has argued for a project publicly and is then also expected to commit to it in the long-run. Learning which projects others find most promising may also have an effect on the own perceptions of which projects are worthwhile pursuing. In addition, it might also be a feeling of collective psychological ownership that is important, i.e. a group as a whole may feel more committed to a project if it was jointly decided and constructed. This is also in line with the findings from the case study, which showed that a feeling of belonging to the community was one of the strongest predictors for participation and project contribution.

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[27] See Figures B2 and B3 in the appendix for the mean valuation and contribution when the donation recipient was the preferred charity (selected either by chance in the "no decision power" treatment or by choice in the "decision power" treatment) compared to when the donation recipient is not the most preferred charity.

2.6   Conclusion

In this chapter, I use an online experiment to examine the hypothesis that having decision power and having invested effort into a project fosters increased project commitment through a stronger feeling of psychological ownership. I find that *perceived* decision power and *perceived* effort invested, i.e. feeling like one had a say in the project and has put effort into its creation, are associated with higher levels of psychological ownership and a greater valuation of the project outcome. Higher levels of psychological ownership, in turn, are associated with more personal contribution. The link between perceived participation and higher project valuation is visible both in the lab experiment results, as well as in the real-world case study, which evaluated the link between perceived (i.e. self-reported) participation and project maintenance of infrastructure projects in rural Nepal.

However, there is a discrepancy between the exogenous treatment variation in decision power and effort invested and the *perceived* decision power and *perceived* effort invested by participants. This discrepancy between actual and perceived treatment likely results from two effects. First, participants experience an illusion of control, feeling like they have decision power if their most preferred charity is selected, regardless of whether this is selected randomly or actively. Second, participants with decision power experience a reduction in perceived effort costs, feeling like they put in less effort for a fixed number of effort tasks. Given that effort levels were fixed in this experiment, this effect was counterproductive. For a setting with endogenous effort levels, however, this result suggests that granting decision power may be particularly effective. It would allow participants to increase the amount of effort provided in step with the reduction in perceived effort costs.

Such unanticipated effects through biases in perception need to be taken into account when attempting to manipulate levels of psychological ownership through requiring participation. In addition, the case study in Nepal showed that in the real world, concerns such as resource constraints may limit the effectiveness of participatory policies. If the beneficiaries targeted by a participatory policy face high opportunity costs, they may not be able to participate in project design or provide additional resources for project maintenance. Those valuing an infrastructure project the most may not be the same people providing the most resources into its maintenance. This may instead be determined by resource availability, opportunity costs and a feeling of belonging to the community. These external constraints and social interaction effects may play

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a more important role in the real world than individual feelings of psychological ownership.

My findings do not call into question the general usefulness of participatory programs, but suggest that their justification cannot be based on psychological ownership alone. Other mechanisms, such as preference matching and social interaction effects, may be substantially driving the success of projects. Exploring these mechanisms further may provide valuable insights into how to increase project commitment and offers promising avenues for further research.

3. DOES STATE OWNERSHIP BIAS GOVERNMENT SUPPORT? EVIDENCE FROM THE FINANCIAL CRISIS

A widely held concern about state ownership is that it leads to inefficient incentive effects and distortions in competition, which could be due to governments supporting firms they own more generously than comparable firms they do not own. Exploiting a unique data set of more than 1,600 public, private not-for-profit and private for-profit hospitals in Germany that were eligible to apply for stimulus money after the 2007/08 financial crisis, we show that state ownership has indeed a causal effect on government support. Public hospitals received significantly and substantially more stimulus money than their private counterparts which cannot be explained by observable characteristics of the hospitals and their environments. Using several different identification strategies we show that hospital ownership is as good as randomly assigned. A simple theoretical model highlights the implications of this result and shows that it can explain many stylized facts about private versus public ownership.[1]

3.1 Introduction

Industrial policy is on the rise. Many governments sponsor new technologies (hydrogen, electric cars, digitization), secure supply chains for vaccines and other "vital" inputs, promote national champions, and engage in massive rescue packages to prevent firm closures and job losses during crises, such as the Covid-19 pandemic or the financial crisis in 2007/2008.[2] If governments engage in these activities, they can intervene at arms' length, using various forms of subsidies and regulation, or they can acquire ownership by injecting equity into existing companies, founding new state-owned firms or even nationalizing industries. For example, both the US and Europe are heavily engaged in promoting their aircraft industries. The US government has no equity stake in Boeing, while 26 percent of the shares of Airbus are owned by the governments of

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[1] This chapter is based on joint work with Prof. Dr. Klaus Schmidt, LMU Munich

[2] The case for state activism is prominently made by Mazzucato (2018, 2020) who offers many examples of recent government interventions.

Germany, France and Spain.[3] This raises the question whether choosing one or the other affects how the government will treat the firm in the future.

A large body of economic literature has examined and compared the relative performance of private and state-owned firms and the debate about the advantages and disadvantages of state ownership has been ongoing for decades. Some common concerns about extensive state ownership have been, first, that it could distort competition by granting an advantage to state-owned firms over their privately-owned competitors (Sappington and Sidak, 2003; Edwards and Waverman, 2006). Second, the government might accept lower profits than a private owner and would be in a position to bail out some unprofitable firms while private firms in the same situation would go bankrupt (Chari and Kehoe, 2016). Finally, the prospect of a soft budget constraint could reduce the management's incentive to reduce costs and to innovate or allow excessive risk-taking, making state-owned firms less efficient (Bertero and Rondi, 2000; Bartel and Harrison, 2005; Bianchi, 2016; Pint, 1991). The empirical evidence largely supports the claim that state-owned firms are less efficient and less profitable than private firms (Ehrlich et al., 1994; Shleifer, 1998; Dewenter and Malatesta, 2001; Megginson and Netter, 2001; Wei et al., 2017; Shirley and Walsh, 2001). One explanation could be if governments support firms that they own more generously than otherwise identical firms that they do not own, i.e. if ownership *causes* governments to be more generous towards a firm. This study seeks to determine if there is a causal effect of ownership on government support.

Providing such causal evidence seems almost impossible for three reasons. First, state-ownership is not randomly assigned. Governments tend to own firms and industries that are particularly important for the economy as a whole, e.g. because they generate large external effects. For these firms more generous government support may be justified. Second, government support comes in many guises that are often difficult to observe and to measure. The government could offer more generous subsidies, provide credit at preferential terms, sell land or other assets at below market prices, accept lower profits than a private owner, ease regulation, or use other discretionary decisions to support a firm that it owns. Third, in most industrialized countries there are explicit legal provisions that forbid unequal treatment of state-owned and privately owned firms. If a government wants to favor a state-owned firm nevertheless, it would have to

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[3] Other prominent examples include the US government that acquired ownership stakes in GM and Chrysler as part of a bailout in the financial crisis. These shares were sold again (at a loss) several years later. In Germany, the vaccine producers BioNTech and CureVac both received generous government support during the Covid-19 pandemic. The German government owns about 20 percent of CureVac while it has no ownership stake in BioNTech.

try to hide the preferential treatment.

In this study we show that it is possible to deal with these identification problems by exploiting a unique data set of project-level stimulus money distributed in 2009 at the local level to more than 1,600 German hospitals that are owned by local governments, private not-for-profit organizations, and private for-profit companies. We restrict attention to general hospitals that provide the same level and quality of health care in all parts of the country and are very similar in structure.[4] Given that all hospitals, regardless of their ownership structure, have the same obligation to the provision of public health care, this setting allows us to rule out a crucial reason for a justified favoritism for state firms: public hospitals do not provide any additional positive external effects compared to private hospitals. Moreover, the stimulus money could be used only for new investment projects, mainly for the construction and renovation of buildings. It was explicitly aimed at stimulating the local construction and infrastructure industry. We argue that the economic benefits of these investments are independent of ownership. All else equal, stimulus money paid to a publicly owned hospital generates the same social benefits as when paid to a privately owned hospital. In fact, this assumption was shared by the federal government which required by law that the funds should be allocated "trägerneutral", i.e. independently of ownership.

This setting has the following advantages that allow us to address all three identification problems mentioned above and to disentangle the causal effect of ownership on government support.

First, the ownership structure of the hospitals in our data set was largely determined when they were founded, mostly in the 19th or early 20th century, by factors that are independent of the current socio-economic conditions of their catchment areas. We argue that ownership is therefore as good as randomly assigned. In Section 3.5, we describe the historical context of hospital ownership in more detail and show that the large majority of hospitals was founded before 1950 and has not changed ownership since their foundation. We make use of this historical context and use ownership type at foundation as an instrument for ownership type in 2009 to rule out concerns about endogeneity of ownership type. We conduct several robustness checks that confirm this result.

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[4] These are so called "plan hospitals" that are listed in the hospital plans of the federal states. Each state has to provide a hospital plan to guarantee the equal and sufficient provision of hospital services in all parts of the country. The hospital financing act (Krankenhausfinanzierungsgesetz) requires the health insurance system and the federal states to fund all of these hospitals independently of their ownership status. See Section 2 for more details.

Second, there is a very simple and accurate metric to measure government support: the amount of stimulus money received. For each hospital we know the exact amount of stimulus money they got. More specifically, we measure three outcome variables: the amount of funding each hospital received, the probability of receiving funds at all, and the size of each funded project.

Third, the money had to be allocated by the local governments very quickly, within a few months, to projects that were proposed by state-owned hospitals, private hospitals, schools and other local institutions. Because of the decentralized decision making within a very short period of time, the usual controls that ensure ownership neutrality were less stringent, allowing us to identify government favoritism in this setting more easily.

Our main finding is that publicly owned hospitals received, on average, about 350k EUR to 400k EUR more than private hospitals, after controlling for observable hospital characteristics, financial performance, regional and political factors and some further robustness checks. Given that the average amount of funding per hospital was around 600k EUR, this is a large effect. For private for-profit hospitals, this difference is driven by a lower probability of receiving funding at all, with the funding probability being 19.5 percent (or 8.6ppt) lower for private for-profit hospitals compared to public hospitals. Conditional on being funded, the amount received per project is similar. In contrast, private not-for-profit hospitals are funded at the same rate as public hospitals, but receive around 380k EUR to 480k EUR less in funding per funded project.

These findings are important for at least two reasons. First, they provide a foundation for some of the concerns about the costs of state ownership mentioned above. In Section 3.6 we develop a simple theoretical model showing that if the government treats a company it owns more generously, this gives rise to a soft-budget constraint which can explain why state-owned firms are often less efficient than comparable private firms. Second, our results show that the legal provisions in many industrialized countries to prevent preferential treatment of state-owned companies are warranted and should be strictly enforced.

There are several mechanisms that could give rise to the preferential treatment of state-owned hospitals. For example, a local government may be held responsible by the public for the performance of a hospital it owns, but less so for the performance of a private hospital. It could be the case that stakeholders of a public hospital (managers or employee representatives) have better access to the local government, for example because representatives of the local government are members of the board. There could be ideological reasons to favor public

hospitals. Left-wing politicians might be convinced that hospitals should be publicly owned and therefore give more subsidies to them. The financing of public hospitals could thus follow the agenda of local politicians, similar to the lending behavior of government-controlled banks, which has been shown to follow the electoral cycle (Englmaier and Stowasser, 2017). Or ownership could have a direct effect on preferences. There is ample psychological evidence that people care more about things they own than things they do not own (Pierce et al., 2001). Our data indicate that some of these mechanisms are at work, and our exploratory analysis suggests that ideological reasons of left-leaning politicians and voters holding the government accountable for the performance of public but not private hospitals are possible explanations. Our main interest in this study, however, is to show that there is a causal effect of ownership on government support. The precise identification of the mechanisms through which it works has to be left to future research.

This chapter is related to three strands of literature. First, there is a theoretical literature on the pros and cons of privatization and state ownership. Many of the papers focus on the efficient provision of public goods under different ownership regimes (Hoppe and Schmitz, 2010; Schmitz, 2015, 2021). Kornai (1980, 1986) argues that nationalized firms face a soft budget constraint which may explain the poor performance of state-owned firms in socialist countries, but also in market economies in which some industries are nationalized. However, he does not explain why there is a soft-budget constraint only for state-owned firms. After all, governments can and do also support privately-owned firms (Heim et al., 2017; Groenewegen et al., 2021; Dong et al., 2022). Schmidt (1996) and Hart et al. (1997) offer explanations for a differential treatment of state-owned and privately-owned firms based on the theory of incomplete contracts.[5] In this project we point to a different explanation: Ownership changes the "preferences" of the government and thereby induces a different treatment.

Second, there is a large empirical literature on the performance of state-owned versus private firms. Shleifer (1998), Dewenter and Malatesta (2001), Megginson and Netter (2001), Wei et al. (2017) show that private companies tend to be more efficient and more profitable than state-owned firms. Harrison et al. (2019) look at a large data set of Chinese companies and show that state-owned firms receive substantially more subsidies than formerly state-owned firms

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[5] In Schmidt (1996) ownership changes access to information. The government is reluctant to bail out a private firm because it does not know whether the firm really needs the subsidy or whether it only claims to be in trouble, while it is less reluctant to do so for a public firm where it observes the cost structure. Hart et al. (1997) assume that quality is not contractible. A private owner will provide worse quality than the government, but he has a stronger incentive to contain costs.

that have been privatized, which in turn receive more subsidies than privately-founded firms. Shen et al. (2007) conduct a meta analysis of several quantitative and qualitative studies on the determinants of the financial performance of US hospitals. They find that state-owned hospitals are on average associated with weaker financial performance as measured by costs, revenues, profits and efficiency. However, all of this literature provides correlational evidence only. We identify a causal effect of state-ownership.

Finally, there is an experimental literature on the psychological effects of ownership. Dawkins et al. (2017), Van Dyne and Pierce (2004), and Pierce et al. (2001, 2003) show that "psychological ownership" can have important behavioral, emotional, and psychological consequences: People care more about an object if they own it. In fact, in the English language "taking ownership" is associated with "feeling responsible" and "getting engaged".

The remainder of this chapter is structured as follows: In Section 3.2, we provide institutional background information on our setting and discuss the identification strategy. Section 3.3 describes the data set. In Section 3.4, we present the OLS regression results and test their robustness. In Section 3.5, we provide several robustness checks, including additional evidence for the validity of our identifying assumption and the use of an instrumental variable (IV) approach to confirm our findings. Section 3.6 highlights the implications of our result. We develop a simple theoretical model showing that the main stylized facts about the performance of private versus public ownership can be explained if the government cares more about a firm that it owns than a privately owned firm. Finally, Section 3.7 concludes.

3.2   Setting and Identification Strategy

In March 2009, at the peak of the financial crisis, the Federal Government of Germany launched an economic stimulus package (Konjunkturpaket II). Part of this package was an "investment program for the future" (Zukunftsinvestitionsgesetz, ZuInvG) to stimulate infrastructure investments. The program had a volume of 15.8 billion EUR (0.68 percent of GDP). The explicit aim of the program was to foster investments into local infrastructure, thereby generating a multiplier effect on the rest of the economy. At least 65 percent of the funds had to be invested into buildings and physical equipment of schools, universities and day care centers. The remaining 35 percent could be spent on hospitals, urban and rural development, and other local infrastructure (§3 ZuInvG). Most of the funds were invested into the construction and renovation

of buildings. The funds were provided as matching grants. The federal government allocated 10 billion EUR to the federal states in proportion to their population under the condition that the states and the municipalities match these funds with at least 3.3 billion EUR. Most states contributed substantially more (5.8 billion EUR in total). At least 70 percent of the funds had to be spent at the local level by counties and municipalities. The actual fraction was larger than 75 percent in almost all states. To be eligible, a project had to be started before the end of 2010 and to be completed by the end of 2011.[6]

We focus on the funds received by hospitals. In Germany, hospitals are either owned by the municipalities/counties, by private not-for-profit organizations (e.g. the catholic or protestant church, the German Red Cross, and others charitable organizations), or by private for-profit companies. We restrict attention to so called "plan hospitals". These are general hospitals for the primary health care of the population. Each state is required to provide a list of plan hospitals that guarantees that each county is equipped with a sufficient number of hospital beds (determined by a Hill-Burton formula) and the major hospital departments (internal medicine, surgery, obstetrics/gynecology, orthopedics, etc.) that satisfy legally determined standards of quality. All hospitals on this list, no matter whether they are publicly or privately owned, are funded in the same way, which is governed by the Hospital Financing Act (Krankenhausfi-nanzierungsgesetz, KHG).[7] The allocation of funds should not be affected by ownership status (KHG §1.2). Running expenses are covered by the health insurance system through "diagnosis related groups" (DRGs)[8] that are fixed amounts for each diagnosis and treatment. Investment costs are funded by the federal states (KHG §6). This "dual financing system" applies to all plan hospitals in the same way. Thus, plan hospitals are very similar in structure independently of their ownership type.[9]

Plan hospitals are also similar in terms of the quality of care they provide. One could worry that there might be systematic differences in quality, if for example private hospitals compromise on quality in order to maximize profits (Hart et al. (1997)). However, Augurzky et al. (2010)

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[6] See Slansky (2010) and Bundesministerium der Finanzen (2013) for detailed descriptions of this program. By the German constitution (Grundgesetz, § 104b) the federal government is allowed to finance investments of the federal states only in exceptional circumstances. Three conditions have to be satisfied: (i) The funding has to be temporary, (ii) the types of investment have to be specified by law, and (iii) the federal government can only provide transfers, so that the decision on which projects will be funded remains with the states.

[7] The purpose of the KHG is to "safeguard the economic viability of hospitals in order to ensure high-quality care for the population that is tailored to patients and needs with efficient, high-quality hospitals that operate on their own responsibility" (KHG §1.1).

[8] Diagnosis related groups ("Fallpauschalen") describe a system of categorizing patients by their clinical diagnosis used to determine payor reimbursement rates.

[9] A more detailed description of the German hospital system is provided by Quentin et al. (2010) and Deutsche Krankenhaus Gesellschaft (2018).

and Augurzky et al. (2012) report that the number of complaints in the regular, official quality assessments is similar across hospital types. If anything, there are fewer complaints about private hospitals. Furthermore, there are some clinical examples validating this assumption: Wübker and Wuckel (2019) do not find a significant difference in the mortality rates for heart attack treatment of private for-profit hospitals as compared to public hospitals. For pneumonia patients they find a slightly lower 30-day-mortality rate in private for-profit hospitals. Moreover, they do not find any evidence for quality changes after hospital privatization. Another possibility to measure perceived hospital quality is to look at patient satisfaction. Augurzky et al. (2012, p. 32-34) report that there is no significant difference in patient satisfaction across hospital types, Zich and Tisch (2018, p. 11) and Kraska et al. (2017, p. 597) report that patient satisfaction is slightly higher in public and private not-for-profit hospitals than in private for-profit hospitals, while Augurzky et al. (2010, p. 118) report that private for-profit and not-for-profit hospitals have a slightly higher patient satisfaction than public ones. Thus, systematic quality differences do not seem to be an issue.

Because there is no systematic difference in quality of care, there is no reason for patient selection into hospitals. One could have worried that, for example, rich patients self-select into private hospitals and poor patients into public hospitals, and governments wanting to subsidize poor patients would therefore favor public hospitals. However, Wübker and Wuckel (2019) show that distance to the hospital is the major factor determining hospital choice and that there is no systematic selection bias. Wübker and Wuckel (2019, p. 383) conclude: " ... within the German hospital system it is difficult for patients to systematically rank hospitals in terms of quality. There are only few tools at hand to learn about the quality of hospitals. In addition, quality does not necessarily correlate between departments. Hence, a significant patient selection bias is unlikely." This is confirmed by Zich and Tisch (2018), who also argue that it is not plausible that differences in hospital ownership affect patient satisfaction.

The stimulus package (Zukunftsinvestitionsgesetz) was passed by the Bundestag on March 5, 2009, and received a lot of public attention. Funds were allocated to counties roughly in proportion to their population. States either delegated the funding decisions to the counties or had some joint selection process.[10] All plan hospitals were encouraged to apply for funds independently of whether they were public or private. There is no information available on the projects that were not funded. Thus, a possible concern could be that public and private hospi-

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[10] See Slansky (2010).

tals had different application rates. However, the Zukunftsinvestitionsgesetz required explicitly that funds should be provided independent of ownership status (ZuInvG § 3.1, "Trägerneutralität"), and we could not find any public complaints about discriminating application procedures. If anything, we would expect more applications by private for-profit hospitals, because they tend to be managed somewhat more efficiently (Bloom et al., 2014). In this case, we would underestimate the extent to which the government favored public hospitals. In any case, the available funds were spent quickly and completely, and the program was widely considered a success.[11] The federal states contributed significantly more than they were required to. A total of 43,000 projects were financed by the program with an average size of 367,442 EUR per project. Buchheim and Watzinger (2023) show that the program was indeed effective in stimulating the economy. However, because the money had to be spent quickly, the usual rules and regulations to allocate funds and to award contracts were suspended (Bundesrechnungshof, 2012). This gave more discretion to the counties and municipalities who decided on the final selection of investment projects.

A crucial feature of the funds provided by the investment program of 2009 is that they were supposed to be add-ons to generate positive spillover effects. Existing projects could not be financed. The projects had to be new and additional to regular investments (§ 3.3 and § 4.1. ZuInvG). Moreover, they were intended to stimulate the local economy, preserve historical buildings, or benefit the climate through improved energy efficiency. These positive spillover effects are independent of whether a hospital is publicly or privately owned. The federal government required the funds to be allocated independent of ownership. Thus, after controlling for possible structural differences, public and private hospitals should be equally successful in acquiring stimulus money. If the federal states and the counties give more funds to public hospitals, this suggests that they are biased towards the hospitals they own.

3.3   Data and Descriptive Statistics

Our data set includes the 1,681 plan hospitals that existed in 2009. Of these, 583 are publicly owned by municipalities and counties, 702 are private not-for-profit (NFP, "frei-gemeinnützig") owned by religious and charitable organizations, and 362 are owned by private for-profit (FP) companies. 34 of the plan hospitals are university hospitals that are not only treating patients

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[11] See Bundesministerium der Finanzen (2013, p. 51). 12.5 percent of the funds were spent in 2009 already, 41.3 percent in 2010, and 46.1 percent in 2011.

but are also engaged in medical research and in teaching students. 31 of them are owned by the federal states while three are private for-profit.[12] However, since university hospitals are much larger than regular hospitals, differ substantially in structure, and could apply for stimulus money that was reserved for the education sector (schools, daycare centers and universities), we exclude them from our sample. Thus, the data set used for the main analyses consists of the remaining 1,647 plan hospitals.

Figure 3.1 shows the distribution of the 1,647 plan hospitals and the distribution of plan hospital beds. While 35 percent of all hospitals are publicly owned, public hospitals account for 45 percent of all hospital beds. Thus, they tend to be somewhat larger than their private counterparts.[13]

Figure 3.1: Plan hospitals and plan hospital beds by ownership type
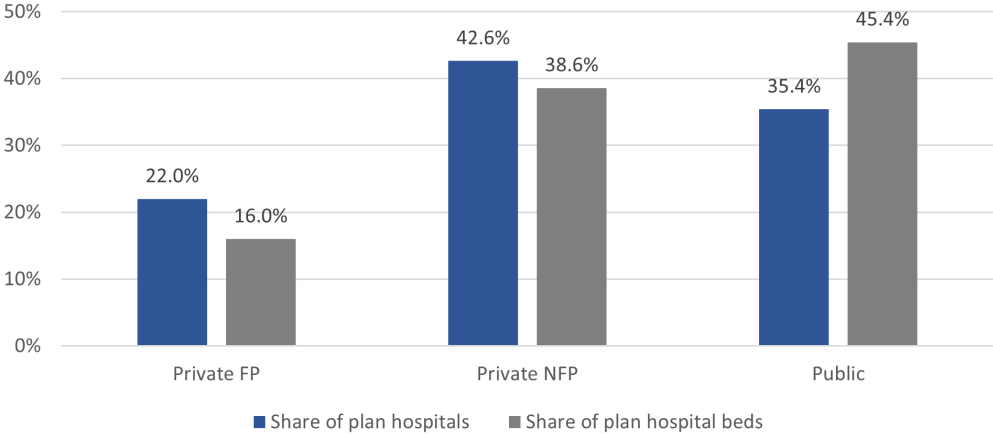
Notes: Share of plan hospitals and plan hospital beds for each ownership type: private for-profit (private FP), private not-for-profit (private NFP), and public hospitals. The total number of plan hospitals is 1,647, the total number of hospital beds is 441,588.

About half (45.6%) of all plan hospitals received funds from the stimulus package. Table 3.1 shows how these funds were allocated across hospitals. While 44.1% of all public hospitals successfully acquired funds, only 25.4% of all private FP and 57.3% of all private NFP hospitals did so. Public hospitals acquired on average two to three times as much as private hospitals (0.97 million EUR per hospital as compared to 0.44 million EUR and 0.36 million EUR for private NFP and private FP hospitals, respectively). This is partly because public hospitals tend to be somewhat larger (as measured by hospital beds). Still, they received 40 to 60 percent more per

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[12] Two of the private university hospitals belong to the University Hospital Gießen-Marburg and one is the heart surgery clinic of the University Hospital Hamburg-Eppendorf

[13] The average number of beds is 195 for private for-profit hospitals, 243 for private not-for-profit hospitals and 344 for public hospitals.

hospital bed than their private counterparts. Thus, public hospitals received substantially more generous funding than private NFP and private FP hospitals.

Table 3.1: Allocation of stimulus money to plan hospitals

	(1)	(2)	(3)	(4)	(5)	(6)
	Number of hospitals	Hospitals receiving funds	Share of hospitals receiving funds	Sum of funds received *(in M €)*	Funds received per hospital *(in M €)*	Funds received per hospital bed *(in k €)*
Private FP	362	92	25.4%	130.19	0.36	1.63
Private NFP	702	402	57.3%	311.34	0.44	1.86
Public	583	257	44.1%	566.62	0.97	2.61
Total	1647	751	45.6%	1008.14	0.61	2.28

Notes: Descriptive statistics showing the allocation of available funds to the hospitals based on ownership type, private for-profit (private FP), private not-for-profit (private NFP), and public hospitals. Values in column (3) result from dividing column (2) by column (1). Values in column (5) result from dividing column (4) by column (1).

Our main data source is a complete hand-collected list of all stimulus-funded projects approved for hospitals.[14] We combine this list with the hospital register of the German Statistical Office from 2009.[15] The hospital register comprises detailed information about the structural characteristics of German hospitals, including the number of beds, types of wards, number of beds per ward and information on ownership.[16] Financial data on a subset of hospitals is provided by the Orbis dataset of Bureau Van Dijk.[17] However, Orbis provides the financial controls for only about 15 percent of all hospitals in our data set (239 out of 1,647). Regional socio-economic data are provided by the statistical offices of the federal states and the Federal Office for Building and Regional Planning.[18] We manually collected data on the political affiliation of the prime ministers of the federal states and of the mayors and district administrators of the municipalities and counties in 2009, as well as data on when the next elections were held after 2009 on the state and county level. Finally, we manually collected information about the founding dates and ownership types at founding from the hospital websites. Where this information was not publicly available, we contacted the hospitals by email. We obtained the information on

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[14] We are very grateful to Martin Watzinger and Lukas Buchheim for sharing their data with us and to the federal states that helped us to update these lists.

[15] The hospital register is published annually, see Statistischen Bundesamt, Grunddaten der Krankenhäuser, Fachserie 12, Reihe 6.1.1, `www.statistischebibliothek.de/mir/servlets/MCRFileNodeServlet/DEHeft_derivate_00010402/2120611107004.pdf;jsessionid=E38CF46ED91921B5772B18F04208973D`.

[16] See Augurzky et al. (2012), Herr et al. (2011) and Pilny (2017) for empirical analyses of the German hospital sector that is partly based on this data.

[17] `www.bvdinfo.com/de-de/unsere-losungen/daten/international/orbis`.

[18] The data is provided at `www.inkar.de`. In Mecklenburg Western Pomerania, the definition of some counties was changed between 2009 and when the regional data was accessed in 2021. Several counties were merged together. Regional data from 2009 was only available on the level of the new, merged counties. We therefore took the regional controls of the new, merged counties to apply equally to each of the smaller counties making up the merged one. This applies to 19 counties from 2009 that were merged into 6 larger counties by 2021.

founding dates for 1,459 hospitals in our sample (89 percent) and on both founding dates and ownership type at founding for 1,400 hospitals in our sample (85 percent). Descriptive statistics for the full list of controls used in the analyses split by ownership type are provided in Table C1 in the Appendix.

3.4 Results

3.4.1 Main Results

Our first main result is that there is a highly significant and large effect of ownership on the average total funding received by each hospital. This is shown in Table 3.2. Column (1) shows that public hospitals receive on average 0.97 million EUR. This is reduced by 0.53 million EUR for private NFP and by 0.61 million EUR for private FP hospitals. Thus, public hospitals receive on average more than twice as much in subsidies compared to non-public ones. Column (2) controls for the number of beds, the number of departments[19], and several regional controls at the municipal and county level (population density, urban vs. rural, share of the population 65 years and older, GDP per head, unemployment rate, share of public hospitals, total number of hospitals beds in the county). Because public hospitals tend to be larger, controlling for the number of beds reduces the effect, but it remains large. We add fixed effects for the federal states in column (3) in order to account for systematic differences between the states (such as political and economic differences, as well as differences in the process of paying out the stimulus money). Finally, we add fixed effects for the quarter century in which a hospital was founded to control for any systematic differences resulting from how old a hospital is.[20] Although this slightly reduces the sample size to 1,459 hospitals, column (4) is our preferred specification. With this specification, we find that private hospitals receive on average around 350k EUR to 400k EUR less than public hospitals.[21]

Do public hospitals receive more funding on average because they are more likely to receive funding, or do they receive larger amounts per funded project than non-public hospitals? This

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[19] We include the number of departments in the regression, because a hospital with more departments may have more buildings that need renovation. The type of departments could also be important, if certain departments are in greater need of investments than others. We repeat our main regressions with department fixed effects in Table C3 in the appendix. This does not change our results.

[20] This could, for example, include the quality of buildings erected in different periods or other structural differences between hospitals founded in different periods. All hospitals founded before 1750 are grouped into the same category.

[21] We use robust standard errors throughout our analysis. Following Abadie et al. (2022), we do not use clustered standard errors, since we observe the full population of interest (all plan hospitals in Germany) and do not rely on a randomly selected sample for our analysis.

Table 3.2: Funding per hospital by hospital type

	(1)	(2)	(3)	(4)
	Average total funding (in Mio EUR)			
Private FP	-0.612***	-0.276	-0.292*	-0.410**
	(0.16)	(0.18)	(0.16)	(0.19)
Private NFP	-0.528***	-0.331**	-0.319**	-0.359**
	(0.12)	(0.16)	(0.15)	(0.17)
Beds in thsd		2.969***	3.039***	2.848***
		(0.72)	(0.68)	(0.75)
Number of departments		-0.004	-0.010	-0.008
		(0.04)	(0.04)	(0.04)
Constant	0.972***	1.150***	0.579	0.292
	(0.12)	(0.41)	(0.56)	(0.57)
Regional Controls	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Founding period FE	No	No	No	Yes
Adj.R^2	0.016	0.136	0.153	0.171
Observations	1647	1647	1647	1459

Notes: OLS regression of the average total amount of funding across all hospitals in Mio EUR. Robust standard errors shown in parentheses. Column (1) shows OLS estimates without controls, column (2) adds number of beds, number of departments and regional controls on the county level (share of public hospitals, unemployment rate, share of inhabitants aged 65+, number of hospital beds per 1000 inhabitants, urban dummy, population density, GDP per capita). Column (3) adds state fixed effects. Column (4) adds fixed effects for the quarter century in which the hospital was founded. Column (4) includes 314 private FP, 653 private NFP and 492 public hospitals. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

question is addressed in Tables 3.3 and 3.4.

Table 3.3: Probability of being funded by ownership type

	(1)	(2)	(3)	(4)
	Linear probability of funding			
Private FP	-0.187***	-0.170***	-0.060*	-0.086**
	(0.03)	(0.04)	(0.03)	(0.03)
Private NFP	0.132***	0.082**	0.003	-0.020
	(0.03)	(0.04)	(0.03)	(0.03)
Beds in thsd		0.086	0.069	0.039
		(0.07)	(0.07)	(0.07)
Number of departments		0.026***	0.024***	0.026***
		(0.01)	(0.01)	(0.01)
Constant	0.441***	0.544***	0.422***	0.580***
	(0.02)	(0.15)	(0.15)	(0.19)
Regional Controls	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Founding period FE	No	No	No	Yes
Adj. R^2	0.059	0.136	0.423	0.442
Observations	1647	1647	1647	1459

Notes: Linear probability model with the dependent variable being a dummy variable equal to 1 if funding was received by a hospital and 0 otherwise. Robust standard errors shown in parentheses. Column (1) shows OLS estimates without controls, column (2) adds number of beds, number of departments and regional controls on the county level (share of public hospitals, unemployment rate, share of inhabitants aged 65+, number of hospital beds per 1000 inhabitants, urban dummy, population density, GDP per capita). Column (3) adds state fixed effects. Column (4) adds fixed effects for the quarter century in which the hospital was founded. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.3 reports results from a linear probability model of being funded. Column (1) shows that without any controls, private FP hospitals are significantly less likely to be funded, while private NFP hospitals are significantly more likely to be funded than public hospitals. The effects are similar, but slightly smaller if we control for number of beds, number of departments, and regional controls in column (2). Including state fixed effects in column (3) absorbs a large part of the effect, especially for private NFP hospitals, reducing the coefficient to a tightly estimated zero.[22] In column (4), we add fixed effects for the quarter century in which the hospital was founded, which slightly increases the magnitude and level of significance for private FP hospitals (and has no effect on the private NFP coefficient). Again, this is our preferred specification. The resulting coefficient for private NFPs is insignificant and very close to zero, while the coefficient for private FPs is negative and significant. The difference in average funding for private NFP hospitals compared to public hospitals is thus apparently not driven by a lower likelihood of being funded. Private for-profit hospitals, on the other hand, are 19.5% (or 8.6ppt) less likely to be funded compared to public hospitals.

Next we turn to the average amount of funding per approved project. Table 3.4 considers the size of the funded projects. Funded projects in a public hospital tend to be much larger than in a hospital that is not publicly owned. Without any controls in column (1), a project in a public hospital receives 1.22 million EUR on average, while a project in a private FP hospital receives 0.82 million EUR and a project in a private NFP hospital receives only 0.42 million EUR. Controlling for the number of beds and departments and for regional controls in column (2) confirms these results, though the magnitude of the difference decreases. The same holds if state fixed effects are added in column (3). Adding fixed effects for the quarter century in which the hospitals were founded in column (4) increases the magnitude and level of significance of the observed effect for both private FP and private NFP hospitals. Overall, public hospitals receive 380k EUR to 480k EUR more per approved project than hospitals that are not publicly owned.

Thus, we find that private NFP hospitals are not in general less likely to be funded, but conditional on being funded they receive significantly less money. Private FP hospitals, on the other hand, are significantly less likely to be funded and receive slightly less money per project.

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[22] The surprising result that private NFPs are more likely to get funding turns out to be largely driven by just one state, North Rhine-Westphalia (NRW). NRW is the largest state in Germany with the highest number of hospitals (385 in total). Plan hospitals in NRW are predominantly private NFP (272 private NFP, 79 public and 28 private FP). Because the probability of being funded is much higher for all plan hospitals in NRW than in all other states (more than 80% of all plan hospitals in NRW received funding, compared to 46% in Germany as a whole), this drives up the relative probability of NFP hospitals being funded compared to the national average. This is corrected for by including state fixed effects.

Table 3.4: Funding per project by ownership type

	(1)	(2)	(3)	(4)
	Funding per project (in Mio EUR)			
Private FP	-0.405	-0.216	-0.253	-0.389*
	(0.27)	(0.28)	(0.20)	(0.22)
Private NFP	-0.804***	-0.561***	-0.376**	-0.476***
	(0.14)	(0.18)	(0.16)	(0.18)
Beds in thsd		0.980***	1.017***	0.892**
		(0.37)	(0.36)	(0.36)
Number of departments		0.037	0.009	0.025
		(0.04)	(0.03)	(0.03)
Constant	1.224***	1.826***	0.236	-1.702
	(0.14)	(0.53)	(0.60)	(1.22)
Regional Controls	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Founding period FE	No	No	No	Yes
Adj.R^2	0.030	0.070	0.415	0.400
Observations	1363	1363	1363	1237

Notes: OLS regression of the amount of funding received per project (some hospitals received funding for more than one project). Column (1) shows OLS estimates without controls, column (2) adds number of beds, number of departments and regional controls on the county level (share of public hospitals, unemployment rate, share of inhabitants aged 65+, number of hospital beds per 1000 inhabitants, urban dummy, population density, GDP per capita). Column (3) adds state fixed effects. Column (4) adds fixed effects for the quarter century in which the hospital was founded. Robust standard errors shown in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A possible explanation could be that the federal government required the stimulus money to be distributed independently of ownership ("trägerneutral"). Because it is easy to observe who gets funded, private NFP hospitals, which are more similar to public hospitals in size, might have complained if their applications had been accepted less frequently. It is more difficult to observe whether the size of the projects is comparable across ownership types. On the other hand, private FP hospitals are fewer in number and smaller, so it is more difficult to recognize a difference in the probability of being funded.

One concern could be that funding for public and private hospitals differs, because they were using the funds in systematically different ways and were applying for different kinds of projects. In Appendix 6.3 we show that this is not the case. There are some small differences in the types of projects that are being procured. However, the funding received by public hospitals is larger for all project types. Thus, differences in the costs of different project types cannot explain why public hospitals were treated more generously.

3.4.2 Financial Controls

So far, we controlled for the number of beds and departments, but not for other hospital characteristics such as financial performance. Public hospitals might receive more funds because

they are in more urgent need of subsidies, for example, if they are underfunded or operate less efficiently compared to private NFP and private FP hospitals. Indeed, there is some empirical evidence that public hospitals are less efficient and less profitable than private NFP and FP hospitals (Pilny, 2017). Note, however, that this is an endogenous effect of ownership. Thus, if we are interested in the total effect of ownership on receiving funds, these financial variables are "bad controls" (Angrist and Pischke, 2009) that should not be included in the regression.

Including financial controls in the regression answers a different question: What is the short-run effect of ownership status, given the (endogenously determined) financial situation of hospitals? This is reported in Table 3.5. We include controls for fixed assets per bed, long-term debt per bed, operating revenue per bed and the ratio of earnings before interest, taxes, depreciation and amortization to operating revenue (EBITDA margin). To avoid our results being driven by outliers in financial performance in any given year (e.g. affected by the financial crisis), we use the average of each measure across the four years from 2006-2009. Unfortunately, we could match the information on all of these financial controls for all four years for only a subset of 239 hospitals.[23]

Table 3.5: Financial controls

	(1) Total average funding	(2) Linear Probability of funding	(3) Per project funding	(4) Total average funding	(5) Linear Probability of funding	(6) Per project funding
Private FP	-0.855*	-0.256***	-0.074	-0.767	-0.213***	-0.140
	(0.47)	(0.08)	(0.50)	(0.47)	(0.08)	(0.49)
Private NFP	-0.921*	-0.116	-0.127	-0.922*	-0.117*	-0.098
	(0.49)	(0.07)	(0.27)	(0.49)	(0.07)	(0.33)
Beds in thsd	1.777	0.040	-0.244	1.781	0.026	-0.329
	(1.09)	(0.17)	(0.51)	(1.13)	(0.16)	(0.55)
Number of departments	0.082	0.011	0.126**	0.078	0.008	0.140**
	(0.07)	(0.01)	(0.06)	(0.07)	(0.01)	(0.06)
EBITDA margin (4yr average)				-1.522	-1.430**	0.688
				(3.63)	(0.66)	(5.52)
Operating revenue in mio per bed (4yr average)				0.615	0.441	-2.178
				(1.91)	(0.50)	(5.37)
Fixed assets in mio per bed (4yr average)				2.459	0.246	0.673
				(3.13)	(0.35)	(2.89)
Long term debt in mio per bed (4yr average)				-7.384	-1.040	4.049
				(7.48)	(0.90)	(6.98)
Number of employees per bed (4yr average)				-0.138	-0.050	0.107
				(0.13)	(0.03)	(0.29)
Constant	1.220	0.298	-0.339	1.829	0.651*	-0.745
	(1.35)	(0.32)	(1.55)	(1.51)	(0.36)	(1.66)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes	Yes	Yes	Yes
$Adj.R^2$	0.319	0.539	0.588	0.310	0.548	0.580
Observations	239	239	245	239	239	245

Notes: OLS regression (total average funding, probability of funding and funding per project) for only the subsample of hospitals for which all financial controls are available. Financial controls consist of the averages of the controls across the years 2006-2009. Standard regression (with regional controls, state fixed effects and fixed effects for the quarter century in which the hospital was founded) in columns 1-3, including financial controls in columns 4-6. Sample not representative of full sample. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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[23] Including 90 public hospitals (37.7%), 111 private NFP hospitals (46.4%), and 38 private FP hospitals (15.9%).

The first three regressions in Table 3.5 report effects on total average funding in column (1), probability of funding in column (2), and funding per project in column (3). These are the same regressions reported in columns (4) of Tables 3.2, 3.3, and 3.4, but restricted to the 239 hospitals for which we have financial controls. Comparing the coefficients in the restricted sample to the unrestricted sample shows that the restricted sample is not representative of the entire population. However, all coefficients go in the same direction as in the full sample. Adding financial controls in columns (4), (5), and (6) hardly affects the magnitude or level of significance of the coefficients on ownership status for all three outcomes. Moreover, almost all of the financial controls have insignificant effects. An exception is that a higher EBITDA margin reduces the probability of funding. Private FP hospitals tend to be somewhat more profitable.[24] Nevertheless, the negative effect of "Private FP" on the probability of being funded remains large and significant even after controlling for the EBITDA margin. Overall, this result suggests that it is not differences in the financial performance of the hospitals (in the four years prior to the stimulus packages) or greater investment needs resulting from lower profit margins that drive our main results.[25]

3.4.3   Mechanisms

We have seen that public hospitals receive on average more subsidies than non-public hospitals. We have presented evidence that this is not driven by differences in regional conditions, financial performance, or greater investment needs, but rather by ownership status itself. By what mechanism could ownership causally affect the subsidy payments? Our data does not allow us to give a full answer to this question, but it provides insights into potential mechanisms that could be at work. One possible mechanism is ideology. Some politicians could believe that hospitals should be owned by the government and that publicly-owned hospitals should get preferential treatment as compared to their private competitors. In this case, left-wing politicians would probably favor public hospitals more than right-wing politicians. We test this hypothesis in Table 3.6, by adding several political controls, in particular whether the prime minister of the state and the mayor or district administrator (DA) of the municipality or county is left-wing, i.e. a member of the social democrats (SPD) or the left party (DIE LINKE). We interact these

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[24] See Augurzky et al. (2012) and Pilny (2017).

[25] To ensure these results are not driven by our definition of financial controls, we re-run the same regression using three different definitions of financial controls: only using data from 2007, using the 3-year average from 2007-2009, and using the 5-year average from 2005-2009. Results are found in the appendix in Tables C5, C6, and C7. The order of magnitude, direction and level of significance of the coefficients do not differ greatly, leaving the interpretation of our findings unchanged.

variables with being a non-public (either private FP or private NFP) hospital. If ideology was a relevant mechanism, the interaction terms should be negative.

Table 3.6: Political controls

	(1) Total average funding	(2) Linear Probability of funding	(3) Per project funding
Private FP	-0.350*	-0.236***	0.134
	(0.19)	(0.06)	(0.21)
Private NFP	-0.302	-0.044	-0.262
	(0.23)	(0.06)	(0.34)
Beds in thsd	2.734***	0.113	0.754**
	(0.72)	(0.09)	(0.38)
Number of departments	-0.005	0.020***	0.065*
	(0.04)	(0.01)	(0.04)
Left-wing MP	1.237***	0.277***	-0.170
	(0.46)	(0.07)	(0.45)
Non-public × left-wing MP	-0.882*	-0.027	0.428
	(0.52)	(0.09)	(0.49)
Left-wing mayor/DA	-0.214	-0.027	-0.245
	(0.27)	(0.05)	(0.32)
Non-public × left-wing mayor/DA	0.229	-0.048	0.275
	(0.28)	(0.06)	(0.35)
Election year	0.169	-0.331***	1.611***
	(0.23)	(0.05)	(0.40)
Non-public × election year	-0.247	0.148**	-1.031**
	(0.26)	(0.06)	(0.44)
Eastern State	-0.733***	-0.685***	1.199***
	(0.27)	(0.07)	(0.36)
Non-public × Eastern State	0.533	-0.036	2.295
	(0.37)	(0.06)	(1.85)
Constant	0.454	0.434**	1.368**
	(0.48)	(0.20)	(0.70)
Regional Controls	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes
$Adj.R^2$	0.161	0.244	0.148
Observations	1445	1445	1237

Notes: OLS regression (total average funding, probability of funding and funding per project) including political controls. The regressions include regional controls and fixed effects for the quarter century in which the hospital was founded. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

With a left-wing prime minister[26], hospitals receive significantly more money than with a conservative prime minister. Public hospitals receive on average 1.2 million EUR more, while this effect is significantly reduced (by more than half) if the hospital is non-public. Furthermore, under a left-wing prime minister the probability that hospitals are funded increases significantly. These results support the hypothesis that left-wing governments are more inclined to finance hospitals more generously, with public hospitals receiving significantly more of those additional funds. The political affiliation of the mayor or district administrator of the municipality or

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[26] Here left wing means a member of the SPD. In 2009 there was no prime minister who was a member of DIE LINKE.

county does not have an additional significant impact.

Another possible mechanism is that voters hold local and state governments accountable for the quality of public hospitals, but less so for private FP and NFP hospitals. To test this hypothesis, we include a dummy variable that equals 1 if there are upcoming state-wide or local elections in 2010. Again we interact this variable with being a non-public hospital. If accountability was a relevant mechanism, this interaction term should also be negative. This is indeed the case for the total amount of funding (although this effect is not significant) and the funding per project, which is significantly lower for private hospitals compared to public hospitals when elections are near. In general, we observe that there is a highly significant negative effect of upcoming elections on the probability of funding, but a positive effect on the size of individual projects. This could suggest that upcoming elections caused the government to be more inclined to fund particularly large, visible and prestigious projects in public hospitals, but had to cut back on the number of projects to make up for this larger spending. This could indicate that politicians are indeed held more accountable for public hospitals and focus on larger and more prestigious projects in public hospitals in an election year.

Lastly, eastern (former GDR) states may have treated their hospitals differently than western states, because hospitals in eastern states benefited from large investments after the German reunification in the 1990s and early 2000s and were less in need for additional projects. A dummy variable for eastern states is indeed highly significant. However, there is no significant difference between public and non-public hospitals in the east.

There are several other plausible mechanisms that may explain the more favorable treatment of public hospitals. For example, public hospitals may have easier and more frequent access to local politicians, if local politicians are members of the board or are engaged in some other fashion in the oversight of a public hospital. Another possible explanation is that there are psychological effects of ownership. If the local government owns a hospital it may feel more responsible (and accountable) for its success and therefore more inclined to favor it. Disentangling these effects is not feasible with our data set and goes beyond the current study, but it would be a very interesting project for future research.

3.5   Robustness Checks

3.5.1   Is Hospital Ownership as Good as Randomly Assigned?

To establish a causal impact of ownership on the amount of subsidies received from the stimulus money, we rely on the identifying assumption that the error terms in our main regressions (described in Tables 3.2, 3.3 and 3.4) are uncorrelated with ownership status. In other words, we require that ownership status is as good as randomly assigned. Looking at the historical context in which German hospitals were founded, this seems highly plausible. Most German hospitals were founded in the 19th and early 20th century and kept their ownership structure since then. Figure 3.2 shows the share of hospitals founded in each quarter century since 1750. Almost half (44%) were founded in the 19th century and another 28% between 1900 and 1950. While the foundation dates are similarly distributed for public and private NFP hospitals, private FP hospitals have generally been founded more recently (see Figure C1 in the appendix). Of all hospitals, around 79% did not change ownership between being founded and 2009. Figure 3.3 plots the relationship between ownership type at foundation and in 2009, when the government subsidies were received. The raw correlation coefficient between the two variables is 0.55.
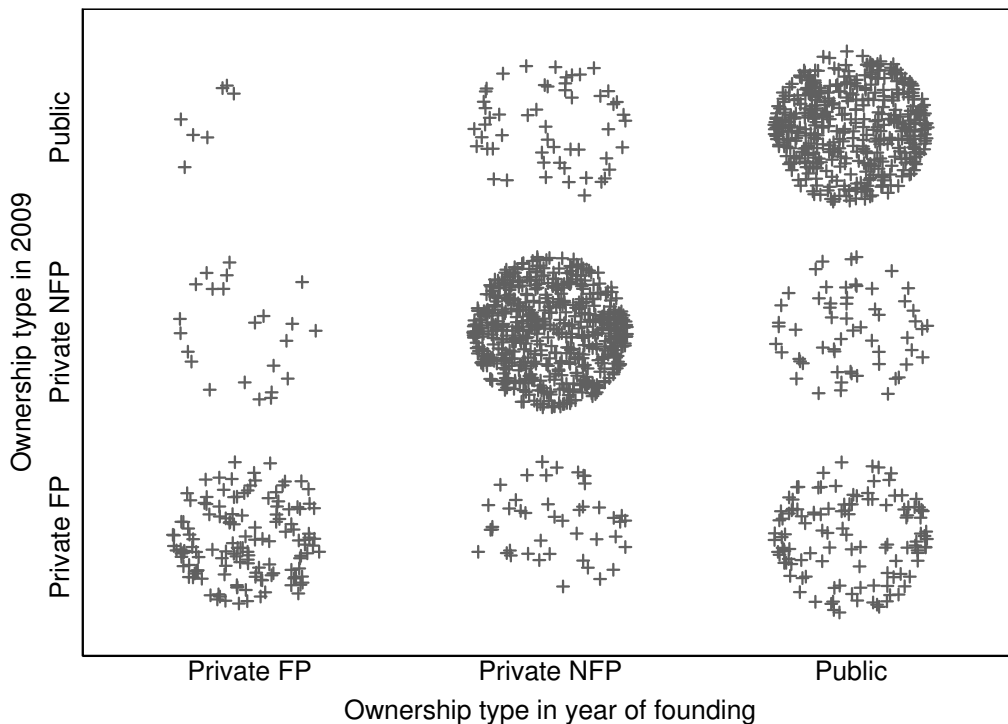
Figure 3.2: Founding dates of hospitals

Notes: Percentage of hospitals founded in each quarter of a century. Leftmost bar aggregates all hospitals founded prior to 1750.

What determined by whom a hospital was founded? Before the 19th century there existed only hospices run by churches or by religious orders. Old and sick people who did not have relatives to look after them and who could no longer support themselves would go there to be cared for until their death. These hospices did not have the facilities to cure diseases. In the 19th century the first modern hospitals were founded with the explicit objective to cure people. However, the probability to catch an infection or a disease in a hospital was high, and everybody who could afford it and who could rely on the care of relatives would not go to a hospital but stay at home and perhaps pay a doctor for a visit. Hospitals were founded for the poor without family support, in particular for the many factory workers, craftsmen, maids and other service staff moving to the cities who could not rely on a network of relatives and who could not afford medical care.[27]

The ownership structure of these hospitals depended on idiosyncratic local conditions. Sometimes a hospital grew out of a local hospice and was owned by the church or a religious order. Sometimes the municipality founded a hospital for its growing number of inhabitants. In some

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[27] See Spree (1999).

cases there was a donation of the local bishop or a local secular ruler on which a hospital was founded. After the Franco-German war (1870-71) organizations like the German Red Cross founded NFP hospitals to care for the wounded and for disabled persons. In industrialized regions (e.g. the Ruhr area) trade unions and labor organizations ("Arbeiterwohlfahrt") founded NFP hospitals to care for workers and their families.[28]

In the southern states, factory workers, craftsmen and service staff were required to buy hospital insurance that would pay for the cost of hospitalization in the 19th century. In northern Germany, in particular in Prussia, mandatory health insurance was introduced in the 1860s. However, in the beginning this insurance covered only the loss of earnings if a person got sick or injured, but not the cost of hospitalization.[29] In southern Germany, municipalities were more inclined to found hospitals because the running cost could be recovered from the insurance, while in Northern Germany the foundation of hospitals was more often left to religious and charitable organizations. After the formation of the GDR in 1949, the communist government in eastern Germany did not expropriate hospitals but kept their nominal ownership structure that was reconstituted after reunification.

While regional, political and economic conditions in the 19th and 20th century have thus influenced hospital ownership at the date of foundation, these do not correlate in an obvious way with prosperity or other economic or political factors in the German states today.[30]

3.5.2 Using an Instrumental Variable Approach

We exploit the historical context to use ownership at foundation as an instrument for ownership in 2009. We argue that this instrument is relevant and exogenous.

For the instrument to be *relevant*, ownership at foundation has to be a good predictor of ownership in 2009. Figure 3.3 suggests that there is a strong relationship. This is confirmed by the first stage of the two stage least squares regression where we regress ownership type in 2009 on ownership type when the hospital was founded (and all other exogenous variables). We do this by running three separate first stage regressions, as shown in Table 3.7. Column (1) shows the first stage regression of the linear probability model that a hospital is private FP in 2009, given ownership type at founding. Columns (2) and (3) show the same for hospitals that are private NFP and public in 2009, respectively. This regression model does not have a constant

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[28] The papers collected in Labisch and Spree (2001) offer fascinating spotlights on the development of hospitals in Germany in the 19th century.

[29] See Spree (1995) for a survey of the history of hospitals in Germany in the 19th century.

[30] See Figure C2 in the appendix for details on the distribution of hospital ownership across the German states.

to allow for all three dummies on ownership types to be included as regressors. As can be seen in Table 3.7, ownership type at foundation is highly predictive of ownership type in 2009. To test for underidentification and weak instruments formally, we report the Kleibergen-Paap rk LM statistic and the Kleibergen-Paap rk Wald F statistic in Table 3.8. The large test statistics in each case allow us to reject the null hypotheses that our model is underidentified or that our instruments are weak.

Table 3.7: First-stage regressions

	(1) Private NFP in 2009	(2) Private FP in 2009	(3) Public in 2009
PNFP when founded	0.716***	0.139	0.145
	(0.19)	(0.14)	(0.17)
PFP when founded	0.084	0.846***	0.070
	(0.19)	(0.13)	(0.17)
Public when founded	0.090	0.317**	0.593***
	(0.19)	(0.14)	(0.17)
Beds in thsd	-0.120***	-0.089*	0.210***
	(0.04)	(0.05)	(0.06)
Number of departments	-0.001	-0.000	0.001
	(0.00)	(0.00)	(0.00)
Regional Controls	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes
$Adj.R^2$	0.785	0.530	0.743
Observations	1400	1400	1400

Notes: First stage regressions of the linear probability of the ownership type of a hospital in 2009 being private FP in Column (1), private NFP in column (2) or public in column (3) based on the instruments (ownership type when founded) and all exogenous regressors. Does not include a constant. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

For the instrument to be *exogenous*, there must be no relationship between ownership at foundation and stimulus money received in 2009 after controlling for all observable exogenous variables. This is plausible because ownership at foundation was largely driven by historical factors long before stimulus money was paid out in 2009, as argued above. Reverse causality can be ruled out, and our main variables on the amount of funding received in 2009 are precisely measured, so measurement error is not an issue. Furthermore, it is difficult to come up with omitted variables that affected both the ownership structure at founding and the need for subsidies in 2009 after controlling for all the economic, social and demographic observables that we have. We present further evidence against an omitted variable in section 3.5.3 below.

Using ownership at foundation as a relevant and exogenous instrument for the ownership status in 2009, we run a two-stage least squares regression. Table 3.8 shows the results of the second stage. Columns (1), (2) and (3) of Table 3.8 show the results from the standard OLS

regression on the subset of 1,400 hospitals for which data on the founding date and ownership type at founding was available. The coefficients are very similar to those from our main regressions, suggesting that the restricted sample is not subject to any selection bias. Columns (4), (5) and (6) show the results of the IV regression. The effects are very similar in terms of sign and statistical significance to our main results, but most of the coefficients are somewhat larger.

Table 3.8: IV Regression with 2SLS

	(1)	(2)	(3)	(4)	(5)	(6)
		OLS			IV	
	Total average funding	Linear Probability of funding	Per project funding	Total average funding	Linear Probability of funding	Per project funding
Private FP	-0.417**	-0.082**	-0.383*	-0.392	-0.153**	-0.394
	(0.19)	(0.03)	(0.22)	(0.31)	(0.07)	(0.34)
Private NFP	-0.358**	-0.007	-0.489***	-0.534*	-0.024	-0.701**
	(0.17)	(0.03)	(0.18)	(0.29)	(0.05)	(0.28)
Beds in thsd	2.873***	0.048	0.856**	2.802***	0.037	0.803**
	(0.75)	(0.07)	(0.36)	(0.79)	(0.07)	(0.37)
Number of departments	-0.008	0.025***	0.028	-0.007	0.025***	0.028
	(0.04)	(0.01)	(0.03)	(0.04)	(0.01)	(0.03)
Constant	0.383	0.657***	-1.767	0.493	0.687***	-1.630
	(0.60)	(0.20)	(1.29)	(0.56)	(0.20)	(1.27)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap rk LM statistic				149.01	149.01	57.88
Kleibergen-Paap rk Wald F statistic				135.84	135.84	57.64
Observations	1400	1400	1215	1400	1400	1215

Notes: Main OLS regressions vs. 2SLS regressions with ownership at founding as instrument for ownership in 2009. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

According to the IV estimates, the probability of a private FP hospital to get funded at all is about 15ppt lower than for public hospitals, while private NFP hospitals receive funding at the same rate as public hospitals. However, private NFP hospitals receive almost 700k EUR less per project, which translates into around 530k EUR less in total average funds. Our IV estimates therefore support the conclusions drawn above and suggest that, if anything, the OLS analysis provides an underestimation of the true effect of ownership on subsidies received.

3.5.3 District Fixed Effects

Despite the long time lag between the founding of most hospitals and the financial crisis, it could be argued that there may be omitted variables affecting both the ownership structure at founding and the need for subsidies in 2009. For example, whether a region was mainly catholic or protestant, whether it was agricultural or industrialized, or whether it belonged to Prussia or to the southern states may have affected both the ownership status when founded, and the affluence of the region in 2009, affecting the need of subsidies after the financial crisis. However, these factors should affect all hospitals in a given region equally. To control for this, we add

fixed effects for the 33 districts (Regierungsbezirke) in Germany to our main regression.[31]

Table 3.9: District fixed effects

	(1) Total average funding	(2) Linear Probability of funding	(3) Per project funding	(4) Total average funding	(5) Linear Probability of funding	(6) Per project funding
Private FP	-0.410**	-0.086**	-0.389*	-0.399**	-0.084**	-0.317
	(0.19)	(0.03)	(0.22)	(0.19)	(0.03)	(0.21)
Private NFP	-0.359**	-0.020	-0.476***	-0.362**	-0.025	-0.400**
	(0.17)	(0.03)	(0.18)	(0.17)	(0.03)	(0.18)
Beds in thsd	2.848***	0.039	0.892**	2.855***	0.037	0.901**
	(0.75)	(0.07)	(0.36)	(0.76)	(0.07)	(0.36)
Number of departments	-0.008	0.026***	0.025	-0.009	0.025***	0.024
	(0.04)	(0.01)	(0.03)	(0.04)	(0.01)	(0.03)
Constant	0.292	0.580***	-1.702	0.369	0.611***	-1.299
	(0.57)	(0.19)	(1.22)	(0.64)	(0.20)	(1.03)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	No	No	No
Region (Bezirk) FE	No	No	No	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R²	0.171	0.442	0.400	0.167	0.452	0.429
Observations	1459	1459	1237	1459	1459	1237

Notes: OLS regression (total average funding, probability of funding and funding per project) using different fixed effects: state fixed effects in columns 1-3 (as in the previous analysis) and district fixed effects in columns 4-6. District fixed effects are based on 33 "Regierungsbezirke" (as defined in 2009). Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The regression results are reported in Table 3.9. Columns (1), (2) and (3) show the regression results for total average funding, linear probability and project funding for the full sample again to facilitate the comparison. Columns (4), (5) and (6) repeat the same analyses adding district level fixed effects. This has almost no effect on our results. The level of significance is slightly reduced on the two coefficients for per project funding. Given that controlling for more granular regional differences does not affect our outcomes, we conclude that regional differences are not acting as important omitted variables in our estimations. Based on this and the fact that ownership at foundation was largely driven by historical factors long before stimulus money was paid out in 2009, we conclude that the instrument is plausibly exogenous.

3.5.4 Recent Privatizations

Lastly, it could be argued that it is not ownership status itself causing the difference in treatment, but secondary effects resulting from ownership, such as poorer management quality driving the need for higher subsidies. In this robustness check, we consider hospitals that changed

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[31] We use the definitions of districts as they were in 2009. We also run a regression on the even more granular level of the 417 counties and municipalities in Table C4 in the appendix. A district comprises several counties but these counties tend to be similar in economic structure and to have a common historical background. For example, the state of Bavaria comprises catholic and protestant regions as well as regions that are very rich and rather poor. However the districts of, say, "Upper Bavaria" or "Lower Franconia" are much more homogenous. Note that only the states North Rhine Westphalia (5), Bavaria (7), Baden-Wurttemberg (4), Hessia (3) and Saxony (3) are subdivided into districts. The smaller territorial states and the city states do not have this additional layer, so we identify the district with the state itself.

their ownership type from public to private in the 5 years prior to the financial crisis, so since 2003. We compare the privatized hospitals (i.e. hospitals that were public in 2003 and private in 2009) to those hospitals that were public throughout this time period ("always public") and hospitals that were private throughout this period ("always private"). If our hypothesis is correct and funding decisions are causally driven by ownership status itself rather than any indirect secondary effects, we should see recently privatized hospitals to be treated exactly the same as hospitals that have always been private and thus receive less funding compared to hospitals that have always been public. If, on the other hand, some other factor were driving funding decisions that correlated with ownership, we would expect the treatment of recently privatized hospitals to be closer to that of "always public" hospitals, because its history of having been public should mean it is more similar to "always public" hospitals than to "always private" hospitals. Table 3.10 shows that recently privatized hospitals do indeed receive less funding than "always public" hospitals, indicated by the negative coefficients in columns (1) and (3), while there is almost no difference between recently privatized and "always private" hospitals, shown by the coefficients being close to 0 in columns (4), (5) and (6). This confirms our hypothesis.

Table 3.10: Recently privatized hospitals

	(1)	(2)	(3)	(4)	(5)	(6)
	Total average funding	Linear Probability of funding	Per project funding	Total average funding	Linear Probability of funding	Per project funding
was public now private	-0.399	0.032	-0.469*	0.060	0.031	-0.054
	(0.30)	(0.06)	(0.26)	(0.24)	(0.05)	(0.19)
Beds in thsd	2.956***	0.007	0.707	1.091***	0.031	1.143***
	(0.72)	(0.08)	(0.45)	(0.41)	(0.10)	(0.25)
Number of departments	0.025	0.033***	0.034	0.044	0.017**	-0.010
	(0.05)	(0.01)	(0.05)	(0.03)	(0.01)	(0.02)
Constant	1.253	0.415	-0.150	0.349	0.496***	0.235
	(1.42)	(0.28)	(1.38)	(0.62)	(0.16)	(0.74)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R^2	0.177	0.259	0.412	0.083	0.532	0.538
Observations	629	629	511	1064	1064	900
Reference group	*Always public*	*Always public*	*Always public*	*Always private*	*Always private*	*Always private*

Notes: OLS regression (total average funding, probability and funding per project) comparing the subsample of hospitals that were privatized between 2003 and 2009 to those that were always public (columns 1-3) or always private (columns 4-6) in that time period. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.6   Implications: A Simple Model of Private versus Public Ownership

In this section we develop a simple theoretical model that highlights the main implications of our empirical result for the performance of publicly owned vs. privately owned firms.

Consider a firm that needs additional funds $I > 0$ in order to continue its operation. The

firm generates two types of returns: private returns, x, that accrue to the owner and social returns or positive external effects, y, that accrue to other stakeholders of the firm or the general public. A private owner does not care about these external effects, but the government does. Importantly, based on our empirical results, we assume that if the government owns the firm, these positive external effects weigh more heavily in its objective function, i.e. they are multiplied by $\lambda > 1$.[32] The investment I can result in either success or failure. If the firm succeeds, it generates $x = \overline{x} > I$ and $y = \overline{y} > 0$. If the firm fails, it can either be shut down, in which case $x = y = 0$, or it can be kept in operation in which case $x = \underline{x} < 0$ and $y = \underline{y} > 0$. Failure happens with probability $p \in (0,1)$. In the simplest version of the model p is exogenous, but it will be endogenized later.

The time structure is as follows. At date 0, the owner, i.e. either a private owner P or the government G, decides on the investment. If there is no investment the game ends and all parties get a payoff that is normalized to 0. If the investment takes place nature determines at date 1 whether the firm succeeds (S) or fails (F), where failure happens with probability p. If the firm fails, the government decides at date 2 whether to rescue the firm by covering losses $\underline{x}$. Note that it can rescue the firm no matter whether it is privately or publicly owned. Finally, at date 3, parties receive their payoffs.

In the following we restrict attention to the most interesting case where $\underline{x} + \underline{y} < 0$ but $\underline{x} + \lambda \underline{y} > 0$. In this case the government does not rescue the firm if the firm is privately owned, but it does rescue the firm if it owns it.

3.6.1   Exogenous Probability of Failure

Let us first characterize the welfare maximizing (first-best) allocation. Ex post social welfare is given by $W = x + y - I$. At date 2, the investment I is sunk. Thus, efficiency requires to continue operation if and only if $x + y > 0$, i.e. in case of success. Therefore, at date 0 the investment should be undertaken if and only if[33]

$$(1-p)[\overline{x} + \overline{y}] > I \quad \Leftrightarrow \quad p < \frac{\overline{x} + \overline{y} - I}{\overline{x} + \overline{y}} \equiv p^{FB} \ . \tag{3.1}$$

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[32] In the hospital example, the positive external effects could be the consumer surplus (the health benefits) of the patients, the rents enjoyed by the employees on their jobs, or the benefits from landmark renovation or climate protection measures.

[33] In the following we ignore the non-generic cases where parameters give rise to equalities. In these cases it does not matter what is being done.

If the firm is privately owned, the private owner does not want to continue operation at date 2 if the firm failed (because $\underline{x} < 0$) and the government does not want to rescue the firm (because $\underline{x} + \underline{y} < 0$), so the firm will be shut down which is efficient. At date 0, the private owner invests if and only if

$$(1-p)\overline{x} > I \quad \Leftrightarrow \quad p < \frac{\overline{x} - I}{\overline{x}} \equiv p^P. \tag{3.2}$$

If the firm is owned by the government, it will continue operation after failure, because the government will bail it out at date 2 ($\underline{x} + \lambda\underline{y} > 0$) which is inefficient. Anticipating this the government will invest if

$$(1-p)[\overline{x} + \lambda\overline{y}] + p[\underline{x} + \lambda\underline{y}] > I \quad \Leftrightarrow \quad p < \frac{\overline{x} + \lambda\overline{y} - I}{(\overline{x} + \lambda\overline{y}) - (\underline{x} + \lambda\underline{y})} \equiv p^G \tag{3.3}$$

The first proposition shows that neither private nor government ownership achieves the first best, and that they deviate from the first best in opposite directions.

Proposition 1 *A privately owned firm does not invest often enough while a publicly owned firm invests too often, i.e.*

$$p^P < p^{FB} < p^G . \tag{3.4}$$

Furthermore, a publicly owned firm is rescued after failure which is inefficient.

The intuition for Proposition 1 is straightforward. With private ownership there is too little investment because the private owner ignores the positive externalities in case of success. With government ownership there is too much investment because the government overweighs the positive externalities and rescues the firm in case of failure. The next proposition shows under which conditions private ownership outperforms public ownership and vice versa.

Proposition 2 *Let $\hat{p} = \frac{\overline{x} + \underline{y} - I}{(\overline{x} + \underline{y}) - (\underline{x} + \underline{y})}$ where $\hat{p} < p^{FB}$. If $\overline{y} > (I - \overline{x}) \cdot (\underline{x} + \underline{y})$, then for all $p \in (p^P, \hat{p})$ public ownership outperforms private ownership. In all other cases social welfare with private ownership is weakly higher than with public ownership.*

Private ownership is clearly superior if p is small ($p < p^P$). In this case both types of owners invest, but the government rescues the firm in case of failure which is inefficient. Private ownership is also superior if p is large ($p > p^{FB}$). In this case investment is inefficient. The private owner does not invest while the government does (as long as $p < p^G$). The interesting

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case is when $p \in (p^P, p^{FB})$. In this case the investment is efficient but not profitable for a private investor. The government does invest, but it also rescues the firm in case of failure. Proposition 2 shows that government ownership can be strictly better than private ownership if the positive external effects in case of success ($\bar{y}$) are large as compared to the private losses in case of failure ($-\underline{x}$). Note that if $\bar{y}$ is small so that the condition in Proposition 2 is not satisfied, then $\hat{p} < p^P$ and private ownership is always optimal.

3.6.2   Endogenous Probability of Failure

We now endogenize the probability of failure. Suppose that the firm is run by a manager who can spend effort e in order to reduce the probability of failure from p to $p - e$ at personal cost $c(e) = \frac{1}{2}ke^2$. The manager's ex post utility is given by

$$U = w - \frac{1}{2}ke^2 \tag{3.5}$$

The manager receives a fixed wage $\bar{w} > 0$ as long as he is employed. If the firm is shut down he looses his job and receives a wage of 0. We assume that the manager's wage cannot be tied directly to the firm's performance, but only indirectly (if it is closed down). Note that the manager is risk neutral, but protected by limited liability, i.e. $w < 0$ is ruled out. The next proposition summarizes the optimal wages and effort choices under private and public ownership.

Proposition 3 *The manager spends more effort to reduce the probability of failure if the firm is privately owned than if it is publicly owned, i.e.*

$$e^P = \frac{\bar{x} - (1-p)k}{2k} > e^G = 0 . \tag{3.6}$$

Furthermore, he will be paid a higher wage by the private owner than by the government, i.e.

$$w^P = \frac{\bar{x} - (1-p)k}{2} > w^G = 0 . \tag{3.7}$$

The intuition is again straightforward. With private ownership the manager is motivated to spend effort in order to avoid that he loses his job in case of failure. With government ownership the manager anticipates that the firm will be bailed out, so there is no need to spend any effort. This is reflected in the wages that are paid.

This simple model explains several "stylized" facts that have been documented in the empirical literature: Public ownership may be superior to private ownership if there are large positive externalities that cannot be realized under private ownership because the necessary investment are not sufficiently privately profitable. However, public ownership results in a soft-budget constraint: The firm will be bailed out too often if it fails. This in turn weakens the incentives of the management to work hard to reduce the probability of failure. Furthermore, managers of public companies are paid lower wages than managers of private companies.

All of theses predictions are derived from a single assumption, namely that the government cares more about the social benefits generated by a firm that it owns than by a firm that it does not own. This assumption is validated by our empirical analysis.

3.7 Conclusion

We have shown that public hospitals received much more generous funding from stimulus money than private NFP and FP hospitals that are similar in structure. Private FP hospitals are around 19.5% less likely to receive funding compared to public hospitals, while private NFP hospitals are equally likely to receive funding, but conditional on being funded receive around 38.9% less funding per project. After controlling for all relevant observables, this results in a lower average funding per hospital of around 350k EUR to 400k EUR for both private NFP and private FP hospitals compared to public hospitals. Because the ownership status of the large majority of hospitals was determined by historical factors in the 19th and early 20th century long before the financial crisis, we argue that ownership is predetermined and as good as randomly assigned. An IV analysis using ownership when a hospital was founded as instrument for ownership in 2009 confirms our results and indicates that, if anything, our results underestimate the true causal effect of ownership on subsidy payments.

The result that state ownership biases government support has important and far reaching implications. It suggests that some of the concerns regarding state ownership, such as the distortion of competition or the over-funding of publicly owned projects, may be warranted. Furthermore, it can explain why state-owned firms face a soft-budget constraint, as first postulated by Kornai (1980). This can result in the management of a state-owned firm having insufficient incentives to reduce costs and inefficient companies being kept alive for too long. Finally, it shows that the legal provisions that prevent governments in many industrialized countries from giving preferential treatment to state-owned firms are warranted and need to be strictly en-

forced. However, there are many ways how a government can support a company it owns. Legal safeguards can prevent some but not all forms of preferential treatment. Governments should be aware of their biases and take into account their favoritism towards their own firms, both when granting state aid, but also when deciding to acquire ownership of companies to pursue industrial policy in the first place.

Our data hint at two mechanisms that might be driving the observed state favoritism: ideological reasons of left-leaning politicians as well as increased public scrutiny regarding the performance of public as opposed to private hospitals. A promising avenue for further research is to dig deeper into these and other mechanisms and shed more light on the reasons for the observed changes in government preference. Moreover, all public hospitals in our data set are fully state-owned. It would be an interesting topic for future research to determine if the intensity of government favoritism varies with the degree of ownership, given that many firms are partially owned by the government while the remaining shares are held by private owners.

4. APPENDIX TO CHAPTER 1

4.1 Additional Tables

Table A1: Valuation of the menstrual underwear at endline

	(1)	(2)	(3)	(4)
		WTP underwear		
	Full sample		Without always takers	
Intervention	68.200	50.122	77.469**	71.525**
	(67.76)	(68.54)	(30.47)	(29.89)
Constant	873.187***	349.941	93.590***	10.775
	(59.43)	(291.30)	(18.71)	(115.50)
Demographic Controls	No	Yes	No	Yes
Observations	476	460	106	102

Notes: Interval regression of the WTP (in BDT) at endline for the reusable menstrual underwear to be collected from a male shopkeeper at the factory store. Prices were increased in steps of 50 BDT from 0 BDT to a maximum of 500 BDT. Demographic controls in columns (2) and (4) include age, years of education, marital status, number of children and baseline use of pads and cloth (as dummies). Columns (3) and (4) exclude participants with a perfectly inelastic demand (i.e. who still preferred the underwear at the maximum price of 500 BDT) from the regression. Robust standard errors reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Valuation of a second underwear at six-month follow-up

	(1)	(2)	(3)	(4)
		WTP underwear		
	Full sample		Without always takers	
Intervention	60.468	33.139	60.061**	62.242**
	(62.74)	(55.47)	(29.46)	(27.82)
Constant	750.456***	1317.654***	156.999***	357.446***
	(53.19)	(219.13)	(20.40)	(109.22)
Demographic Controls	No	Yes	No	Yes
Observations	339	339	87	87

Notes: Interval regression of the WTP (in BDT) at six-month follow-up for the reusable menstrual underwear to be collected from a male shopkeeper at the factory store. Sample includes 291 women who had already collected the first underwear directly after the experiment. Prices were increased in steps of 50 BDT from 0 BDT to a maximum of 500 BDT. Demographic controls in columns (2) and (4) include age, years of education, marital status, number of children and baseline use of pads and cloth (as dummies). Columns (3) and (4) exclude from the regression participants with a perfectly inelastic demand (i.e. who still preferred the underwear at the maximum price of 500 BDT). Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Stigma, taboo and social norm on collecting underwear from a male shopkeeper at six-month follow-up

	(1) Stigma	(2) Taboo	(3) Norm
Follow-Up	-0.687***	-0.563***	0.282***
	(0.12)	(0.12)	(0.03)
Intervention	-0.073	0.080	0.005
	(0.14)	(0.14)	(0.04)
Intervention*Follow-Up	0.030	-0.068	0.024
	(0.17)	(0.18)	(0.04)
Mean of dep. var	1.834	1.652	0.424
Demographic Controls	Yes	Yes	Yes
Observations	337	337	337

Notes: Difference-in-differences regression coefficients of the perceived stigma (column 1), taboo (column 2) and the social norms on purchasing pads from a male shopkeeper (column 3, normalized to a value between 0 and 1) on the treatment, comparing reported values six months after the treatment with the baseline. *Mean of dep. var* represents the control group mean before the discussion session. *Follow-Up* is a dummy equal to 0 for measures elicited in the baseline survey and 1 in the six-months follow-up survey. *Intervention* is a dummy equal to 0 if the respondent belongs to the control group and 1 if she belongs to the treatment group. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A1: Typical pharmacy in Bangladesh

Notes: Photo taken on 13. April 2022 in Dhaka, Bangladesh.

Figure A2: Distribution of material used at baseline by age and education
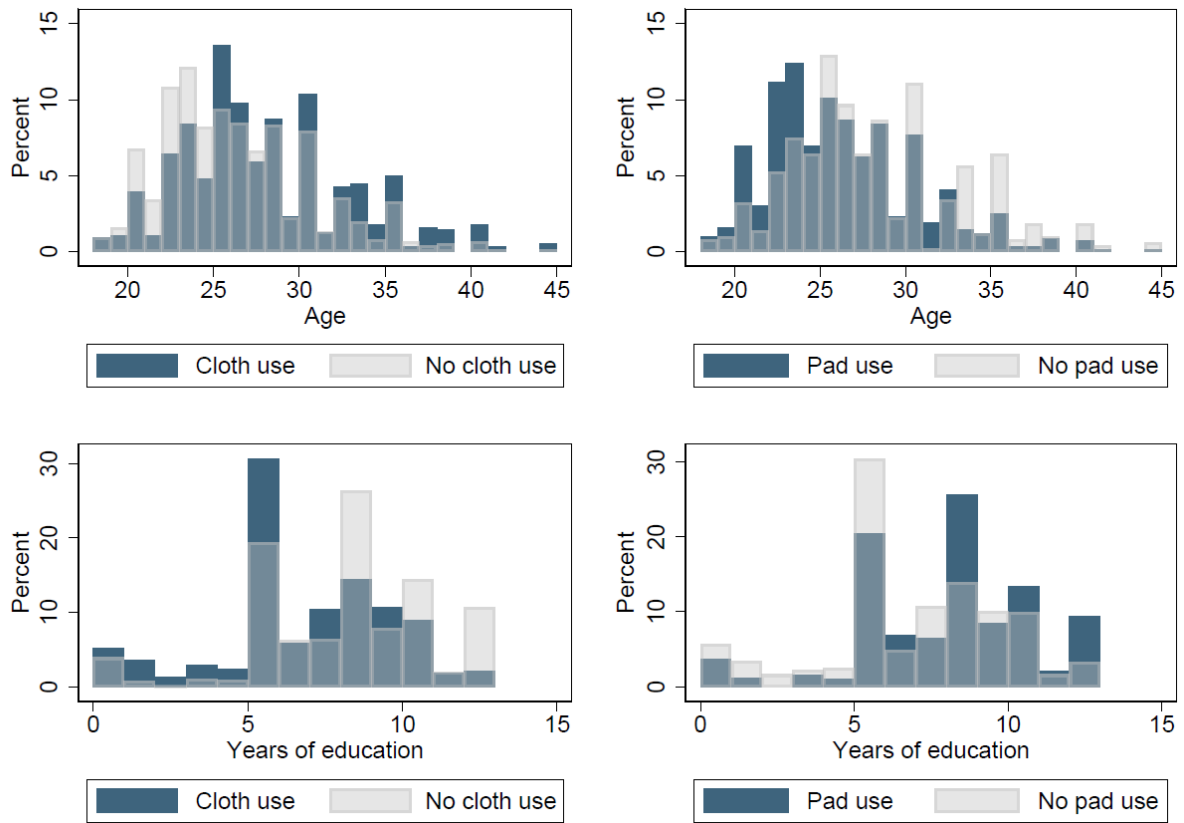
Notes: Histograms showing the percentage share of women reporting to use cloth frequently (blue bars in left-hand panels) and reporting to use pads frequently (blue bars in right-hand panels), split by age (top panels) and years of education (bottom panels). Light grey bars indicate women responding that they do not use the respective materials frequently.

Figure A3: Relationship of the share of pad and cloth users and group-level outcomes
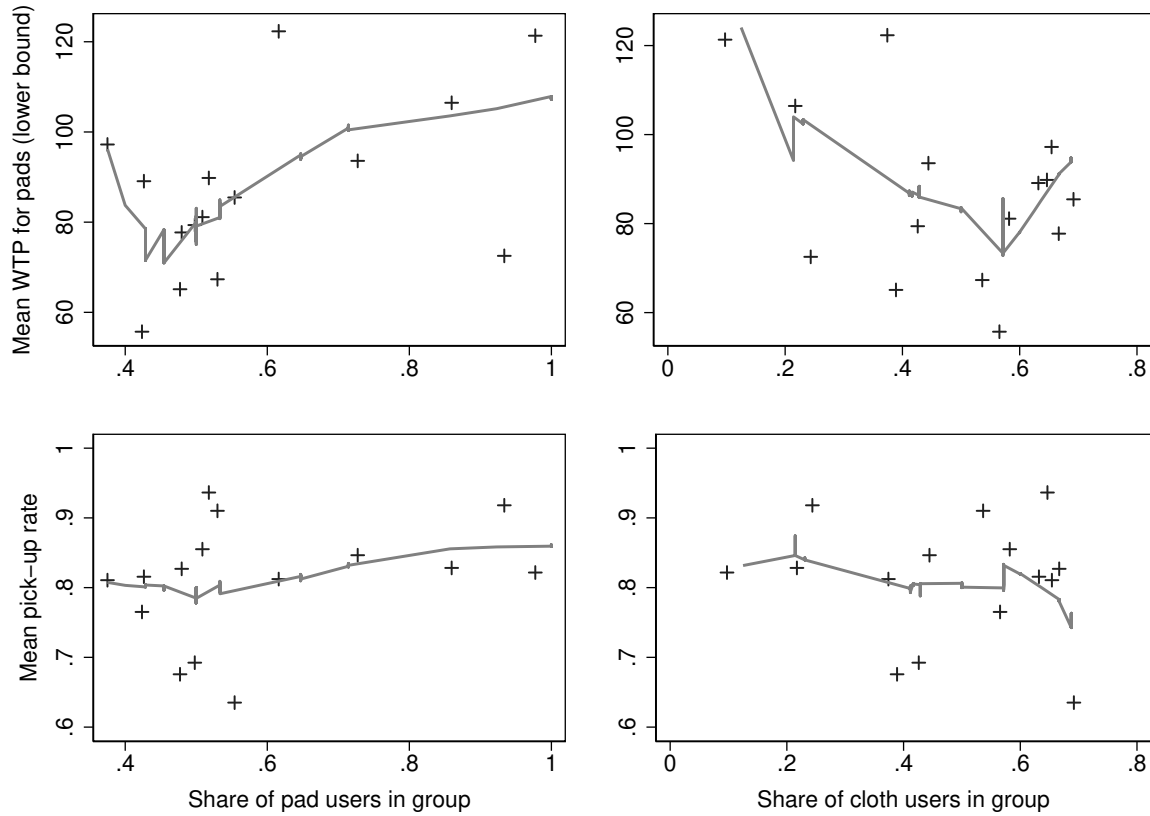
Notes: The four plots show the average lower bound of the WTP (top panels) and average pickup rates (bottom panels) for each of the 15 discussion groups, plotted against the share of pad users in each group (left-hand panels) and the share of cloth users in each group (right-hand panels). Pad users are defined as women reporting using pads frequently (2 days or more during a period) at baseline, cloth users are defined as women reporting using cloth frequently (2 days or more during a period) at baseline. The lower bound of the WTP is the last value at which a woman preferred the product over the money. The line of best fit is drawn as smoothed locally weighted regression line.

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Figure A4: Relationship of stigma and taboo and group-level outcomes
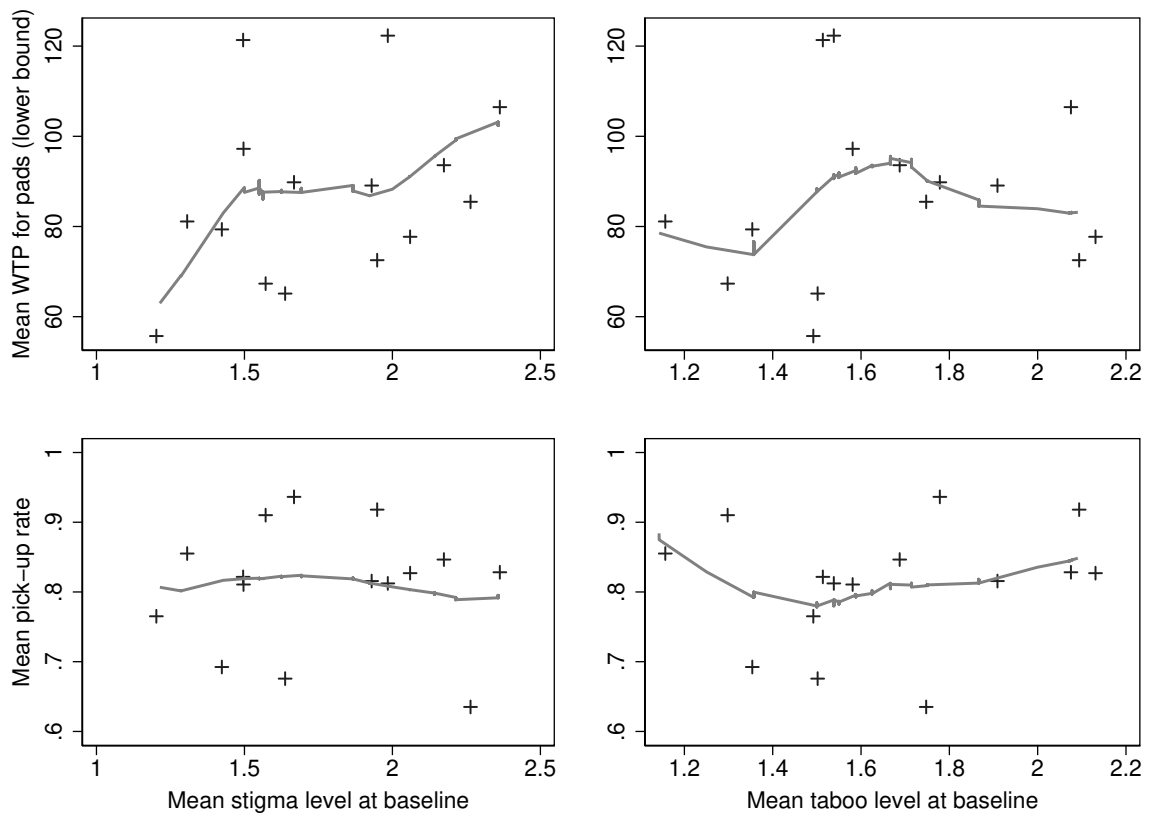
Notes: The four plots show the average lower bound of the WTP (top panels) and average pickup rates (bottom panels) for each of the 15 discussion groups, plotted against the average stigma levels in each group (left-hand panels) and the average taboo levels in each group (right-hand panels). The lower bound of the WTP is the last value at which a woman preferred the product over the money. The line of best fit is drawn as smoothed locally weighted regression line.

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4.3 Robustness checks

4.3.1 Enumerator Fixed Effects

To make sure that our results are not driven by systematic differences based on who conducted the survey, we repeat our main regressions including enumerator fixed effects.

Table A4: Willingness to pay and pick-up rates - enumerator fixed effects

	(1)	(2)	(3)	(4)
	WTP pads		Pick-up rates	
Intervention	22.760**	21.720**	0.089**	0.101**
	(9.34)	(9.12)	(0.04)	(0.04)
Constant	94.220**	52.281	0.413**	0.262
	(39.49)	(40.10)	(0.17)	(0.18)
Demographic Controls	Yes	Yes	Yes	Yes
Enumerator Fixed Effects	No	Yes	No	Yes
N	460	460	454	454

Notes: Columns (1) and (2) report the regression coefficients (OLS) of the intervention on the WTP for pads, with and without enumerator fixed effects. Columns (3) and (4) report the linear probability regression of the collection of the underwear with column (4) adding enumerator fixed effects. Differences in the number of observations between WTP and collection rates are due to six participants winning money or pads in the WTP lottery instead of the underwear. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.3.2 Excluding Discussion Groups 11 and 15

We re-run our main regression excluding discussion groups 11 and 15 in turn, to rule out that our results are driven by these two groups with exceptionally high treatment effects.

Table A5: Willingness to pay and pick-up rates - reduced group sample

	(1)	(2)	(3)	(4)
	WTP for pads		Pickup of underwear	
Intervention	18.817**	18.455*	0.088**	0.087**
	(9.39)	(9.42)	(0.04)	(0.04)
Constant	82.339**	87.923**	0.386**	0.412**
	(39.28)	(39.50)	(0.17)	(0.17)
Excluded Group	*11*	*15*	*11*	*15*
Demographic Controls	Yes	Yes	Yes	Yes
Observations	443	445	438	439

Notes: Columns (1) and (2) report the willingness to pay (in BDT) for disposable menstrual pads from a male shopkeeper at the factory store. Columns (3) and (4) report the linear probability of the collection of the underwear from a male shopkeeper at the factory store. Even columns exclude discussion group 15 from the analysis, odd columns exclude discussion group 11 from the analysis. Demographic controls include age, years of education, marital status, number of children and baseline use of pads and cloth (as dummies). Robust standard errors reported in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To account for any potential non-linearities in our social norms measure, which was elicited using a 4-point Likert scale, we re-run the difference-in-differences regression using an ordered logit model instead of OLS. While the size of the coefficients does not have a direct economic interpretation, these results confirm that the direction of the effect is the same as when estimated with OLS. Moreover, the levels of significance are the same for the coefficients on endline and even higher for the coefficients on the interaction term. This suggests that, if anything, OLS is underestimating the effect of the treatment on the probability of an individual switching to a more socially appropriate category.

Table A6: Social norms using an ordered logit regression model

	(1)	(2)	(3)	(4)
	Use as absorbent		*Purchase pads from*	
	Cloth	Disposable pads	Male shop-clerk	Female shop-clerk
Endline	-0.146	1.206***	1.352***	1.536***
	(0.24)	(0.23)	(0.15)	(0.34)
Intervention	-0.017	0.089	0.022	0.040
	(0.36)	(0.20)	(0.18)	(0.25)
Endline*Intervention	-0.828*	0.936**	0.568***	1.163*
	(0.43)	(0.42)	(0.21)	(0.69)
Observations	132	475	475	475

Notes: Ordered logit estimation of the treatment effect on perceived social norms regarding absorbent use and pad purchase. Dependent variables are the beliefs about social norms on 1) using reusable cloth as an absorbent during menstruation, 2) using disposable pads as an absorbent during menstruation 3) buying pads from a male shopkeeper, and 4) buying pads from a female shopkeeper. Dependent variables were elicited on a 4-point Likert scale (*very socially appropriate, socially appropriate, socially inappropriate, very socially inappropriate*). *Endline* is a dummy equal to 0 for measures elicited in the baseline survey and 1 in the endline survey. *Intervention* is a dummy equal to 0 if the respondent belongs to the control group and 1 if she belongs to the treatment group. In column (1) the number of observations is lower as some social norms were only elicited from a randomly selected subset of respondents to reduce the length of the survey. Clustered standard errors at the individual level are reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.4   Additional Information on the Discrete Choice Experiment

4.4.1   Constructing the Choice Sets

The method of the discrete choice experiment (DCE) is based on random utility theory (Pérez-Troncoso, 2020). The assumption is that individuals receive utility not from the product itself, but from the characteristics, such that the total utility received depends on the combination of characteristics and a random additional term. The utility is thus given by

$$V_{isj} = A'_{isj}\delta + \epsilon_i$$

where V_{isj} is the utility of individual i gained by choosing alternative j in scenario s. A_{isj} is a vector of the attributes and δ is the vector of coefficients. Assuming a linear relationship, the total utility is a linear combination of the utility obtained from each individual characteristic plus the random utility term ϵ_i.

To construct the choice set, using a full-factorial design was not feasible. With three different attributes that have either two or four levels each, there are $2 \times 2 \times 4 = 16$ possible scenarios. This results in $(16 \times 15)/2 = 120$ different comparison scenarios. This is clearly too many to test them all. Instead, we follow the standard procedure as discussed in Mangham-Jefferies et al. (2009) and construct a fractional factorial design that is orthogonal, balanced and maximizes the D-efficiency.[1] We use the existing features of SPSS to construct the choice set fulfilling all of these criteria: Using the inbuilt SPSS orthogonal design feature, we determine that a minimum of eight choice sets is needed to achieve an efficient design. Subsequently, we let SPSS generate eight choice scenarios using the inbuilt "choice design" feature, which fulfil the above criteria. This results in eight scenarios in which the participants need to choose between two alternatives.

In our analysis of the DCE data, we closely follow Lancsar et al. (2017). The coefficients of interest are estimated using the following model:

$$V_{isj} = \alpha_j + A'_{isj}\delta + Z'_i\gamma_j$$

A_{isj} is the vector of characteristics, where price is estimated as continuous variable and location and shopkeeper gender as dummy variables. Z_i is a vector of case-specific control variables (age,

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[1] Orthogonal means that the linear parameter estimates are uncorrelated, so the different attributes are independent of each other. A balanced design means each attribute level occurs equally often. A D-efficient design minimizes the size of the variance-covariance matrix given a prior for δ (Mangham-Jefferies et al., 2009).

education, marital status, and baseline material used). We omit these control variables in the main text, but include them as robustness check in Table A7 below. We use a conditional logit model (McFadden's Choice Model, McFadden (1974)) to estimate the coefficients of interest. Our DCE design uses unlabelled alternatives, i.e. the options are defined entirely by the different characteristics and there is no additional name or label to the set of characteristics containing any additional information. Therefore, we estimate the model without the alternative-specific constant α_j, since we would expect that there is no difference in the utility obtained from Option 1 or Option 2 if they have the same characteristics, i.e. there is no constant utility obtained from choosing either Option 1 or Option 2 independent of the characteristics. In order to determine the effect of the treatment on the evaluation, we add interaction effects of the treatment with each characteristic. These steps allow us to finally determine the willingness to pay (in BDT) of the participants in the treatment and control group to avoid having a male shopkeeper (as opposed to a hypothetical female one) and to avoid collecting the underwear on the factory premises (as opposed to a more anonymous external corner store).

4.4.2 Including Demographic Controls

To ensure our results are not driven by any demographic factors, we include case-specific variables as demographic controls. These include age, education, marital status, and baseline material used. They enter the regression as interaction term with each product characteristic (shopkeeper gender, location and price). The results are shown in Table A7.

Table A7: Discrete choice experiment with all control variables

	(1) Utility
Location inside	-0.253
	(0.69)
Male shopkeeper	-2.252***
	(0.59)
Price	-0.050
	(0.06)
Intervention*Location inside	0.385**
	(0.18)
Intervention*Male shopkeeper	0.581***
	(0.14)
Intervention*Price	0.020
	(0.02)
Age*Location inside	-0.011
	(0.02)
Age*Male shopkeeper	0.013
	(0.02)
Age*Price	-0.002
	(0.00)
Education*Location inside	-0.014
	(0.03)
Education*Male shopkeeper	0.029
	(0.02)
Education*Price	-0.004
	(0.00)
Married*Location inside	-0.203
	(0.21)
Married*Male shopkeeper	-0.205
	(0.22)
Married*Price	-0.051***
	(0.02)
Pad user*Location inside	0.235
	(0.24)
Pad user*Male shopkeeper	0.098
	(0.20)
Pad user*Price	0.011
	(0.02)
Cloth user*Location inside	0.139
	(0.22)
Cloth user*Male shopkeeper	0.094
	(0.21)
Cloth user*Price	0.013
	(0.02)
Observations	476

Notes: Conditional logit regression of the utility of sanitary pads including the different attributes of pad collection (price, gender of the shopkeeper, and location) and a series of demographic controls. Clustered standard errors at the individual level in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.5   Surveys

4.5.1   Baseline Survey

Baseline Survey

Field	Question	Answer	
intronote	Welcome to the survey! Please answer the first few questions *before* you make the call. Please keep a record of which numbers you have already called and how often. Please swipe forward to continue.		
enumerator *(required)*	Who is conducting the survey?	1	
		2	
		3	
		4	
		5	
		6	
		-999	TEST

ection A - Call

Section A - Call > Call Number

Field	Question	Answer	
callnote	Please enter the phone number you are about to call. If the person you are calling does not answer the phone, please indicate so below. You should attempt to call her a second time on a different day. If she doesn't answer the second call, we will not try again.		
phone *(required)*	Worker phone number		
call_first_second *(required)*	Is this the first or second call or a scheduled follow-up call?	1	First
		2	Second
		3	Scheduled follow-up
note_call	****Please now dial the number, if the worker picks up, please start the survey.****		
phone_pick_up *(required)*	Has the worker picked up the phone?	1	Yes
		0	No

ection A - Call > Verification
Group relevant when: ${call_first_second} <3 and ${phone_pick_up} =1

Field	Question	Answer	
intro_check_ID	Hello, my name is [enumerator_name]. I am working with a group of researchers from Germany. We are conducting a survey to research women's health. We have received your phone number through your employer ▮▮▮▮, your employer is collaborating with us in this survey. To ensure that the information we received from ▮▮▮ is correct, I would like to confirm your name and worker ID. We have received the following information from ▮▮▮: **Worker Name**: [name] **Worker ID**: [ID]		
info_check *(required)*	Is this information correct?	1	Yes, the information is correct
		2	No, I need to correct the name
		3	No, I need to correct the ID
		4	No, this is the wrong person

Section A - Call > Correcting the name and ID

Field	Question	Answer	
correct_name	The name on record is [name]. What is the correct name? *Question relevant when: selected(${info_check} ,2) and not(selected(${info_check} ,4))*		
correct_ID	The worker ID on record is [ID]. What is te correct worker ID? *Question relevant when: selected(${info_check} ,3) and not(selected(${info_check} ,4))*		

ection A - Call > Consent
Group relevant when: ${call_first_second} <3 and ${phone_pick_up} =1 and not(selected(${info_check} ,4))

Field	Question	Answer	
still_working *(required)*	Do you currently still work at ▮▮▮▮n (so are not on leave and have not resigned)?	1	Yes
		0	No
consent *(required)*	We would like to invite you to participate in this survey. The survey will consist of a few questions that will last approximately **15-20 minutes today** and there will be 1 or 2 follow up calls in the future. Additionally, you might be selected to participate in 2 information sessions that will take place at the factory. *Important:* **Anything that you tell us will be used for research purposes only and will not be shared with ▮▮▮!** For your participation in the study we will compensate you with 40 BDT in phone credit. Do you agree to participate? *Question relevant when: ${still_working} = 1*	1	Yes
		0	No
phone_other_1 *(required)*	We have called this number because it is the one that ▮▮▮ provided. We will continue calling this number in the future and will also pay you for your participation in this survey by charging 40BDT to this number, we will deposit the money the latest next week. Would you like to change this to a different phone number? *Question relevant when: ${consent} =1*	1	Yes
		0	No
phone_other_2 *(required)*	Enter the phone number *Question relevant when: ${phone_other_1} =1*		
call_othertime *(required)*	If you have the time now to talk for 15-20min, we will start the survey now. If you do not have time right now, we would like to call you again at a different time that suits you better. Would you like us to call you again at a different time? *Question relevant when: ${consent} =1*	1	Yes
		0	No
call_othertime_2 *(required)*	Note down date and time to call *Question relevant when: ${call_othertime} =1*		
note_consent	Please write here any additional notes, if there is any *Question relevant when: ${call_othertime} =1*		

Field	Question	Answer	

Field	Question	Answer	
note_demographic	[name], thank you for participating in the survey. We will start by asking you a series of questions about yourself and your family. As indicated earlier, the answers will not be shared with ▉▉▉▉ and we will only use it for research purposes. It is very important that you answer truthfully. You can refuse to answer any question at any point.		
age	How old are you?		
religion *(required)*	What is your religion?	1	Muslim
		2	Hindu
		3	Buddist
		4	Catholic
		-999	Other (please specify)
religion_other	Enter other religion: *Question relevant when: ${religion} =-999*		
married *(required)*	Are you married?	1	Yes
		2	Divorced/Separated/Widowed
		0	Unmarried
child_1	Do you have children? *Question relevant when: ${married} !=0*	1	Yes
		0	No
child_son_1	How many **sons** do you have? *Question relevant when: ${child_1} =1*	0	0
		1	1
		2	2
		3	3
		4	4
		5	5
child_son_1_age *(required)*	Age of oldest son *Question relevant when: ${child_son_1} >0*		
child_son_2_age	Age of second oldest son *Question relevant when: ${child_son_1} >1*		
child_son_3_age	Age of third son *Question relevant when: ${child_son_1} >2*		
child_son_4_age	Age of fourth son *Question relevant when: ${child_son_1} >3*		
child_son_5_age	Age of fifth son *Question relevant when: ${child_son_1} >4*		
child_daughter_1	How many **daughters** do you have? *Question relevant when: ${child_1} =1*	0	0
		1	1
		2	2
		3	3
		4	4
		5	5
child_daughter_1_age *(required)*	Age of oldest daughter *Question relevant when: ${child_daughter_1} >0*		
child_daughter_2_age	Age of second oldest daugther *Question relevant when: ${child_daughter_1} >1*		
child_daugther_3_age	Age of third daughter *Question relevant when: ${child_daughter_1} >2*		
child_daughter_4_age	Age of fourth daugther *Question relevant when: ${child_daughter_1} >3*		
child_daughter_5_age	Age of fifth daughter *Question relevant when: ${child_daughter_1} >4*		
educ	What was the last class that you attended in school?	0	I did not go to school
		1	Class 1
		2	Class 2
		3	Class 3
		4	Class 4
		5	Class 5
		6	Class 6
		7	Class 7
		8	Class 8
		9	Class 9
		10	Class 10
		11	Class 11
		12	Class 12
		13	More than highschool

Field	Question	Answer	
note_absorbent	We would like to know more about female health, therefore, we will ask you now a series of questions about menstruation. We would appreciate it if you would answer truthfully. These questions will help us understand how we can support women's health better in Bangladesh.		
ab_others_1	When you think about the **other women (not yourself)** at your factory, what material do you think that they use **the most** as absorbent during their menstruation?	0	Cloth/fabric
		1	Disposable pads
		2	Reusable underwear/pads
		3	Paper/Tissues
		4	No absorbent
		-999	Other (please specify)
ab_others_2	Enter other method: *Question relevant when: ${ab_others_1} =-999*		
menstruation *(required)*	In the last 6 months, have you had your menstruation?	1	Yes
		0	No
menstruation_lack	Why have you not had your menstruation? *Question relevant when: ${menstruation} =2*	0	Injection
		1	Pregnant
		2	Irregular
		3	Menopause
		-999	Other (please specify)
menstruation_lack_other	Enter other reason: *Question relevant when: selected(${menstruation_lack} , -999)*		

Absorbents > Material used
Group relevant when: ${menstruation} =1

Field	Question	Answer	
note_method	Now we would like to know more about what material **you** frequently use as absorbent during your menstruation. Think about the material you have used for the last 6 months. We are only interested in methods used frequently or very frequently (i.e. what you use for 2 days or more during menstruation).		
note_method_2	Have you used the following materials frequently in the last 6 months?	1	Yes
		0	No
ab_cloth_1	Cloth or fabric	1	Yes
		0	No
ab_pads_1	Disposable pads	1	Yes
		0	No
ab_reusable_1	Reusable pads or underwear	1	Yes
		0	No
ab_nothing_1	No absorbent	1	Yes
		0	No

Absorbents > Why not using pads
Group relevant when: ${ab_pads_1} != 1 and ${menstruation} =1

Field	Question	Answer	
note_method_3	You have indicated that you lately have not used disposable pads (or not often). We would like to learn more about this to understand the preferences of Bangladeshi women. We will ask you a series of questions, please indicate whether you agree or disagree with the following statements.		
note_method_4	Do you agree or disagree with the following statements:	1	Agree
		0	Disagree
ab_pads_2_a	You are uncomfortable buying pads in a store due to a lack of privacy because there is usually men around	1	Agree
		0	Disagree
ab_pads_2_b	There is no store that sells pads nearby	1	Agree
		0	Disagree
ab_pads_2_c	Pads are too expensive for you	1	Agree
		0	Disagree
ab_pads_2_d	You are happy with the method that you are using and see no need to switch	1	Agree
		0	Disagree
ab_pads_2_e	You have never thought about switching menstrual products before	1	Agree
		0	Disagree
ab_pads_2_f	You started with cloth and got used to it	1	Agree
		0	Disagree
ab_pads_2_g	Pads are not comfortable to wear	1	Agree
		0	Disagree
ab_pads_2_h	Pads are not easy to dispose of because there is not available specific waste disposal for them	1	Agree
		0	Disagree
ab_pads_2_i	I dont think that pads work well	1	Agree
		0	Disagree
ab_pads_2_j	I dont think that buying pads is socially appropriate/acceptable	1	Agree
		0	Disagree
ab_pads_2_k	I dont think that using pads is socially appropriate/acceptable	1	Agree
		0	Disagree

Absorbents > Who buys the pads

Field	Question	Answer	
ab_pads_3_a_1	You have indicated that you have used disposable pads frequently in the last 6 months. If you need to buy new pads, do you usually buy them yourself?	1	Yes
		0	No
ab_pads_3_a_2	If you do not buy the pads yourself, who usually provides you with new pads? *Question relevant when: ${ab_pads_3_a_1} =0*	1	My husband
		2	A female friend
		3	My mother
		4	Another female relative
		-999	Other (please specify)
ab_pads_3_a_2_other	Enter other person: *Question relevant when: selected(${ab_pads_3_a_2} , -999)*		
Absorbents > Purchasing pads			
Group relevant when: ${ab_pads_1} =1 and ${ab_pads_3_a_1} =1			
buying_pads_note	When you buy new pads, do you do any of the following things at the time of purchase?		
ab_pads_label	Which of the following do you do:	1	Agree
		0	Disagree
ab_pads_3_b	You cover your face (fully or partially) at the time of the purchase to provide anonymity	1	Agree
		0	Disagree
ab_pads_3_c	You go to a store far away from home where nobody knows you to buy the pads	1	Agree
		0	Disagree
ab_pads_3_d	When you purchase pads, you feel uncomfortable if there are men around the store	1	Agree
		0	Disagree
ab_pads_3_e	When you purchase pads, you feel uncomfortable if there are women around the store	1	Agree
		0	Disagree
Absorbents > Start using pads			
Group relevant when: ${ab_pads_1} =1			
ab_pads_4	We would like to know how you started using pads. Who recommended pads to you that made you decide to use them?	1	A friend
		2	My mother
		3	My husband
		4	Another female relative
		5	A teacher at school
		6	The doctor recommented it to my husband
		7	The doctor recommented it to me
		8	Commercial/advertisement
		9	A store clerk recommended it
		-999	Other (please specify)
ab_pads_4_other	Enter other person: *Question relevant when: selected(${ab_pads_4} , -999)*		
ab_first_method	You have indicated that you now use pads. We would like to know what the first method was that you ever used, so what you used when you had your first period?	0	Cloth/fabric
		1	Disposable pads
		2	Reusable underwear/pads
		3	Paper/Tissues
		4	No absorbent
		-999	Other (please specify)
ab_first_method_other	Enter other method: *Question relevant when: selected(${ab_first_method} , -999)*		
Knowledge			
Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} =1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} =1			
Knowledge > Knowledge of mensturation			
note_know	We will now ask you a few questions about menstruation, please answer to the best of your knowledge.		
know_label	Please indicate if you think the following statements are true or false.	1	TRUE
		0	FALSE
know_2_a	Menstruation is a process of eliminating toxic blood from the body	1	TRUE
		0	FALSE
know_2_b	Menstruation is an illness	1	TRUE
		0	FALSE
know_2_c	Menstruation is a curse	1	TRUE
		0	FALSE
know_2_d	Pads can absorb more blood than cloth	1	TRUE
		0	FALSE
know_2_e	Menstruation is a biological process related to fertility and childbearing	1	TRUE
		0	FALSE
know_2_f	Using pads does not reduce the risk of urinary infections compared to cloth	1	TRUE
		0	FALSE

Field	Question	Answer	
		0	FALSE

Field	Question	Answer	
know_2_g	Menstrual cloth does not need to be dried after washing, it can be directly stored	1	TRUE
		0	FALSE
know_1	How did you learn/hear about menstruation for the first time (when you were a teenager)?	1	From my mother
		2	From another female relative (sister, aunt..)
		3	From my father
		4	I learned about it by surprise the first time that I menstruated
		5	From a friend
		6	From a co-worker
		7	At school
		-999	Other (please specify)
know_1_other	Enter other person: *Question relevant when: selected(${know_1} , -999)*		
Knowledge > Beliefs about how children should learn			
note_know_3	In this question, we would like to know what your opinion is regarding how school girls and school boys in Bangladesh should learn that menstruation exists.		
know_3_a	In your opinion, what is the best way for **girls** to learn about the topic of menstruation?	1	In school
		2	From their mother
		3	From another family member
		4	When menarche arrives through their own experience
		5	From friends
		6	From TV or advertisement
		7	Other (please specify)
		-999	I dont have an opinion about it
know_3_a_other	Enter other person: *Question relevant when: selected(${know_3_a} , 7)*		
know_3_b	In your opinion, what is the best way for **boys** to learn about the topic of menstruation?	1	In school
		2	From their mother
		3	From another family member
		4	They shouldnt learn about it at all, because it doesnt affect them
		5	From friends
		6	From TV or advertisement
		7	Other (please specify)
		-999	I dont have an opinion about it
know_3_b_other	Enter other person: *Question relevant when: selected(${know_3_b} , 7)*		
know_3_c	Do you think that your daughter(s) know about menstruation? *Question relevant when: ${child_daughter_1} >0 and ${child_daughter_1_age} > 6*	1	Yes
		0	No
know_3_d	How do you think that she has/they have learned about it? *Question relevant when: ${know_3_c} =1*	1	You explained it
		2	Another relative explained it
		3	Learned by own experience when reaching menstruation
		4	Learned about it from a teacher at school
		5	Learned about it from friends
		6	Learned about it from TV and advertisement
		7	Not sure
		-999	Other (please specify)
know_3_d_other	Enter other person: *Question relevant when: selected(${know_3_d} , -999)*		
know_3_e	Do you think that your son(s) know about menstruation? *Question relevant when: ${child_son_1} >0 and ${child_son_1_age} >6*	1	Yes
		0	No

Field	Question	Answer
know_3_f	How do you think that he has/they have learned about it? *Question relevant when: ${know_3_e} =1*	1 You explained it 2 Another relative explained it 3 Learned about it from a teacher at school 4 Learned about it from friends 5 Learned about it from TV and advertisement 6 Not sure -999 Other (please specify)
know_3_f_other	Enter other person: *Question relevant when: selected(${know_3_f} , -999)*	

Group relevant when: ${group} =1 or ${group} =4 or ${group} =null

PRIME_RANDOMIZATION_norms > Measure of stigma

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
stigma_n *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, because others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently	

PRIME_RANDOMIZATION_norms > Measure of Taboo

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
taboo_1_n *(required)*	Like in the previous question, I will now read you 4 statements and I would like to know how many you agree with. Again, just tell me the number, 0,1,2,3 or 4. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone	
taboo_2a_n	How many of the following people do you sometimes talk to about menstruation? We are only interested in the total number, so just answer 0,1,2,3,4 or 5. We do not need to know who you talk to in particular. Do you sometimes talk to: - One of your female coworkers - One of your male coworkers - Your husband - Your doctor - Your line manager *Question relevant when: ${randnum1} < 0.50 and ${child_daughter_1} =1*	
taboo_2b_n	How many of the following people do you sometimes talk to about menstruation? We are only interested in the total number, so just answer 0,1,2,3,4,5 or 6. We do not need to know who you talk to in particular. Do you sometimes talk to: - One of your female coworkers - One of your male coworkers - Your husband - Your daughter - Your doctor - Your line manager *Question relevant when: ${randnum1} >= 0.50 and ${child_daughter_1} =1*	

PRIME_RANDOMIZATION_norms > Social Norms

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
note_norms_n	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate	
note_example_n	For example, if i say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.	

Field	Question	Answer
sn_label_n	How will the other women judge the following:	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_cloth_n *(required)*	She uses cloth to manage her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_pads_n *(required)*	She uses pads to manage her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_pray_n *(required)*	She prays during her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_purchase_1_n *(required)*	She goes to a shop and purchases pads from a male clerk	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_purchase_2_n *(required)*	She goes to a shop and purchases pads from a female clerk	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_wash_n *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond)	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_dry_n *(required)*	She dries her menstrual cloth outside in direct sunlight	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_daughter_1_n *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_son_1_n *(required)*	Romana's husband explains to her son about menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_daughter_2_n *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_son_2_n *(required)*	Romana explains to her son about menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate

PRIME_RANDOMIZATION_stigma
  Group relevant when: ${group} =2 or ${group} =5
PRIME_RANDOMIZATION_stigma > Social Norms
  Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
note_norms_s	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate	
note_example_s	For example, if i say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.	

Field	Question	Answer
sn_label_s	How will the other women judge the following:	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_cloth_s *(required)*	She uses cloth to manage her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_pads_s *(required)*	She uses pads to manage her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_pray_s *(required)*	She prays during her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_purchase_1_s *(required)*	She goes to a shop and purchases pads from a male clerk	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_purchase_2_s *(required)*	She goes to a shop and purchases pads from a female clerk	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_wash_s *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond)	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_dry_s *(required)*	She dries her menstrual cloth outside in direct sunlight	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_daughter_1_s *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_son_1_s *(required)*	Romana's husband explains to her son about menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_daughter_2_s *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_son_2_s *(required)*	Romana explains to her son about menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate

PRIME_RANDOMIZATION_stigma > Measure of Taboo

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
taboo_1_s *(required)*	Like in the previous question, I will now read you 4 statements and I would like to know how many you agree with. Again, just tell me the number, 0,1,2,3 or 4. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone	

Field	Question	Answer
taboo_2a_s	How many of the following people do you sometimes talk to about menstruation? We are only interested in the total number, so just answer 0,1,2,3,4 or 5. We do not need to know who you talk to in particular. Do you sometimes talk to: - One of your female coworkers - One of your male coworkers - Your husband - Your doctor - Your line manager *Question relevant when: ${randnum2} < 0.50 and ${child_daughter_1} =1*	
taboo_2b_s	How many of the following people do you sometimes talk to about menstruation? We are only interested in the total number, so just answer 0,1,2,3,4,5 or 6. We do not need to know who you talk to in particular. Do you sometimes talk to: - One of your female coworkers - One of your male coworkers - Your husband - Your daughter - Your doctor - Your line manager *Question relevant when: ${randnum2} >= 0.50 and ${child_daughter_1} =1*	

PRIME_RANDOMIZATION_stigma > Measure of stigma
Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
stigma_s *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, beause others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently	

PRIME_RANDOMIZATION_taboo
Group relevant when: ${group} =3 or ${group} =6

PRIME_RANDOMIZATION_taboo > Social Norms
Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
note_norms_t	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate	
note_example_t	For example, if i say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.	
sn_label_t	How will the other women judge the following:	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_cloth_t *(required)*	She uses cloth to manage her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_pads_t *(required)*	She uses pads to manage her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_pray_t *(required)*	She prays during her menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_purchase_1_t *(required)*	She goes to a shop and purchases pads from a male clerk	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate

Field	Question	Answer
sn_purchase_2_t *(required)*	She goes to a shop and purchases pads from a female clerk	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_wash_t *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond)	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_dry_t *(required)*	She dries her menstrual cloth outside in direct sunlight	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_daughter_1_t *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_son_1_t *(required)*	Romana's husband explains to her son about menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_daughter_2_t *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate
sn_son_2_t *(required)*	Romana explains to her son about menstruation	1 Very socially inappropriate 2 socially inappropriate 3 socially appropriate 4 Very socially appropriate

PRIME_RANDOMIZATION_taboo > Measure of stigma

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
stigma_t *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, beause others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently	

PRIME_RANDOMIZATION_taboo > Measure of Taboo

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer
taboo_1_t *(required)*	Like in the previous question, I will now read you 4 statements and I would like to know how many you agree with. Again, just tell me the number, 0,1,2,3 or 4. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone	
taboo_2a_t	How many of the following people do you sometimes talk to about menstruation? We are only interested in the total number, so just answer 0,1,2,3,4 or 5. We do not need to know who you talk to in particular. Do you sometimes talk to: - One of your female coworkers - One of your male coworkers - Your husband - Your doctor - Your line manager *Question relevant when: ${randnum3} < 0.50 and ${child_daughter_1} =1*	
taboo_2b_t	How many of the following people do you sometimes talk to about menstruation? We are only interested in the total number, so just answer 0,1,2,3,4,5 or 6. We do not need to know who you talk to in particular. Do you sometimes talk to: - One of your female coworkers - One of your male coworkers - Your husband - Your daughter - Your doctor - Your line manager *Question relevant when: ${randnum3} >= 0.50 and ${child_daughter_1} =1*	

Field	Question	Answer	

Priming experiment

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Priming experiment > Priming Questions for Social Norms

Group relevant when: ${group} = 1

Field	Question	Answer	
note_prime_1	For this part of the survey, please think about the following statements and tell me whether you agree or disagree with them		
prime_label	Do you agree or disagree:	1	Agree
		0	Disagree
prime_norm_1	I think most Bangladeshi adults find it socially acceptable if a woman uses pads	1	Agree
		0	Disagree
prime_norm_2	I think most Bangladeshi adults find it socially unacceptable if a woman goes to a store to buy pads from a male shopkeeper	1	Agree
		0	Disagree
prime_norm_3	I think most Bangladeshi adults believe daughters should not learn about menstruation from their mothers but from personal experience	1	Agree
		0	Disagree
prime_norm_4	I think most Bangladeshi adults find it perfectly socially acceptable to hang washed menstrual cloth outside to dry	1	Agree
		0	Disagree

Priming experiment > prime_stigma

Group relevant when: ${group} = 2

Field	Question	Answer	
note_prime_2	For this part of the survey, please think about the following statements and tell me whether you agree or disagree with them		
prime_label_2	Do you agree or disagree:	1	Agree
		0	Disagree
prime_stigma_1	I feel like people who watch me buy menstrual products in a store might think less of me	1	Agree
		0	Disagree
prime_stigma_2	I would feel ashamed to hang my menstrual cloth outside even if it is clean	1	Agree
		0	Disagree
prime_stigma_3	I feel dirty when I have my period	1	Agree
		0	Disagree
prime_stigma_4	I try to keep my period secret	1	Agree
		0	Disagree

Priming experiment > prime_taboo

Group relevant when: ${group} = 3

Field	Question	Answer	
note_prime_3	For this part of the survey, please think about the following statements and tell me whether you agree or disagree with them		
prime_label_3	Do you agree or disagree:	1	Agree
		0	Disagree
prime_taboo_1	I would not discuss my menstruation with my father	1	Agree
		0	Disagree
prime_taboo_2	I would feel uncomfortable to ask my line manager about period products	1	Agree
		0	Disagree
prime_taboo_3	Discussing menstruation with my daughter would be uncomfortable for me	1	Agree
		0	Disagree
prime_taboo_4	If others discuss their menstruation in front of me it makes me feel uncomfortable	1	Agree
		0	Disagree

Priming experiment > donation_1

Group relevant when: ${consent} =1 and ${call_othertime} =0 and ${phone_pick_up} =1 and not(selected(${info_check} ,4)) and ${menstruation} = 1 or ${call_first_second} =3 and ${phone_pick_up} =1 and ${menstruation} = 1

Field	Question	Answer	
note_donation	We are now almost done with the survey. Thank you so much for your participation! As we mentioned before, you will receive 40BDT in phone credits as compensation for your time. Now in addition, we have some extra money available, 10BDT. We plan to give half of this to you, so you receive 5BDT extra. The other 5BDT we plan to give to an organization which works to educate underprivileged boys and girls about menstruation. Any money we give to them will help to support an education program which educates boys and girls together in schools in Dhaka. However, it is up to you how much of the money we give to them and how much we give to you. You can freely decide. If you do nothing, we will keep it at 5BDT for you and 5BDT for the program. Or you can decide to keep more yourself or give more to the program. You can either give 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10BDT to the program. You will receive the remainder.		
donation_yesno	Would you like to change how the money is split?	1	Yes
		0	No
donation	If you answered yes, how much of the 10BDT would you like to give to the program?		

4.5.2   Endline Survey

Outcome Survey

Field	Question	Answer	
intronote	Welcome to the survey! Please swipe forward to continue.		
enumerator *(required)*	Who is conducting the survey?	1	▇
		2	
		3	
		4	
		5	
		6	
		-999	TEST
Call Number			
callnote	Please enter the phone number you are calling		
phone *(required)*	Worker phone number		
SectionB - Consent			
worker_ID	You are calling the following person: **Worker Name:** [name] **Worker ID:** [ID]		
consent *(required)*	Hello [name], I am [enumerator_name]. I already spoke with you a few weeks ago, when I asked you to participate in a survey on female health and you agreed to participate. Today, we would like to ask a few follow-up questions. This will take around 15min. Is that ok with you?	1	Yes
		0	No
Survey starts			
Group relevant when: ${consent} = 1			
Survey starts > Start			
note_start	[name], thank you for participating in the survey. We will now ask you a series of questions. As I explained last time, the answers will not be shared with ▇ and we will only use it for research purposes. It is very important that you answer truthfully. You can refuse to answer any question at any point.		
Survey starts > Knowledge of menstruation			
note_know	Like in the first call that we had with you, we will ask you a few questions about menstruation, please answer to the best of your knowledge.		
know_label	Please indicate if you think the following statements are true or false.	1	TRUE
		0	FALSE
know_2_a *(required)*	Menstruation is a process of eliminating toxic blood from the body	1	TRUE
		0	FALSE
know_2_b *(required)*	Menstruation is an illness	1	TRUE
		0	FALSE
know_2_c *(required)*	Menstruation is a curse	1	TRUE
		0	FALSE
know_2_d *(required)*	Pads can absorb more blood than cloth	1	TRUE
		0	FALSE
know_2_e *(required)*	Menstruation is a biological process related to fertiliy and childbearing	1	TRUE
		0	FALSE
know_2_f *(required)*	Using pads does not reduce the risk of urinary infections compared to cloth	1	TRUE
		0	FALSE
know_2_g *(required)*	Menstrual cloth does not need to be dried after washing, it can be directly stored	1	TRUE
		0	FALSE
Survey starts > PRIME_RANDOMIZATION_norms			
Group relevant when: ${order_group} < 0.33			
Survey starts > PRIME_RANDOMIZATION_norms > Measure of stigma			
stigma *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, beause others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently		
Survey starts > PRIME_RANDOMIZATION_norms > Measure of Taboo			
taboo_1_n *(required)*	Like in the previous question, I will now read you 4 statements and I would like to know how many you agree with. Again, just tell me the number, 0,1,2,3 or 4. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone		
Survey starts > PRIME_RANDOMIZATION_norms > Social Norms			

Field	Question	Answer	
note_norms_n	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate		
note_example_n	For example, if I say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.		
sn_label_n	How will the other women judge the following:	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_cloth_n *(required)*	She uses cloth to manage her menstruation *Question relevant when: ${norm_group} <= 0.25*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pads_n *(required)*	She uses pads to manage her menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pray_n *(required)*	She prays during her menstruation *Question relevant when: ${norm_group} <= 0.25*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_1_n *(required)*	She goes to a shop and purchases pads from a male clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_2_n *(required)*	She goes to a shop and purchases pads from a female clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_wash_n *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond) *Question relevant when: ${norm_group} > 0.25 and ${norm_group} <= 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_dry_n *(required)*	She dries her menstrual cloth outside in direct sunlight *Question relevant when: ${norm_group} > 0.25 and ${norm_group} <= 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_1_n *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices *Question relevant when: ${norm_group} > 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_1_n *(required)*	Romana's husband explains to her son about menstruation *Question relevant when: ${norm_group} > 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_2_n *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_2_n *(required)*	Romana explains to her son about menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate

Survey starts > PRIME_RANDOMIZATION_stigma
  Group relevant when: ${order_group} >= 0.33 and ${order_group} < 0.66
Survey starts > PRIME_RANDOMIZATION_stigma > Social Norms

Field	Question	Answer	
note_norms_s	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate		
note_example_s	For example, if i say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.		
sn_label_s	How will the other women judge the following:	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_cloth_s *(required)*	She uses cloth to manage her menstruation *Question relevant when: ${norm_group} <= 0.25*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pads_s *(required)*	She uses pads to manage her menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pray_s *(required)*	She prays during her menstruation *Question relevant when: ${norm_group} <= 0.25*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_1_s *(required)*	She goes to a shop and purchases pads from a male clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_2_s *(required)*	She goes to a shop and purchases pads from a female clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_wash_s *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond) *Question relevant when: ${norm_group} > 0.25 and ${norm_group} <= 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_dry_s *(required)*	She dries her menstrual cloth outside in direct sunlight *Question relevant when: ${norm_group} > 0.25 and ${norm_group} <= 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_1_s *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices *Question relevant when: ${norm_group} > 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_1_s *(required)*	Romana's husband explains to her son about menstruation *Question relevant when: ${norm_group} > 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_2_s *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_2_s *(required)*	Romana explains to her son about menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate

Field	Question	Answer	
taboo_1_s *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone		
Survey starts > PRIME_RANDOMIZATION_stigma > Measure of stigma			
stigma_s *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, beause others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently		
Survey starts > PRIME_RANDOMIZATION_taboo			
Group relevant when: ${order_group} >= 0.66			
Survey starts > PRIME_RANDOMIZATION_taboo > Social Norms			
note_norms_t	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate		
note_example_t	For example, if i say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.		
sn_label_t	How will the other women judge the following:	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_cloth_t *(required)*	She uses cloth to manage her menstruation *Question relevant when: ${norm_group} <= 0.25*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pads_t *(required)*	She uses pads to manage her menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pray_t *(required)*	She prays during her menstruation *Question relevant when: ${norm_group} <= 0.25*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_1_t *(required)*	She goes to a shop and purchases pads from a male clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_2_t *(required)*	She goes to a shop and purchases pads from a female clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_wash_t *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond) *Question relevant when: ${norm_group} > 0.25 and ${norm_group} <= 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_dry_t *(required)*	She dries her menstrual cloth outside in direct sunlight *Question relevant when: ${norm_group} > 0.25 and ${norm_group} <= 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_1_t *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices *Question relevant when: ${norm_group} > 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate

Field	Question	Answer	
sn_son_1_t *(required)*	Romana's husband explains to her son about menstruation *Question relevant when: ${norm_group} > 0.5*	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_2_t *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_2_t *(required)*	Romana explains to her son about menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
Survey starts > PRIME_RANDOMIZATION_taboo > Measure of stigma			
stigma_t *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, beause others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently		
Survey starts > PRIME_RANDOMIZATION_taboo > Measure of Taboo			
taboo_t *(required)*	Like in the previous question, I will now read you 4 statements and I would like to know how many you agree with. Again, just tell me the number, 0,1,2,3 or 4. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone		
Survey starts > Discrete Choice Experiment			
note_DCE	In this section of the survey we want to try and understand what is important to you when you buy sanitary pads. If you do not usually buy sanitary pads, that is ok. Just answer as you think you would feel if you were to go to a store to buy sanitary pads for the first time. I will present you with two different options how to obtain a pack of 4 sanitary pads and then ask you tell me which you prefer. You will see that each option has advantages and disadvantages. Consider both options and then tell me which you think is better. The options are always about obtaining a pack of 4 sanitary pads. There will be 8 such decisions in total, in each of the 8 cases the options are slightly different. Therefore, please pay close attention to the different options I describe.		
DCE_1 *(required)*	Which of the following 2 options would you prefer? **Option 1:** Buying the sanitary pads from a **male** store keeper in a **store inside Hop Lun** for **30 BDT** **Option 2:** Buying the sanitary pads from a **female** store keeper in a **store in your neighbourhood** for **50 BDT**	0	Option 1
		1	Option 2
DCE_2 *(required)*	Which of the following 2 options would you prefer? **Option 1:** Buying the sanitary pads from a **male** store keeper in a **store in your neighbourhood** for **60 BDT** **Option 2:** Buying the sanitary pads from a **female** store keeper in a **store inside Hop Lun** for **50 BDT**	0	Option 1
		1	Option 2
DCE_3 *(required)*	Which of the following 2 options would you prefer? **Option 1:** Buying the sanitary pads from a **female** store keeper in a **store inside Hop Lun** for **60 BDT** **Option 2:** Buying the sanitary pads from a **female** store keeper in a **store in your neighbourhood** for **40 BDT**	0	Option 1
		1	Option 2
DCE_4 *(required)*	Which of the following 2 options would you prefer? **Option 1:** Buying the sanitary pads from a **female** store keeper in a **store in your neighbourhood** for **30 BDT** **Option 2:** Buying the sanitary pads from a **female** store keeper in a **store inside Hop Lun** for **40 BDT**	0	Option 1
		1	Option 2
DCE_5 *(required)*	Which of the following 2 options would you prefer? **Option 1:** Buying the sanitary pads from a **female** store keeper in a **store inside Hop Lun** for **30 BDT** **Option 2:** Buying the sanitary pads from a **male** store keeper in a **store in your neighbourhood** for **40 BDT**	0	Option 1
		1	Option 2
DCE_6 *(required)*	Which of the following 2 options would you prefer? **Option 1:** Buying the sanitary pads from a **male** store keeper in a **store inside Hop Lun** for **50 BDT** **Option 2:** Buying the sanitary pads from a **female** store keeper in a **store inside Hop Lun** for **60 BDT**	0	Option 1
		1	Option 2

Field	Question	Answer	
DCE_7 *(required)*	Which of the following 2 options would you prefer? **Option 1**: Buying the sanitary pads from a **male** store keeper in a **store inside Hop Lun** for **30 BDT** **Option 2**: Buying the sanitary pads from a **female** store keeper in a **store inside Hop Lun** for **40 BDT**	0	Option 1
		1	Option 2
DCE_8 *(required)*	Which of the following 2 options would you prefer? **Option 1**: Buying the sanitary pads from a **male** store keeper in a **store inside Hop Lun** for **50 BDT** **Option 2**: Buying the sanitary pads from a **female** store keeper in a **store in your neighbourhood** for **30 BDT**	0	Option 1
		1	Option 2
Survey starts > WTP_intro			
note_WTP	In this section of the survey, **I will** present you with two different options: you can either choose to receive **an amount of money** or a **menstrual product for free**. Please tell me which of the 2 options you prefer. The amount of money is different in each choice and there are different menstrual products available, so pay close attention to the options. Always tell me whether you would prefer to receive the money or the free menstrual product. At the end of the entire survey, a computer will randomly select one of these choices. Whatever you said you prefer for this choice, the money or the menstrual product, will be yours. You should therefore always respond truthfully which you prefer, the money or the free menstrual product, because you may end up getting what you chose. Both the money and the menstrual product will not be made available immediately. Instead, you will receive it once we have finished all the surveys. This might take some time (up to 3 weeks). If you choose the money, it will be transferred to your phone in the form of phone credits. If you choose the menstrual product, you will be able to pick it up at one of the small stores at Hop Lun. There will be **a man** in the store giving you the product. We will give this man a list and your worker ID will be on it if you select the free menstrual product, so you will need to tell the man in the store that you want to pick up the menstrual product and he will give it to you. *Make sure to emphasize that pick-up is from a MALE shopkeeper*		
male_emphasis *(required)*	*For the enumerator only (not for the participant)*: Have you emphasized that pick up will be from a **MALE** shopkeeper?	1	Yes
		0	No
Survey starts > Willingness to pay for pads			
WTP_pads_note	In the next questions, you always have the choice between receiving some money and receiving a free pack of 4 sanitary pads. Again, if you choose the pads you will be able to pick them up from a **male** shopkeeper at one of the factory stores. For the following choices, please tell me whether you prefer the free pack of pads or the money: *Make sure to emphasize that pick-up is from a MALE shopkeeper*		
WTP_pads_0 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 0 BDT?	0	Pack of pads
		1	Money (0BDT)
WTP_pads_10	Would you prefer to receive a pack of 4 pads from a man or 10 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (10BDT)
WTP_pads_20 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 20 BDT? *Question relevant when: ${WTP_pads_0}=0*	0	Pack of pads
		1	Money (20BDT)
WTP_pads_30	Would you prefer to receive a pack of 4 pads from a man or 30 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (30BDT)
WTP_pads_40 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 40 BDT? *Question relevant when: ${WTP_pads_20}=0*	0	Pack of pads
		1	Money (40BDT)
WTP_pads_50	Would you prefer to receive a pack of 4 pads from a man or 50 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (50BDT)
WTP_pads_60 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 60 BDT? *Question relevant when: ${WTP_pads_40}=0*	0	Pack of pads
		1	Money (60BDT)
WTP_pads_70	Would you prefer to receive a pack of 4 pads from a man or 70 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (70BDT)
WTP_pads_80 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 80 BDT? *Question relevant when: ${WTP_pads_60}=0*	0	Pack of pads
		1	Money (80BDT)
WTP_pads_90	Would you prefer to receive a pack of 4 pads from a man or 90 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (90BDT)
WTP_pads_100 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 100 BDT? *Question relevant when: ${WTP_pads_80}=0*	0	Pack of pads
		1	Money (100BDT)
WTP_pads_120	Would you prefer to receive a pack of 4 pads from a man or 120 BDT? *Question relevant when: ${WTP_pads_100}=0*	0	Pack of pads
		1	Money (120BDT)
WTP_pads_140	Would you prefer to receive a pack of 4 pads from a man or 140 BDT? *Question relevant when: ${WTP_pads_120}=0*	0	Pack of pads
		1	Money (140BDT)
WTP_pads_160	Would you prefer to receive a pack of 4 pads from a man or 160 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (160BDT)
WTP_pads_180	Would you prefer to receive a pack of 4 pads from a man or 180 BDT? *Question relevant when: 0*	0	Pack of pads
		1	Money (180BDT)
WTP_pads_200 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 200 BDT? *Question relevant when: ${WTP_pads_140}=0*	0	Pack of pads
		1	Money (200BDT)
Survey starts > Introduction to the menstrual underwear			

Field	Question	Answer	
underwear_intro	In the last question, we are offering you a new menstrual product for free: a **menstrual underwear**. This menstrual underwear was developed especially for the needs of Bangladeshi women like you. I will tell you a little bit about the product now before we start the next section of the survey where you can select if you want to receive one for free: - The menstrual underwear looks and feels just like regular underwear, but you can wear it during your menstruation to absorb the blood - It works like pads, but absorbs as much as 2 pads, so you can go for many more hours without changing it - It is leak proof and has a layer to prevent leakage - It is fast-drying, so it will not feel wet - It is anti-bacterial, so it kills bacteria and reduces the risk of infection - Before using it again, you need to wash and dry it, but it dries very fast - It will last for at least 1 year or longer and you can use it every time again - It is black on the outside (anti-bacterial fabric on the inside is blue)		
Survey starts > Williness to pay for the underwear			
note_underwear	You now always have the choice between receiving some money and receiving the menstrual underwear I just described to you, which you will be able to pick up from a **male** shopkeeper at the store in the factory. For the following choices, please tell me whether you prefer the free underwear or the money: *Make sure to emphasize that pick-up is from a MALE shopkeeper*		
WTP_underwear_0 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 0 BDT?	0	Menstrual underwear
		1	Money (0BDT)
WTP_underwear_40	Would you prefer to receive a free menstrual underwear from a man or 40 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (40BDT)
WTP_underwear_50 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 50 BDT? *Question relevant when: ${WTP_underwear_0} =0*	0	Menstrual underwear
		1	Money (50BDT)
WTP_underwear_60	Would you prefer to receive a free menstrual underwear from a man or 60 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (60BDT)
WTP_underwear_80	Would you prefer to receive a free menstrual underwear from a man or 80 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (80BDT)
WTP_underwear_100 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 100 BDT? *Question relevant when: ${WTP_underwear_50} =0*	0	Menstrual underwear
		1	Money (100BDT)
WTP_underwear_120	Would you prefer to receive a free menstrual underwear from a man or 120 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (120BDT)
WTP_underwear_150 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 150 BDT? *Question relevant when: ${WTP_underwear_100} =0*	0	Menstrual underwear
		1	Money (150BDT)
WTP_underwear_160	Would you prefer to receive a free menstrual underwear from a man or 160 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (160BDT)
WTP_underwear_200 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 200 BDT? *Question relevant when: ${WTP_underwear_150} =0*	0	Menstrual underwear
		1	Money (200BDT)
WTP_underwear_240	Would you prefer to receive a free menstrual underwear from a man or 240 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (240BDT)
WTP_underwear_250 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 250 BDT? *Question relevant when: ${WTP_underwear_200} =0*	0	Menstrual underwear
		1	Money (250BDT)
WTP_underwear_280	Would you prefer to receive a free menstrual underwear from a man or 280 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (280BDT)
WTP_underwear_300 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 300 BDT? *Question relevant when: ${WTP_underwear_250} =0*	0	Menstrual underwear
		1	Money (300BDT)
WTP_underwear_320	Would you prefer to receive a free menstrual underwear from a man or 320 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (320BDT)
WTP_underwear_350 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 350 BDT? *Question relevant when: ${WTP_underwear_300} =0*	0	Menstrual underwear
		1	Money (350BDT)
WTP_underwear_360	Would you prefer to receive a free menstrual underwear from a man or 360 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (360BDT)
WTP_underwear_400 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 400 BDT? *Question relevant when: ${WTP_underwear_350} =0*	0	Menstrual underwear
		1	Money (400BDT)
WTP_underwear_440	Would you prefer to receive a free menstrual underwear from a man or 440 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (440BDT)
WTP_underwear_450 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 450 BDT? *Question relevant when: ${WTP_underwear_400} =0*	0	Menstrual underwear
		1	Money (450BDT)
WTP_underwear_480	Would you prefer to receive a free menstrual underwear from a man or 480 BDT? *Question relevant when: 0*	0	Menstrual underwear
		1	Money (480BDT)
WTP_underwear_500 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 500 BDT? *Question relevant when: ${WTP_underwear_450} =0*	0	Menstrual underwear
		1	Money (500BDT)
Survey starts > pickup			

Field	Question	Answer
note_WTP_underwear_0	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 0 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory . Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${order_group} < 0.98 and ${WTP_underwear_0} = 0*	
note_WTP_underwear_50	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 50 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.16 and ${WTP_underwear_50} = 0*	
note_WTP_underwear_100	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 100 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.32 and ${pickup_variable} > 0.16 and ${WTP_underwear_100} = 0*	
note_WTP_underwear_150	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 150 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.66 and ${pickup_variable} > 0.64 and ${WTP_underwear_150} = 0*	
note_WTP_underwear_200	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 200 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory . Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.68 and ${pickup_variable} > 0.66 and ${WTP_underwear_200} = 0*	
note_WTP_underwear_250	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 250 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.70 and ${pickup_variable} > 0.68 and ${WTP_underwear_250} = 0*	
note_WTP_underwear_300	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 300 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.72 and ${pickup_variable} > 0.70 and ${WTP_underwear_300} = 0*	

Field	Question	Answer
note_WTP_underwear_350	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 350 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.74 and ${pickup_variable} > 0.72 and ${WTP_underwear_350} = 0*	
note_WTP_underwear_400	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 400 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.76 and ${pickup_variable} > 0.74 and ${WTP_underwear_400} = 0*	
note_WTP_underwear_450	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 450 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory . Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.78 and ${pickup_variable} > 0.76 and ${WTP_underwear_450} = 0*	
note_WTP_underwear_500	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 500 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.84 and ${pickup_variable} > 0.78 and ${WTP_underwear_500} = 0*	
note_WTP_underwear_0_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 0 BDT. You selected not to receive the underwear. Many thanks for your participation! *Question relevant when: ${order_group} < 0.98 and ${WTP_underwear_0} = 1*	
note_WTP_underwear_50_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 50 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.16 and ${WTP_underwear_50} = 1*	
note_WTP_underwear_100_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 100 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.32 and ${pickup_variable} > 0.16 and ${WTP_underwear_100} = 1*	
note_WTP_underwear_150_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 150 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.66 and ${pickup_variable} > 0.64 and ${WTP_underwear_150} = 0*	
note_WTP_underwear_200_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 200 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.68 and ${pickup_variable} > 0.66 and ${WTP_underwear_200} = 1*	

Field	Question	Answer
note_WTP_underwear_250_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 250 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.70 and ${pickup_variable} > 0.68 and ${WTP_underwear_250} = 1*	
note_WTP_underwear_300_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 300 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.72 and ${pickup_variable} > 0.70 and ${WTP_underwear_300} = 1*	
note_WTP_underwear_350_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 350 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.74 and ${pickup_variable} > 0.72 and ${WTP_underwear_350} = 1*	
note_WTP_underwear_400_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 400 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.76 and ${pickup_variable} > 0.74 and ${WTP_underwear_400} = 1*	
note_WTP_underwear_450_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 450 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.78 and ${pickup_variable} > 0.76 and ${WTP_underwear_450} = 1*	
note_WTP_underwear_500_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 500 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.84 and ${pickup_variable} > 0.78 and ${WTP_underwear_500} = 1*	
note_WTP_pads_0	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 0 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.48 and ${pickup_variable} > 0.32 and ${WTP_pads_0} = 0*	
note_WTP_pads_20	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 20 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.64 and ${pickup_variable} > 0.48 and ${WTP_pads_20} = 0*	
note_WTP_pads_40	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 40 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.86 and ${pickup_variable} > 0.84 and ${WTP_pads_40} = 0*	

Field	Question	Answer
note_WTP_pads_60	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 60 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.88 and ${pickup_variable} > 0.86 and ${WTP_pads_60} = 0*	
note_WTP_pads_80	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 80 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement in the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.90 and ${pickup_variable} > 0.88 and ${WTP_pads_80} = 0*	
note_WTP_pads_100	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 100 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement in the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.92 and ${pickup_variable} > 0.90 and ${WTP_pads_100} = 0*	
note_WTP_pads_200	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 200 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement in the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 1 and ${pickup_variable} > 0.92 and ${WTP_pads_200} = 0*	
note_WTP_pads_0_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 0 BDT. You selected no to receive the pads. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.48 and ${pickup_variable} > 0.32 and ${WTP_pads_0} = 1*	
note_WTP_pads_20_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 20 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.64 and ${pickup_variable} > 0.48 and ${WTP_pads_20} = 1*	
note_WTP_pads_40_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 40 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.86 and ${pickup_variable} > 0.84 and ${WTP_pads_40} = 1*	
note_WTP_pads_60_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 60 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.88 and ${pickup_variable} > 0.86 and ${WTP_pads_60} = 1*	
note_WTP_pads_80_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 80 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.90 and ${pickup_variable} > 0.88 and ${WTP_pads_80} = 1*	
note_WTP_pads_100_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 100 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 0.92 and ${pickup_variable} > 0.90 and ${WTP_pads_100} = 1*	

Field	Question	Answer
note_WTP_pads_200_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 200 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation! *Question relevant when: ${pickup_variable} <= 1 and ${pickup_variable} > 0.92 and ${WTP_pads_200} = 1*	

[name], thank you for participating in the survey.

It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 200 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!

Question relevant when: ${pickup_variable} <= 1 and ${pickup_variable} > 0.92 and ${WTP_pads_200} = 1

4.5.3   Discussion Group Facilitator Feedback Survey

Education Session Feedback

Field	Question	Answer	
intronote	Please provide a short feedback for each education session.		
General Information			
session_day *(required)*	On what date did the session take place?	1	Sunday, 21.03.
		2	Monday, 22.03.
		3	Tuesday, 23.03.
		4	Wednesday, 24.03.
		5	Thursday, 25.03.
		6	Sunday, 04.04.
		7	Monday, 05.04.
		8	Tuesday, 06.04.
		9	Wednesday, 07.04.
		10	Thursday, 08.04.
session_time *(required)*	At what time did the session take place?	1	10:00 AM
		2	11:30 AM
		3	2:00 PM
trainer *(required)*	Who was conducting the education session?	1	███████
		2	███████
		3	███████
		4	███████
number	Was it the workers' first or second education session?	1	First Session
		2	Second Session
attendees *(required)*	How many workers participated in this education session?		
Atmosphere			
atmopshere_note	Please rate your level of agreement to each of the following questions on a 4-point scale: completely disagree, disagree, agree, completely agree		
label	How did the education session go?	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
technical_difficulties *(required)*	There were no technical difficulties (no internet problems, good audio quality, etc.)	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
comfortable_format *(required)*	The women were not constrained by the remote format and felt comfortable to speak up	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
equal_participation *(required)*	The women were all equally active and participated to the same degree	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
sharing_experiences *(required)*	The women were eager to share their personal experiences about their menstruation	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
dominant_participants *(required)*	One or two women clearly dominated the discussions	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
further_discussions *(required)*	I have the feeling the discussions between the women will continue also outside the session	1	Completely disagree
		2	Disagree
		3	Agree
		4	Completely agree
Topics			

Field	Question	Answer	
topics *(required)*	Which of the following topics were discussed in the session?	1	Menstrual absorbents in general
		2	Pads in particular
		3	Menstrual underwear in particular
		4	First experiences with menstruation as teenager
		5	Issues or problems with menstruation today
		6	Feeling uncomfortable with menstruation
		7	Discussing menstruation with children
		8	Health
		-999	Other
main_topic *(required)*	Which of these topics did the group spend the most time on discussing?	1	Menstrual absorbents in general
		2	Pads in particular
		3	Menstrual underwear in particular
		4	First experiences with menstruation as teenager
		5	Issues or problems with menstruation today
		6	Feeling uncomfortable with menstruation
		7	Discussing menstruation with children
		8	Health
		-999	Other
questions *(required)*	What were the most frequent questions, comments or concerns of the women?		
comments	Do you have any other comments about the education session?		

4.5.4   Follow-up Survey

Follow-Up Outcome Survey

Field	Question	Answer
intronote	Welcome to the survey! Please swipe forward to continue.	
enumerator *(required)*	Who is conducting the survey?	1 ▮▮▮ 2 ▮▮▮ 3 ▮▮▮ 4 ▮▮▮ 5 ▮▮▮ 6 ▮▮▮ -999 TEST
Call Number		
callnote	Please enter the phone number you are calling	
phone *(required)*	Worker phone number	
SectionB - Consent		
worker_ID	You are calling the following person: **Worker Name:** [name] **Worker ID:** [ID]	
consent *(required)*	Hello [name], I am [enumerator_name]. I already spoke with you a few weeks ago, when I asked you to participate in a survey on female health and you agreed to participate. Today, we would like to ask a few follow-up questions. This will take around 5min. Is that ok with you?	1 Yes 0 No
Survey starts		
Survey starts > WTP_intro		
note_WTP	In this section of the survey, I will present you with two different options: you can either choose to receive **an amount of money** or a **menstrual product for free**. Please tell me which of the 2 options you prefer. The amount of money is different in each choice and there are different menstrual products available, so pay close attention to the options. Always tell me whether you would prefer to receive the money or the free menstrual product. At the end of the entire survey, a computer will randomly select one of these choices. Whatever you said you prefer for this choice, the money or the menstrual product, will be yours. You should therefore always respond truthfully which you prefer, the money or the free menstrual product, because you may end up getting what you chose. Both the money and the menstrual product will not be made available immediately. Instead, you will receive it once we have finished all the surveys. This might take some time (up to 3 weeks). If you choose the money, it will be transferred to your phone in the form of phone credits. If you choose the menstrual product, you will be able to pick it up at one of the small stores at Hop Lun. There will be **a man** in the store giving you the product. We will give this man a list and your worker ID will be on it if you select the free menstrual product, so you will need to tell the man in the store that you want to pick up the menstrual product and he will give it to you. *Make sure to emphasize that pick-up is from a MALE shopkeeper*	
male_emphasis *(required)*	*For the enumerator only (not for the participant):* Have you emphasized that pick up will be from a **MALE** shopkeeper?	1 Yes 0 No
Survey starts > Willingness to pay for pads		
WTP_pads_note	In the next questions, you always have the choice between receiving some money and receiving a free pack of 4 sanitary pads. Again, if you choose the pads you will be able to pick them up from a **male** shopkeeper at one of the factory stores. For the following choices, please tell me whether you prefer the free pack of pads or the money: *Make sure to emphasize that pick-up is from a MALE shopkeeper*	
WTP_pads_0 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 0 BDT?	0 Pack of pads 1 Money (0BDT)
WTP_pads_10	Would you prefer to receive a pack of 4 pads from a man or 10 BDT?	0 Pack of pads 1 Money (10BDT)
WTP_pads_20 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 20 BDT?	0 Pack of pads 1 Money (20BDT)
WTP_pads_30	Would you prefer to receive a pack of 4 pads from a man or 30 BDT?	0 Pack of pads 1 Money (30BDT)
WTP_pads_40 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 40 BDT?	0 Pack of pads 1 Money (40BDT)
WTP_pads_50	Would you prefer to receive a pack of 4 pads from a man or 50 BDT?	0 Pack of pads 1 Money (50BDT)
WTP_pads_60 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 60 BDT?	0 Pack of pads 1 Money (60BDT)
WTP_pads_70	Would you prefer to receive a pack of 4 pads from a man or 70 BDT?	0 Pack of pads 1 Money (70BDT)
WTP_pads_80 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 80 BDT?	0 Pack of pads 1 Money (80BDT)
WTP_pads_90	Would you prefer to receive a pack of 4 pads from a man or 90 BDT?	0 Pack of pads 1 Money (90BDT)

Field	Question	Answer	
WTP_pads_100 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 100 BDT?	0	Pack of pads
		1	Money (100BDT)
WTP_pads_120	Would you prefer to receive a pack of 4 pads from a man or 120 BDT?	0	Pack of pads
		1	Money (120BDT)
WTP_pads_140	Would you prefer to receive a pack of 4 pads from a man or 140 BDT?	0	Pack of pads
		1	Money (140BDT)
WTP_pads_160	Would you prefer to receive a pack of 4 pads from a man or 160 BDT?	0	Pack of pads
		1	Money (160BDT)
WTP_pads_180	Would you prefer to receive a pack of 4 pads from a man or 180 BDT?	0	Pack of pads
		1	Money (180BDT)
WTP_pads_200 *(required)*	Would you prefer to receive a pack of 4 pads from a man or 200 BDT?	0	Pack of pads
		1	Money (200BDT)
Survey starts > Introduction to the menstrual underwear			
underwear_intro	In the last question, we are offering you a new menstrual product for free: a **menstrual underwear**. This menstrual underwear was developed especially for the needs of Bangaldeshi women like you. I will tell you a little bit about the product now before we start the next section of the survey where you can select if you want to receive one for free: - The menstrual underwear looks and feels just like regular underwear, but you can wear it during your menstruation to absorb the blood - It works like pads, but absorbs as much as 2 pads, so you can go for many more hours without changing it - It is leak proof and has a layer to prevent leakage - It is fast-drying, so it will not feel wet - It is anti-bacterial, so it kills bacteria and reduces the risk of infection - Before using it again, you need to wash and dry it, but it dries very fast - It will last for at least 1 year or longer and you can use it every time again - It is black on the outside (anti-bacterial fabric on the inside is blue)		
Survey starts > Williness to pay for the underwear			
note_underwear	You now always have the choice between receiving some money and receiving the menstrual underwear I just described to you, which you will be able to pick up from a **male** shopkeeper at the store in the factory. For the following choices, please tell me whether you prefer the free underwear or the money: *Make sure to emphasize that pick-up is from a MALE shopkeeper*		
WTP_underwear_0 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 0 BDT?	0	Menstrual underwear
		1	Money (0BDT)
WTP_underwear_40	Would you prefer to receive a free menstrual underwear from a man or 40 BDT?	0	Menstrual underwear
		1	Money (40BDT)
WTP_underwear_50 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 50 BDT?	0	Menstrual underwear
		1	Money (50BDT)
WTP_underwear_60	Would you prefer to receive a free menstrual underwear from a man or 60 BDT?	0	Menstrual underwear
		1	Money (60BDT)
WTP_underwear_80	Would you prefer to receive a free menstrual underwear from a man or 80 BDT?	0	Menstrual underwear
		1	Money (80BDT)
WTP_underwear_100 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 100 BDT?	0	Menstrual underwear
		1	Money (100BDT)
WTP_underwear_120	Would you prefer to receive a free menstrual underwear from a man or 120 BDT?	0	Menstrual underwear
		1	Money (120BDT)
WTP_underwear_150 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 150 BDT?	0	Menstrual underwear
		1	Money (150BDT)
WTP_underwear_160	Would you prefer to receive a free menstrual underwear from a man or 160 BDT?	0	Menstrual underwear
		1	Money (160BDT)
WTP_underwear_200 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 200 BDT?	0	Menstrual underwear
		1	Money (200BDT)
WTP_underwear_240	Would you prefer to receive a free menstrual underwear from a man or 240 BDT?	0	Menstrual underwear
		1	Money (240BDT)
WTP_underwear_250 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 250 BDT?	0	Menstrual underwear
		1	Money (250BDT)
WTP_underwear_280	Would you prefer to receive a free menstrual underwear from a man or 280 BDT?	0	Menstrual underwear
		1	Money (280BDT)
WTP_underwear_300 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 300 BDT?	0	Menstrual underwear
		1	Money (300BDT)
WTP_underwear_320	Would you prefer to receive a free menstrual underwear from a man or 320 BDT?	0	Menstrual underwear
		1	Money (320BDT)
WTP_underwear_350 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 350 BDT?	0	Menstrual underwear
		1	Money (350BDT)
WTP_underwear_360	Would you prefer to receive a free menstrual underwear from a man or 360 BDT?	0	Menstrual underwear
		1	Money (360BDT)

Field	Question	Answer	
WTP_underwear_400 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 400 BDT?	0	Menstrual underwear
		1	Money (400BDT)
WTP_underwear_440	Would you prefer to receive a free menstrual underwear from a man or 440 BDT?	0	Menstrual underwear
		1	Money (440BDT)
WTP_underwear_450 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 450 BDT?	0	Menstrual underwear
		1	Money (450BDT)
WTP_underwear_480	Would you prefer to receive a free menstrual underwear from a man or 480 BDT?	0	Menstrual underwear
		1	Money (480BDT)
WTP_underwear_500 *(required)*	Would you prefer to receive a free menstrual underwear from a man or 500 BDT?	0	Menstrual underwear
		1	Money (500BDT)
Survey starts > pickup			
note_WTP_underwear_0	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 0 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory . Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!		
note_WTP_underwear_50	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 50 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!		
note_WTP_underwear_100	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 100 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!		
note_WTP_underwear_150	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 150 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!		
note_WTP_underwear_200	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 200 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory . Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!		
note_WTP_underwear_250	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 250 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!		

Field	Question	Answer
note_WTP_underwear_300	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 300 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!	
note_WTP_underwear_350	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 350 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!	
note_WTP_underwear_400	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 400 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!	
note_WTP_underwear_450	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 450 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory . Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!	
note_WTP_underwear_500	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 500 BDT. You selected to receive the underwear. This means, the menstrual underwear will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once the underwear is ready to pick up, we will announce it at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you off the list and you will receive your free menstrual underwear! Many thanks for your participation!	
note_WTP_underwear_0_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 0 BDT. You selected not to receive the underwear. Many thanks for your participation!	
note_WTP_underwear_50_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 50 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_100_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 100 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_150_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 150 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_200_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 200 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	

Field	Question	Answer
note_WTP_underwear_250_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 250 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_300_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 300 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_350_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 350 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_400_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 400 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_450_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 450 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_underwear_500_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the underwear and receiving 500 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_pads_0	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 0 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	
note_WTP_pads_20	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 20 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	
note_WTP_pads_40	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 40 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	
note_WTP_pads_60	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 60 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement at the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	

Field	Question	Answer
note_WTP_pads_80	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 80 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement in the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	
note_WTP_pads_100	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 100 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement in the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	
note_WTP_pads_200	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 200 BDT. You selected to receive the pack of pads. This means, the pack of pads will be available to you for free at Hop Lun. We will put your worker ID on a list that the shop keeper will receive. Once you can pick up the pads, we will make an announcement in the factory. Then you can go to the store at your convenience and tell the shopkeeper your ID. He will check you of the list and you will receive your free pack of pads! Many thanks for your participation!	
note_WTP_pads_0_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 0 BDT. You selected no to receive the pads. Many thanks for your participation!	
note_WTP_pads_20_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 20 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_pads_40_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 40 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_pads_60_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 60 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_pads_80_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 80 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_pads_100_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 100 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	
note_WTP_pads_200_2	[name], thank you for participating in the survey. It was randomly selected that the choice that is relevant for you is between receiving the pack of pads and receiving 200 BDT. You selected to receive the money. It will be transferred to your phone as phone credits within the next 2-3 weeks. Many thanks for your participation!	

4.5.5   Survey Pure Control

Follow up pure control group

Field	Question	Answer	
enumerator *(required)*	Who is conducting the survey?	1	⬛
		2	
		3	
		4	
		5	
		6	
		-999	TEST
Call Number			
callnote	Please enter the phone number you are calling		
phone *(required)*	Worker Phone Number		
SectionB = Consent			
worker_ID	You are calling the following person: **Worker Name:** [name] **Worker ID:** [ID]		
consent *(required)*	Hello [name], I am [enumerator_name]. I am working with a group of researchers from Germany. We are conducting a survey to research women's health. We have already surveyed some of your coworkers last year and have now received your phone number through your employer [■■■■] your employer is collaborating with us in this survey. The survey will take around 15min. Are you willing to participate in this survey?	1	Yes
		0	No
Start survey			
Start survey > Demographics			
note_demographic	[name], thank you for participating in the survey. We will start by asking you a series of questions about yourself and your family. The answers will not be shared with [■■■■] and we will only use it for research purposes. It is very important that you answer truthfully. You can refuse to answer any question at any point.		
age *(required)*	How old are you?		
religion *(required)*	What is your religion?	1	Muslim
		2	Hindu
		3	Buddist
		4	Catholic
		-999	Other (please specify)
religion_other	Enter other religion:		
married *(required)*	Are you married?	1	Yes
		2	Divorced/Separated/Widowed
		0	Unmarried
child_1 *(required)*	Do you have children?	1	Yes
		0	No
educ *(required)*	What was the last class that you attended in school?	0	I did not go to school
		1	Class 1
		2	Class 2
		3	Class 3
		4	Class 4
		5	Class 5
		6	Class 6
		7	Class 7
		8	Class 8
		9	Class 9
		10	Class 10
		11	Class 11
		12	Class 12
		13	More than highschool
Start survey > Absorbents			
note_absorbent	We would like to know more about female health, therefore, we will ask you now a series of questions about menstruation. We would appreciate it if you would answer truthfully. These questions will help us understand how we can support women's health better in Bangladesh.		
ab_others_1	When you think about the **other women (not yourself)** at your factory, what material do you think that they use **the most** as absorbent during their menstruation?	0	Cloth/fabric
		1	Disposable pads
		2	Reusable underwear/pads
		3	Paper/Tissues
		4	No absorbent
		-999	Other (please specify)
ab_others_2	Enter other method:		
menstruation *(required)*	In the last 6 months, have you had your menstruation?	1	Yes
		0	No

Field	Question	Answer	
menstruation_lack	Why have you not had your menstruation?	0	Injection
		1	Pregnant
		2	Irregular
		3	Menopause
		-999	Other (please specify)
menstruation_lack_other	Enter other reason:		

Field	Question	Answer	
note_method	Now we would like to know more about what material **you** frequently use as absorbent during your menstruation. Think about the material you have used for the last 6 months. We are only interested in methods used frequently or very frequently (i.e. what you use for 2 days or more during menstruation).		
note_method_2	Have you used the following materials frequently in the last 6 months?	1	Yes
		0	No
ab_cloth_1 *(required)*	Cloth or fabric	1	Yes
		0	No
ab_pads_1 *(required)*	Disposable pads	1	Yes
		0	No
ab_reusable_1 *(required)*	Reusable pads or underwear	1	Yes
		0	No
ab_tissue_1 *(required)*	Tissues or toilet paper	1	Yes
		0	No
ab_nothing_1 *(required)*	No absorbent	1	Yes
		0	No

Field	Question	Answer	
spillover_1	Last year, we surveyed some of your coworkers and a few of them also participated in a training. Do you know anyone who participated in our survey or in the training?	1	Yes
		0	No
spillover_2	Some workers received a reusable menstrual underwear after the training. Do you know anyone who received a free resusable menstrual underwear?	1	Yes
		0	No
spillover_3	In the last 6 months, have you talked about the topic of menstruation with any of your coworkers?	1	Yes
		0	No

Field	Question	Answer	
note_know	We will now ask you a few questions about menstruation, please answer to the best of your knowledge.		
know_label	Please indicate if you think the following statements are true or false.	1	TRUE
		0	FALSE
know_2_a *(required)*	Menstruation is a process of eliminating toxic blood from the body	1	TRUE
		0	FALSE
know_2_b *(required)*	Menstruation is an illness	1	TRUE
		0	FALSE
know_2_c *(required)*	Menstruation is a curse	1	TRUE
		0	FALSE
know_2_d *(required)*	Pads can absorb more blood than cloth	1	TRUE
		0	FALSE
know_2_e *(required)*	Menstruation is a biological process related to fertiliy and childbearing	1	TRUE
		0	FALSE
know_2_f *(required)*	Using pads does not reduce the risk of urinary infections compared to cloth	1	TRUE
		0	FALSE
know_2_g *(required)*	Menstrual cloth does not need to be dried after washing, it can be directly stored	1	TRUE
		0	FALSE

Field	Question	Answer	
note_norms_n	Think of a woman who is very similar to you, called Romana. She lives in Gazipur and works at Hoplun. She lives in a neighbourhood similar to yours with her husband, a 10-year-old son and a 12-year-old daughter. She is muslim. She woke up today and noticed that it is the first day of her monthly period. Think about the other women that know Romana and are her neighbours. What do you think how socially acceptable would they find it if Romana did the following things during her menstruation. The answer options are: very socially inappropriate, socially inappropriate, socially appropriate or very socially appropriate		
note_example_n	For example, if I say "she fasts in Ramadan during her menstruation", one common answer to this is socially inappropriate or very socially inappropriate because during the days of menstruation in Bangladesh women do not consider that it is appropriate to fast. Remember that I am not asking about your opinion, but think about what Romana's neighbours will think and tell me what they would say.		
sn_label	How will the other women judge the following:	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate

Field	Question	Answer	
sn_cloth_t *(required)*	She uses cloth to manage her menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_pads_t *(required)*	She uses pads to manage her menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_1_t *(required)*	She goes to a shop and purchases pads from a male clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_purchase_2_t *(required)*	She goes to a shop and purchases pads from a female clerk	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_wash_t *(required)*	She washes menstrual cloth outside (in the communal laundry area of the neighbourhood or in the pond)	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_dry_t *(required)*	She dries her menstrual cloth outside in direct sunlight	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_1_t *(required)*	Romana's husband explains to her daugther about menstruation and hygienic menstrual practices	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_1_t *(required)*	Romana's husband explains to her son about menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_daughter_2_t *(required)*	Romana explains to her daugther about menstruation and hygienic menstrual practices	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
sn_son_2_t *(required)*	Romana explains to her son about menstruation	1	Very socially inappropriate
		2	socially inappropriate
		3	socially appropriate
		4	Very socially appropriate
Start survey > Measure of stigma			
measurestigma *(required)*	Now I will read to you a list of 4 statements, I would like you to tell me how many you personally agree with. Just answer the total number 0,1,2,3 or 4. You do not need to tell me which ones you agree with. 1. Women should hide any evidence of menstruation 2. Menstruation is something unclean 3. I worry about stains or odour during menstruation, because others might realize I am menstruating 4. If someone would know that I am menstruating they might treat me or look at me differently		
Start survey > taboo			
taboo_1 *(required)*	Like in the previous question, I will now read you 4 statements and I would like to know how many you agree with. Again, just tell me the number, 0,1,2,3 or 4. 1. I would feel embarrassed to talk about menstruation with my family 2. I would feel embarrassed if they talked about menstruation on the TV or on the radio 3. I would feel embarrassed to ask advice about menstrual products from a teacher, a doctor or a health officer at the factory 4. I prefer not to talk about menstruation with anyone		

5. APPENDIX TO CHAPTER 2

5.1 Additional Tables

Table B1: Descriptive statistics and full balance table across treatments

	(1)	(2)	(3)	(4)
	Control	Decision power	Effort	Effort & Decision power
Age	25.74	24.08	24.63	24.75
	(7.33)	(3.90)	(5.09)	(6.34)
Male	0.33	0.30	0.32	0.33
	(0.47)	(0.46)	(0.47)	(0.47)
Student	0.79	0.84	0.83	0.80
	(0.41)	(0.37)	(0.38)	(0.40)
Econ student	0.11	0.15	0.09	0.14
	(0.32)	(0.36)	(0.29)	(0.35)
Highest degree: high school	0.44	0.51	0.55	0.48
	(0.50)	(0.50)	(0.50)	(0.50)
Highest degree: Bachelor	0.30	0.31	0.27	0.31
	(0.46)	(0.46)	(0.45)	(0.46)
Highest degree: Master	0.21	0.14	0.13	0.14
	(0.41)	(0.34)	(0.34)	(0.34)
Donating regularly	2.25	2.21	2.17	2.30
	(0.84)	(0.88)	(0.87)	(0.93)
Sunk cost index	2.13	2.15	2.16	2.17
	(0.62)	(0.64)	(0.66)	(0.65)
Highest rank: AMF	0.46	0.49	0.43	0.49
	(0.50)	(0.50)	(0.50)	(0.50)
Highest rank: Cool Earth	0.67	0.66	0.65	0.60
	(0.47)	(0.47)	(0.48)	(0.49)
Highest rank: GiveDirectly	0.27	0.31	0.26	0.26
	(0.45)	(0.46)	(0.44)	(0.44)

Notes: This table shows the mean and standard deviation (in parentheses) of each control variable by treatment group in Columns (1)-(4). Differences between groups were checked for statistical significance, only two differences are statistically significant: Age in (1) is higher than in (2) ($p < 0.05$) and Highest degree: High School is higher in (1) than in (3) ($p < 0.10$). All other differences between all groups are not statistically significant at conventional levels.

Table B2: Effect of actual treatment on perceived treatment

	(1)	(2)
	Perceived Decision Power	Perceived Effort
Decision power only	0.010	-0.564***
	(0.13)	(0.21)
Effort only	0.139	-0.041
	(0.12)	(0.20)
Decision power and effort	0.029	-0.522***
	(0.12)	(0.20)
Constant	5.461***	4.325***
	(0.31)	(0.56)
Controls	Yes	Yes
Adj. R^2	0.031	0.037
Observations	439	439

Notes: OLS regression of perceived decision power and perceived effort on being assigned to the different treatment groups. The baseline category is the control group (no decision power, no effort). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.2   Additional Figures

Figure B1: Psychological ownership scores by treatment group
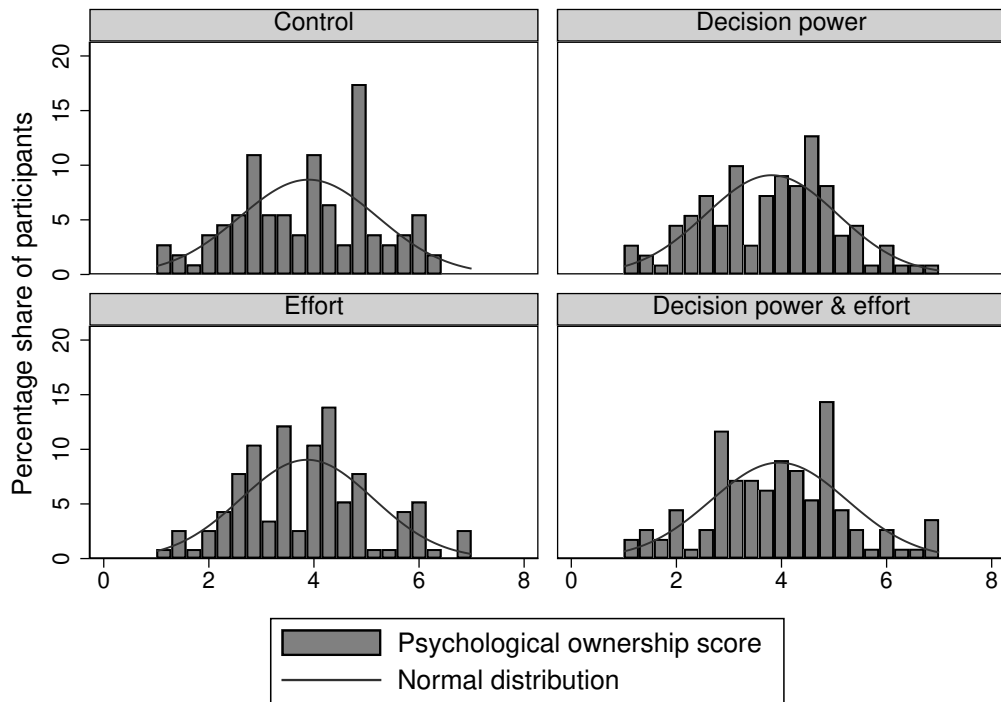
Notes: Histogram of the psychological ownership scores (average of four survey items, each on a scale from 1 to 7) by treatment groups, compared to a normal distribution.

Figure B2: Valuation by preference
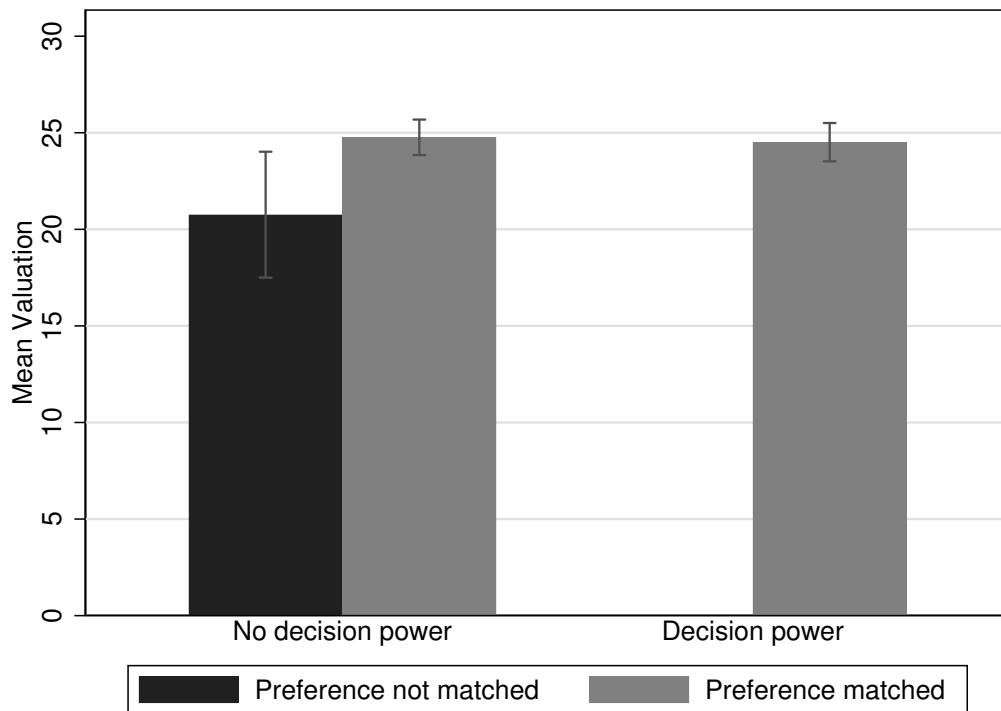
Notes: Mean valuation of participants donating to their preferred charity (light grey bars) compared to participants donating to a non-preferred charity (dark grey bar). Those in the treatment group with no decision power (left) were randomly assigned to a charity, those with decision power (right) could select themselves. Error bars represent 95% confidence intervals.

Figure B3: Contribution by preference
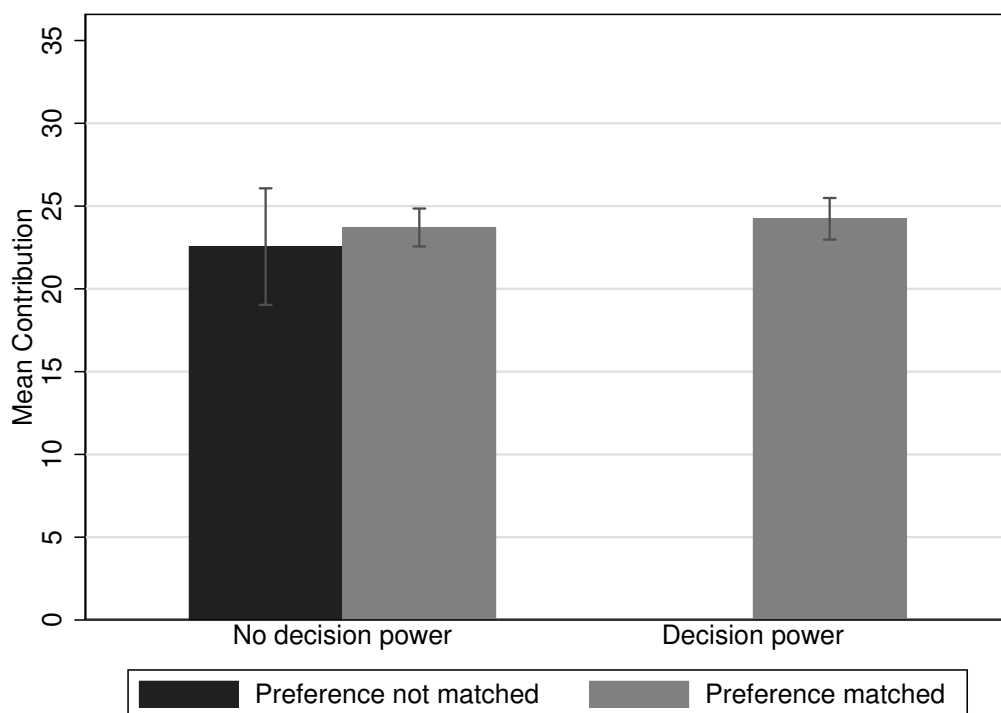
Notes: Mean contribution of participants donating to their preferred charity (light grey bars) compared to participants donating to a non-preferred charity (dark grey bar). Those in the treatment group with no decision power (left) were randomly assigned to a charity, those with decision power (right) could select themselves. Error bars represent 95% confidence intervals.

I use a charity donation rather than a project with personal payoffs for two reasons. First, the aim of the experiment is to show the effect of the treatment on the subjective valuation of the project. If the project outcome is measured as a monetary payoff to the participant, however, the valuation of this outcome will be much less subjective. A monetary gain of 10 EUR has a much more similar value to each participant than a monetary donation to a charity, which depends on other factors (e.g. pro-social preferences, "warm glow"). It is thus more meaningful to elicit the valuation of a project that does not provide monetary payoffs but a different kind of utility, but can nevertheless be objectively measured. Second, in the contexts where these policies are used, the projects usually provide a public good or at least have a positive externality. To mirror this, I use a project that only generates a positive externality without a personal gain.

The donation participants generated could go to one of three charities: the Against Malaria Foundation, Cool Earth or GiveDirectly. I chose them from a list of charities ranked as highly effective by GiveWell[1], an organisation which evaluates and ranks charities. The different charities cover a spectrum of causes (health, environmental protection, poverty alleviation), but all have a strongly perceived benefit. It could be argued that using charities that are vaguely similar in their mission and effectiveness will reduce the strength of participants' preference ordering and so limit the perception of choice. However, the opposite can also be argued: if one of the charities would seem obviously preferable, the participants may feel like it is not really a choice, because there is a "correct" answer. Therefore, I use charities of similar quality, so that the choice is perceived as real. At the same time, I chose different causes to induce a strong preference ordering.

To determine the preference ordering, participants had to rank the charities at the beginning of the experiment. They allocated 6 points across the three charities, giving more points to their more preferred charities. Most participants (50.6%) allocated the points in a 1-2-3 order, thus indicating a moderate preference strength, while 8.7% allocated 5 or 6 of their points to one charity only, showing a very strong preference for one charity. Only 15.8% of the sample gave 2 points to each charity, thus indicating that they were indifferent between them. I use the preference ranking to rule out one immediate explanation for why participation can increase project commitment, namely the preference channel. When one has decision power, the resulting choice will be in line with one's preferences and commitment to a more preferred choice will

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[1] https://www.givewell.org/

naturally be higher (Grillos, 2022). To determine the effect of having decision power *per se*, I eliminate the preference channel. Participants who were assigned a random charity that is not the same as their (weakly) most preferred charity as indicated in the ranking are excluded from the main analysis. I therefore only compare participants who donate to their most preferred charity, which was selected either by chance or by choice.

The outcome measures were framed in the loss domain for two reasons. First, to mirror the main motivating example of community-driven development, where it is usually about maintenance of a completed project. Second, it was assumed that effects in the loss domain might be more pronounced due to loss aversion, though the effect was hypothesized to not be limited to the loss domain.

The difference in total number of tasks in the two scenarios (30 in the one-person scenario and 35 in the two-person scenario) was chosen for two reasons. First, assigning a different "price" for each point saved in each scenario makes the two decisions more independent and limits anchoring effects. Second, the higher number of tasks in the two-person scenario introduces a social cost to this scenario that makes it overall less efficient, but allows each participant to free-ride and save the donation for sure without doing any work. Participants are asked to indicate their preferred scenario and explain their choice in a free text field at the end of the experiment. Through this additional social cost, the aim of this question is to draw conclusions about their willingness to free-ride at the expense of overall efficiency. Appendix 5.4 provides an analysis of the preferred scenario and the free text field answers.

5.4   Preferences Over the Two Scenarios

After the experiment, participants stated their preference for the one-person or two-person scenario and were asked to provide an explanation for their choice in a free text field. Across all participants, 47.7% preferred the one-person scenario compared to 25.3% preferring the two-person scenario and 27% being indifferent. The majority of participants was therefore not willing to free-ride, but preferred the socially efficient alternative. Interestingly, not receiving the preferred charity (by chance) compared to receiving the preferred charity (by chance) did not increase the participants' willingness to free-ride. In fact, it shifted participants away from wanting to free-ride to being indifferent between which scenario was chosen, as seen in Table B3.

Among those participants who expressed a preference, there were no differences in the desire to

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Table B3: Preference for the two scenarios by preference matching

	(1)	(2)	(2)
	Full sample	Preference matched (by chance)	Preference not matched (by chance)
Prefer one-person scenario	47.7%	49.1%	48.3%
Prefer two-person scenario	25.3%	24.6%	13.8%
Indifferent	27.0%	26.3%	37.9%
Observations	474	224	29

Notes: Share of participants indicating that they prefer a given scenario or are indifferent.

free-ride (i.e. prefer the two-person scenario) by treatment group, see Table B4.

Table B4: Preference for the two-person scenario by treatment

	(1) Prefer two-person scenario
Decision power only	0.018
	(0.08)
Effort only	-0.081
	(0.07)
Decision power and effort	-0.023
	(0.08)
Constant	0.377***
	(0.06)
Adj. R^2	-0.006
Observations	328

Notes: OLS regression of the preference for the two-person scenario on the treatment group assignment. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Analyzing the free text explanations shows a similar trend: the most frequently used words (any word occurring in more than 6% of responses) and bigrams (any bigram occurring in more than 3% of responses) are very similar across treatment groups (Tables B5 and B6).

The only notable difference is the occurrence of the word "responsibility", which is part of the most frequent words in both treatment groups involving decision power. Table B7 shows the frequency of the word by treatment group. This could indicate that an increased feeling of "personal responsibility" for the project outcome was perceived by study participants in the treatment groups with decision power, potentially contributing to the observed difference in perceived cost of effort for treatment groups with decision power.

Table B5: Most frequent words mentioned in free text field

Control (no effort, no decision power)		Decision power only		Effort Only		Decision power and effort	
donation	30.95%	donation	41.56%	donation	24.14%	task	29.27%
tasks	21.43%	tasks	15.58%	tasks	20.69%	donation	28.05%
solve	14.29%	work	15.58%	person	16.09%	less	20.73%
less	14.29%	scenario	14.29%	sure	14.94%	person	14.63%
person	11.90%	less	14.29%	would	10.34%	would	12.20%
saved	11.90%	person	12.99%	effort	9.20%	solve	8.54%
money	10.71%	like	10.39%	make	9.20%	scenario	8.54%
would	10.71%	amount	9.09%	less	9.20%	number	7.32%
donated	9.52%	want	7.79%	save	9.20%	get	7.32%
like	9.52%	trust	7.79%	work	9.20%	want	7.32%
summation	8.33%	points	7.79%	like	8.05%	saved	7.32%
sure	8.33%	would	7.79%	scenario	8.05%	better	6.10%
saved	8.33%	responsible	7.79%	wanr	6.90%	higher	6.10%
higher	7.14%	saved	6.49%	control	6.90%	responsibilty	6.10%
one	7.14%	money	6.49%			like	6.10%
scenarios	7.14%	know	6.49%				
others	7.14%						

Table B6: Most frequent bigrams mentioned in free text field

Control (no effort, no decision power)		Decision power only		Effort Only		Decision power and effort	
('summat', 'task')	8.33%	('donat', 'save')	6.49%	('make', 'sure')	6.90%	('person', 'scenario')	4.88%
('donat', 'save')	8.33%	('less', 'work')	6.49%	('person', 'scenario')	5.75%	('number', 'task')	3.66%
(dont', 'care')	5.95%	('donat', 'nt')	5.19%	('save', 'donat')	5.75%	('less', 'task')	3.66%
('less', 'work')	4.76%	('either', 'way')	3.90%	('less', 'work')	4.60%	('less', 'effort')	3.66%
('anoth', 'person')	4.76%	('person', 'scenario')	3.90%	('task', 'twopersonscenario')	4.60%	('would', 'like')	3.66%
('solv', 'task')	4.76%	('nt', 'want'=	3.90%	('summat', 'task')	3.45%	('save', 'donat')	3.66%
('scenario', 'would')	4.76%	('twoperson', 'scenario')	3.90%			('less', 'work')	3.66%
('save', 'donat')	3.57%	('anoth', 'person')	3.90%				
('task', 'less')	3.57%	('task', 'solv')	3.90%				
		('donat', 'amount')	3.90%				
		('save', 'donat')	3.90%				

Table B7: Occurrence of the word "responsibility" in free text field

	Control (no effort, no decision power)	Decision power only	Effort only	Decision power and effort
contains 'responsib'	2.38%	9.09%	5.75%	7.32%

5.5   Field Study Survey Questions

Variable Type	Variable Name	Questions	Answer choices	Unit of observation	Variable created for analysis
Dependent variable	**Decision power**	It is important to me that I be involved in community decision-making. I feel that I can influence decisions made by [the NGO]. I think [the NGO] should take my opinion into account in their decision-making processes. I understand the current organizational structure of [the NGO]. [the NGO]'s decision-making processes are clear and open. [the NGO]'s decision-making processes are predictable and clear. [the NGO]'s staff are held accuntable for their decisions. Communication about community decision-making is open and two-way. Anyone in the community who wants to participate has access to the decision-making process of [the NGO]. [the NGO] seeks out and facilitates the involvement of those who are potentially affected by or interested in decision. [the NGO] seeks input from community members in designing how communities participate in [the NGO]'s decision-making processes. [the NGO] provides participants with the information they need to participate in a meaningful way. [the NGO] communicates to participants how their input affected decisions made. When I offer input to [the NGO], receiving information on the final decision is important to me. [the NGO] usually considers my opinion. [the NGO] is truly interested in my involvement in the decision-making process. I always attend meetings when representatives from [the NGO] are present My involvement has made a psoitive contribution to the decision-making proccesses in the past.	4-point Likert scale: *strongly disagree,* *somewhat disagree,* *somewhat agree,* *strongly agree*	Individual respondent level	A single factor variable created using principal component analysis, factor variable standardized with mean = 0 and standard deviaion = 1
	Level of Effort	How much effort did you put into the creation of the [...] project?	4-point Likert scale: *none,* *a little,* *very much,* *extreme effort*	Project level	Values standardized with mean = 0 and standard deviation = 1 on the project level, then averaged across all projects for each respondent
Outcome variable	**Valuation**	How important is it to you that the [...] project continues and is maintained?	4-point Likert scale: *not at all,* *a little,* *very much,* *extremely important*	Project level	Values standardized with mean = 0 and standard deviation = 1 on the project level, then averaged across all projects for each respondent
	Contribution	Did you contribute to the maintenance of the [...] project in any of the following ways ... ... Project design ... Manual labor ... Provide construction materials ... Provide money	Dummy *(0 or 1)*	Project level	Aggregated the dummy variables to one score of overall contribution, then standardized with mean = 0 and standard deviation = 1
Control variable	**Belonging**	I put a lot of time and effort into being part of this community. Being a member of this community is part of my identity. Fitting into this community is important to me. This community can influence other communities. I care about what other community members think of me. I have influence over what this community is like. If there is a problem in this community, members can get it solved. This community has good leaders. It is very important to me to be part of this community. I am with other community members a lot and enjoy being with them. I expect to be a part of this community for a long time.	4-point Likert scale: *not at all,* *somewhat,* *mostly,* *completely*	Individual respondent level	A factor variable created using principal component analysis, factor variable standardized with mean = 0 and standard deviaion = 1
	Usefulness	I get important needs of mine met because I am part of this community. Community members and I value the same things. This community has been successful in getting the needs of its members met. Being a member of this community makes me feel good. When I have a problem, I can talk about it with members of this community. People in this community have similar needs, priorities, and goals. I can trust people in this community. The community has symbols and expressions of membership such as clothes, signs, art, architecture, logos, landmarks, and flags that people can recognize. Members of this community have shared important events together, such as holidays, celebrations, or disasters. I feel hopeful about the future of this community. Members of this community care about each other.	4-point Likert scale: *not at all,* *somewhat,* *mostly,* *completely*	Individual respondent level	A factor variable created using principal component analysis, factor variable standardized with mean = 0 and standard deviaion = 1
	Familiarity	I can recognize most of the members of this community. Most community members know me.	4-point Likert scale: *not at all,* *somewhat,* *mostly,* *completely*	Individual respondent level	A factor variable created using principal component analysis, factor variable standardized with mean = 0 and standard deviaion = 1

The full experiment instructions are included below. Text only seen by specific treatment groups is marked as such and color-coded. Note that the treatment groups are referred to as 1A, 1B, 2A and 2B in the following. The number corresponds to the decision power treatment *(1 = Decision power, 2 = No decision power)*, the letter corresponds to the effort treatment *(A = Effort, B = No effort)*. In sum, the treatment groups are referred to in the following way:

- ***Group 1A:*** Decision power & Effort

- ***Group 1B:*** Decision power

- ***Group 2A:*** Effort

- ***Group 2B:*** Control

We are very pleased to welcome you to this study!

Thank you for participating in this research project. Before you start, please read the following instructions carefully and answer the question below.

Purpose:

You are being asked to participate in a research study by a researcher at the University of Munich (LMU Munich), Germany. This research study investigates how people make decisions.

Your participation in this study is voluntary and you may withdraw your participation or your data at any time. If you wish to end the study prematurely by closing the browser window, your data will be deleted. However, please note that you are thereby withdrawing from the study and are thus forfeiting any payments.

Procedure:

The study will take around 30 to 45 minutes.

If you agree to participate in this study, you will need to complete a series of online tasks and take some decisions. Each task and each required decision will be explained in detail beforehand.

You should complete this study in one session, without stopping or taking breaks. Please do not communicate with anyone else throughout this study.

This study is designed, conducted, and reported following recognized scientific standards and ethical principles, and has been approved by the ethics committee of the Department of Economics at the LMU Munich. All information provided during the study is correct. For example, if we promise a certain payment, participants will receive the promised payments and if you are told that your actions will affect another participant in the experiment, this is indeed the case.

Confidentiality:

The data collected throughout this study will be evaluated anonymously. Your name will not be linked to any of the decisions you make during this study.

Payments:

You will receive a monetary payment for your participation in this study. Your total take-home pay consists of a fixed amount of 10 EUR for completing the entire study, and may include an additional bonus payment of 6 EUR earned during the study.

In addition to the payments made to you, you will also earn money that will be donated to a charitable cause. It will be made clear throughout the study whether the money at stake is part of the donation or your personal take-home pay. The amount of money donated as well as the receiving charity will be determined during the study.

All money earned during the study, both your bonus payments as well as the donation, is denoted in points and will be converted to Euro at the end of the session. The conversion rate is

<div align="center">

25 points = 1 EUR
(or 100 points = 4 EUR)

</div>

Your personal take-home pay will be paid out to you either via PayPal or by bank transfer. You can choose your preferred method of payment and provide your payment details by following the separate payment link in your invitation email. Your donation will be transferred to the charity by us on your behalf. A confirmation of the donation having been transferred will be made available to you. Please note that it can take up to 3 weeks until the payment to you and the donation have been transferred.

By clicking "I agree" below you are indicating that you are at least 18 years old, have read this consent form and agree to participate in this research study under the terms and conditions detailed above.

Do you agree to participate in this study according to the information above?

○ I agree

○ I do not agree

Next

Study Overview

This study consists of two parts.

In part 1, you will complete several tasks and take decisions in order to generate monetary payoffs that will be **donated to a charitable organization**. At the end of part 1, you will be asked to answer a few questions, which might generate additional bonus payments as part of your **personal take-home pay**, depending on your answers. Part 1 has 7 sections and will take around 30 minutes to complete.

In part 2, you will answer a questionnaire.

At the beginning of each part or section, you will receive detailed instructions about how to proceed. In some parts, we will ask you to complete a short set of control questions to ensure that you have understood the task correctly. Your answers to these questions do not affect your payoff, but you will need to answer the questions correctly to proceed.

Please note that throughout the experiment there is no "Back" button, you cannot return to a previous page once you click "Next". **Do NOT use the browser Back button to navigate!**

Should you encounter any problems during this study, you can contact the responsible researcher at: dzi.experiment.help@gmail.com

When you are ready to begin the study, please click "Next".

<div style="border:1px solid; padding:10px; display:inline-block;">**Next**</div>

Part 1 – Section 1

Practice Round

During this study, you will encounter two types of tasks, a "summation task" and a "slider task". You will now have the opportunity to familiarize yourself with both tasks. The detailed instructions for each task are given on the next pages. You will need to complete 3 rounds of each task to proceed.

Next

Practice Round: Summation Task Instructions

In this task, you are presented with a 3 x 3 grid with each cell containing a number with one decimal place. There are exactly two numbers in the grid that sum up to 10.0 exactly. Your task is to identify these two numbers. Be sure to type the numbers exactly as you see them on the grid. For example, if you are presented with a grid that includes the numbers 9.7 and 0.3, you would input 9.7 and 0.3, since these two numbers add up exactly to 10.0. You must type 0.3 and not .3.

Example:

In the following grid, identify the two numbers that sum to 10.0 exactly. Enter your answer into the corresponding fields below the grid:

3.8	1.1	4.8
2.6	9.7	5.9
0.3	8.3	0.4

Enter one of the two numbers that sum to 10.0:

0.3

Enter the second number that sums to 10.0:

9.7

In this scenario, you need to enter 0.3 and 9.7 into the fields below the grid (the order of your entries does not matter). If you enter an incorrect answer and click "Next", you will be shown an error message and need to correct your answer before you can continue. If your answer was correct, you will directly proceed to the next summation task. There is no time limit for solving the summation tasks, take as much time as you need.

Please click "Next" to start the 3 practice rounds of the summation task.

Next

PLACEHOLDER - 3 rounds of summation task

Practice Round: Summation Task (1 of 3)

In the following grid, identify the two numbers that sum to 10.0 exactly. Enter your answer into the corresponding fields below the grid:

5.5	1.2	3.4
8.9	1.6	6.6
7.6	9.9	2.5

Enter one of the two numbers that sum to 10.0:

Enter the second number that sums to 10.0:

Next

Practice Round: Slider Task Instructions

In this task, you are presented with a series of sliders on the page. Each slider is positioned at a random number between 0 and 100 to start with. The current position of the slider can be seen in the grey field to the right. For each slider, you are given a target number between 0 and 100 above the slider. Use your mouse to click and drag the slider to match the given target number. As you drag the slider, the number in the grey field on the right adjusts dynamically, showing you the current position of the slider.

Example:

Adjust the sliders in such a way, that the number in the grey box on the right side of the slider matches the target number given just above the slider:
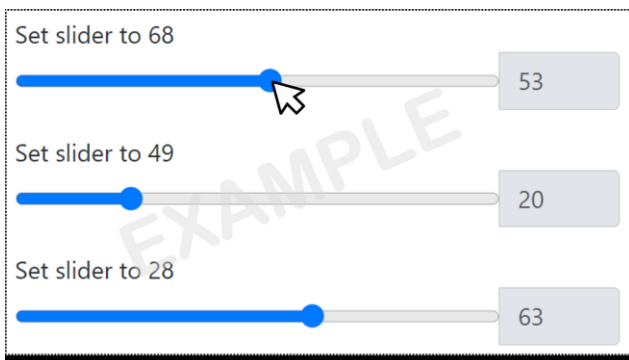
In this scenario, you would drag the first slider to the right using your mouse, until the number in the grey box is equal to 68. For the second slider, you would do the same until it reaches 49. The third one needs to be dragged to the left until it reaches 28. Once you have positioned all the sliders, click "Next". An error message will flag any incorrectly positioned sliders. There is no time limit for solving the sliders, take as much time as you need.

Please click "Next" to start the 3 practice sliders.

Next

PLACEHOLDER – 3 Slider tasks

Set slider to 47

83

Set slider to 47

74

Set slider to 56

37

Next

Part 1 – Section 2

Overview of the Charities

In this part of the study you will earn monetary payoffs that will be **donated to a charitable organization**. So the more money you earn in this part of the study, the higher your donation to the charity. There are three possible recipients of your donation: The **Against Malaria Foundation, Cool Earth, and GiveDirectly**.

On the next page, you will receive some information about each charity's work and can watch a short promotional video of each. Please take some time to familiarize yourself with each charity. Afterwards, you need to provide a personal ranking of the three available charities. Think about which charity you think is best and you would most like to donate to. Rank this charity highest.

Ranking procedure:

You can rank the charities by allocating points to them. You have 6 points to allocate in total. You must allocate all 6 points. You can allocate between 0 and 6 points to any given charity, but the sum of the total points allocated must always be 6. So, to rank the charities, give 3 points to your most preferred charity, 2 points to your second most preferred charity and 1 point to your third most preferred charity. If you have one clear favorite, you can also give 6 points to only one charity and 0 points to the other two. If you value each charity the same, you can give each charity 2 points.

Please take as much time as you need to read through the information provided on the following pages. You can then allocate the 6 points to the three charities.

Next

Against Malaria Foundation

Overview:

The Against Malaria Foundation (AMF) provides long-lasting insecticide-treated nets (for protection against malaria) in bulk to other non-profit organizations or government agencies, which then distribute the nets in developing countries. As of July 2019, AMF has supported large-scale distributions in eight countries (Malawi, DRC, Ghana, Uganda, Togo, Papua New Guinea, Zambia, and Guinea), for a total of 38 million nets distributed.

Background:

Malaria killed around 438,000 people in 2015, including an estimated 306,000 children. There are about 200 million cases of the disease every year. Insecticide treated bednets are one of the most effective ways to prevent transmission of malaria and have averted about 450 million cases from 2000 to 2015. The Against Malaria Foundationfights malaria by funding and tracking/monitoring insecticide-treated mosquito nets in Sub-Saharan Africa.

Approach:

AMF receives and reviews requests for mosquito nets from local ministries of health. It carries out pre-distribution surveys to establish the number of nets needed. It works with local health leaders to educate populations on all elements of malaria prevention, including the correct use of malaria nets. It purchases the nets and delivers them (through its distribution partners). It also provides independent supervisors to ensure that the nets are not misappropriated, and go to the people who need them. It continues to monitor local malaria rates, and carries out post-distribution surveys to monitor the use and condition of the nets. Depending on the outcomes of these surveys, it provides further malaria education and additional nets as needed.

Sources: givewell.org and givingwhatwecan.org; video: CBS News

Cool Earth

Overview:

Cool Earth aims to reduce the impacts of climate change by combating deforestation in a variety of rainforest locations - including the Ashaninka and Awajun Projects in Peru, the Lubutu project in the Democratic Republic of Congo, the Orangerie Bay Project in Papua New Guinea, the Awacachi Project in Ecuador (completed), and the Madeira Project in Brazil (completed).

Background:

Emissions of CO2 contribute to anthropogenic climate change which, in turn, has extensive negative impacts on human health and wellbeing. The World Health Organisation estimates that, by 2030, an additional 250,000 people will die each year due to the effects of climate change and people living in extreme poverty will be disproportionately affected. Models by Giving What We Can, a UK-based ThinkTank, indicate that current emissions will increase human mortality by approximately 1 death per 258,200t of CO2-equivalent emitted (likely a low estimate). This does not, however, include the detrimental effects on biodiversity and the natural environment which are also likely to be considerable.

Approach:

Cool Earth does not buy rainforest directly, but rather establishes sustainable agreements with local communities to ensure that local communities opt not to sell the nearby forest to loggers. These agreements aim to improve the lives of these communities to the point where they can withstand pressure to sell to loggers, and are based on the needs and specific requests of the community. They have previously involved support for local industries such as cacao and coffee, technical assistance, funding for local schools, provision of boats for emergency health evacuations, and targeted maternal healthcare. Based on this, Cool Earth's work also contributes to economic empowerment at a community level.

GiveDirectly

Overview:

GiveDirectly transfers cash to poor households in low-income countries primarily via mobile phone-linked payment services. It has operated since 2009 and is currently active in Kenya, Uganda, Rwanda, Liberia, Malawi, the Democratic Republic of the Congo (DRC), and Morocco. To date, GiveDirectly has primarily provided large, one-time transfers. It also operates a basic income guarantee program, in which recipients receive long-term (over two or twelve years in the initial study), ongoing cash transfers sufficient for basic needs.

Background:

Poverty (understood in an income-based sense) has effects on food security, access to healthcare and safe water services. Living in poverty can lead to a self-sustaining cycle keeping people from improving their living conditions, a so-called poverty-trap (though a recent study using 20 year panel data in Northern Nigeria finds no clear evidence of poverty traps). Unconditional cash transfers have been shown to be effective ways of tackling economic vulnerability.

Approach:

GiveDirectly makes unconditional cash transfers to extremely poor people using mobile phone payment systems. They transfer approximately one year's worth of income (approximately $1,000) directly to recipients. The money is collected from local mobile money agents, and can be spent on anything the recipient wishes. The reasoning is that presumably those best placed to know what people living in extreme poverty need are the people themselves.

Please Rank the Three Charities

You can allocate a total of 6 points across the three available charities.

How many points would you like to allocate to the Against Malaria Foundation?

-------- ⌄

How many points would you like to allocate to Cool Earth?

-------- ⌄

How many points would you like to allocate to GiveDirectly?

-------- ⌄

Next

Part 1 – Section 3

Your donation

We now give you the opportunity to **generate a donation to one of these three charities.**

On the next pages, you will collect points that will be converted to Euro at the end of the study and will make up **your donation to one of the three charities.** Note that throughout this part, points may be added or removed from your total donation amount. The final sum of points earned depends on your actions. The total number of points you earned by the end of this part will then make up your final donation.. **So the more points you earn in this part, the higher your monetary donation to the charity will be.**

[For Groups 1A and 1B only]:

In the first step, you can now decide which charity you want to donate to as part of this study. You have seen the three available charities and can now make a decision and select one of the three. The decision you make now determines the recipient of your final donation.

Please indicate your decision by selecting the corresponding charity from the drop-down menu.

I select the following charity:

--------- ⌄

[For Groups 2A and 2B only]: In the first step, it is randomly decided which charity your donation will go to as part of this study. You have seen the three available charities and a computer will randomly select one charity for you. The random decision the computer makes now determines the recipient of your final donation.

Get random charity

(after clicking:)

The computer has randomly selected the following charity:
The Against Malaria Foundation

Next

Your donation

You will now collect points that go toward your donation to the randomly chosen charity, GiveDirectly.

You will now collect points that go toward your donation to the charity you selected, Cool Earth.

To earn the points, you need to complete several slider tasks, which you already encountered in the practice round.

You will need to solve 20 such sliders correctly. Each slider solved will pay you 5 points. So for each slider you solve, you increase your donation to Cool Earth by 5 points. The total number of points you earn in this round will go toward your total donation to Cool Earth.

Click "Next" to begin the slider task.

Next

Your Donation

Each of these sliders will pay you 5 points, which will go towards your donation to Cool Earth.

Adjust the sliders in such a way, that the number in the grey box on the right side of the slider matches the target number given just above the slider:

Set slider to 34

| | 22 | **+5 points** |

Set slider to 18

| | 8 | **+5 points** |

Set slider to 30

| | 60 | **+5 points** |

Set slider to 49

| | 14 | **+5 points** |

Set slider to 9

| | 66 | **+5 points** |

Set slider to 52

| | 2 | **+5 points** |

Set slider to 51

| | 51 | **+5 points** |

Set slider to 54

| | 7 | **+5 points** |

Your Donation

CONGRATULATIONS! You have earned **100 points** !

These 100 points now make up your current donation amount to your selected charity, Cool Earth.

Next

Your Donation

CONGRATULATIONS! You have received **100 points** !

These 100 points now make up your current donation amount to The Against Malaria Foundation.

Next

Part 1 – Section 4

Your usual donation behavior

[For 1A:] In section 3 you decided that your donation would go to **charity X** and you earned 100 points by solving 20 slider tasks. These 100 points make up your current donation amount to charity X

[For 1B:] In section 3 it was randomly determined that your donation would go to **charity X** and you earned 100 points by solving 20 slider tasks. These 100 points make up your current donation amount to charity X.

[For 2A:] In section 3 you decided that your donation would go to **charity X** and you received 100 points. These 100 points make up your current donation amount to charity X.

[For 2B:] In section 3 it was randomly determined that your donation would go to **charity X** and you received 100 points. These 100 points make up your current donation amount to charity X.

In this section, we would like to learn about your usual donation behavior and your general opinion of donating to charities. Please rate the following statements in terms of how much you agree with them.

1. I regularly donate money to charity

   ○ Completely disagree   ○ Disagree   ○ Agree   ○ Completely agree

2. I think donating money is important

   ○ Completely disagree   ○ Disagree   ○ Agree   ○ Completely agree

3. Donating money makes me happy.

   ○ Completely disagree   ○ Disagree   ○ Agree   ○ Completely agree   ○ N/A

4. If I donate money, I always donate to the same charity or the same cause.

   ○ Completely disagree   ○ Disagree   ○ Agree   ○ Completely agree   ○ N/A

5. It is important to me that my donations only go to charities and causes I strongly support.

   ○ Completely disagree   ○ Disagree   ○ Agree   ○ Completely agree   ○ N/A

6. Donating money for a good cause is worth making a personal sacrifice.

   ○ Completely disagree   ○ Disagree   ○ Agree   ○ Completely agree

Next

Slider task

Next

Slider Task

Adjust the sliders in such a way, that the number in the grey box on the right side of the slider matches the target number given just above the slider:

Set slider to 34

22

Set slider to 18

18

Set slider to 30

60

Set slider to 49

14

Set slider to 9

66

Set slider to 52

2

Set slider to 51

51

Set slider to 54

7

Set slider to 42

84

Part 1 – Section 5

Saving Your Donation

[For 1A:] In section 3 you decided that your donation would go to charity X and you earned 100 points by solving 20 slider tasks. These 100 points make up your current donation amount to charity X

[For 1B:] In section 3 it was determined that your donation would go to charity X and you earned 100 points by solving 20 slider tasks. These 100 points make up your current donation amount to charity X.

[For 2A:] In section 3 you decided that your donation would go to charity X and you received 100 points. These 100 points make up your current donation amount to charity X.

[For 2B:] In section 3 it was determined that your donation would go to charity X and you received 100 points. These 100 points make up your current donation amount to charity X.

As announced earlier, you may incur a loss of some of the points you earned.

In this section, half of the points you earned for your donation are at risk of being destroyed. If this happens, only 50 points are paid out to GiveDirectly. However, you have the opportunity to prevent this and save your donation!

To save your donation, you have to invest effort in the form of the summation tasks, which you already encountered in the practice round. You will have to commit to completing a number of these summation tasks. There are two possible scenarios you can be in. In one scenario, you complete the summation tasks alone. This is called the **"one-person-scenario"**. In the other scenario, there is a second person who can contribute as well. This is called the **"two-person-scenario"** .

Both scenarios are explained in detail on the following pages. You have to make a decision for each scenario. The computer will then randomly determine which scenario you are in and is relevant for determining your final donation amount.

Please carefully read the instructions for both scenarios and make your decision for each case.

Next

The One-Person Scenario

If this scenario is chosen, you will have to complete the summation tasks by yourself to save your donation to GiveDirectly. The number of summation tasks you need to solve is determined in the following 3 steps:

Step 1: Your turn
You need to state the **maximum number of summation tasks**, between 0 and 30, that you are willing to complete in order to save your donation. You might have to actually complete this number of summation tasks later on. Therefore, the number you report here should be such that you would still be fine with having to complete this number of summation tasks to save your donation, but not a larger number.

Step 2: The computer's turn
A computer will randomly select a number between 1 and 30. This number shows how many summation tasks **have to be completed** to save the donation. You can think of this number as the "required investment", i.e. the effort investment needed to save the donation. Each number between 1 and 30 is chosen with the same probability.

Step 3: Comparing your number with the computer's number
The number you reported and the number the computer randomly selected are compared.
If your reported number (the maximum number of summation tasks you are willing to complete) **is greater than or equal to** the randomly drawn required investment, it means you accept the required investment. You are then committed to solving that number of summation tasks corresponding to the required investment and thereby you save your full donation. If your reported number (the maximum number of summation tasks you are willing to complete) is **less than** the randomly drawn required investment, it means you reject the required investment. You will not have to solve any summation tasks, but you will also not save the donation and half the donation is destroyed.

So the higher the maximum number of summation tasks you are willing to commit to, the higher the probability that the donation is saved. If you select 0, there is no chance that the donation is saved. If you select 30, the donation is saved for sure. **It is best for you to truthfully state how many summation tasks saving the donation is worth to you.**

Example 1: You state that you are willing to solve a maximum of 5 summation tasks to save your donation. The computer randomly determines a required investment of 13 summation tasks to save the donation. As your maximum number of summation tasks is less than the required investment, you do not solve any summation tasks. You loose half of your donation. **Your final donation to GiveDirectly is 50 points.**

Example 2: You state that you are willing to solve a maximum of 26 summation tasks to save your donation. The computer randomly determines a required investment of 13 summation tasks to save the donation. As your maximum number of summation tasks is higher than the required investment, you need to complete 13 summation tasks. You save your full donation. **Your final donation to GiveDirectly is 100 points.**

Control questions: Assume you have stated a maximum number of summation tasks of 15. Are the following statements true or false?

If the randomly determined required investment is 4, the donation is saved:

If the randomly determined required investment is 15, the donation is saved:

If the randomly determined required investment is 15, I do not have to complete any summation tasks:

The probability of saving the donation is 50%:

The One-Person Scenario

Please indicate the maximum number of summation tasks you are willing to commit to in order to save 50 points of your donation to Cool Earth.

Maximum number of summation tasks
(0 to 30):

26

Next

The Two-Person Scenario

If this scenario is chosen, you can delegate some of the summation tasks to another person, referred to hereafter as Participant B. Participant B is also voluntarily participating in this study, but is randomly selected from a different pool of participants in a separate study session. The identity of Participant B is not revealed to you, and your identity is not revealed to Participant B. The number of summation tasks you and Participant B each need to solve is determined in the following way:

Between yourself and Participant B, you have to complete 35 summation tasks in total to save your donation. Each summation task completed saves the same number of points (~1.4 points). You can decide what share of your donation you save yourself by solving the corresponding number of summation tasks. Participant B then has to solve the remaining summation tasks that you choose not to do yourself and thereby Participant B saves the remaining share of the donation you do not save yourself.

There is no way in which Participant B can refuse to complete the allocated tasks. You can be certain that any tasks you allocate will be completed. Both the share you save and the share Participant B saves will go to GiveDirectly. Thus, in this scenario, the probability of saving the donation to GiveDirectly is 100%. But only the share of points you save by completing the corresponding number of summation tasks **yourself** are counted toward **your donation to GiveDirectly** in the end.

Example 1: You decide to save all of the donation yourself and select 35 summation tasks. This means you will have to solve 35 summation tasks. You thereby save the entire donation, so 50 points, yourself. Participant B does not need to solve any of your summation tasks. **Your final donation to GiveDirectly will be 100 points.**

Example 2: You decide to save part of the donation yourself and select 21 summation tasks. This means you will have to solve 21 summation tasks. You thereby save 60% of the donation, so 30 points (60% of 50 points), yourself. You delegate 14 summation tasks to Participant B. Participant B has to complete these 14 summation tasks and thereby saves 40% of the donation, so 20 points (40% of 50 points). **Your final donation to GiveDirectly will be 80 points (50 plus the 30 that you saved).** GiveDirectly will receive the full 100 points (the share you saved plus the share Participant B saved).

Control questions: Are the following statements true or false?

Depending on my choice, my contribution to the final donation can be between 50 and 100 points:

The higher the number of summation tasks I choose, the larger the share of the donation I personally save:

The sum of all summation tasks completed in this scenario is always 35:

The probability of saving the donation is 50%:

[**Next**]

The Two-Person Scenario

What number of summation tasks (out of 35) would you like to complete yourself?

25

Share of the 50 points saved by you

Share of Participant B: 28.6 %

Your Share: 71.4 %
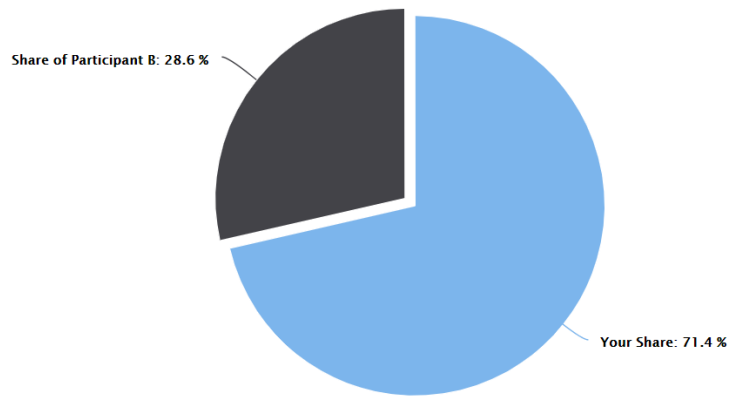
Highcharts.com

Next

Need help? Contact the researcher at: dzi.experiment.help@gmail.com

Part 1 – Section 6

Estimation Questions

Before you learn the outcome of the previous section, we would like to know what you believe how other study participants behaved in making their decisions. These questions refer to other participants who took part in an earlier installment of the same study. They have completed very similar and comparable tasks to you.

You will be asked to estimate the response of those other participants of the earlier study installment. In total, there are 5 questions. Of those, 2 questions will be selected and your answer for those 2 questions are compared to the actual true response. For each question where your estimate matches the true response, you will earn an additional 125 points (as part of your personal take-home pay). The maximum additional bonus you can earn is thus 250 points.

You will not learn which questions are chosen to determine your payment. It is therefore in your best interest to answer all questions to the best of your abilities. Where you are asked to provide a numerical estimate, please round your estimate to the nearest integer.

Q1) Which charity do you believe was ranked highest across all the other participants, i.e. has received the highest total number of points across all participants?

Q2) In the two-person-scenario, what do you believe is the average number of summation tasksthe other participants were willing to solve themselves? *[between 0 and 35]*

Q3) In the two-person-scenario, what do you believe is the share of the other participants (in percent) who delegated all summation tasks (i.e. allocated 0 summation tasks to themselves)? *[between 0 and 100%]*

Q4) In the two-person-scenario, what do you believe is the share of the other participants (in percent) who delegated no summation tasks (i.e. allocated all summation tasks to themselves)? *[between 0 and 100%]*

Q5) In the one-person-scenario, what do you believe is the average maximum number of summation tasks that the other participants were willing to complete (at what number did they on average position the slider)? *[between 0 and 30]*

Next

Questions About Your Donation

Please think of your donation to GiveDirectly, which you have just generated in this study. Rate the following statements about your donation in terms of how much you agree with them.

Q1) This is MY donation to GiveDirectly.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q2) It is hard for me to think of this donation to GiveDirectly as MINE.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q3) I feel a very high degree of personal ownership for this donation to GiveDirectly.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q4) I sense that this is MY donation to GiveDirectly.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q5) I am responsible for the donation to GiveDirectly.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q6) I am totally comfortable participating in this study to generate a donation to GiveDirectly.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q7) My choices affected the outcome of this study.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q8) I feel that I could influence the decisions made in this study.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q9) The decision making process in this study was clear and open.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q10) I put a lot of effort into generating this donation to Charity X.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q11) It is very important to me that this donation to Charity X is saved and not reduced.

○ Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neutral ○ Somewhat agree ○ Agree ○ Strongly agree

Q12) Would you prefer that the one-person-scenario (solving between 0 and 30 summation tasks yourself) or the two-person-scenario (splitting 35 summation tasks between yourself and Participant B) is realized?

○ One-person scenario   ○ Two-person scenario   ● I have no preference

Why? [____]

[**Next**]

[Two-person-scenario:]

Part 1 - Section 7
Results

It was randomly determined that you are in the two-person-scenario.

You will have to do 5 summation tasks.

Reason: You chose to do 5 summation tasks out of 35 yourself. You delegated the remaining 30 summation tasks to Participant B. Therefore, you will have to do 5 summation tasks.

By completing the 5 summation tasks, you save 7 points of the 50 points at stake. Your final donation to The Against Malaria Foundation is therefore 57 points. The Against Malaria Foundation will receive 100 points.

Next

[One-person-scenario: if it can be saved]

Part 1 - Section 7
Results

It was randomly determined that you are in the one-person-scenario.

You can save your full donation to GiveDirectly!

You will have to do 5 summation tasks.

Reason: You indicated that your maximum acceptable number of summation tasks is 23. The randomly determined required investment is 5. Since your maximum number of summation tasks is larger than the required investment, it means you accepted the required investment. Therefore, you will have to do 5 summation tasks.

By completing the 5 summation tasks, you will save your full donation to GiveDirectly. GiveDirectly will receive 100 points.

Next

In the following grid, identify the two numbers that sum to 10.0 exactly. Enter your answer into the corresponding fields below the grid:

2.3	7.7	1.8
3.6	2.6	1.1
5.8	2.0	7.3

Enter one of the two numbers that sum to 10.0:

Enter the second number that sums to 10.0:

Next

Part 2

Questionnaire

You have successfully completed part 1 of the study! You are now moving on to part 2. This is the last part.

In the following, you will be presented with 8 hypothetical scenarios, each of which leads to a choice between two actions. One action is presented on the left, one on the right and there is a 6-point scale in between. For each hypothetical scenario, indicate which action you would be more inclined to do by choosing on the 6-point scale how strongly you lean toward one or the other action. The closer the point you select is to one of the actions, the higher your inclination toward that action. For example, if you would do the action on the left for sure, click the left-most button. Or, if you have only a weak inclination toward that action, click on the third button from the left.

A. You have been looking forward to this year's Halloween party. You have the right cape, the right wig, and the right hat. All week, you have been trying to perfect the outfit by cutting out a large number of tiny stars to glue to the cape and the hat, and you still need to glue them on. On the day of Halloween, you decide that the outfit looks better without all these stars you have worked so hard on. [Go without, Wear stars]

B. You have been asked to give a toast at your friend's wedding. You have worked for hours on this one story about you and your friend taking drivers' education, but you still have some work to do on it. Then you realize that you could finish writing the speech faster if you start over and tell the funnier story about the dance lessons you took together. [Finish the toast about driving; Rewrite the toast about dancing.]

C. You are painting your bedroom with a sponge pattern in your favorite color. It takes a long time to do. After you finish two of the four walls, you realize you would have preferred the solid color instead of the sponge pattern. You have enough paint left over to redo the entire room in the solid color. It would take you the same amount of time as finishing the sponge pattern on the two walls you have left. [Finish the sponge pattern; redo the room in a solid color.]

D. You have invested a good deal of your time into a project and it is failing. You have the option to start on something different that you now know is more likely to be successful but you know you cannot get the time back that you spent on the project. [Keep going with the project; Start something different.]

E. You have an investment strategy that you have developed over several months. It is not working and you are losing money, but there is no way for you to recover the lost effort put into developing the strategy. [Start afresh; Keep going.]

F. Your relationship with your partner is not going well. You have reasoned it out and you have realized that if you knew how it would go when you started the relationship you would not have gone through with it. You now have the opportunity to break up, but you have been together for many months. [Keep going; Break up.]

G. You have been thinking about how to vote in an election and have invested a good deal of your time to try and make the right decisions including reading newspapers and comment pieces online and thinking hard about the issues. You discover that much of the information you were using is false and a more trustworthy source suggests your initial view was wrong. [Keep beliefs; change beliefs.]

H. You have been thinking hard about the best route to get to somewhere you haven't been to before. Unfortunately, your internet connection isn't working so you have to base your decision on your beliefs about the town's layout. You come to a conclusion on the best possible route but then suddenly the internet is back online. [Look up route online; Stick to planned route.]

Next

Your Information

Please provide your personal information.

What is your age?

[   ]

What is your gender?

[--------- ▾]

What is your nationality?

[   ]

What is your occupation?

[   ]

If you are a student, what is your field of study?

[   ]

What is the highest degree or level of education you have completed?

[--------- ▾]

[Next]

Payment summary

Thank you for taking part in this study! Here is a summary of your payment information.

Your take-home pay is €15.00:

- €10.00 fixed fee for completing the study
- 125 points = €5.00 earned throughout the study

Your donation to GiveDirectly is : €2.12

- 50 points = €2.00
- 3 points saved = €0.12

The total amount GiveDirectly will receive is 100 points = €4.00.

You can choose whether your take-home pay will be paid to you via PayPal or by bank transfer. Please see your invitation email for the payment link. Follow the link and provide your payment details. Payment will be made within the next 3 weeks.

Next

Thank you very much for your participation!

The study has now ended. You can close the browser window.

6. APPENDIX TO CHAPTER 3

6.1 Additional Tables

Table C1: Descriptive statistics and full balance table

	(1)	(2)	(3)	(4)	(5)
	Private FP	Private NFP	Public	Diff private FP - public	Diff private NFP - public
Number of beds	194.98	242.71	344.11	-149.13***	-101.40***
	(203.09)	(171.44)	(331.56)	(17.39)	(15.18)
Number of departments	3.36	4.08	5.27	-1.91***	-1.19***
	(3.00)	(2.52)	(3.55)	(0.22)	(0.18)
Fixed assets in mio per bed (4yr mean)	0.15	0.14	0.13	0.02	0.01
	(0.21)	(0.23)	(0.08)	(0.03)	(0.02)
EBITDA margin (4yr mean)	0.09	0.06	0.07	0.03***	-0.00
	(0.06)	(0.03)	(0.04)	(0.01)	(0.00)
Operating revenue in mio per bed (4yr mean)	0.21	0.21	0.16	0.05	0.04
	(0.35)	(0.30)	(0.06)	(0.05)	(0.03)
Long-term debt in mio per bed (4yr mean)	0.02	0.02	0.02	0.01	0.00
	(0.03)	(0.05)	(0.03)	(0.01)	(0.01)
Number of employees per bed (4yr mean)	2.66	2.64	1.90	0.76	0.74**
	(5.37)	(3.72)	(1.00)	(0.81)	(0.36)
Share of public hospitals in county	0.23	0.20	0.62	-0.39***	-0.43***
	(0.23)	(0.20)	(0.28)	(0.02)	(0.01)
Unemployment rate	8.33	8.60	7.26	1.08***	1.35***
	(3.38)	(3.05)	(3.36)	(0.23)	(0.18)
Share of inhabitants 65+	21.12	20.59	20.82	0.30*	-0.23*
	(2.33)	(2.11)	(2.18)	(0.15)	(0.12)
Hospital beds per 1000 inhabitants	6.75	7.25	6.40	0.35	0.86***
	(3.09)	(3.15)	(3.60)	(0.22)	(0.19)
Urban	0.54	0.75	0.54	0.00	0.22***
	(0.50)	(0.43)	(0.50)	(0.03)	(0.03)
Population density	0.81	1.05	0.56	0.26***	0.50***
	(1.17)	(1.13)	(0.78)	(0.07)	(0.05)
GDP per capita	29.87	31.08	29.27	0.59	1.80***
	(13.76)	(12.95)	(12.03)	(0.88)	(0.70)
East	0.23	0.10	0.14	0.08***	-0.04**
	(0.42)	(0.30)	(0.35)	(0.03)	(0.02)
SPD MP	0.14	0.17	0.08	0.06***	0.10***
	(0.35)	(0.38)	(0.26)	(0.02)	(0.02)
SPD or LINKE Mayor/DA	0.35	0.39	0.29	0.07**	0.10***
	(0.48)	(0.49)	(0.45)	(0.03)	(0.03)
Election year	0.61	0.82	0.54	0.07**	0.29***
	(0.49)	(0.38)	(0.50)	(0.03)	(0.03)
Communal debt in EUR per inhabitant	1.48	1.96	1.43	0.04	0.53***
	(1.00)	(1.33)	(1.03)	(0.07)	(0.07)

Notes: This table shows the mean and standard deviation (in parentheses) of each control variable by ownership type in columns (1)-(3). Columns (4) and (5) show the coefficient of a simple regression of each control variable on a dummy indicating ownership (in a restricted sample including only private FP and public hospitals in column (4) and only private NFP and public hospitals in column (5)). Robust standard errors of these regressions are reported in parentheses. Stars indicate statistical significance of the differences. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C2: Number of funded projects per hospital

	(1)	(2)	(3)	(4)
	Number of projects funded per hospital			
Private FP	-0.073	0.088	-0.123	-0.060
	(0.21)	(0.28)	(0.29)	(0.30)
Private NFP	0.042	0.143	0.061	0.125
	(0.17)	(0.26)	(0.24)	(0.23)
Beds in thsd		0.573**	0.523**	0.544**
		(0.24)	(0.26)	(0.22)
Number of departments		0.048	0.068	0.031
		(0.04)	(0.04)	(0.04)
Constant	1.802***	0.404	2.453	2.631
	(0.13)	(1.01)	(1.65)	(1.74)
Regional Controls	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Founding period FE	No	No	No	Yes
$Adj.R^2$	-0.002	0.023	0.082	0.079
Observations	751	751	751	679

Notes: OLS regression of the number of projects for which each hospital received funds. Column (1) shows OLS estimates without controls, column (2) adds number of beds, number of departments and regional controls on the county level (share of public hospitals, unemployment rate, share of inhabitants aged 65+, number of hospital beds per 1000 inhabitants, urban dummy, population density, GDP per capita). Column (3) adds state fixed effects. Column (4) adds fixed effects for the quarter century in which the hospital was founded. Only includes the subset of hospitals that received any funding at all, consisting of 92 PFP, 402 PNFP and 257 public hospitals in columns (1)-(3) and 80 PFP, 372 PNFP and 227 public hospitals in column (4). Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C3: Department fixed effects

	(1)	(2)	(3)
	Total average funding	Linear Probability of funding	Per project funding
Private FP	-0.419**	-0.074**	-0.387*
	(0.19)	(0.03)	(0.23)
Private NFP	-0.393**	-0.023	-0.452***
	(0.17)	(0.03)	(0.17)
Beds in thsd	2.677***	0.099	0.519
	(0.77)	(0.09)	(0.40)
Number of departments	0.081	0.026	-0.077
	(0.17)	(0.03)	(0.14)
Constant	0.275	0.532***	-1.301
	(0.61)	(0.19)	(1.25)
Regional Controls	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Hosp. Dept. fixed effects	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes
$Adj.R^2$	0.179	0.445	0.408
Observations	1459	1459	1237

Notes: OLS regression (total average funding, probability and funding per project) including department fixed effects, i.e. a dummy variable for each department a hospital has. 21 different departments are included. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C4: County fixed effects

	(1)	(2)	(3)
	Total average funding	Linear Probability of funding	Per project funding
Private FP	-0.537***	-0.080**	-0.486**
	(0.19)	(0.04)	(0.24)
Private NFP	-0.387**	-0.025	-0.314
	(0.18)	(0.04)	(0.20)
Beds in thsd	2.791***	0.063	1.079***
	(0.63)	(0.08)	(0.41)
Number of departments	-0.028	0.022***	-0.022
	(0.04)	(0.01)	(0.02)
Constant	-1.900**	-0.120	-0.053
	(0.80)	(0.15)	(0.40)
County (Landkreis) FE	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes
$Adj.R^2$	0.356	0.481	0.673
Observations	1459	1459	1237

Notes: OLS regression (total average funding, probability and funding per project) using county fixed effects insted of state fixed effects. County fixed effects are based on 417 counties, i.e. "Landkreise" and "kreisfreie Städte" (as defined in 2009). Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.2   Additional Figures

Figure C1: Hospital founding dates by ownership types
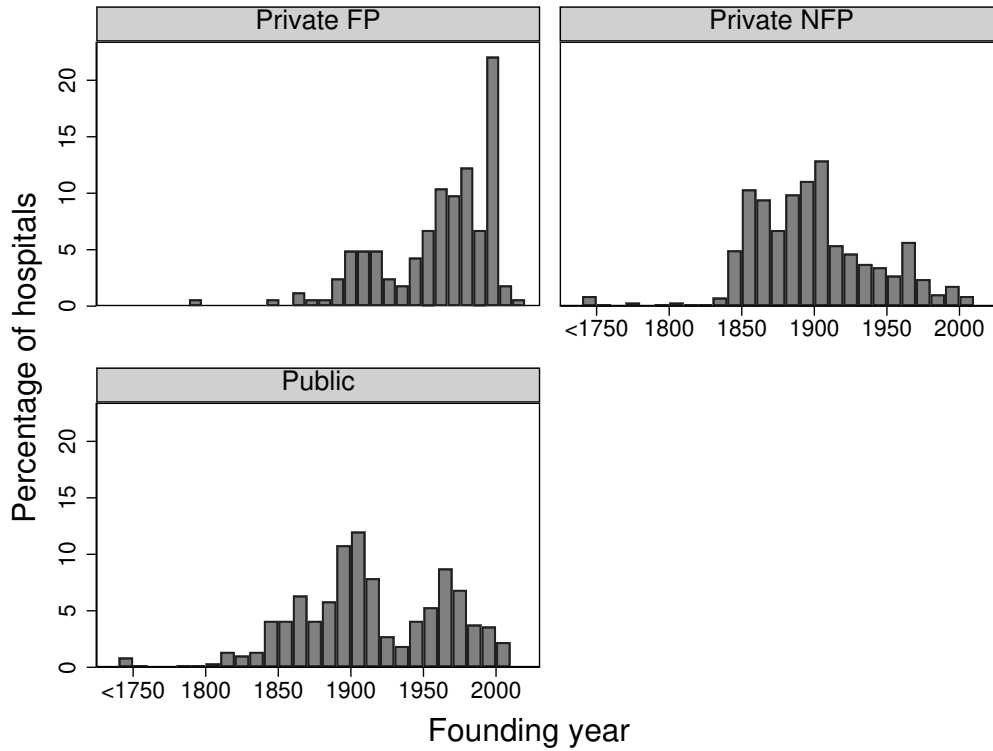
Notes: Percentage of hospitals founded in each decade by ownership type. Leftmost bar aggregates all hospitals founded prior to 1750. Includes 1400 hospitals in total, 163 private FP, 658 private NFP, and 579 public (referring to ownership type in the founding year, not ownership type in 2009).

Figure C2: Distribution of ownership types across federal states

Private FP   Private NFP   Public
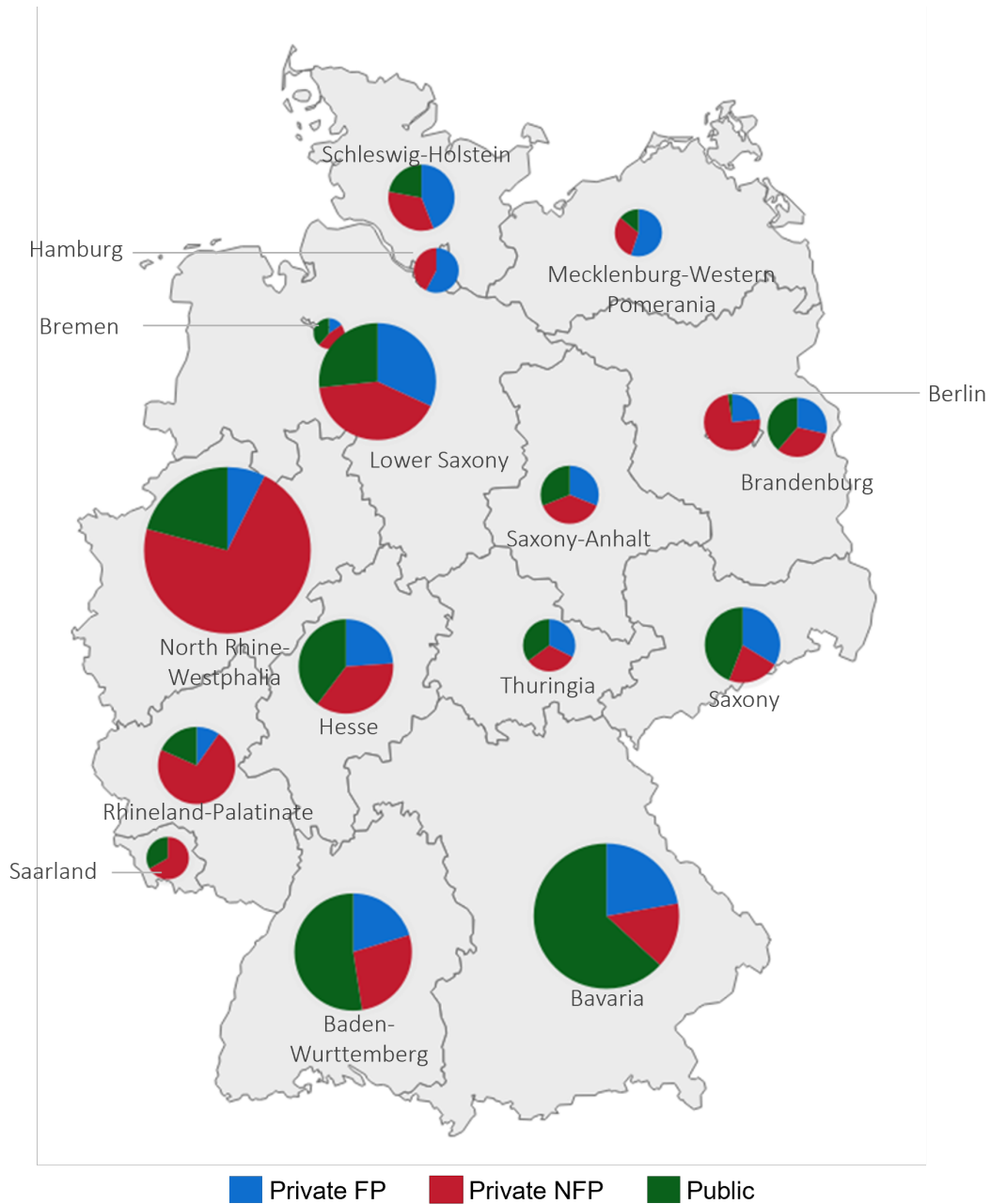
Notes: Map showing the share of hospitals by ownership types in each of the 16 German states. The size of the pie chart represents the total number of hospitals in each state.

6.3 Categories of Projects

Figure C3 shows the share of approved projects by category for each ownership type. Public hospitals engage more in energy efficiency measures than private hospitals. Private NFP hospitals procure more medical equipment, while both private FP and private NFP hospitals spend more on construction measures than public hospitals. The shares of projects on IT infrastructure or other projects are similar.

Figure C3: Financed projects by category
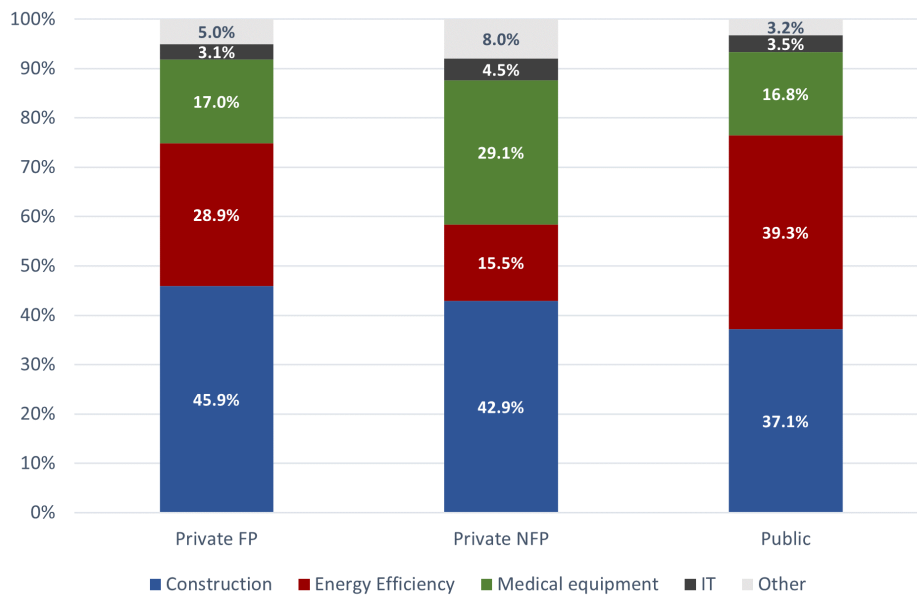
Notes: Financed projects by the 5 categories: construction, energy efficiency, medical equipment, IT and other, for each ownership type. Shares in percent of all funded projects per ownership type. Includes 159 projects of private FP, 741 of private NFP and 463 of public hospitals.

If buying medical equipment were significantly cheaper than energy efficiency measures, this could explain why private NFP hospitals received less funding. However, Figure C4 illustrates that this is not the case. Moreover, Figure C4 shows that the average funding received by public hospitals is, in fact, larger for all project categories. Thus, differences in the costs of different project types cannot explain the difference in funding received by public NFP hospitals, as they receive fewer funds across the board (and especially for construction measures, which make up the majority of measures for all ownership types).

Figure C4: Average funding per project by project category
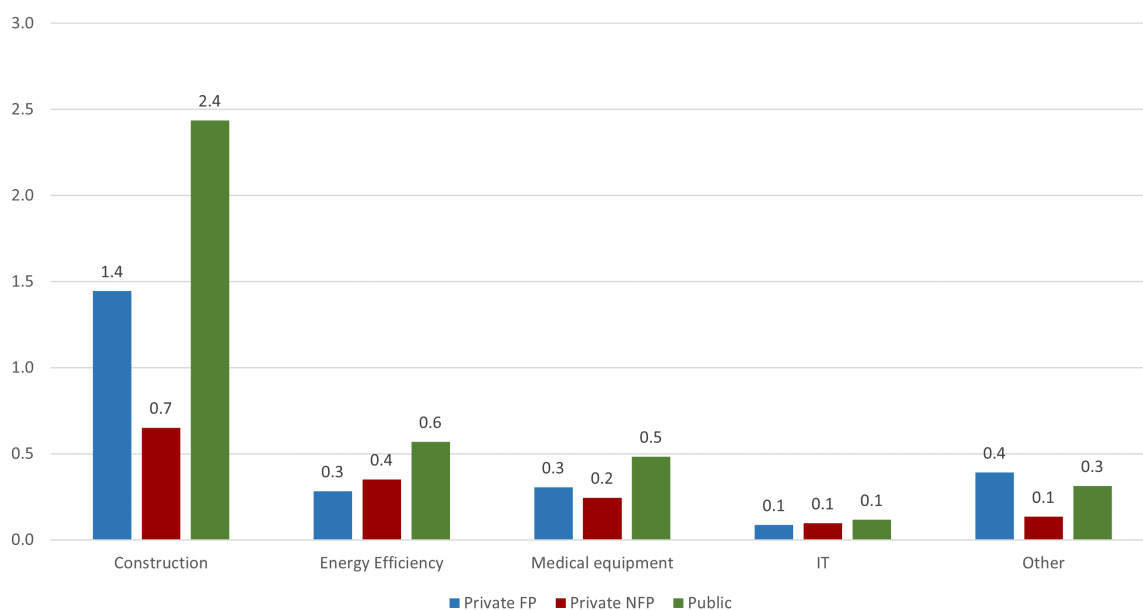
Notes: Average funding received per project in a given category (construction, energy efficiency, medical equiment, IT, other), by ownership type. Figures are in Mio EUR.

6.4 Financial Controls

In the main regressions, we constructed financial controls as the averages across four years from 2006-2009. To ensure that our findings are not dependent on the specific years chosen, we repeat the analysis with three different specifications: using the year 2007 only (Table C5), using the 3-year average from 2007-2009 (Table C6), and using the 5-year average from 2005-2009 (Table C7). Neither specification changes the interpretation of our results.

	(1)	(2)	(3)	(4)	(5)	(6)
	Main regression *(restricted sample)*			Including Financial Controls		
	Total average funding	Linear Probability of funding	Per project funding	Total average funding	Linear Probability of funding	Per project funding
Private FP	-0.889**	-0.196***	-0.074	-0.788**	-0.196***	0.016
	(0.39)	(0.06)	(0.46)	(0.37)	(0.06)	(0.39)
Private NFP	-0.689*	-0.094	-0.100	-0.673*	-0.099*	-0.041
	(0.37)	(0.06)	(0.24)	(0.37)	(0.06)	(0.25)
Beds in thsd	1.958*	0.003	0.301	2.033*	-0.006	0.238
	(1.08)	(0.14)	(0.34)	(1.12)	(0.14)	(0.36)
Number of departments	0.071	0.018	0.090**	0.064	0.017	0.081*
	(0.06)	(0.01)	(0.04)	(0.06)	(0.01)	(0.04)
Fixed assets in mio per bed				1.381	0.102	-0.589
				(1.76)	(0.29)	(1.30)
EBITDA margin				-0.155	0.004	-0.853
				(0.12)	(0.01)	(0.65)
Operating revenue in mio per bed (in 2007)				-0.681	0.146	1.559
				(1.17)	(0.32)	(3.11)
Long term debt in mio per bed (in 2007)				-3.159	-0.884	4.291
				(3.90)	(0.65)	(4.41)
Number of employees per bed (in 2007)				0.001	-0.021	-0.105
				(0.07)	(0.02)	(0.13)
Constant	1.837*	0.407	0.050	1.947*	0.417	0.503
	(1.10)	(0.25)	(1.13)	(1.09)	(0.26)	(1.14)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.273	0.576	0.576	0.268	0.577	0.584
Observations	356	356	378	356	356	378

Notes: OLS regression (total average funding, probability and funding per project) with financial controls, using only the year 2007 as input for the financial controls. Columns (1)-(3) replicate the main regressions in the restricted sub-sample containing only those hospitals for which financial data from 2007 is available, financial controls are added in columns (4)-(6). The sample includes 58 private FP, 172 private NFP and 126 public hospitals. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C6: Using financial controls from 2007-2009 (3-year mean)

	(1)	(2)	(3)	(4)	(5)	(6)
	Main regression *(restricted sample)*			Including Financial Controls		
	Total average funding	Linear Probability of funding	Per project funding	Total average funding	Linear Probability of funding	Per project funding
Private FP	-0.662	-0.207***	-0.047	-0.557	-0.192***	-0.087
	(0.43)	(0.07)	(0.48)	(0.42)	(0.07)	(0.44)
Private NFP	-0.661	-0.096	-0.194	-0.668	-0.109*	-0.198
	(0.42)	(0.06)	(0.28)	(0.42)	(0.06)	(0.31)
Beds in thsd	1.976*	0.012	0.346	2.007*	-0.017	0.379
	(1.10)	(0.15)	(0.36)	(1.19)	(0.15)	(0.37)
Number of departments	0.046	0.017	0.057	0.038	0.014	0.054
	(0.06)	(0.01)	(0.04)	(0.06)	(0.01)	(0.04)
Fixed assets in mio per bed (3yr mean)				1.793	-0.149	1.400
				(2.61)	(0.33)	(1.76)
EBITDA margin (3yr mean)				-2.790	-0.922***	-1.090
				(2.04)	(0.35)	(1.96)
Operating revenue in mio per bed (3yr mean)				0.740	0.652	0.429
				(1.59)	(0.41)	(3.38)
Long term debt in mio per bed (3yr mean)				-5.479	-0.573	-0.588
				(5.94)	(0.77)	(5.06)
Number of employees per bed (3yr mean)				-0.125	-0.049*	-0.089
				(0.10)	(0.03)	(0.13)
Constant	1.439	0.537**	-0.355	2.064*	0.727**	-0.232
	(1.15)	(0.27)	(1.12)	(1.23)	(0.28)	(1.14)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R^2	0.316	0.579	0.595	0.311	0.589	0.589
Observations	303	303	334	303	303	334

Notes: OLS regression (total average funding, probability and funding per project) with financial controls, using the 3-year average across the years 2007-2009 as input for the financial controls. Columns (1)-(3) replicate the main regressions in the restricted sub-sample containing only those hospitals for which financial data from 2007-2009 is available, financial controls are added in columns (4)-(6). The sample includes 42 private FP, 151 private NFP and 110 public hospitals. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C7: Using financial controls from 2005-2009 (5-year mean)

	(1)	(2)	(3)	(4)	(5)	(6)
	Main regression *(restricted sample)*			Including Financial Controls		
	Total average funding	Linear Probability of funding	Per project funding	Total average funding	Linear Probability of funding	Per project funding
Private FP	-1.802*	-0.325***	-1.416	-1.792*	-0.315**	-0.147
	(0.92)	(0.12)	(1.13)	(0.93)	(0.13)	(0.79)
Private NFP	-1.799**	-0.254***	0.232	-1.788**	-0.257**	0.012
	(0.87)	(0.10)	(0.42)	(0.89)	(0.10)	(0.58)
Beds in thsd	1.395	0.047	-1.662	1.366	0.025	-0.993
	(1.46)	(0.21)	(1.03)	(1.46)	(0.22)	(0.73)
Number of departments	0.178	0.018	0.329**	0.168	0.015	0.291**
	(0.12)	(0.02)	(0.13)	(0.12)	(0.02)	(0.12)
Fixed assets in mio per bed (5yr mean)				4.196	0.034	3.964
				(5.08)	(0.67)	(10.22)
EBITDA margin (5yr mean)				-1.545	-0.872	-4.114
				(6.80)	(1.03)	(15.15)
Operating revenue in mio per bed (5yr mean)				0.105	0.590	-22.320
				(3.47)	(0.79)	(14.55)
Long term debt in mio per bed (5yr mean)				-11.371	-1.038	-10.821
				(14.58)	(1.87)	(11.92)
Number of employees per bed (5yr mean)				-0.139	-0.045	0.951
				(0.27)	(0.05)	(0.82)
Constant	12.431***	0.136	4.352	13.780***	0.415	5.846
	(2.17)	(0.51)	(5.00)	(2.74)	(0.70)	(5.88)
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Founding period FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.357	0.527	0.585	0.327	0.512	0.586
Observations	128	128	141	128	128	141

Notes: OLS regression (total average funding, probability and funding per project) with financial controls, using the 5-year average across the years 2005-2009 as input for the financial controls. Columns (1)-(3) replicate the main regressions in the restricted sub-sample containing only those hospitals for which financial data from 2005-2009 is available, financial controls are added in columns (4)-(6). The sample includes 23 private FP, 47 private NFP and 58 public hospitals. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Proposition 1: *A privately owned firm does not invest often enough while a publicly owned firm invests too often, i.e.*

$$p^P < p^{FB} < p^G \ . \tag{A1}$$

Furthermore, a publicly owned firm is rescued after failure which is inefficient.

Proof of Proposition 1: Note that

$$\frac{d\left(\frac{\overline{x}+\overline{y}-I}{\overline{x}+\overline{y}}\right)}{d\overline{y}} = \frac{(\overline{x}+\overline{y}) - (\overline{x}+\overline{y}-I)}{(\overline{x}+\overline{y})^2} = \frac{I}{(\overline{x}+\overline{y})^2} > 0 \ . \tag{A2}$$

Thus, because $\overline{y} > 0$, we have $p^P < p^{FB}$. Note further that

$$p^{FB} = \frac{\overline{x}+\overline{y}-I}{\overline{x}+\overline{y}} < \frac{\overline{x}+\lambda\overline{y}-I}{(\overline{x}+\lambda\overline{y}) - (\underline{x}+\lambda\underline{y})} = p^G \ . \tag{A3}$$

This must be true because

$$p^{FB} = \frac{\overline{x}+\overline{y}-I}{\overline{x}+\overline{y}} < \frac{\overline{x}+\lambda\overline{y}-I}{\overline{x}+\lambda\overline{y}} \tag{A4}$$

by (A2) and

$$\frac{\overline{x}+\lambda\overline{y}-I}{\overline{x}+\lambda\overline{y}} < \frac{\overline{x}+\lambda\overline{y}-I}{(\overline{x}+\lambda\overline{y}) - (\underline{x}+\lambda\underline{y})} = p^G \tag{A5}$$

because $\underline{x} + \lambda\underline{y} > 0$, so the denominator is reduced.

Proposition 2: *Let $\hat{p} = \frac{\overline{x}+\overline{y}-I}{(\overline{x}+\overline{y}) - (\underline{x}+\underline{y})}$ where $\hat{p} < p^{FB}$. If $\overline{y} > (I - \overline{x}) \cdot (\underline{x} + \underline{y})$, then for all $p \in (p^P, \hat{p})$ public ownership outperforms private ownership. In all other cases social welfare with private ownership is weakly higher than with public ownership.*

Proof of Proposition 2:

If the probability of failure is small $(p < p^P)$, both types of owner invest, but the private owner does not rescue the firm in case of failure while the government does. Therefore, private ownership is strictly better. If the probability of failure is large $(p < p^{FB})$, then the investment is inefficient. The private owner does not invest, while the government does invest if $p \in (p^{FB}, p^G)$ and the government rescues in case of failure, so again private ownership is strictly better. If $p > p^G$ nobody invests and both types of ownership are equally good.

The interesting case is if $p \in (p^P, p^{FB})$, i.e. the private owner does not invest, but investment would be efficient. If the government owns the firm, it does invest, but it will also rescue the firm in case of failure. Government ownership outperforms private ownership in this case iff

$$(1-p)(\overline{x}+\overline{y}) + (\underline{x}+\underline{y}) - I > 0 \quad \Leftrightarrow \quad p < \hat{p} = \frac{\overline{x}+\overline{y}-I}{(\overline{x}+\overline{y})-(\underline{x}+\underline{y})} \;. \tag{A6}$$

Note that

$$\hat{p} = \frac{\overline{x}+\overline{y}-I}{(\overline{x}+\overline{y})-(\underline{x}+\underline{y})} < \frac{\overline{x}+\overline{y}-I}{\overline{x}+\overline{y}} = p^{FB} \tag{A7}$$

because the numerator is the same while the denominator is larger on the left hand side. Furthermore,

$$p^P = \frac{\overline{x}-I}{\overline{x}} < \frac{\overline{x}+\overline{y}-I}{(\overline{x}+\overline{y})-(\underline{x}+\underline{y})} = \tilde{p} \tag{A8}$$

if and only if

$$(\overline{x}-I)[(\overline{x}+\overline{y})-(\underline{x}+\underline{y})] < \overline{x}^2 + \overline{x}\cdot\overline{y} - I\cdot\overline{x}$$

$$\Leftrightarrow \quad \overline{x}^2 + \overline{x}\cdot\overline{y} - \overline{x}\cdot\underline{x} - \overline{x}\cdot\underline{y} - I\cdot\overline{x} - I\cdot\overline{y} + I\cdot\underline{x} + I\cdot\underline{y} < \overline{x}^2 + \overline{x}\cdot\overline{y} - I\cdot\overline{x}$$

$$\Leftrightarrow \quad \underbrace{(I-\overline{x})}_{<0}\underbrace{(\underline{x}+\underline{y})}_{<0} < I\cdot\overline{y}$$

$$\Leftrightarrow \quad \frac{(I-\overline{x})(\underline{x}+\underline{y})}{I} < \overline{y} \tag{A9}$$

Thus, if inequality (A9) holds and $p \in (p^P, \hat{p})$, then governemnt ownership strictly outperforms private ownership. If $p > \hat{p}$ or if inequality (A9) does not hold, private ownership is better.

Proposition 3: *The manager spends more effort to reduce the probability of failure if the firm is privately owned than if it is publicly owned, i.e.*

$$e^P = \frac{\overline{x}-(1-p)k}{2k} > e^G = 0 \;. \tag{A10}$$

Furthermore, he will be paid a higher wage by the private owner than by the government, i.e.

$$w^P = \frac{\overline{x}-(1-p)k}{2} > w^G = 0 \;. \tag{A11}$$

Proof of Proposition 3: Under private ownership the manager chooses e to maximize

$$U = (1 - p + e)w - \frac{1}{2}ke^2 \tag{A12}$$

The optimal effort level is characterized by the first order condition

$$\frac{\partial U}{\partial e} = w - ke = 0 \quad \Leftrightarrow \quad e^P = w/k \quad \Leftrightarrow \quad w = ke^P . \tag{A13}$$

The private owner choose the w in order to maximize his profits

$$\Pi = (1 - p + e)(\overline{x} - w) - I = (1 - p + e)(\overline{x} - ke) - I \tag{A14}$$

Thus, the firm will implement an effort level that is characterized by

$$\frac{\partial \Pi}{\partial e} = \overline{x} - ke - k(1 - p + e) = 0 \quad \Leftrightarrow \quad e^P = \frac{\overline{x} - (1 - p)k}{2k}. \tag{A15}$$

For this it has to pay $w^P = ke^P = \frac{\overline{x}-(1-p)k}{2k}$.

If the government owns the firm, the manager anticipates that the government will rescue the firm in case of failure, so his expected utility is

$$U = (1 - p + e)w + (p - e)w - \frac{1}{2}ke^2 = w - \frac{1}{2}ke^2. \tag{A16}$$

Hence the manager has no incentive to spend effort and chooses $e^G = 0$ for which he gets paid $w^G = 0$.

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