Unintended Effects of Conflict of Interest Disclosure: a Psychological Perspective

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Abstract

Conflicts of interest are defined as situations with a risk that professional judgment and behavior regarding a primary interest are unduly influenced by a secondary interest (IOM, 2009; Thompson, 1993). Such situations have a high prevalence in medicine, due to a long grown history of interactions between pharmaceutical companies and health care professionals (HCPs). As these interactions have indeed been found to unduly influence medical research as well as physicians' behavior, strategies for conflict of interest management were developed. One important factor of conflict of interest management is the disclosure of the conflict of interest. In some countries, nation-wide transparency codices for pharmaceutical companies have been implemented, regulating that pharmaceutical companies' payments to HCPs are disclosed in publicly accessible transparency databases. While the provision of such information is the first order effect of disclosure, there are several unintended second order effects discussed, e.g, that disclosure of payment data decreases public's trust in the medical profession or, as investigated in behavioral experiments, that disclosure leads to even more bias by an advisor in an advice-giving situation. The aim of this work was to investigate unintended effects of conflict of interest disclosure from a psychological perspective. A special focus was set on the interaction between the recipients of the disclosed information and the disclosing person and also on the effect of disclosure on the disclosing person. A further aim was to explore individual differences in the context of disclosure.

To investigate this aim, three studies were conducted: In the first study, which was a descriptive analysis of the German transparency database „Euros for Doctors", entries of 28,230 HCPs were analyzed, each entry summarizing the voluntarily disclosed sum of payments the HCP received from pharmaceutical companies. A

focus was on the comparison between the first year and the second year of the transparency regulation regarding payment sums and HCPs' consent to disclose. Results showed that only fragments of the actual interactions between pharmaceutical companies and HCPs were disclosed and that HCPs' consent to disclose further decreased from the first to the second year of the transparency regulation. In the second study, which was a survey of German physicians who disclosed in the Euros for Doctors database, predictors for nondisclosure in said database were investigated. Further, it was investigated whether second order effects of disclosure in terms of amount and quality of reactions differed between the first and the second year of the transparency regulation. Results showed that physicians received very little reactions towards the disclosed entry by patients, colleagues or in their private surrounding. None of the investigated hypotheses in this study could be supported by the data. Further exploration showed that physicians were afraid that disclosures lead to a wrong impression in the public and that they were concerned by negative media reporting in the context of the transparency regulation. The third study was a behavioral experiment in which two conditions were varied: disclosure of a conflict of interest in an advice-giving situation, and education of the advisee. Main outcome was advisors' bias, and advisors' individual differences were investigated by exploring their cognitions and personality structure. The results of this study also did not support the investigated hypothesis. The main challenge were outliers in the data, which is why a detailed three-pronged analysis was conducted. This analysis showed indications for a backfiring effect after disclosure if outliers in the data were trimmed to a certain distance from the median. Explorative analyses of individual differences showed that in terms of bias in advice-giving, agreeableness may play a role.

In summary, these findings show that in Germany, consent to disclose in a voluntary transparency database was low. While no statistical effect of the investigated predictors on disclosure behavior was found, data suggests that there may be other unintended effects of conflict of interest disclosure that lead to a decision against disclosure, e.g., being upset about negative media reporting and worries about reputation. Furthermore, results of the experimental study provide first indications that in future research on unintended effects of conflicts of interest disclosure, individual differences may be a promising subject to investigate.

Zusammenfassung

Interessenkonflikte sind definiert als Situationen, in denen das Risiko besteht, dass professionelles Urteilen und Verhalten bezüglich eines primären Interesses auf unangemessene Weise durch ein sekundäres Interesse beeinflusst wird (IOM, 2009; Thompson, 1993). In dem lange bestehenden System aus Interaktionen zwischen gewinnorientierten pharmazeutischen Unternehmen und Gesundheitsfachpersonal treten solche Situationen innerhalb der Medizin häufig auf. Hier zeigten Untersuchungen, dass solche Interaktionen tatsächlich zu unangemessenen Verzerrungen in der medizinischen Forschung und im Verhalten von Ärzt*innen führen, weswegen Strategien zur Regulierung von Interessenkonflikten entwickelt wurden. Ein wichtiger Faktor dabei ist die deren Offenlegung. Eine solche Offenlegung von Zahlungen durch pharmazeutische Unternehmen an Gesundheitsfachpersonal in einer öffentlich zugänglichen Datenbank erfolgt mittlerweile in einigen Ländern flächendeckend in Form eines Transparenzkodex. Dabei wird diskutiert, dass es neben dem primären Effekt der Offenlegung – der Bereitstellung von Informationen – auch nicht intendierte sekundäre Effekte von Offenlegung gibt, beispielsweise, dass das Vertrauen von Patient*innen in die medizinische Profession Schaden nimmt. Ein anderer sekundärer Effekt von Offenlegung ist, dass die Offenlegung eines Interessenkonflikts durch beratende Personen zu noch mehr Verzerrung in der Beratung seitens der beratenden Personen führen kann. Die vorliegende Arbeit beschäftigt sich mit der psychologischen Seite solcher nicht intendierten sekundären Effekte der Offenlegung von Interessenkonflikten und richtet einen speziellen Fokus auf die Interaktion zwischen den Personen, die die offengelegte Information empfangen (beispielsweise Patient*innen), und jenen Personen, die die Information offenlegen (beispielsweise

Ärzt*innen). Des Weiteren werden individuelle Unterschiede zwischen offenlegenden Personen hinsichtlich der unangemessenen Verzerrung in ihrem Beratungsverhalten exploriert.

Um diese Fragestellung zu untersuchen, wurden drei wissenschaftliche Studien durchgeführt. Im Rahmen der ersten Studie, einer deskriptiven Analyse der deutschen Transparenzdatenbank „Euros für Ärzte“, wurden alle Einträge der offenlegenden 28 230 Ärzt*innen und anderem Gesundheitsfachpersonal untersucht. Ein Eintrag summiert alle Zahlungen durch pharmazeutische Unternehmen im vergangenen Jahr, deren Offenlegung die Person zugestimmt hat. Diese Studie fokussierte den Vergleich von Einträgen und der Zustimmungsrate zur Offenlegung zwischen dem ersten und zweiten Jahr der Transparenzregulierung. Die Ergebnisse zeigten unter anderem, dass nur ein kleiner Anteil der tatsächlichen finanziellen Interaktionen zwischen pharmazeutischen Unternehmen und Gesundheitsfachpersonal offengelegt wurde und dass die Bereitschaft, Zahlungen offenzulegen, vom ersten zum zweiten Jahr weiter abnahm. In der zweiten Studie wurden anhand einer Befragung deutscher Ärzt*innen, die in dieser Datenbank ihre Zahlungen pharmazeutischer Unternehmen offenlegten, Prädiktoren für eine Entscheidung gegen die Offenlegung von Zuwendungen sowie Unterschiede in sekundären Effekten zwischen dem ersten und dem zweiten Jahr der Transparenzregulierung untersucht. Die Daten in dieser Studie zeigten, dass die befragten Ärzt*innen sehr wenige Reaktionen auf ihre Offenlegung durch Patient*innen, Kolleg*innen oder im privaten Umfeld erfuhren. Die aufgestellten Hypothesen konnten anhand der erhobenen Daten nicht bestätigt werden. Eine explorative Analyse der Daten lieferte jedoch Hinweise darauf, dass die befragten Ärzt*innen befürchteten, die Offenlegungen würden zu einem falschen Eindruck in der Öffentlichkeit führen und dass Bedenken bezüglich

der negativen Medienberichterstattung über die Offenlegungen existieren. Als dritte Studie wurde ein Verhaltensexperiment durchgeführt, in dem zwei Bedingungen variiert wurden: die Offenlegung eines Interessenkonflikts in einer Beratungssituation und die Aufklärung der zu beratenden Person. Untersucht wurden hier die Auswirkungen auf Verzerrungen im Beratungsverhalten sowie individuelle Unterschiede bei den beratenden Personen mit Interessenkonflikten hinsichtlich Verzerrungen im Beratungsverhalten. Auch diese Studie konnte die aufgestellten Hypothesen anhand der erhobenen Daten nicht bestätigen. Eine Herausforderung waren Ausreißer in den Daten, weswegen die Analyse dreifach mit unterschiedlicher Handhabung der Ausreißer durchgeführt wurde. Signifikant mehr Verzerrungen im Beratungsverhalten nach Offenlegung im Vergleich zu keiner Offenlegung zeigte sich in jenem Analyseverfahren, bei welchem die Ausreißer auf einen bestimmten Abstand zum Median getrimmt worden waren. Zudem zeigten explorative Analysen in diesem Experiment, dass die Persönlichkeitsdimension Verträglichkeit eine Rolle hinsichtlich Verzerrungen im Beratungsverhalten mit Interessenkonflikten spielen könnte.

Zusammengefasst zeigen die Ergebnisse dieser Arbeit, dass die Bereitschaft, in einer freiwilligen Transparenzdatenbank Zahlungen offenzulegen, niedrig ist. Zwar konnte kein signifikanter Effekt bezüglich des Prädiktionsmodells für eine Nicht-Offenlegung gefunden werden, jedoch liefern die erhobenen Daten Hinweise auf sekundäre Effekte der Offenlegung von Interessenkonflikten, beispielsweise dass sich Offenlegende durch negative Berichterstattung angegriffen fühlen oder Angst vor Rufschädigung haben. Die Erkenntnisse aus der Arbeit zeigen zudem Hinweise, dass individuelle Unterschiede zwischen offenlegenden Personen eine relevante Rolle hinsichtlich sekundärer Effekte von Offenlegung spielen könnten, was in zukünftigen Studien untersucht werden sollte.

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"Seid umschlungen, Millionen!" [Be embraced, millions!]. This was the title of a German news article in the summer of 2016 (Elmer et al., 2016), presumably a reference to Friedrich Schiller's Ode to Joy (1786). While Schiller wrote about the millions of brothers standing beneath the starry canopy, the authors of the mentioned news article wrote about the millions of euros that German pharmaceutical companies spent on health care professionals (HCPs) and organizations. In June 2016, for the first time in Germany, pharmaceutical companies disclosed information about how much they had spent on German HCPs and organizations: 575 million €. This transparency initiative had its origin in the "Freiwillige Selbstkontrolle für die Arzneimittelindustrie e.V." [association of voluntary self-regulation in the pharmaceutical industry] (FSA, 2018) and was described as a break with culture in the news article (Elmer et al., 2016).

I made first contact with this culture and the research topic of conflicts of interest in medicine during my work as research assistant in the teaching section of the department of psychiatry and psychotherapy in the University Medical Center Mainz. One of my tasks was to help educate medical students about the concept of conflicts of interest in medicine and why it is important to scrutinize the grown system of interactions between pharmaceutical companies and physicians. As a psychology student, I was mostly interested in our lecture about the psychological mechanisms behind conflicts of interest. One such mechanism is the *bias blind spot*: the tendency to see oneself as less influenceable than others (Pronin et al., 2004). For example, physicians believe that their colleagues are likely to be unconsciously influenced by pharmaceutical companies' marketing methods, while they see

themselves as hardly influenceable (Lieb & Brandtönies, 2010; Steinmann, 2001)—they have the illusion that they are more immune to bias than others. Against this background, it totally made sense to me that conflicts of interest in medicine need to be externally regulated and that there is a need to make interactions between industry and HCPs or organizations transparent. One milestone in the history of conflict of interest transparency regulations in medicine was the Physician Payment Sunshine Act (PPSA) in the United States, passed in 2009: By law, U.S. pharmaceutical companies must publicly disclose all payments made to HCPs and health care organizations (Silverman, 2013). To this date, no such law exists in Germany. However, for the first time in 2016, European pharmaceutical companies disclosed data in the course of a self-regulation transparency codex (Mental Health Europe [MHE], 2019). HCPs could decide whether or not they wanted their payments to be disclosed on the pharmaceutical company's website. In Germany, only a third of all HCPs gave their consent to disclosure. The investigative journalist newsroom CORRECTIV combined the German pharmaceutical companies' data into a searchable database titled „Euros für Ärzte" [Euros for Doctors] and covered the process with news articles. One of the articles was the one mentioned in the beginning. The database and its press coverage were also a popular subject for discussions in our teaching classes where we debated the pros and cons of transparency.

In 2017, I got the opportunity to work in a research project on the second order effects of conflict of interest regulation in medicine as part of a national research project on the independence of research. The project was funded by the Volkswagen Foundation and led by Professor Klaus Lieb, head of the working group „conflicts of interest and bias in medicine" of the University Medical Center Mainz. I

had just graduated from university with a master thesis in personality psychology and was looking forward to diving into the psychological aspects of conflict of interest disclosure. While I oriented myself in this research topic, the Euros for Doctors database was updated with data of the second year of the voluntary transparency codex. CORRECTIV now reported that only every forth physician disclosed payments from pharmaceutical companies: From 2016 to 2017, German HCPs' willingness to disclose payments of the previous year had thus further decreased, from 31% to about 25% (Wehrmeyer et al., 2017). This raised my curiosity: Why was there even less interest in transparency than the year before? Who are those physicians who now decided against disclosure and what was their motive? In an interview published by CORRECTIV, some physicians reported they had made negative experiences with the disclosure in the Euros for Doctors database and therefore did not want to disclose their payments in a public database anymore (Boytchev, 2016). In our working group, we therein saw a valuable opportunity to examine second order effects of disclosure by the example of the transparency regulation in Germany.

But how does research on conflict of interest disclosure look like? Looking at the methodological state of the art on conflict of interest disclosure, there is a full bandwidth of methods with detailed descriptive analysis of the particular situation in the medical field on the one hand and experimental research on the basal mechanisms of information disclosure on the other. Regarding second order effects of disclosure, the works of behavioral economist George Loewenstein and his team soon captured my attention: They had conducted experiments on conflict of interest disclosure in advice-giving where they showed that persons who had to disclose a conflict of interest in an experimental situation show even more biased behavior than those who did not have to disclose: a *backfiring effect* of disclosure (Loewenstein et al., 2014).

To investigate unintended second order effects of conflict of interest disclosure, I decided to take both perspectives: The specific perspective on the current situation of the German voluntary transparency regulation and the experimental investigation of the general mechanism of disclosure.

The objective of the present work is to examine effects of the disclosure of conflicts of interest from a psychological perspective. Therefore, I will explore the relevant characteristics of the German disclosure database as an example of a voluntary transparency regulation over the course of the years 2015 and 2016. The Euros for Doctors database will be analyzed to answer the questions: What information is disclosed and by whom? Is there a difference between the years? Further, I will explore German physicians' individual experiences with the Euros for Doctors database and ask which factors lead to a subsequent decision against disclosure and whether these experiences differed between the years 2015 and 2016. Finally, I will conduct a laboratory experiment in which I will examine the core mechanisms behind disclosure. The main question here is to study whether the backfiring effect of disclosure can be moderated through education of the recipient. Another question investigated in the experiment is whether the second order effects of disclosure vary depending on people's personality structure or cognitions.

This dissertation aims to answer these outlined research questions and consists of five chapters. Chapter 1 gives a theoretical overview, including definitions of the central concepts and the relevant theoretical models. This is the basis for three empirical studies I conducted and that will each be explained in detail in the following chapters: Chapter 2 describes a descriptive analysis of the Euros for Doctors database with disclosures of 28,230 German HCPs. Chapter 3 displays evidence of a quantitative survey of physicians who disclosed payments of pharmaceutical

companies in this database, and chapter 4 reports a psychological randomized experiment on individual differences regarding bias in advice-giving with student participants. Finally, I will discuss the overall findings in chapter 5, give a reflection on the used methods and put this work's findings into a greater context. Chapter 6 aims to draw a conclusion of this work and finishes this dissertation with an outlook. By providing evidence on the unintended effects of conflict of interest disclosure in this dissertation, I aim to contribute to the continuous improvement of conflict of interest management in medicine.

Chapter I:

Theoretical Background

1. Theoretical Background

In this chapter, I will define the term *conflict of interest* in regard to this work and give insight into the current situation in the medical sector, where conflicts of interest arise from collaboration between pharmaceutical companies and physicians. I will summarize evidence on effects of such conflicts of interest and thus the need for regulation.

One of the major approaches to encounter conflicts of interest in medicine—and the approach central to this thesis—is *disclosure*. I will explain disclosure as it is done in economic research and provide evidence on the basic mechanisms of disclosure in general and in the medical field in particular. As the implementation of disclosure in medicine occurs mostly in the form of transparency guidelines, I will give an overview of international transparency guidelines, with a focus on the German transparency regulation, and thereafter carve out similarities and differences between the regulations, followed by a summary of evidence on their reception and consequences.

An even deeper understanding of conflicts of interest, bias and disclosure can be reached by looking at the psychological mechanisms behind them. Thus, the last part of this chapter addresses the subjects attention, norms, and personality dimensions as important psychological concepts that are discussed regarding conflicts of interest and disclosure. The chapter closes with the theoretical framework of this thesis and an outlook of this works' contributions.

1.1. Conflicts of Interest

Conflicts of interest appear in various fields such as law, the government, journalism, academia and in organizational contexts; definitions vary depending on

the context. The relevant context for the work at hand are conflicts of interest in the medical sector. A typical example is that a physician is invited to talk about a new drug at a continuing medical education (CME) event by the pharmaceutical company that produces the drug. The company pays for the physician's travel costs, board and lodging, and maybe pays a fee for the talk. These payments or provided accomplishments create a risk that the physician's judgment regarding the drug is influenced, which could manifest in an exaggeration of the drug's benefits in the talk, or in a subsequent increased prescription of the drug although a better alternative exists, which leads to suboptimal patient care. In the long run, the independence of this physician's professional judgment is at risk and patients could suffer.

1.1.1. Definition

The Institute of Medicine (IOM), a U.S. non-profit non-governmental organization, defines a conflict of interest as a "set of circumstances that creates a risk that professional judgment or actions regarding a primary interest will be unduly influenced by a secondary interest" (IOM, 2009, p. 2-2). This definition is used in various institutional policies and can be understood regarding a person's profession in general. The concept and theoretical framework behind this definition, however, have their origin in the discussion of medical literature (Thompson, 1993). In the physician's case illustrated above, this would mean that professional judgment regarding optimal patient care (primary interest) is at risk to be influenced by financial incentives (secondary interest).

Brody (2011) later aimed to clarify the concept of conflicts of interest and provides four former necessary conditions that specify whether a physician has a conflict of interest: first, the physician has a duty on behalf of patients or the public;

second, the physician is also subject to other internal interests or interests of a third party; third, the physician gets involved in social arrangements; fourth, due to psychological mechanisms, the physician neglects the patient's or public's interests in favor of their own interests or the interest of the third party.

Yet another approach is Stark's conflict of interest taxonomy (2003), which describes three stages. Those stages respect the motivational and psychological aspect of a situation, and the stages entail each other and form a circle of determination. The stages are titled antecedent acts; states of mind; behavior of partiality and are described in more detail later in 1.3. In the line of my thesis, I will begin to outline the key elements of a conflict of interest with the general definition provided by the IOM (2009) and will later come back to the social and psychological aspects of conflicts of interest.

1.1.2. Key Elements

Following the IOM report of 2009, the key elements of a conflict of interest are the primary interest, the secondary interest and the conflict itself. Primary interests are closely related to the purpose of the professional activity, e.g., the end, goal or obligation of a person who fulfills the profession. In medicine, the primary interest can be seen in the code of conduct of medical associations: the "health and well-being" of a patient, as stated in the World Medical Association (WMA) declaration of Geneva (Parsa-Parsi, 2017). The German Model Professional Code for Physicians states that

> physicians must practice their profession conscientiously and do justice to the confidence placed in them in practicing their profession. In doing so, their medical activity must be in accordance with the welfare of the patient. In

> particular, they may not put the interests of third parties above the welfare of the patient. (Bundesärztekammer, 2011)

So, the general primary interests in the medical profession are stated in national and international code of conducts for physicians. They can be summed up, in general, as the well-being of the patient and the integrity of research as well as education of students (Thompson, 1993).

Primary interests can also be viewed on a more abstract level in the context of advice-giving situations, in which advisors with expert knowledge convey information to an advisee with lay knowledge. In such situations, the professional goal is that the advice empowers the advisee to make a decision. As the advisees have less knowledge on the topic than the advisor, they need to trust the advisor and the objectivity of the given information. So in the profession of an advisor, the primary interest is to give valid and unbiased advice.

Secondary interests are often components of the profession and legitimate within certain limits. Not the existence of a secondary interest is problematic, but the weight it may have on professional decisions (Thompson, 1993). In medicine, a frequently discussed secondary interest is financial gain through for-profit companies[1]. In an advice-giving situation, advisor salary that is dependent on an advisees' decision is a secondary interest that might influence the advisor's advice (e.g., a bonus payment if advisees decide in a certain way; given that the primary interest is to give unbiased advice) (IOM, 2009; Klemperer, 2011).

The conflict itself is defined as a risk situation where the coexistence of primary and secondary interests unduly increases the probability of a biased judgment; it does not necessarily imply an actual influence on the concerned person.

[1] Other interests are for example desire for professional advancement, favors to family, allegiance towards a specific treatment method, or non-financial cooperation or personal relationships with the industry.

"Unduly" means that a biased judgment will neglect the primary interest. Whether such a risk situation is apparent, i.e., whether the probability for biased judgment is increased, is to be assessed by experience, common sense or evidence from the psychological and social sciences (IOM, 2009). Examples for the assessment of conflicts of interest in medicine are that there is evidence that industry sponsorship relates to biased, namely, more positive, research outcomes (Lundh et al., 2017, 2018; Schott, Pachl, Limbach, Gundert-Remy, Ludwig & Lieb, 2010) and that physicians' contact with the industry relates to bias in physicians' prescribing patterns – namely, a higher frequency of brand-name drug descriptions (DeJong et al., 2016; Lieb & Scheurich, 2014). Thus, contacts between physicians and pharmaceutical companies are assessed to increase the probability of undue influence on the primary interest of patient welfare. These situations are therefore classified as conflicts of interest.

1.1.3. Prevalence in Medicine

Beginning in the 1980s, studies have described a variety of conflicts of interest in the medical sector regarding financial interests[2] that involve physicians, medical researchers, and medical institutions. The area focused in this thesis is the interaction between pharmaceutical companies and the health care sector, especially physicians[3]. Interactions between pharmaceutical companies and the health care sector come for example in form of financial support of physicians' CME, in form of payments for talks and consulting, in settling travel expenses and, of course, in the support of drug research (Agrawal & Brown, 2016; Bekelman et al., 2003). In 2015, 449,864 of 933,295 U.S. physicians received payments by a pharmaceutical company:

[2] For a discussion on the determination of non-financial vs. financial interests, see Bero and Grundy (2016).
[3] Other areas where conflicts of interest in medicine appear are e.g. self-referral by physicians, risk-sharing in health care organizations, hospital purchasing, bonding practices, and research on patients (Thompson, 1993).

$2.4 billion dollars in total (Tringale et al., 2017). In 2017, U.S. pharmaceutical companies paid overall $8.4 billion dollars to about 628,000 physicians and 1,100 teaching hospitals (Sullivan, 2017). Further studies show that between 2015 and 2017, a U.S. physician, on average, received about $1,000–$4,700 dollars by the pharmaceutical industry per year (Inoue et al., 2019). In Germany, corresponding numbers are available for pharmaceutical companies who are members of the "Verband forschender Arzneimittelhersteller e.V (vfa)" [association of research-based pharmaceutical companies] and the "Freiwillige Selbstkontrolle für die Arzneimittelindustrie e.V. (FSA)" [association of voluntary self-regulation in the pharmaceutical industry]. The member companies represent about 75% of the German market for prescription drugs. In 2017, those companies paid about 398 million € for research and development, about 105 million € to individual HCPs for CME and honoraria such as speaker fees, and about 102 million € to health care institutions to support events, to foundations or as donations (FSA, 2018).

Financial conflicts of interests are also an issue regarding clinical practice guidelines. Those guidelines are "systematically developed decision aids for the appropriate medical management of specific disease conditions" (Schott et al., 2013, p. 575). Their development is based on evidence and expert opinions. Besides their tool as decision aid for health care providers, they are also considered by payors in the health care system, e.g., regarding reimbursements. While there are some case studies of industry influence on guideline decision (Schott et al., 2013; Wang et al., 2010), a final statement about the actual prevalence of industry ties among guideline panel members is challenging because information regarding their financial conflicts of interest is missing. Estimations suggest that the prevalence of financial conflicts of

interests in panel members who are involved in the guideline development process is high (Cosgrove et al., 2010; Norris et al., 2011; Schott et al., 2013, 2015).

1.1.4. Consequences

Interactions between pharmaceutical companies and HCPs are seen as conflicts of interest because it was shown that they lead to consequences via increasing the probability for biased judgment or behavior. Consequences of conflicts of interest in medicine can for example be measured if behavior of physicians with contact to pharmaceutical companies is systematically different from the behavior of physicians without such contacts. This systematic difference is called bias and can come in different shapes. In the context of conflicts of interest in medicine, bias as consequence of an undue influence by a secondary interest can, e.g., affect the physician's judgment or behavior, and it can thereby have consequences for the treatment of a patient, the quality of research, decisions for clinical practice guidelines, accuracy information on medication or diseases, and indirectly user trust as well (MHE, 2019). Evidence is available, i.a., regarding consequences of conflicts of interest on clinical decision-making, prescription behavior, and research outcomes, as I will outline in the following section.

Studies on clinical decision-making found that medical researchers with conflicts of interest more frequently draw pro-industry conclusions (Bekelman et al., 2003), or have more favorable views on the safety of the companies' drugs (Wang et al., 2010), as for example in the case of Rosiglitazone, an antidiabetic drug. In 2007, researchers raised the question whether this medicament increases the risk for cardiac infarctions. They conducted a meta-analysis of 202 studies on Rosiglitazone and cardiac infarction risk (Nissen & Wolski, 2007). What they found was that the

appraisal of cardiac infarction risk by the authors of the primary studies was very heterogeneous: Although all of them relied on the same dataset, some judged Rosiglitazone positive, some neutral, and some negative in relation to cardiac infarction risk. A consequent study of Wang et al. (2010) found that of those authors who judged Rosiglitazone positive, 94% had a conflict of interest: They had received money from a pharmaceutical company. Of those who judged it negative, 28% had a conflict of interest. In 2010, the drug was withdrawn from the market because of the cardiovascular risks (Klemperer, 2011).

Another point is that interaction with pharmaceutical companies was found to affect the day-to-day contacts between physicians and patients: Physicians with financial ties to the industry were up to twice as likely to prescribe brand-name drugs (Brax et al., 2017; DeJong et al., 2016; Fickweiler et al., 2017; Lieb & Scheurich, 2014; Yeh et al., 2016). For example, studies in the United States (DeJong et al., 2016) and Germany (Lieb & Scheurich, 2014) showed that physicians who received industry-sponsored meals that promoted a brand-name drug (DeJong et al., 2016) and who took part in sponsored CME (Lieb & Scheurich, 2014) were more likely to prescribe the brand-name drug than an alternative drug in the same class (DeJong et al., 2016; Lieb & Scheurich, 2014).

Further, in the context of medical research, several reviews and meta-analyses found an association between industry-sponsoring and results of research (Bekelman et al., 2003; Lexchin et al., 2003; Lundh et al., 2017; Schott, Pachl, Limbach, Gundert-Remy, Ludwig & Lieb, 2010). One systematic review by Lundh et al. (2017) for example showed that industry sponsored medical research significantly more often showed results that are favorable for the sponsors' products and more often had favorable overall conclusions than non industry-sponsored medical research. Further,

industry sponsored studies were found to show significantly less agreement between results and conclusions than non-industry sponsored studies (Lundh et al., 2017).

These areas only show a fragment of the wide range of possible consequences of conflicts of interest in medicine (further information on consequences can for example be found in the IOM report, 2009). Such observations provide one main argument for the regulation of conflicts of interest in medicine.

1.1.5. Regulation Strategies

The regulation of conflicts of interest in medicine has, according to Thompson (1993), two basic purposes: First, to sustain the integrity of professional judgment. Second, to maintain confidence in professional judgment. The question arises as to who is responsible for the regulation. Following Thompson (1993), this responsibility can be shifted towards the conflicted persons themselves, towards the profession, or towards the government. The first option—regulation of the conflict by the conflicted individuals themselves—implies to rely on the good character of the individual person and is not reasonable due to psychological mechanisms (e.g., being blind to one's own suggestibility, discussed in section 1.3.). It might, however, work in individual long-term face-to-face relations (Thompson, 1993). The second option—regulation by the profession—provides the advantage of a collective measure. Such a collective measure profits from the professional expertise of those who form the rules, e.g., a medical association might know best which rules might fit to the special circumstances of the medical field. At the same time, the medical profession might see itself torn between the interests to maintain the integrity of the profession and promoting the welfare of its members. The third option—regulation by the government—provides a highly standardized way, from making the rules to their

reinforcement. The main disadvantage is that this uniformity has its costs regarding the fitting of rules to the variety of different conflicts of interest in the profession (Thompson, 1993).

In addition to the question regarding the responsibility to regulate conflicts of interest, there are also different forms of regulations to be taken into account. These different forms of conflict of interest regulation are sometimes classified into hard forms and weak forms. Hard forms imply consequences. Examples are:

- mediation (insulate the physician from the secondary interest);
- abstention (withdraw a person with a conflict of interest from decisions where the conflict of interest may be relevant, e.g., in guideline developments);
- divestiture (elimination of the secondary interest); and
- prohibition (withdraw conflicted persons from the field permanently) (McDowell, 1989; Thompson, 1993).

Unlike those hard forms, weak forms of conflict of interest regulation do not automatically imply consequences. The most common example is disclosure, because the requirement to disclose information about a conflict of interest does not necessarily pose consequences for the discloser but informs others of potential bias (Sah et al., 2016).

An overview of the regulation strategies regarding financial conflicts of interest in medicine in Germany (Koch et al., 2016) shows that first of all, disclosure of financial payments seems to be the most frequently used regulation strategy, by pharmaceutical companies as well as by associations such as the Drug Commission of the German Medical Association (DCGMA). Further strategies include the management of publication bias through the German Clinical Trials Register by

mandating registration of clinical trials; the strategies used in the evaluation of drugs and medical devices by the DCGMA, who aim to create committees that consist of members who are free of relevant conflicts of interest; an initiative called "Leitlinienwatch" (www.leitlinienwatch.de) that assesses the transparency and regulation of conflicts of interest in guideline development; and rules regarding the independence of German CME (e.g., that speakers should discuss all alternative therapeutic strategies or that they are not to use presentations designed by pharmaceutical companies).

To conclude, there are several ways to regulate financial conflicts of interest in medicine, varying in their strictness and impact. Notably, hard forms of conflict of interest regulation can't be implemented if the conflict of interest is not known. Therefore, disclosure of an HCP's conflict of interest is the necessary first step for subsequent measures. Both are needed for an effective conflict of interest regulation.

1.2. Disclosure

Despite the fact that disclosure actually does not imply consequential problem solving, it is regarded as a central intervention to prevent ethical and legal problems posed by conflicts of interest, including the interactions between the health care sector and the industry (Goldberg, 2019; Loewenstein et al., 2014; Thompson, 1993). The basic mechanisms of disclosure are researched and discussed mainly in economic research. Therefore, I will first explain the definition of disclosure and its effects in the context of (behavioral-) economic research and afterwards provide information regarding disclosure in medicine and then its effects in general and regarding transparency guidelines in particular.

1.2.1. Definition

In standard economic theory, disclosure means the targeted provision of information (Loewenstein et al., 2014). Sometimes—mostly in cases of favorable information—the provision of information occurs voluntarily, e.g., if sellers want to advertise their product: A manufacturer of clothes may want to provide information on the manufacturing process if the clothes are produced ethically fair so that potential clients can make an informed decision as to whether they are willing to pay a higher price for fairly produced clothes. In case of information that is not favorable for the perceived quality of their product, sellers may not want to provide this information; consumers, on the other side, are interested in such information. This sometimes leads to an active market for product quality information, which is often disclosed by a third party (e.g., the German "Stiftung Warentest" or other specific seals of quality) (Loewenstein et al., 2014).

In other cases, producers are obliged to provide information (i.e., mandatory disclosure), namely if consumers need to be fully informed. Examples of mandatory disclosure of information are the requirements to inform about side effects of medical drugs or about ingredients of processed food (Schneider & Ben-Shahar, 2011). But despite many benefits of disclosure on behalf of the consumers, there are also costs to be considered: A general cost of information disclosure is that consumers need time to process the provided information or that they suffer emotional costs of dealing with the information[4]. The specific costs and benefits for each specific case of mandatory disclosure, adapted to the specific target audience, need to be considered when implementing and evaluating disclosure guidelines (see Schneider & Ben-Shahar, 2011; Loewenstein et al., 2014).

[4] An example is the discussion of graphic cigarette warning labels, see e.g., Wang et al. (2015).

In order to discuss disclosure guidelines in medicine, I will first give an oversight of the state of evidence in behavioral economic research before turning towards the effects of current disclosure regulations in medicine. In economic research, the subject of disclosure is discussed in the context of advice-giving situations, a professional relationship consisting of an expert (advisor) and a lay advice-seeker (advisee), whose aim is to make an informed decision. Because of the imbalance of expertise between advisor and advisee, such situations are particularly susceptible for conflicts of interest and bias. Advisees mostly do not have the knowledge to verify the correctness of the advice, just as patients often do not have the knowledge to verify whether their doctor gives them correct advice. Sometimes it happens that an advisor has secondary interests that negatively affect the advice. As advisees have no knowledge to judge whether the advice is influenced or the advisor is conflicted—and therefore lack information that could be important for their informed decision—advisors can be demanded to disclose any secondary interests to advisees. The research on disclosure and especially on the effectiveness of disclosure in advice-giving situations provides evidence for the basic mechanisms of disclosure and helps to understand effects in the context of transparency guidelines in medicine.

1.2.2. First and Second Order Effects

The main goal of disclosure is to help recipients make informed decisions (Loewenstein et al., 2014). In economic terms, this means that an advisee is able to discount a given advice because of disclosed information. Hereby, the disclosed information is that the advisor has a conflict of interest. Cain et al. (2011) state that this aim of disclosure can only be met under the assumption that the recipients of disclosure (i.e., the advisees) have a corresponding mental model to predict the impact

of the conflict of interest. Otherwise, they might simply ignore the disclosed information. This means that recipients first need to understand the disclosed information (i.e., the impact of the conflict of interest) and why it is disclosed so that thereafter they are able to estimate the impact on the advice they received. If these conditions are not met, disclosure may not only be not helpful but can also have unintended effects on both sides, for advisors and advisees (Cain et al., 2011). An example is that an advisor's disclosure of a financial connection to the industry is meant to inform the advisee of a potential bias. However, laypersons sometimes interpret this disclosed information as expertise cue and subsequently show even more trust towards the conflicted advisor (Sah et al., 2018).

The effects of disclosure can be classified into an immediate first order effect and subsequent second order effects. The first order effect of disclosure is that information is available that has not been there before. The provision of this information, then, causes several other effects. These second order effects can concern all parties involved in the disclosure: the party that discloses the information, the party that the disclosed information is about (i.e., the advisor) and the party that the information is provided to (i.e., the recipient/advisee). The following outline of economic research focuses on the specific case that advisors simultaneously are disclosers. Other cases are that third parties disclose information about the conflicted person, which I will discuss later in this chapter.

Second order effects that occur on the part of recipients can arise through misinterpretation of the provided information: For example, disclosure may lead to moral misdirection if recipients think that the disclosure of a conflict of interest resolves the risk of undue influence (Chambers, 2017). That way, conflict of interest disclosure may cause increased trust towards the discloser. Indeed, a survey of

German patients found that they wish their physicians to disclose their conflict of interest because a disclosure would increase their trust towards the physicians (Riedl et al., 2016). Evidence for the actual effect of disclosure in trust provides varying results: In one study, disclosure of a financial conflict of interest by social media bloggers was interpreted as an expertise cue by readers, who subsequently reported increased trust in the bloggers and evaluated them more favorably (Sah et al., 2018). Other studies, conducted in a medical setting, found that sending patients an appointment-reminder letter with a disclosure of their physician's financial conflict of interest did not affect these patients' trust in their physician compared to patients without disclosures on their appointment-reminder letter (Rose et al., 2019). Another study found that physicians' disclosure led to decreased trust in the advice, but patients felt increased pressure to comply with the advice (*panhandler effect*) or even feared to signal distrust after a disclosed conflict of interest (*insinuation anxiety*, see Sah et al., 2019).

This means that disclosure of information may be intended to enable recipients to make informed decisions, but in many cases, the information can't be easily interpreted and may therefore affect the discloser-recipient relationship in unintended, and sometimes detrimental, ways.

On the part of disclosing advisors, provision of information may cause intra-psychological processes that lead to positive or negative second order effects. A positive effect of disclosure is that it may motivate people to "clean up their act" (Loewenstein et al., 2014, p. 403). That way, disclosure will lead them—directly or indirectly—to turn their behavior for the better (an effect termed *telltale heart effect*, explained in detail later in 1.3.2.2.). An example for one of the positive second order effects of disclosure is the following scenario: A guideline for food manufacturers

requires that all product ingredients must be disclosed, and this could initiate food manufactures to adjust the products' ingredient composition and banish unhealthy additives from their product. One explanation for such positive second order effects is that people in general do not like to be viewed as influenced or biased. This means that advisors may be motivated to avoid conflicts of interest, so that they can subsequently disclose the absence of conflicts (Sah & Loewenstein, 2014). These examples show that disclosure of conflicts of interest can have positive consequences.

However, there is evidence that disclosure can also have unintended, and rather negative, effects: Among advisors, disclosure of a conflict of interest sometimes even backfires and leads to even more biased advice relative to advisors who do not disclose (Cain et al., 2011; Koch & Schmidt, 2010). One explanation is the *moral licensing* effect (Cain et al., 2005): An advisor who has an undisclosed conflict of interest may feel intrinsically motivated to give unbiased advice due to moral considerations and self-worth preservation—and this intrinsic motivation could get undermined by the disclosure of the conflict of interest (Cain et al., 2005, 2011). Another explanation is an effect called *strategic exaggeration* (Cain et al., 2011): A (rather self-interested) advisor who discloses a conflict of interest could anticipate that the advisee discounts his advice because of the disclosed conflict of interest, thus they will give more biased advice to counteract the expected discount—similar to a hawker who starts a quarrel as high as possible because they anticipate the client to haggle downward. Such backfiring effects of disclosure can be boosted in cases where advisors have to disclose their conflict of interest and cannot avoid them: Then, advisors give more biased advice than advisors who do not have to disclose a conflict of interest (Sah & Loewenstein, 2014). However, there is also evidence that this

backfiring effect can be diminished or reverted with growing expertise and reputation (Koch & Schmidt, 2010).

Summarized, it is apparent that the one thing disclosure achieves is the provision of information. Further subsequent positive and negative second order effects can affect both the conflicted person and the recipient, and they are highly dependent on the context. Therefore, I will next have a look at disclosure in the context of medicine.

1.2.3. Disclosure in Medicine

In general, disclosure of information means that a person or an institution is responsible for the dissemination of relevant information (IOM, 2009). In the context of medicine, the most discussed and meanwhile omnipresent disclosure regulation is the disclosure of financial conflicts of interest, mostly in terms of the disclosure of payments by the pharmaceutical industry[5], either mandatory or voluntary. It is the most common conflict of interest policy because of its low costs (Thompson, 1993; Loewenstein et al., 2014) and is described as a "critical but limited first step in the process of identifying and responding to conflicts of interest" (IOM, p. 1-5). Conflict of interest disclosure in the form of transparency of financial payments is therefore necessary for an effective conflict of interest management in medicine.

For a more detailed context analysis of disclosure in medicine, differences are to be considered as to who discloses to whom in which specific context. For example, regulations can be implemented by government, by higher institutions or by the pharmaceutical companies themselves and the disclosed information can be geared towards members of the profession as well as towards the public. In medicine,

[5] Yet other areas of disclosure in medicine do exist, e.g., the disclosure of specialty bias (Sah et al., 2016), the disclosure of quality of care, patient experiences, individual health data or transparency of medical errors (Bell et al., 2017).

disclosure of financial conflicts of interest appears in the publication process (Cooper et al., 2006; Grundy, Dunn, et al., 2018), in patient advocacy organizations (Li et al., 2019) or professional medical associations (Rothman et al., 2009), on the level of medical schools (Carlat et al., 2016), in the context of guideline committees, e.g., the German "Arbeitgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften" [Association of the Scientific Medical Societies in Germany] (AWMF, 2017), but also on the national level in the form of nation-wide transparency guidelines (MHE, 2019). Notably, all other transparency guidelines would not be required if transparency was regulated on a national level by law. The focus of the thesis at hand therefore lies on nation-wide transparency guidelines that regulate the disclosure of financial interactions between pharmaceutical companies and HCPs to the public.

1.2.4. Transparency Guidelines

Why are nation-wide transparency guidelines so popular? The main arguments for importance of nation-wide transparency guidelines in medicine are as follows: Transparency gives the public a legitimate expectation that all payments by the pharmaceutical industry to HCPs are available for scrutiny and it somehow may motivate disclosers to change their behavior (Parker et al., 2019). Also, transparency is necessary because recipients (public, institutions, the scientific community) cannot evaluate or respond to a financial interaction of an HCP with the industry if they do not know about it. Thereby, transparency helps the recipient assess the risk of bias of the discloser (IOM, 2009; Parker et al., 2019).

First nation-wide transparency guidelines appeared around the turn of the millennium. The oldest law mandating disclosure of industry payments was passed in

Minnesota in 1993, but the disclosed data was difficult to access and of low quality (Ross et al., 2007). In 2007, Australia implemented a self-regulatory transparency program through the pharmaceutical industry trade association Medicines Australia (Parker et al., 2019; Robertson et al., 2009). However, it was not until 2010 that the PPSA in the United States was seen as an international new standard of transparency for financial relationships between the pharmaceutical industry and the health care sector (MHE, 2019). This legally enforced measure was passed in 2011 as part of the Affordable Care Act and regulates that, starting in 2014, pharmaceutical companies are obliged to disclose payments to health care organizations and HCPs exceeding $10 (Silverman, 2013). This disclosed information is publicly available through the Open Payments database, a federal program by the Centers for Medicare & Medicaid Services (CMS; https://www.cms.gov/openpayments).

Over the years, other nations followed, either by laws similar to the U.S. law or by self-regulatory approaches of the pharmaceutical industry (MHE, 2019). The respective regulations and rules vary considerably (Fabbri et al., 2018; MHE, 2019). I will now give a short overview over the heterogeneous picture of transparency regulations all over the world and the German model in particular. Thereafter, I will subsume the important characteristics of these guidelines that contribute to their heterogeneity and summarize evidence on their effectiveness.

1.2.4.1. International Transparency Guidelines. Following the example of the PPSA in the United States, legally binding transparency regulations have been implemented i.a. in Belgium, Denmark, France, Greece, Latvia, Portugal, and Romania (Fabbri et al., 2018; Grundy, Habibi, et al., 2018; MHE, 2019). In contrast, other countries such as Australia and most European countries rely on

transparency self-regulatory approaches by the pharmaceutical industry. In Europe, for example, pharmaceutical companies synergized and passed a "Disclosure Code" by the European Federation of Pharmaceutical Industries and Associations (EFPIA) in 2013 (EFPIA, 2013). These companies commit to disclose transfers of values to health care organizations or HCPs—though with some limitation, e.g., that only some forms of transfers of values are disclosed (e.g., payments for research and development are often not disclosed in detail) and that HCPs have to give consent to the disclosure of the transfers of values paid to them due to data protection laws (MHE, 2019). Other nations with self-regulatory approaches include Australia, Japan, and Canada (Grundy, Habibi, et al., 2018).

Germany follows the line of the EFPIA and relies on a self-regulatory approach by the pharmaceutical industry. An equivalent "Transparency Codex" was passed by the FSA in 2013 (FSA, 2013). This codex obliges the 59 (as of 2020) pharmaceutical companies that are members of the FSA to publish payments to health care organizations and HCPs. First data were published in summer 2016 for the payments of the year 2015[6].

1.2.4.2. Characteristics. The heterogeneity of transparency guidelines can be explained by the following major factors. The first important difference concerns the institution responsible for regulation and thereby the factor of legality of the regulation: As mentioned before, some guidelines are enacted as legally binding laws and regulated by the government, while others are introduced through self-regulation codices by the pharmaceutical industry. In the first case, pharmaceutical companies are required by law to publicly disclose the requested transfers of values;

[6] For background information on the FSA codex, including a detailed analysis of why it was adopted in this form by the German pharmaceutical industry, see Töller (2017).

in the second case, the companies themselves draft the policy and are responsible for the implementation and execution.

A second factor is the voluntariness of disclosure: If data protection laws apply—which is mostly the case if the regulation is based on self-regulation by the pharmaceutical industry—individual transfers of value are only disclosed if the respective HCP consents. Disclosure from the perspective of the HCPs is therefore voluntary. They can decide whether or not they want that the pharmaceutical company discloses the payments. For HCPs who fall under a transparency law, disclosure of payments is mandatory[7].

Another factor concerns the question of who discloses the information. Information in some cases is disclosed by the party that provides the money, namely the pharmaceutical companies, because a law or a self-imposed regulation requires them to do so. In other cases, information is disclosed by an uninvolved party, e.g., a governmental institution or investigative data analysts. Sometimes, both applies: the companies disclose raw data and another party edits, aggregates and publishes the information.

From the perspective of the public, yet another major factor concerns the access to the disclosed information, which can either be published on a central collection point or scattered on each pharmaceutical companies' websites. This partially depends on whether the underlying regulation demands and provides a collection platform. The U.S. Open Payments website for example provides a publicly visible search interface that supports the search of the individual HCP and provides analyzable files for free download. If the respective regulation does not demand a centralized platform, the information is only provided on the websites of the

[7] Notably, the act of disclosing the information is done by the pharmaceutical company.

pharmaceutical companies, often in non-searchable and non-analyzable formats. In some cases, third parties initiated a collection of these scattered data and established centralized, searchable platforms by themselves. In Germany, each pharmaceutical company publishes separate, partly non-analyzable documents on their websites. After the first disclosure in 2016, the German non-profit investigative journalism newsroom CORRECTIV combined the separate disclosure documents into the Euros for Doctors database, aiming to integrate the individual companies' individual data per HCP into a centralized platform[8].

Further characteristics of transparency guidelines include the time frame of disclosure (in most cases, disclosure is required periodically, e.g., per year); the administrative burden of the policy for the disclosing parties; how data is monitored and the policy enforced; and the indemnification of the accuracy and completeness of disclosures (e.g., whether the disclosed information is verifiable or unverifiable, whether misinformation will be punished, whether the conflicted persons can easily report errors in their disclosed data (Loewenstein et al., 2014)).

Summed up, the heterogeneity of transparency guidelines can be traced to few major differing characteristics: legality, voluntariness, and access to the disclosed information, as well as other characteristics that mostly concern the implementation of the guideline. The guidelines' underlying aims, however, are in general the same. Which aims the guidelines pursue and to what extent they are achieved will be outlined in the following section.

[8] another example is the French initiative „Euros for Docs" (https://www.eurosfordocs.fr)

1.2.4.3. Aims. The PPSA was introduced with the aim "to shed light" (Grassley, 2017, para. 16) on the relationship between physicians and the pharmaceutical industry and thereby uncover potential conflicts of interest. By now, the image of "sunshine" policies[9] has become an international way to talk about transparency guidelines in general (Fabbri et al., 2018; Grundy, Habibi, et al., 2018; MHE, 2019). It metaphorically demonstrates the general aim of these guidelines: enlightenment and elucidation.

In economic research, the aim of disclosure is described less flowery: The purpose of disclosure is seen in addressing market failures that derive from asymmetric information and misaligned incentives, thereby helping to protect people against their own propensity to err (Loewenstein et al., 2014). Specifically for medicine, this means that transparency is enforced so that citizens are able to check, analyze, verify and control the actions of public servants and public bodies (i.e., physicians and health care organizations) through accessible information (MHE, 2019). That way, transparency databases can help strengthen the relationship between physicians and patients by increasing trust towards physicians and their decisions, and by maintaining the integrity of the profession (Thacker et al., 2014; Thompson, 1993). Besides these main aims, it still needs to be considered that beneficial collaborations between industry and health care sector are not damaged (IOM, 2009).

To conclude, the aims of transparency guidelines can be summed up into enlightenment of patients, restoring their trust and the integrity of the profession, and enable patients to scrutinize their physicians' actions. Next, I will summarize evidence to find an answer to the question whether these aims are met and what other effects can be shown.

[9] not to be confused with South Korea's „Sunshine Policy", the theoretical basis for their foreign policy against North Korea

1.2.4.4. Effects. While behavioral-economic experimental studies (e.g., Cain et al., 2005, 2011) raise questions about the general effectiveness of disclosure per se, it is further argued that the effectiveness of conflict of interest disclosure in medicine has to be evaluated regarding other factors than those discussed in the experimental studies (IOM, 2009): They should be monitored regarding the specific subject and aim of the guidelines. As mentioned above, one important aim of transparency guidelines is to inform and protect patients, and to maintain trust and integrity in the medical profession. I will now summarize the evidence on the effect of transparency guidelines on patients, on physicians, and on medical research.

Some studies have investigated the impact of transparency guidelines on patients: Representative surveys of patients regarding the usage of Open Payments showed that very few U.S. citizens know about the database or whether their own doctor is receiving payments (Pham-Kanter et al., 2017; Young et al., 2018). Other studies showed that Open Payments was associated with decreased trust in the medical profession as well as with lower trust in a patient's own physician (Kanter et al., 2019). Also, if confronted with the information of their physicians' disclosed industry payments, patients changed their perceptions of the physicians' honesty and fidelity (but not of their competence) while it did not affect trust ratings for the medical profession or the pharmaceutical industry as a whole (Hwong et al., 2017). Another study found that the type of payment is crucial for patients' perception of trust: Disclosed information about payments for consulting fees increased trust, whereas information about payments for traveling decreased perceived trustworthiness and perceived competence (Perry et al., 2014). A comprehensive statement on whether transparency guidelines fulfill the aim to inform patients, to

help them make better decisions or to maintain trust, is, based on the current evidence, difficult.

Regarding physicians' perspective on and experiences with a transparency guideline, evidence also is scarce. One study is that of Chimonas et al. (2017), who conducted stratified focus groups with U.S. physicians on their experiences with the PPSA. Those physicians reported that they valued the idea of transparency, but disliked being the objects of scrutiny. Technical problems and law issues were named as frequent source of annoyance. While they downplayed the value of PPSA for ensuring scientific integrity and building patient trust, the physicians interviewed in this study saw the PPSA as personal and professional threat to privacy and reputation. They also reported not to be interested in using the Open Payments database and that they were sure that patients are not interested either (Chimonas et al., 2017).

Transparency guidelines may not only affect patients or physicians; on a more abstract level, their implementation makes a relevant difference for the meta-research on the interactions between the health care sector and the pharmaceutical industry. The disclosed data provides valuable information on the financial interactions between HCPs and pharmaceutical industries—knowledge that was not available before. This data can be used to, firstly, analyze the prevalence of conflicts of interest in medicine; secondly, to evaluate other transparency guidelines; and thirdly, to conduct research on conflicts of interest and its consequences.

As to the first point, the descriptive analysis of the data enables an assessment of the actual situation of the prevalence of industry payments to physicians in general. But also, the data enables specific investigations—for example, to investigate how many panel members on a guideline committee have relevant conflicts of interest regarding the subject of the guideline; or to examine the characteristics of an HCP

who receives high payment amounts by pharmaceutical companies compared to an HCP who receives low payment amounts. Tringale et al. (2017) analyzed Open Payments reports of 933,295 U.S. physicians and found that they received $2.4 billion dollars in total, that those payments were primarily general payments, and that physicians in surgical care and male physicians were more likely to disclose high amounts of payments than physicians in general care and female physicians (Tringale et al., 2017). Other studies investigated the prevalence of payments among journal editors (Liu et al., 2017). Further examples for detailed analyses of conflict of interest prevalence in medicine and especially the effect of the implementation of the PPSA on the prevalence of industry payments are the studies of Guo et al. (2017), wo found no significant impact of PPSA implementation on disclosed payments, and Rhee et al. (2020), who followed a "natural experiment" and investigated the development of payments by non-orthopedic surgeons and orthopedic surgeons from 2014 to 2017. They found that the implementation of the PPSA was related to an increase in the number of general payments, mostly in form of payments for food and beverages, and to a decreased median value of each payment for non-orthopedic surgeons only. Such descriptive information about the actual prevalence of conflicts of interest is highly valuable for drafting and implementing effective conflict of interest regulations.

The second point is that the disclosed data can also be used to evaluate other transparency guidelines: For example, it has been shown that disclosures in scientific journals often do not match with data in the Open Payments database. Often, study authors' relationships to pharmaceutical companies (apparent through Open Payments) are not reported in the conflict of interest disclosure section below their published studies (Chimonas et al., 2011; Norris et al., 2011). Similar results were found for clinical practice guideline disclosure policies: Many of the guideline authors

did not completely or only inaccurately disclose the payments they received and that were documented in the Open Payments database (Checketts et al., 2018; Combs et al., 2018).

As to the third point, the disclosed data can also be brought together with data on physicians' behavior—e.g., prescription behavior. Such analyses provide insight into the effects of conflicts of interest and the relevance of the discussion about the relationship of the health care sector and the pharmaceutical industry, e.g., the earlier mentioned studies on the association between physician payments and changed prescription patterns (DeJong et al., 2016; Jones & Ornstein, 2016; Lieb & Scheurich, 2014; Sharma et al., 2018; Yeh et al., 2016).

When summarizing the proposed evidence on the stated aims of transparency guidelines, it seems impossible to judge whether these guidelines fulfill the intended aim of regaining trust or informing patients; furthermore, no evidence is available that shows that transparency comprehensively changes physicians' behavior for the good. However, they provide a dataset that offers the possibility to learn more about the interactions of the pharmaceutical industry and the health care sector, thereby enlightening the meta-experts of the field. For this last point, however, gapless transparency is necessary.

The next part of this chapter turns away from the detailed description of conflict of interest regulations and explores the psychological perspective on conflicts of interest disclosure.

1.3. Psychological Perspective

Psychological mechanisms can help to explain why people think or act the way they do. The knowledge about mechanisms such as cognitive or perceptional processes can help to understand behavior and how to deal with it. For the subject of this thesis, the psychological perspective gives insight into why, how and under which circumstances conflicts of interest lead to bias in behavior. Further, psychological considerations help to understand unintended second order effects of disclosure.

A basic psychological insight is that our brains have the capacity to disburden from continuing overstimulation through automatic processing mechanisms. In most cases, these lead to sensible and effective stimulus-reaction-patterns called behavioral heuristics (Felser & Klemperer, 2011). For example, if we are faced with a new situation, we intuitively orient ourselves towards how people in our surrounding behave. These automatic processing heuristics form one important part of the human behavioral repertoire[10]. It is argued that knowledge about these heuristics is actively used for the cause of advertising by the (pharmaceutical) industry—e.g., if people can identify with the person in the TV commercial on a product, it is more likely that they will subsequently buy the product (Cialdini, 2009). These heuristics need to be considered in the investigation of why financial conflicts of interest in medicine impact behavior and the development of effective measures against undue influence in the health care sector (Dana & Loewenstein, 2003; Felser & Klemperer, 2011).

Important behavioral heuristics that are discussed in terms of conflicts of interest are listed in Table 1.

[10] The counterpart is described as "deliberative processing" (Sah et al., 2018) or controlled behavior (Felser & Klemperer, 2011). Daniel Kahneman called this antagonism "thinking, fast and slow" and made it a worldwide bestseller in 2011 (Kahneman, 2011).

Table 1

Behavioral Heuristics Discussed in Terms of Conflicts of Interest

Description	Example
▪ Motivated evaluation / self-serving bias	
Evaluation of evidence (i.e., recognizing, remembering and assessing information) is influenced by peoples' own desires / interests	Clinical evidence is more positively interpreted if physicians have a relevant conflict of interest regarding the investigated drug (Wang et al., 2010)
▪ Confirmation bias	
People tend to a stronger attention regarding information that fits their earlier set beliefs.	If physicians once have been persuaded of the effectiveness of a drug (e.g., by a pharmaceutical representative), they will subsequently more frequently perceive signs for the drug's effectiveness than for its harm.
▪ Framing	
People judge differently based on how the question is posed.	If information is framed in terms of a drug's benefit, people might judge it more positive than if it is framed towards the drug's harms—an effect frequently used in marketing.
▪ Anchoring effect	
A numeric judgment is influenced based on a (random) target / preset number.	Information on effectiveness of a drug is embedded in comparing numbers that benefit the drug, which is also an effect frequently used in marketing.

▪ Reciprocity	
An unconscious pressure to respond to a favor, even if the favor was not asked for.	Even small advertisement gifts bearing a drug's name changes the way the drug is evaluated (Grande et al., 2009).
▪ Sympathy	
People prefer friends' and attractive peoples' requests.	Pharmaceutical representatives are trained to systematically form a relationship to the physician so that they are seen as friends (Fugh-Berman & Ahasi, 2007)
▪ Social reliability	
People orient their behavior toward others and adopt others' behavior as the norm.	As long as there is a culture in medicine where most physicians attend pharma-sponsored events or accept invitations to "free lunches", the individual physician will be less likely to scrutinize such behavior.
▪ Commitment and consistency	
Unconscious pressure to behave in accordance to earlier shown behavior; people have a hard time changing the direction of their behavior if they somehow invested in this behavior.	Guideline panels have difficulties to decide against the recommendation of a treatment that they earlier had recommended – even if its ineffectiveness or harm has meanwhile been proven.
▪ Fundamental attribution error	
People neglect information regarding a specific situation and overemphasize personality characteristics.	Physicians overestimate their uninfluencability and underestimate the potential risk of situations when they are exposed to pharmaceutical marketing.

Note. Adapted from "Psychologische Aspekte von Interessenkonflikten". In K. Lieb, D. Klemperer, & W. D. Ludwig (Eds.), *Interessenkonflikte in der Medizin* (pp. 27–45), by Felser, G., & Klemperer, D. (2011), p. 30. Springer. Copyright Springer-Verlag Berlin Heidelberg 2011

1.3.1. Psychology and Conflicts of Interest

These heuristics can explain why even small gifts do make an impact and why some situations increase bias and some do not (Dana & Loewenstein, 2003; Felser & Klemperer, 2011; Sah, 2012, 2017). For example, advisors with a conflict of interest give more biased advice when they feel psychologically distanced from the recipients, e.g., when they do not know the name of the recipient compared to a known recipient (Sah, 2012). Goldberg (2019) further argues that most of the literature on conflicts of interest in medicine undervalues the importance of cognitive science evidence on motivated bias. He refers to political scientists Andrew Stark's conflict of interest taxonomy (2003). This taxonomy involves three stages: In the first stage, people engage with each other, in acts that deepen the relationship between the parties (e.g., physicians and employees of the pharmaceutical industry at a CME event; a sponsored talk; a shared lunch; gift exchange). In the second stage, a stage of mind is built due to these antecedent acts. This stage of mind involves mostly favorable dispositions between the parties and can be explained through the above-mentioned heuristics. This leads to stage three, the actual behavior of partiality, in which behavior is shown that is biased in favor towards a third party. Stark sees this motivated bias as a process in which stage three will merge into stage one, thereby generating a culture of antecedent acts and biased behavior that further inseminates the heuristics *commitment* and *consistency* as well as *social reliability* that were mentioned above.

Many physicians are aware that they are targets for the pharmaceutical industry marketing division and that, for example, pharmaceutical representatives intend to influence them. However, they deem themselves as immune to this influence; on the other hand, they judge their colleagues as influenceable (Felser &

Klemperer, 2011; Lieb & Brandtönies, 2010; Steinman et al., 2001). This cognitive bias is called *bias blind spot* (Pronin et al., 2004; Scopelliti et al., 2015) and describes the illusion of objectivity. Several studies investigated this cognitive bias and found similar results in various settings: In a German sample of 160 general physicians, 6% of the survey respondents stated that they are often or always influenced, while 21% stated that their colleagues are often or always influenced (Lieb & Brandtönies, 2010). Another survey study in the United States showed that 61% of the surveyed physicians considered themselves to be not influenceable by industry promotions and contacts, while only 16% considered their colleagues as not influenceable (Steinman et al., 2001). Such a bias blind spot was also found in medical students. They are in early contact with the pharmaceutical industry (only 12% had never had contact to pharmaceutical companies), and 24% of the surveyed students believe that gift acceptance will affect their own future prescription behavior; however, at the same time, 45% of them believe that it influences their peers' future prescription behavior (Lieb & Koch, 2013; see also Koch et al., 2020).

This means that even if there is knowledge about the potential influence through pharmaceutical companies, physicians have the illusion that they themselves are the ones that can accept payments from the pharmaceutical industry without being influenced (Felser & Klemperer, 2011; Lieb & Brandtönies, 2010; Steinman et al., 2001). This evidence provides the main argument why external regulation of conflicts of interest is needed: As people themselves tend to misjudge whether they are influenced, external and standardized guidelines are required. These external regulations need information about the conflicted persons, which is why full transparency about the persons' conflicts of interest is necessary.

1.3.2. Psychology and Disclosure

If recipients reacted rationally to the disclosure of a conflict of interest, they would account for the disclosed information and behave accordingly (Loewenstein et al., 2014). But humans often do not behave rationally. Therefore, unintended consequences of conflict of interest disclosure arise (Loewenstein et al., 2012; Sah, 2017). The psychological perspective provides insights into why disclosure in some cases backfires, leading to unintended second order effects. Important factors hereby are humans' limitation of attention and the human nature as a social being (Loewenstein et al., 2014). These two concepts will be looked at in more detail in the following section.

1.3.2.1. Limited Attention. For our brains, attention is a scarce resource because we can only attend to a limited amount of information at one point in time. This might be the reason why the disclosure target group sometimes ignores the disclosed information—for example, only 3% of consumers in the United States pay attention to privacy disclosures on websites (Jensen et al., 2005). So even if information is disclosed, this does not necessarily lead to better-informed recipients.

Not only is attention a limited resource, it also is often not in our control how to allocate the available attention (Loewenstein et al., 2014). Different information is differently salient for us, leading to the phenomenon that certain items catch our attention while others, which may be equally important, are ignored. In terms of information disclosure, it deems rational that information that is present may be equally important as information that is absent: For example, in terms of quality information disclosure, the absence of a quality certification seal is at least equally important as is the presence of a quality certification seal. But psychological research

shows that people pay less attention to absent information than to present information, even if both are equally worth reporting (Loewenstein et al., 2014). For example, salad dressing makers whose dressing contained more fat than average dressings did not disclose the ingredients on the product—and consumers did not seem to care. Only when ingredient disclosure became mandatory by law, consumers paid attention to the provided information, finally came to an informed decision and consequently, sales of the high fat salad dressings declined (Mathios, 2000). This is one main argument against voluntary disclosure of industry payments by physicians: Due to limited attention, patients will focus on the present information—i.e., information about physicians who decided to disclose payments—rather than the absent information—i.e., that information about other physicians is missing.

Further, attention goes where motivation directs it. Generally, people prefer good news to bad news, and if they expect bad news, they rather do not want to have any news at all (Eil & Rao, 2010). This means that people, on the one hand, ignore or downplay information that threatens them or that speaks against an already taken decision; and on the other, they overestimate information that benefits them and that supports decisions they have already made (Loewenstein et al., 2014). They will thus interpret both disclosed and undisclosed information in a way that is beneficial for them.

Summarized, the knowledge about limited attention shows that the absence of information is often ignored. This stresses the importance of mandatory compared to voluntary disclosure regulations. The knowledge about limited attention also explains why disclosure of information does not imply better-informed recipients. For the implementation of transparency guidelines, it is therefore important to help recipients notice and understand the disclosed information; for a subsequent evaluation of the

guidelines, an important criterion is the amount of attention paid to the disclosed information.

1.3.2.2. The Telltale Heart Effect and the Spotlight Effect. A positive second order effect of disclosure is that even if there is limited attention by recipients, disclosure might nevertheless change the conflicted party's behavior for the better. For example, fast food restaurants that were required to label calories on the menu increased their healthier food options compared to fast food restaurant who were not required to label calories (Namba et al., 2013)—although, from current evidence, it seems not likely that consumers will choose the healthier options because of calory disclosure alone (Sinclair et al., 2014). The effect that conflicted people will change their behavior for the better even if no reaction by recipients is expected is described as the *telltale heart effect*[11]. Transparency guidelines were expected to have such an effect, for example by then-U.S. senator McCaskill who said about the PPSA he believes "that by bringing light to these relationships, this legislation will go far by reducing big drug companies' influence on the business of medicine" (reported by Grassley, 2007, para. 4).

It seems not rational that disclosure makes conflicted parties change their behavior although recipients do only pay limited attention to the disclosed information. It nevertheless happens, and this is explained by the *spotlight effect* (Gilovich et al., 2000), which describes that people in some situations overestimate how much other people are looking at them: People who disclose a conflict of interest may have the impression that lots of people will pay attention towards the disclosed information, feel guilty about it, and hence, adjust their behavior. Loewenstein et al.

[11] named after Edgar Allen Poe's short story (1843), in which a murderer confesses a crime because he is afraid the police will hear the dead man's heart beating and find him out.

(2014) raise the question of whether this positive second order effect of disclosure will persist if the conflicted persons realize the limited impact of the disclosed information.

In summary, transparency guidelines might lead conflicted parties to change their behavior for the better (e.g., avoid a conflict of interest) because of an exaggerated impression of how this disclosed information affects the public. However, it is unclear whether this positive second order effect of disclosure persist if conflicted parties realize the actual impact of the provided information.

1.3.2.3. Social Norms. While the considerations on limited attention made before help to explain how humans process information with regard to disclosure, another psychological perspective can be taken by investigating predictors of behavior. One strong predictor of behavior is how normal the behavior is judged by the individual person, the *social norm* (see e.g., Ajzen, 1985; Chung & Rimal, 2016), which may play an important role in conflict of interest management (Sah, 2017).

In terms of the subject of this thesis, social norms regarding two kinds of behavior are worth a look: Firstly, physicians' acceptance of money by the industry: Can disclosure affect social norms and thereby influence future acceptance of money? Secondly, the disclosure of payments in case of voluntary transparency regulations: How far can disclosure-related social norms predict future disclosure behavior?

Social norms describe people's perceptions about what relevant others expect them to do. It is differentiated between descriptive norms (popularity of behavior) and injunctive norms (societal approval of behavior) (Chung & Rimal, 2016). Descriptive norms are based on the perception of the prevalence of the behavior, i.e., what others

actually do. Injunctive norms, contrarily, concern the underlying values, namely the perceived shared beliefs of a social group, i.e., what others think should be done.

The first behavior of interest mentioned above—accepting money by the industry—is likely to be influenced by the descriptive norm (e.g., how many physicians in the surroundings also accept money by pharmaceutical companies) as well as by the injunctive norm (e.g., whether the acceptance of money from pharmaceutical companies is an approved part of being a physician). The earlier mentioned social reliability heuristic derives from these concepts. Transparency is likely to play an important part: The provision of information regarding how many physicians actually accept money may likely impact individual's descriptive norm of the acceptance of money. Furthermore, evidence shows that the more frequently a behavior is observed, the more likely an individual judges this behavior as normal (Asch, 1955). Therefore, the acceptance of money, if shown to be of high prevalence, will be seen as part of the profession to be a physician; descriptive and injunctive norm will interact and thereby, transparency of financial payments could lead to an increase in the subjective impression of how "normal" it is to accept money—not only by physicians, but also in the public. Such considerations not only concern the fact that money is accepted, but also the amount of accepted sums. Transparency could thereby lead to a changed perception of which monetary sum is appropriate or "normal" to be received by pharmaceutical companies, which is another possible side effect of disclosure that has not been paid attention to so far.

Regarding the second behavior of interest—voluntary disclosure—it is the decision to disclose payments that is likely to depend on social norms: the descriptive norm describes how many physicians also decide to disclose payments and the injunctive norm describes whether disclosure is judged to be appropriate by

significant others. One important marker for the descriptive norm of voluntary disclosure in a nation-wide transparency regulation is the overall consent rate, e.g., how many of all German physicians decide to disclose their payments. Notably, this rate not only depends on those who give their consent on disclosure (i.e., the HCPs), but also on those responsible for the regulation (i.e., the pharmaceutical companies who ask for consent).

In these stated cases of the interplay of social norms and transparency of financial conflicts of interest, other persons' judgments play a crucial role regarding what behavior is seen as "normal". Again, this underlines the importance of bringing everyone involved in transparency guidelines aboard, namely the conflicted HCPs as well as the public. They need to be educated about the background of the regulation so that they are able to understand and interpret the provided information and judge accordingly. Experts therefore prompt the medical community to help patients understand how to interpret the disclosed information (Borden 2018; Thacker et al., 2016). Regarding this issue, the media could play an important role, as a powerful influence on the perception of society issues. In advice-giving situations, accompanying education about bias risk could help recipients to process the provided information.

To conclude: Nation-wide transparency guidelines lead to new information regarding the financial interactions between pharmaceutical industry and the health care sector. This could affect the social norms related to accepting payments by the pharmaceutical industries and the disclosure of those. In case of voluntary disclosure, the disclosure consent rate is likely to be a critical factor for the perceived norm to disclose.

1.3.2.4. Moral Licensing and Strategic Exaggeration. As mentioned earlier in this chapter, conflict of interest disclosure can lead to more bias in advice through moral licensing and a strategic exaggeration effect. These effects describe that advisors who disclose a conflict of interest might give even more biased advice than advisors who do not disclose their conflict of interest. Disclosure, then, backfires. Explanations for these effects can be found in human cognitions, experimentally investigated in the behavioral economics. Notably, in the following described experiments it is clearly controlled that the conflicted advisors themselves actively disclose information about their conflicts of interest, and no third party is involved. If a third party discloses the conflict of interest, the following stated second order effects of disclosure are dependent on how either advisor and advisee are aware of the disclosed information.

In a classic advice-giving situation, strategic considerations may involve deliberate thoughts by advisors on how they can maximize their payoff. Cain et al. (2011) designed a study where participants were told to imagine giving advice to another person whose aim was to estimate the number of jelly beans in a pictured jar. While the other person only knew that there were many jelly beans, the advisors knew the exact amount: 2,400 jelly beans. Advisors were told that they were paid according to how much the other person, after having received the advice, overestimates the number of jelly beans, which led to a financial conflict of interest. It was varied whether advisors had to disclose this information or not. Afterwards, advisors were asked to give freehand responses on their actual thought processes: 35% reported to have strategically restraint and 50% reported to have strategically exaggerated their advice in order to receive a higher payoff.

A second study was designed to examine how disclosure affects the perceived morality of giving biased advice. In a similar setting as in the first study, participants were asked to rate the ethicality of suggesting a high number of jelly beans in the hope that the other person will overestimate; it was further varied whether participants had to disclose their payment modality (i.e., receiving a higher payoff if the other person overestimates) or not. The results show that the participants rated biased advice on average as "somewhat ethical" if the conflict of interest was disclosed, compared to "somewhat unethical" if the conflict of interest was not disclosed.

These studies show that, if advice is linked to higher payoff, it makes a difference whether this conflict of interest must be disclosed or not—and this difference can be explained by strategic cognitions and moral considerations. However, in these studies it is only manipulated whether payment modalities are disclosed or not; the disclosed conflict of interest is not further explained to the recipients. To educate recipients about bias risk could not only help them to interpret the given advice but also moderate the bias on the part of advisors: Advisors might consider the recipient's education into their moral or strategic cognitions, so recipient education could change the amount of bias in advice.

1.3.2.5. Personality. It is now apparent that psychological heuristics as well as human's limited attention span and social norms may play an important role regarding general effects of conflicts of interest and disclosure. However, humans also react differently not only just dependent on the situation, but also dependent on their personality structure.

An established taxonomy for personality traits is the *Big Five* model (e.g., Asendorpf & Neyer, 2012; Goldberg, 1993; McCrae & John, 1992). The underlying

theory provides five factors: openness, conscientiousness, extraversion, agreeableness, and negative emotionality. Each factor stands for one broad dimension to describe human personality.

For example, it was found that people with higher conscientiousness performed better in integrity tests (Murphy & Lee, 1994). Further studies showed that personality structure affected ethical decision-making of scientists in training (Antes et al., 2007): In a study of graduate students, entitlement—a dimension of narcissism—was negatively related to ethical decision-making in all investigated areas. Cynicism was modestly negatively correlated with ethical data management and professional practices, whereas basic personality characteristics showed weaker and less consistent correlations. The authors argue that narcissism and cynicism involve self- and other-perception and are therefore relevant in ethical decision-making situations that involve other people (Antes et al., 2007). Another study, investigating psychiatry physicians, found that Machiavellianistic traits—as opposed to self-esteem, narcissistic or psychopathic traits—were significantly associated with self-reported research misbehavior of scientists (Tijdink et al., 2016); and a pilot study of 167 researchers in counseling found that in parts of the sample, a higher sense of entitlement became maladaptive to counseling (Davis et al., 2011).

While there is some evidence on the relation of narcissism and ethical behavior in scientists, the relationship of conflicts of interest, disclosure and personality structure seems understudied. Knowledge about individual differences regarding bias after disclosure could help to tailor regulation guidelines, and further improve our understanding on how bias in advice-giving generally or in medicine particularly works.

1.4. Contribution of This Thesis

Loewenstein et al. (2014) proposed a taxonomy of the different ways to investigate disclosure (Table 2), thereby pointing out the diversity of current empirical research methods that are used to investigate disclosure. They stress that the interaction between demand side (i.e., recipients) and supply side (i.e., disclosers) is of particular importance in the context of disclosure, and therefore studies that investigate these both dimensions simultaneously, falling into the far right column of Table 2, are considered the gold standard of methods to investigate disclosure effects. Also, study quality improves from the first to the fourth row of the table.

Table 2

Taxonomy of Information Disclosure Research Methodologies

Method	Study focus		
	Demand side	Supply side	Demand and supply side
Hypothetical choice	I	II	III
Laboratory experiments with real payoffs	IV	V	VI
Case studies	VII	VIII	IX
Field experiments	X	XI	XII

Note. Reprinted from "Disclosure. Psychology changes everything," by Loewenstein, G., Sunstein, C.R., & Golman R., 2014, *Annual Review of Economics*, *6*, p. 399. Copyright 2014 by Annual Reviews.

In this work, I will contribute to the outlined evidence on conflict of interest disclosure. Considering the taxonomy of information disclosure research methodologies by Loewenstein et al. (2014), it is a further aim to provide high-quality methods by either using field data or by taken into account the interaction between recipients and disclosers. The psychological perspective on unintended effects of conflict of interest disclosure will be investigated in the following ways:

Firstly, I will focus on disclosed information: Through an analysis of the disclosed content in the nation-wide transparency guideline in Germany and the willingness of German HCPs to disclose, I aim to provide knowledge about the prevalence of disclosed financial conflicts of interest in the German health care sector, thereby focusing on the voluntary characteristic of the database, on individual differences in disclosing behavior and disclosed content, and on change in disclosing behavior and disclosed content over time.

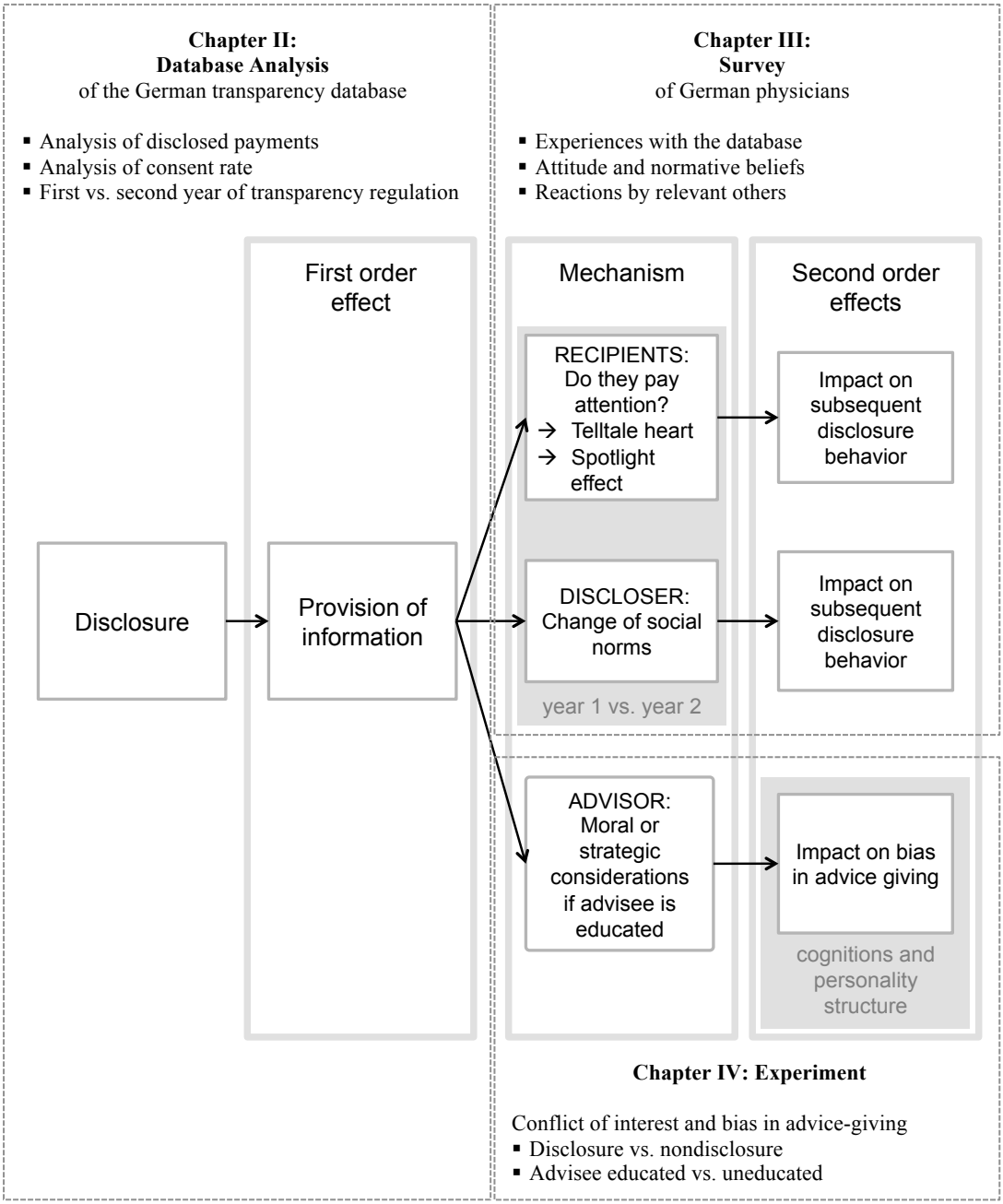
A second focus will be on the attention that is paid to the disclosed information (in the present study: prevalence of financial conflicts of interest in the German health care sector) and how this information affects a) physicians who gave their consent for disclosure and b) the relationship between physicians and patients, colleagues or their private surrounding. The aim is to investigate the experiences of physicians with the German transparency guideline regarding their use of the database, the reactions they experienced by possible recipients of the disclosed information (patients, colleagues, or in their private surrounding) as well as the physicians' general attitude towards transparency and their perceived social norms regarding the German transparency regulation. I will further investigate whether these factors lead to second order effects on subsequent disclosing behavior.

Lastly, disclosure within a professional relationship will be investigated by translating the scenario of advisors who disclose their conflicts of interest towards an advisee into a behavioral experiment. I aim to contribute to the economic behavioral approach by investigating the potential role of education in an advice-giving scenario while varying whether the conflict of interest needs to be disclosed. In this experiment, I will also explore the differential perspective on second order effects of disclosure by investigating psychological mechanisms, particularly how participants' cognitions and their personality traits relate to bias after disclosure.

These outlined aims can be further summarized into a theoretical framework depicted in Figure 1. The database analysis described in chapter 2 will focus on field data of disclosed information, thereby investigating the current state of the art in the German transparency regulation. A detailed examination of German HCPs' commitment to engage in this transparency database may provide first indications for second order effects of such disclosure. The survey described in chapter 3 and the experiment described in chapter 4 both investigate second order effects of disclosure on behavior, thereby considering psychological mechanisms, namely attentional processes that are described by the telltale heart effect and the spotlight effect as well as normative assumptions, strategical considerations and personality dimensions. The framework of this dissertation thereby covers high-quality methodological approaches that involve the interaction between disclosers and recipients as well as comprises relevant theoretical concepts.

Figure 1

Theoretical Framework



Chapter II:

Voluntary Disclosures of Payments From Pharmaceutical Companies to Healthcare Professionals in Germany – a Descriptive Study of Disclosures in 2015 and 2016[12]

[12] This chapter is based on the publication: Stoll, M., Hubenschmid, L., Koch, C., Lieb, K. (2020). Voluntary disclosures of payments from pharmaceutical companies to healthcare professionals in Germany: a descriptive study of disclosures in 2015 and 2016. *BMJ Open*, Article e037395. https://doi.org/10.1136/bmjopen-2020-037395 ; formatting was adjusted to APA style for the present dissertation, corresponding to the submitted manuscript of the publication.

2. Voluntary Disclosures of Payments From Pharmaceutical Companies to Healthcare Professionals in Germany – a Descriptive Study of Disclosures in 2015 and 2016

2.1. Background

Pharmaceutical companies pay large sums to physicians to support their continuing medical education, to pay for lectures, meals, travel, speaking and consulting, and to support drug research (Agrawal & Brown, 2016; Bekelman et al., 2003). In 2017, $8.4 billion were paid by U.S. pharmaceutical companies to about 628,000 U.S. physicians and 1,100 teaching hospitals (Sullivan, 2018). Studies show that in 2017, nearly half of all U.S. physicians received payments by a pharmaceutical company (Tringale et al., 2017) and between 2015 and 2017, pharmaceutical companies paid $5.8 billion to U.S. physicians with estimated mean annual payment values of about $1000 – $4700 per physician (Inoue et al., 2019). Such financial ties create conflict of interests (COIs), that is, the risk that the professional judgment or action of a physician or researcher is unduly influenced (IOM, 2009; Koch et al., 2016; Thompson, 1993). Indeed, a large body of evidence exists that industry sponsorship is related to research outcomes (Bekelman et al., 2003; Lundh et al., 2017; Schott, Pachl, Limbach, Gundert-Remy, Ludwig & Lieb, 2010; Schott, Pachl, Limbach, Gundert-Remy, Lieb & Ludwig, 2010) and may influence physicians' prescribing patterns (Brax et al., 2017; Brunt, 2019; DeJong et al., 2016; Lieb & Scheurich, 2014; Sharma et al., 2018).

Some form of regulation regarding pharmaceutical companies' disclosure of such financial ties to the public exists in many countries worldwide but these rules vary considerably (MHE, 2019; Fabbri et al., 2018). One important difference is whether pharmaceutical companies' disclosure is based on legally binding laws and

therefore mandatory or whether disclosure is introduced through self-regulation codices by the pharmaceutical companies themselves. Legally binding disclosure laws have been implemented in the United States through the Physician Payment Sunshine Act (Ornstein, 2017), but also in Australia, France, Belgium, Portugal, Denmark and Romania (Fabbri et al., 2018; Grundy, Habibi, et al., 2018; MHE, 2019). In contrast, some European countries such as Germany, Italy and Spain have no transparency laws but leave transparency entirely to a self-regulatory approach of the pharmaceutical industry, implemented in form of a Disclosure Code by the European Federation of Pharmaceutical Industries and Associations (EFPIA; EFPIA, 2014). Combined with data protection laws this means in Germany that payments are only made transparent if the individual healthcare professional (HCP) agrees. Therefore disclosure is voluntary, because companies are not allowed to publish individual information without consent. Another major difference between disclosure policies is whether the disclosed information is aggregated centrally or exists only on the different pharmaceutical companies' websites. The U.S. Open Payments website for example provides a publicly visible search interface that supports the search of the individual HCP and provides analyzable files for free download. In most European states, however, the information is only provided on the websites of the pharmaceutical companies in non-searchable and non-analyzable documents.

Voluntary disclosure databases have been described for Great Britain (Mulinari & Ozieranski, 2018) and Austria (Mantsch et al., 2016), by analyzing disclosed payment sums by the pharmaceutical companies. However, to the best of our knowledge, the disclosure behavior of individual HCPs in voluntary databases has not been examined in detail before. In the current study, we analyzed disclosed data from 54 pharmaceutical companies representing about 75% of the German

pharmaceutical industry market for prescription drugs (vfa & FSA, 2016; vfa & FSA, 2017). The database is unique as it not only allows for analysis of the number of HCPs that agreed to the disclosure of their financial ties and the amount of annual disclosed payments, but also allows to examine individual HCPs' disclosing behavior, i.e., whether HCPs agreed to disclosure only in one year or repeatedly in both years. The objective of this study was therefore to investigate (1) how many German HCPs agreed to disclose their payments in the database in total and per year, and whether they agreed to disclose repeatedly or only once, (2) how much money was disclosed (a) in total and (b) on average per HCP, and (3) how payment amounts differ with respect to disclosure behavior, year of disclosure, gender and academic degree of the disclosing HCP.

2.2. Methods

2.2.1. Database

Since 2016, German pharmaceutical companies organized in the association of voluntary self-regulation in the pharmaceutical industry (Freiwillige Selbstkontrolle für die Arzneimittelindustrie e.V., FSA) have agreed to annually publish documents on their homepages containing information about transfers of value (ToVs) to healthcare organizations and individual HCPs during the previous year, in the context of a transparency codex. Due to data protection laws in Germany, pharmaceutical companies are not allowed to make the ToV to individual HCPs public without their consent. Thus all individual disclosures are voluntary for the HCP. HCPs are free to disclose none, some, or all payments made to them. Where consent cannot be acquired, companies publish aggregated data for this year. Irrespective of this, all ToVs related to research and development are disclosed in aggregated form without

identification of individuals (FSA, 2019). The codex further determines the location of the disclosure—the companies' public websites—and provides a non-binding example for the structure of the disclosure document, but otherwise it does not state how disclosure should occur. In the past, this resulted in different document formats from different companies, of which many were non-searchable. The FSA explicitly does not aim to aggregate these data (FSA, 2015). In Germany, first data of the transparency codex were published in summer 2016 for the payments of the year 2015.

The German non-profit investigative journalism newsroom CORRECTIV combined the separate disclosure documents for the years 2015 and 2016 into the database "Euros for Doctors", aiming to integrate the companies' individual data per HCP. Based on extrapolations using the total amount of payments spent by pharmaceutical companies to HCPs and the disclosed payment sums per HCP, CORRECTIV estimated the number of HCPs who received payments by these companies to be 71,000 in 2015 and 66,000 in 2016 (Grill & Wehrmeyer, 2017).

The publicly available online version of the CORRECTIV database offers a search tool by which individual HCPs can be searched by name, location or postcode. All individual entries are headed with "Mr / Ms [name of HCP] agreed to disclose the following payments:" and include a table with all ToV the HCP agreed to disclose. Each entry concludes with the overall payment sum the HCP received in that year. In the case that data for one year are missing, it is not apparent whether HCPs did not agree to disclose the payment or whether they did not receive any payments that year. CORRECTIV provided us with the data behind this database in form of an analyzable excel sheet which contained the following information for each HCP who is listed in the "Euros for Doctors" database: name, academic degree, gender, address, number of

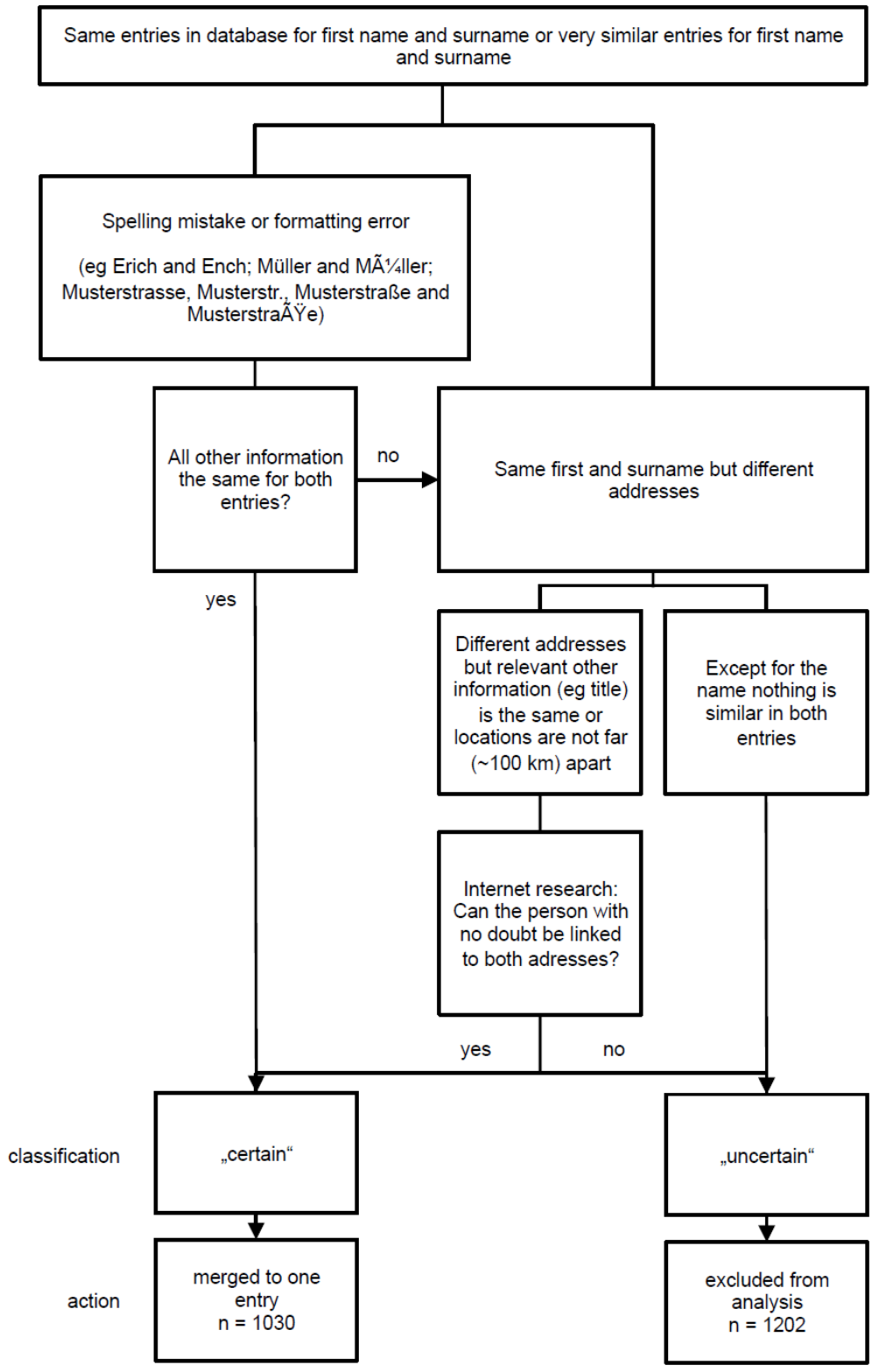
companies from which payments were received for 2015 and 2016, and disclosed annual payment sums in 2015 and 2016. We therefore could not distinguish between different kind of payments or companies. Data of the pharmaceutical companies' total payment amounts were taken from press releases by the FSA (vfa & FSA 2016; vfa & FSA 2017).

2.2.2. Procedure

2.2.2.1. Preparation of the Database. CORRECTIV's data collection for the "Euros for Doctors" database was machine-based. Parts of the pharmaceutical companies' documents were in a non-editable format, leading to spelling errors that complicated the correct mapping of payments to HCP. We, therefore, screened the data for duplicates (see Figure 2) and matched entries that obviously belonged to the same person but were separated because of, e.g., two working addresses or typing errors – 2,076 double or triple entries were found and could be merged into 1,030 entries. 1,202 duplicates could neither be traced to one HCP, nor could we identify an obvious error, so we excluded these entries from further analyses.

Figure 2

Decision Tree for Handling of Duplicate Entries in the Database



2.2.2.2. Endpoints of Interest. The main outcomes of the analyses were the number of HCPs who disclosed at least one payment in the database, further separated by year of disclosure and disclosure behavior; and the amount of disclosed payments as well as distribution parameters of disclosed annual payment sums per person, separated by year of disclosure and disclosure behavior.

2.2.2.3. Analysis. First, we analyzed the number of HCPs who disclosed their received payments in total, dependent on year (2015 vs. 2016) and disclosure behavior (repeatedly vs. once). We then examined the total amount of disclosed payments as well as the annual disclosed payments and number of companies from which HCPs received payments per person. To gain insight in the distribution of payment sums, the median, interquartile range (*IQR*) and the 99th percentile was calculated. These analyses were also examined separately for year, disclosure behavior, gender and academic degree. For quantification of the differences between various groups of HCPs regarding payment amount, we calculated two-sided nonparametric tests and separated the analyses into examination of independent samples on the one hand and dependent samples on the other. For the comparison of two independent samples, Wilcoxon rank-sum tests, and for the comparison of three independent samples, Kruskal-Wallis tests were conducted. For dependent samples, Wilcoxon signed-rank tests were performed. Effect sizes are given as rank-biserial correlation r_b (Wilcoxon tests) and epsilon squared ε^2 (Kruskal-Wallis test) with the corresponding 95% confidence intervals (CI).

Analyses were done in JASP version 0.10.2 (JASP Team, 2019), RStudio, R version 3.6.1 (R Core Team, 2019), and Microsoft Excel (2011).

2.2.3. Patients and Public Involvement

Patients or the public were not involved.

2.3. Results

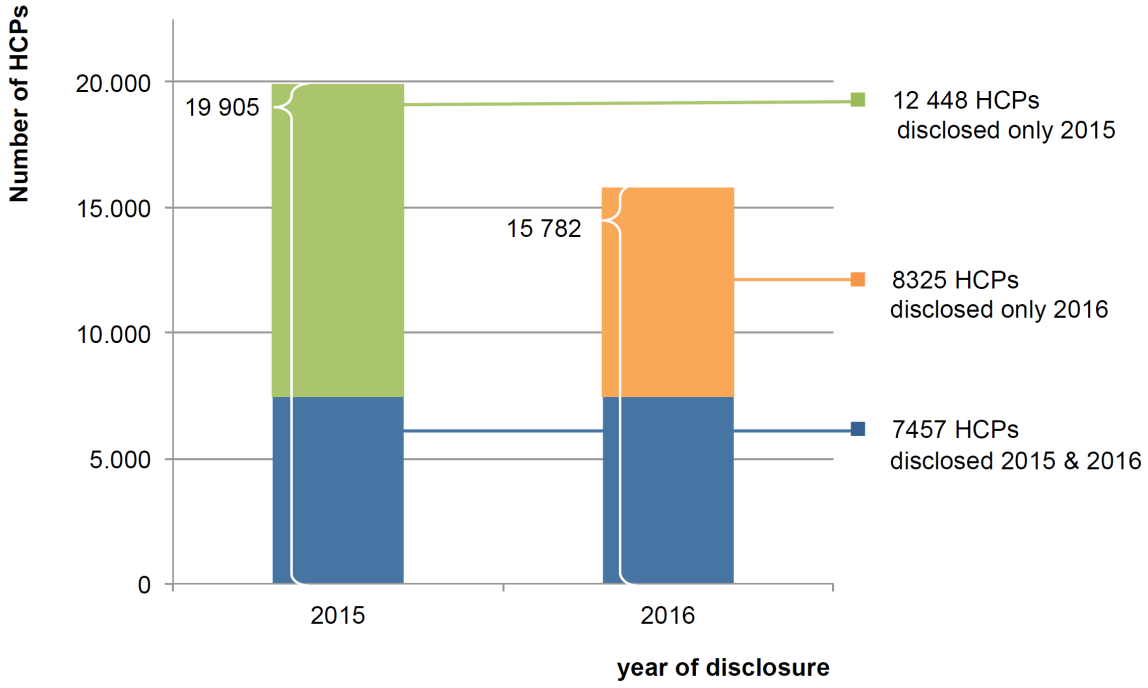
2.3.1. Number of HCPs who Disclosed Payments

In total, 28,230 HCPs disclosed payments in at least one year. Figure 3 shows the total number of HCPs separated by year and disclosure behavior. The total number of HCPs decreased from 2015 to 2016 by 21%. Of all HCPs, 26% agreed to disclose repeatedly in both years, and 74% only in one year (44% in 2015, 29% in 2016).

The proportion of HCPs who disclosed payments in relation to the number of HCPs who received payments (as estimated by CORRECTIV) was about 28% in 2015 (19,905 / 71,000) and 24% in 2016 (15,782 / 66,000).

Figure 3

Number of HCPs who Disclosed Their Annual Payment Sums per Year, Separated by Disclosure Behavior (Onetime vs. Repeated Disclosure)

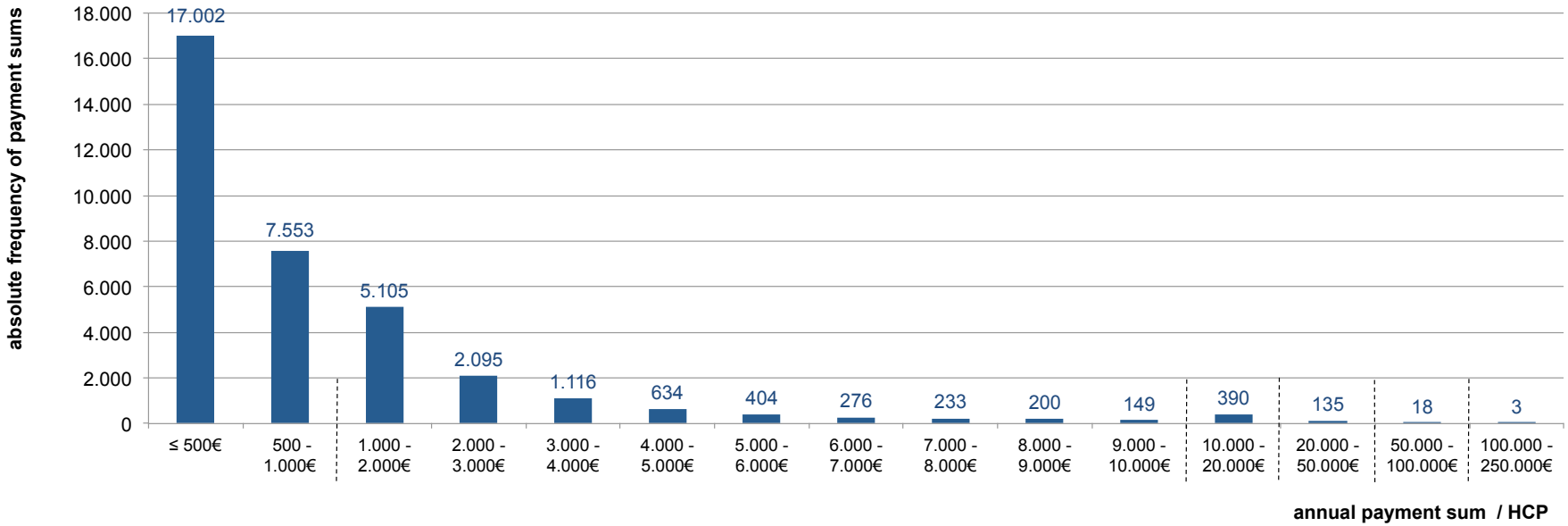


2.3.2. Amount of Disclosed Payments

2.3.2.1. Total Payment Amounts. The investigated 54 companies paid 119,000,000 € to HCPs in 2015 and 105,000,000 € to HCPs in 2016, resulting in a total of 224,000,000 € (FSA, 2016; FSA, 2017). Summarized over both years, 55,716,063 € (25%) of payments were disclosed in the form of 35,687 annual payment sums. The minimum disclosed annual payment sum per person was 1 € and the maximum sum 200,194 €. The mean annual payment sum per person was 1,561 € (*SD* 4,221 €). Half of all HCPs disclosed annual payment sums of 536 € or less (*IQR* 1,092 €). The top percentile included payments equal or larger than 17,049 €. This indicates a distribution of annual payment sums per person that is strongly skewed to lower payments, see Figure 4.

Figure 4

Absolute Frequencies of Disclosed Annual Payment Sums in Respective Categories 2015 - 2016 up to the Maximum Amount of Payment



2.3.2.2. Disclosed Payment Amounts in 2015 vs. 2016. A higher percentage of the total sum of payments was disclosed to HCPs in 2015 (32,426,721 €/119,000,000 €; 27%) than 2016 (23,289,343 €/105,000,000 €; 22%). The total amount of disclosed payments per year decreased by 28% from 32,426,721 € in 2015 to 23,289,343 € in 2016. The mean annual payment sum per person decreased by 9% from 2015 to 2016 (see Table 3 for further descriptive data). In 2015, the top ten highest annual payment sums per person summarized to 1,048,929 €, meaning that the ten HCPs with the highest payments disclosed 3% of the total disclosed payments; in 2016, the top ten highest annual payment sums summarized to 845,597 €, which is 4% of the disclosed payments.

On average, an HCP received payments from 2 pharmaceutical companies per year (*Mdn* = 1) both in 2015 and 2016. The top percentile for company count per HCP was 10 in both years, which means that 99% of HCPs received payments by less than 10 pharmaceutical companies per year. The HCP with the highest company count per year received payments by 31 pharmaceutical companies in 2015 and by 28 companies in 2016.

Table 3

Disclosed Annual Payments per Person and in Total, Separated per Disclosure Behavior, Gender and Academic Degree for Each Year

	2015						2016						2015 and 2016	
		amount of disclosed annual paym. per person in €						amount of disclosed annual paym per person in €						
	n (paym.)	*M* (*SD*)	*Mdn* (*IQR*)	*Min*[a]	99th Perc	*Max*	*n* (paym.)	*M* (*SD*)	*Mdn* (*IQR*)	*Min*[1]	99th Perc	*Max*	total *n*	total amount in €
All	19,905	1,629 (4,363)	551 (1,162)	1	17,429	200,194	15,782	1,476 (4,033)	516 (1,033)	1	16,667	199,775	35,687	55,716,063
Disclosure behavior														
Once	12,448	1,021 (2,367)	452 (773)	1	10,082	61,380	8,325	760 (1,490)	387 (660)	1	6,352	59,250	20,773	19,035,707
Rep.	7,457	2,644 (6,310)	899 (2,102)	4	26,735	200,194	7,457	2,275 (5,544)	790 (1,732)	1	23,198	199,775	14,914	36,680,357
Gender														
Female	7,516	935 (2,298)	380 (669)	3	9,651	85,062	6,122	830 (2,103)	347 (619)	1	8,547	69,906	11,375	12,108,475
Male	12,385	2,051 (5,188)	741 (1,492)	1	21,866	200,194	9,655	1,886 (4,832)	712 (1,353)	1	19,859	199,775	16,848	43,601,289
Academic degree														
Prof.	1,764	5,675 (10,740)	2,404 (5,309)	4	46,493	200,194	1,463	4,904 (9,756)	2,062 (3,928)	3	50,609	199,775	2,211	16,885,282
Dr.	8,370	1,650 (3,608)	669 (1,301)	3	15,657	86,654	6,398	1,512 (3,371)	629 (1,167)	1	15,938	70,923	11,005	23,623,640
None	9,771	881 (1,817)	393 (6,86)	1	9,040	57,787	7,921	813 (1,745)	375 (647)	2	7,879	54,483	15,014	15,207,142

Note. Paym = payments; Perc = Percentile.

[a] In contrast to other databases, there is no threshold for disclosure. $N = 87$ HCPs received annual payments sums ≤ 10 €; the reasons for these low payments are unclear.

2.3.2.3. Comparison of Disclosed Payments: Year and Disclosure Behavior. Table 3 shows descriptive statistics split up for disclosing behavior and year of disclosure and Table 4 shows the quantification of differences between the analyzed groups.

Regarding year of disclosure, those who agreed to disclose only once in 2015 disclosed slightly higher payments than those who disclosed only once in 2016, as indicated by a Wilcoxon rank-sum test with a trivial effect size of r_b = .07 [.06; .09]. Those who agreed to disclose both in 2015 and 2016 also showed slightly higher annual payment sums in 2015 than in 2016, indicated by a Wilcoxon signed-ranked test with a small effect size of r_b = .14 [.12; .17]).

Regarding disclosure behavior, those HCPs who disclosed only in one year disclosed lower payments than HCPs who agreed to disclose in both years, with a medium effect sizes as indicated by a Wilcoxon rank-sum test, r_b = -.31 [-.32; -.29] (see Table 4 for similar results for 2016).

Table 4

Effect Sizes and 95% CI for the Comparison of Various Groups Regarding Annual Payment Amounts per Person

Independent variable	Factor levels	Effect size [95% CI]
Disclosure behavior: once		
Year	2015 vs. 2016	r_b = .07 [.06, .09]
Disclosure behavior: repeatedly		
Year	2015 vs. 2016	r_b = .14 [.12, .17]
2015		
Disclosure behavior	Once vs. repeatedly	r_b = -.31 [-.23, -.29]
Gender	Male vs. female	r_b = .28 [.26, .29]
Academic degree	None vs. Dr. vs. Prof.	ε^2 = .12 [.11, .13]
	None vs. Dr.	r_b = -.24 [-.25, -.22]
	None vs. Prof.	r_b = -.68 [-.69, -.66]
	Dr. vs. Prof.	r_b = -.51 [-.53, -.49]
2016		
Disclosure behavior	Once vs. repeatedly	r_b = -.32 [-.34, -.31]
Gender	Male vs. female	r_b = .31 [.30, .33]
Academic degree	None vs. Dr. vs. Prof.	ε^2 = .12 [.11, .13]
	None vs. Dr.	r_b = -.21 [-.23, -.20]
	None vs. Prof.	r_b = -.68 [-0.70, -.66]
	Dr. vs. Prof.	r_b = -.50 [-.53, -.48]

Note. r_b = rank-biserial correlation: positive values indicate that the after scores are smaller than the before scores.

2.3.2.4. Comparison of Disclosed Payments: Gender and Academic Degree.

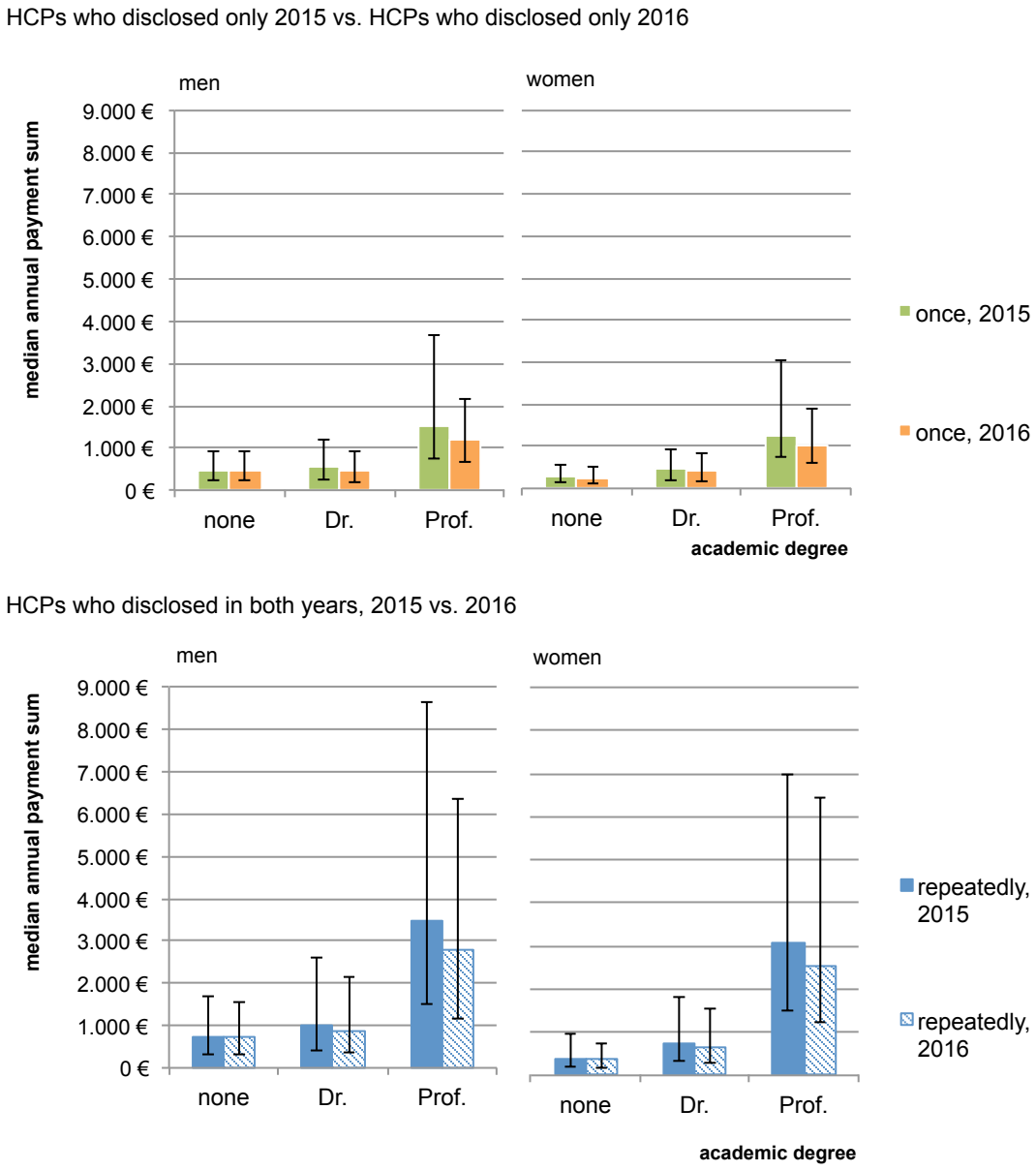
The descriptive annual and total payment sums and absolute frequencies separated by gender and academic degree can be seen in Table 3. Of all 28,230 HCPs, 40% were female and 60% were male. Regarding academic degree, 8% had a German post-doctoral degree ("habilitation" / "Prof."), 39% had a doctoral degree but no habilitation, and 53% had no academic degree stated.

The proportion of female HCPs in our sample was higher for those who agreed to disclose only once: 44% female vs. 56% male, compared to those who disclosed repeatedly: 30% female vs. 70% male. In 2015 (see Table 4 for similar results for 2016), male HCPs disclosed higher annual payment sums than female HCP, indicated by a Wilcoxon rank-sum test delivering a small effect size: r_b = .28 [.26, .29].

The proportion of habilitations and doctoral degrees in our sample was higher for those who disclosed only once: 6% habilitation vs. 35% doctoral degree vs. 59% no academic degree, compared to those who disclosed repeatedly: 14% habilitation, 50% doctoral degree, and 36% no academic degree. Academic degree had a medium effect on disclosed payment sums, ε^2 = .12 [.11, .13], as indicated by a Kruskal-Wallis test. Pairwise comparisons indicate that habilitated HCPs disclosed higher annual payment sums than doctoral HCPs and those without academic degree; and doctoral HCPs disclosed higher annual payment sums than those without academic degree (see Table 4 for further details). Median annual payment sums including *IQR*, separated by year of disclosure, disclosure behavior, gender and academic degree are depicted in Figure 5.

Figure 5

Median Annual Payment Sums With Interquartile Range Separated by Year, Disclosing Behavior, Gender, and Academic Degree



2.4. Discussion

2.4.1. Principal Findings

To our knowledge, this is the first analysis of a two-year database of voluntary disclosures of payments from pharmaceutical companies to HCPs allowing for a detailed description of disclosing behavior of individual HCPs. Our analyses showed that the amount of disclosed payments, as well as the number of HCPs who agreed to disclose payments, decreased over the period of two years. Furthermore, of all HCPs disclosing at least one payment in 2015 and 2016, only 26% disclosed payments in both years. The disclosures by German pharmaceutical companies can therefore be described as a very fragmented and limited insight into the actual interactions with German HCPs. The distribution of disclosed annual payment amounts was skewed to lower amounts of payments with half of all disclosing HCPs disclosing annual payment sums up to 536 €, while one percent of HCPs disclosed payment sums of 17,049 € to 200,194 €. This is comparable to the distribution of non-voluntary disclosed payments in the United States (Inoue et al., 2019): a large proportion of the total payments is concentrated among few physicians, whereas many physicians receive comparable smaller amount of payments.

We observed that on average, female HCPs disclosed lower amounts of payments than male HCPs and HCPs with lower academic degrees disclosed lower amounts of payments than HCPs with higher academic degrees. This is comparable to studies from the United States that have shown that male physicians (Inoue et al., 2019; Tringale et al., 2017; Weng et al., 2019), physicians who have been practicing longer, and those who graduated from a top-ranked U.S. medical school receive higher industry payments (Inoue et al., 2019). These factors, however, might interact at various levels: e.g., women are less likely to attain senior-level positions, and

therefore are more likely to have lower academic degrees (Carr et al., 2017; Carr et al., 2018).

2.4.2. Findings in Context

It is often argued by pharmaceutical companies that adherence to self-regulation codices like the EFPIA provides a sufficient basis for transparency of payments to HCPs (FSA, 2019). Based on our data, we would argue against this view as only approximately a quarter of all payments were disclosed. Comparison of disclosure rates to other countries providing voluntary transparency of payments is difficult since transparency codices can be implemented in many different ways and because companies did not report the number of all HCPs who received payments. However, analyses of comparable European databases for the year 2015 and 2016 show that the proportion of disclosed payments to HCPs in 2015 was higher in Switzerland (estimated 56%) (Gruhnwald et al., 2017) and Great Britain (48%) (Mulinari & Ozieranski, 2018), but even lower in Austria (17%) (Mantsch et al., 2016). In contrast to our finding that disclosure rates decreased from 2015 to 2016, disclosure rates increased from 2015 to 2016 in Switzerland and Great Britain. Even more problematic to analyze is the proportion of HCPs agreeing to disclose payments because pharmaceutical companies in Germany did not give the exact number of HCPs who received payments. Indeed, we only had estimates of those numbers by CORRECTIV and thereof calculated consent rates of 28% (2015) and 24% (2016) (Grill & Wehrmeyer, 2017). In other countries, estimates show a development of consent rates from 2015 to 2016 of 22 to 21% in Austria (Mantsch et al., 2016) and of 56 to 65% in Great Britain (Mulinari & Ozieranski, 2018). The reasons for these discrepancies between countries are unclear but might be found in the different

implementations of the EFPIA. Even within one country, a transparency guideline might be implemented differently by different pharmaceutical companies. The German example shows that there is high variance of consent rates between the companies, ranging from 91% for GlaxoSmithKline (GSK) to 16% for Genzyme (Le Ker & Grill, 2016). In reply to an enquiry by CORRECTIV, the pharmaceutical companies with the highest consent rates stated that they actively endeavored to reach HCPs' consent, e.g., by multiple inquiries if an HCP did not respond. GSK stated that they prefer working with physicians who agree to disclose ToVs and may quit collaborating with HCPs who are not supporting transparency. The companies with the lowest disclosure rates did either not provide a statement, or stated that they requested written consent by HCPs (Le Ker & Grill, 2016). Other factors that influence the consent rate might lie in the communication and framing of the transparency guideline towards the public. Some physicians in Germany reported that they did not disclose because they were afraid the public might get a "false impression" by the disclosed information (Boytchev, 2016). Unfortunately, we have no data regarding these factors, nor on the further development of disclosure rates, as the CORRECTIV database was only available for 2015 and 2016.

2.4.3. Strengths and Weaknesses

A strength of our dataset is that it allowed for an analysis of the individual disclosing behavior of HCPs over two years. Our analyses showed that only 26% disclosed repeatedly. A major weakness of the given database was that no information was available whether HCPs disclosed all their payments or just some; and whether HCPs without an entry did not receive any payments or did receive payments but did not agree to disclose. This left us with the uncertainty that HCPs without an entry in

one or both years could either have decided against disclosure or not have received any payments. An argument for the latter is that the group of HCPs who only disclosed in 2015 disclosed smaller annual payment sums than those who disclosed repeatedly. This group may therefore consist of HCPs who sometimes receive smaller payments and sometimes none at all, whereas repeatedly disclosing HCPs sometimes receive higher payments and sometimes lower payments. If this is the case and payments "naturally fluctuate", however, the consent rate between the years should have been similar, where in reality it decreased from 27% to 22%. Also, in 2015 the ratio of those who disclosed only once was higher than 2016—62% vs. 53% of all disclosing HCPs. This might be a clue that in 2016, more HCPs decided against disclosure. However, from the current body of evidence, we can only speculate.

A further weakness was that the database was not the original database as, e.g., in analyses of Open Payments / Disclosure UK but collected by a third party. This may have created transcription and transmission errors. We worked hard to omit obvious transcription errors by conscientiously examining the duplicates in the database, merging obvious duplicates and deleting cases in which it was unsure whether a transcription error was apparent from the analysis. A standardized procedure that not only builds and maintains a centralized database, but compares disclosed and actually transferred payments and provides the opportunity for HCPs to feedback errors in their entries would contribute to full transparency.

2.4.4. Policy Implications

Our data are of relevance for policymakers. Voluntary disclosure of payments leads to low numbers of physicians agreeing to disclose and are dependent on how the guidelines are interpreted and implemented by those responsible, resulting in a

fragmented picture of the interactions between HCPs and pharmaceutical companies. Full transparency of such payments, therefore, can only be provided if disclosures are required by legislation. In our view, full transparency is necessary for several reasons. Only full transparency provides an unbiased view on the true degree of financial ties between HCPs and pharmaceutical companies. This is the basis for all further measures of COI regulation (Bero, 2017; Grundy, Habibi, et al., 2018; Kanter & Loewenstein, 2019). In addition, patients can use this information to make informed decisions about which physicians to place their trust in, and, under certain circumstances, how to interpret their physicians' recommendations (Bero, 2017; Cain et al., 2011; Grundy, Habibi, et al., 2018; Kanter & Loewenstein, 2019; Koch et al., 2017). All data should be made transparent through user-friendly, searchable and downloadable databases to allow for continuing analysis of interactions between HCPs and pharmaceutical companies.

2.5. Conclusion

This example of a self-regulating transparency codex of German pharmaceutical companies shows that only every third to fourth HCP decides to make their payments by pharmaceutical companies voluntarily transparent, and consent rates decrease over the years. The analysis shows that only a quarter of those HCPs who disclosed 2015 or 2016 disclosed payments in both years. To gain true transparency, disclosed information must be complete. Only on that condition the disclosed information adds value to current discussions about COIs and only then further regulation mechanisms can be discussed and implemented.

Chapter III:

Experiences of Physicians who Disclosed Payments From Pharmaceutical Companies in a Voluntary Transparency Database – a Survey

3. Experiences of Physicians who Disclosed Payments From Pharmaceutical Companies in a Voluntary Transparency Database – a Survey

3.1. Background

In the United States, it is regulated by law that pharmaceutical companies have to publicly disclose all their financial interactions with HCPs. When this transparency regulation was first introduced as PPSA in 2007, then-senator Grassley explained its aim with the following words (Grassley, 2007, paras. 14-16):

> Payments to a doctor can be big or small. They can be a simple dinner after work or they can add up to tens of thousands and even hundreds of thousands of dollars each year. […] Companies wouldn't be paying this money unless it had a direct effect on the prescriptions doctors write, and the medical devices they use. Patients, of course, are in the dark about whether their doctor is receiving this money. The Physician Payments Sunshine Act sheds light on these hidden payments and obscured interests through the best disinfectant of all: sunshine.

Transparency guidelines are often introduced with the aim to "shed light" on formerly unknown information, in this case: information about payments from pharmaceutical companies to HCPs. In the United States, payments by pharmaceutical companies to health care organizations and HCPs are fully transparent since introduction of the PPSA. Payments are publicly disclosed on the searchable Open Payments website (https://www.cms.gov/openpayments). Metaphorically speaking, the transatlantic sun shines bright on the financial interactions between industry and HCPs. In contrast, in Europe, sunlight is partly concealed, since pharmaceutical companies only fragmentarily disclose payments. Here, transparency of interactions between pharmaceutical companies and the health care system is regulated primarily by

voluntary self-regulation of the pharmaceutical industry. Only if HCPs give their consent for public disclosure, the respective financial interaction is disclosed on the company's website.

As outlined in chapter 1, disclosure of financial conflicts of interest can have unintended, so called second order effects. While some research has been done on the experiences of U.S. physicians and patients with the PPSA, there is a lack of evidence concerning experiences with industry-driven transparency regulations like the European approach. Little is known about how being put in the sunlight affects physician-patient relationship of HCPs who voluntarily disclose payments by pharmaceutical companies (e.g., Chimonas et al., 2017). This study therefore aims to investigate the effects of the European transparency regulation on physicians and their relationship with patients in Germany.

3.1.1. Physicians' Experiences With Transparency Guidelines

Few studies evaluating the effect of transparency regulations on the disclosers (i.e., the physicians) and the recipients (i.e., the patients) have been published (Thacker et al., 2014). Chimonas et al. (2017) conducted focus groups with physicians in the United States on their experiences with the PPSA. They found that the physicians did not know much about the PPSA and its background and had only limited experience with the Open Payments website. The physicians interviewed in the study expressed a positive attitude towards the general concept of transparency, but also reported negative experiences, including the administrative burden and inaccuracies in the disclosed data. Also, they felt treated unfairly and were worried the disclosures might mislead patients (Chimonas et al., 2017).

Another source of reports about a voluntary transparency regulation, specifically the German transparency guideline, is a German newspaper article titled "Warum Ärzte schweigen" [Why physicians are silent] (Boytchev, 2016). It is a report about physicians who explicitly decided against disclosure in the German transparency database. The physicians who were interviewed for this article showed similar attitudes to the physicians interviewed by Chimonas et al. (2017). They stated that they approve of transparency in general, but they also said the current regulation was unfair, that the disclosed information was misleading, that patients' trust would suffer and that they did not want critical journalists or their ex-wife to know about their financial interactions with pharmaceutical companies (Boytchev, 2016). However, this was not a representative sample. A systematic survey on that topic has not been conducted yet.

3.1.2. Effects of Recipients' Attention to Transparency Databases on Physicians

One idea behind transparency guidelines in medicine is that the disclosure of conflicts of interest could motivate conflicted persons, i.e., the physicians, to change their behavior for the better. It has been speculated that this mechanism works even though recipients are not aware of the disclosed information (see section 1.3.2.2., and Loewenstein et al., 2014). However, it is currently unclear whether such an effect persists over a longer period of time.

Indeed, physicians who suddenly have to disclose payments might feel ashamed or like they are standing in the spotlight, as reported by the U.S. physicians interviewed by Chimonas et al. (2017). Having disclosed, the feeling of being put in a spotlight may thus lead the disclosing physicians to an adjustment of their behavior. For example, they might subsequently avoid the conflict of interest so that they do not

have to disclose it and don't feel ashamed about it anymore. This effect, however, might cease if disclosers realize that the public is not aware of the disclosed information, as is argued in Loewenstein et al. (2014):

> sellers may well have an inflated sense of the public salience of disclosures, in a phenomenon related to the spotlight effect […] by which people exaggerate how much other people are looking at them. If this is indeed the underlying mechanism, it raises the question whether the effect will persist once sellers likely come to recognize the limited impact of disclosures on consumers. (Loewenstein et al., 2014, p. 404)

Public salience of disclosure is, at least according to a representative survey of 3,542 U.S. citizens in 2014, low: only 12% of the respondents were aware that information about their physicians' payments by pharmaceutical companies was publicly available, and only 5% knew whether their physician had received payments (Pham-Kanter et al., 2017). Another survey in 2015 found that of 1,000 U.S. residents, only 8% had heard of the Open Payments website and even fewer—1.5%—had ever used it (Young et al., 2018). Also, U.S. physicians interviewed in the focus groups by Chimonas et al. (2017) believed that patients were uninterested in the data and that they would not access the data. The German physicians interviewed by Boytchev (2016), contrarily, feared that patients would be misled by the disclosed data and would draw false conclusions, which they named as reasons for why they decided against disclosure in the German database.

In summary, conflicted physicians who believe that patients are aware of disclosed information might show other second order effects of disclosure (e.g., they might feel more ashamed if they experience a direct reaction) than physicians who believe that no one pays attention to the disclosed information. For transparency, it

might therefore play an important role whether physicians notice reactions concerning the disclosed conflicts of interest by recipients. Experiencing reactions as a consequence of disclosure could function as an indication that recipients are aware of the disclosed information. The quality of the reaction (i.e., whether it is negative or positive) may further indicate how recipients interpret the disclosed information. Such reactions could play a role regarding physicians' handling of conflicts of interest in the future and also regarding consent to disclose payments by the industry in a public database.

This study therefore investigates whether German physicians experienced reactions towards disclosed financial conflicts of interest and of what quality these reactions were. A further aim is to investigate the impact of such reactions on future disclosure behavior.

3.1.3. Norms

Social norms represent a shared perception on what behavior a specific group approves of; they are usually not written down or openly discussed (Chung & Rimal, 2016; Lapinski & Rimal, 2005). This perception is reinforced through socially mediated rewards and punishment (Lapinski & Rimal, 2005).

Data disclosed in the context of nation-wide transparency guidelines provides information about the national prevalence of conflicts of interest, which in turn may lead to a new general perspective on the degree to which conflicts of interests are seen as "normal". In case of a voluntary transparency regulation, the nation-wide amount of HCPs who agree to cooperate and disclose their conflicts of interest could be of critical importance for the commitment of HCPs, as it may indicate whether conflict of interest disclosure is seen as "normal" among German HCPs. In the current

example of voluntary transparency guidelines, the perceived prevalence of behavior—the descriptive norm—is of particular interest (see section 1.3.2.3.), as HCPs could base their decision whether or not to consent to the disclosure of payments at least in part on their perception of how many other physicians disclose payments.

As norms are indications for behavior that is accepted by a group (Chung & Rimal, 2016; Lapinski & Rimal, 2005), the first time that area-wide information about the frequency of behavior becomes available may be critical for the establishment of new norms. For the implementation of a nation-wide transparency guideline, there is always a first time point where new information is disclosed to the broad public. In the current example, this was in 2016 for payments in the year 2015, from which point on information was available regarding how many German HCPs decided to disclose payments in the database and how much money they disclosed. Such information could form a new reference frame for what is seen as "normal" behavior.

This first time information is disclosed is furthermore a critical time point because the disclosed information is new to the public, meaning that it may not yet be perceived as "normal" or appropriate but as scandalous. So, in the first year of a voluntary transparency guideline, the media and the public are likely to direct a lot of attention the disclosures, directing the spotlight on those who decided to disclose. By rewarding or punishing the behavior, they may thus reinforce the social norm to disclose. Therefore, recipients may show more extreme reactions toward the person whose information is disclosed (i.e., the physician) in the first year of a transparency database than in the following years. Relevant recipients for information about a physician's payment by pharmaceutical companies are their patients, but also professional contacts or colleagues and persons in their private surrounding.

This study thus investigates how physicians' descriptive norm to disclose (i.e., the estimated prevalence of transparency cooperativeness in Germany) predicts future disclosure behavior; and it further investigates whether reactions by recipients differed between the first and the second year of the transparency guideline.

3.1.4. Germany's Transparency Regulation

The specific German transparency regulation of interest in this study is also outlined in chapter 1.2.4. and 2.2.1. In short, the pharmaceutical companies organized in the FSA passed a self-regulation transparency codex, which requires German HCPs to give consent to each pharmaceutical company if they agree to publicly disclose the payment sums they have received from that company. The companies then disclose single transfers of values on their websites. The investigative newsroom CORRECTIV subsequently gathered all data from pharmaceutical companies that are part of the FSA and established the Euros for Doctors database with the aim to provide easy access to the disclosed information. They accompanied the kick-off of the Euros for Doctors database with investigative articles in collaboration with SPIEGEL ONLINE, which is a popular German online news magazine—the third most-visited German online magazine in 2017 (Schröder, 2017). The subjects of the articles were, among others, background information on the financial interactions between German physicians and pharmaceutical companies and the voluntary nature of the transparency guidelines (https://correctiv.org/aktuelles/euros-fuer-aerzte).

The Euros for Doctors database differs from the German pharmaceutical companies' disclosures regarding the form in which payments are presented: the user interface provides a search function, leading to information on single HCPs, listing all

payments grouped by pharmaceutical companies and year, and the total annual payment sum for the respective year across all pharmaceutical companies.

In conclusion, the information regarding German HCPs' financial conflicts of interest was first disclosed by the pharmaceutical companies and afterwards edited by a neutral third party, the newsroom CORRECTIV. Because of the attention of the news media, it seems likely that German HCPs as well as the public were more aware of the Euros for Doctors database than of the pharmaceutical companies' documents.

For the research question of this study, we focus on physicians' and recipients' experiences with the disclosed information. It is therefore of secondary importance where either of them found the disclosed information. However, the media attention might have had specific unintended effects on both parties, therefore this study will investigate the role of the media in an explorative way.

3.1.5. Study Aim

This study aims to give insight into physicians' experiences with the German transparency regulations. The focus lies on the reactions the physicians experienced, on their perceived social norms and their attitude towards transparency. These factors will be investigated regarding their relation to the physicians' subsequent consent to disclose. Additionally, the time point of disclosure will be considered regarding its impact on the received reactions. To our knowledge, there has not yet been a survey of HCPs who disclosed in such a database. From this survey, one may gain insights into how disclosure guidelines affect physicians and how this, in turn, affects their willingness to comply with transparency guidelines afterwards.

3.1.6. Research Question and Hypotheses

The following research questions and respective hypotheses will be investigated: Research question 1 concerns predictors of the willingness to disclose in the database: Does physicians' subjective appraisal of reactions to disclosure (how pleasant the reactions were experienced) in one year and the descriptive norm to disclose (the subjective impression of how many HCPs decided to disclose) predict the decision to disclose in the following year? Does a positive attitude towards transparency play a moderating role in this relationship?

- Hypothesis 1a: The more unpleasant the reactions were experienced and the lower the percentage of people agreeing to disclose is estimated, the higher the probability that the person decided against disclosure in the following year.
- Hypothesis 1b: A positive attitude towards transparency will moderate the relationships from Hypothesis 1a in such a way that the relationship between predictor (pleasantness of reaction; descriptive norm) and outcome (probability for decision against disclosure) will be smaller if the attitude towards transparency is more positive.

Research questions 2 and 3 concern the difference between the first and the second year of the transparency regulation: Do physicians experience a higher amount of reactions and more negative reactions in the first than in the second year of the regulation?

- Hypothesis 2: Reactions by recipients were more frequent in the first than in the following year.
- Hypothesis 3: Reactions by recipients were more negative in the first than in the following year.

3.2. Method

In order to ask German physicians about their experiences with the transparency guideline, we developed a questionnaire that was sent to 750 randomly chosen physicians who disclosed financial interactions with pharmaceutical companies in Germany. The following section will provide details on the sampling method, the developed questionnaire and the procedure as well as on the main measurements and statistical analyses that were used to answer the above-mentioned research questions.

3.2.1. Sample Plan

The population from which our sample was drawn consisted of the 28,230 HCPs who gave consent to disclose at least one financial interaction with a pharmaceutical company in the German Euros for Doctors database in 2015 or 2016.

3.2.1.1. Inclusion Criteria. For the purpose of the study, we focused on HCPs who firstly, disclosed an annual payment sum ≥ 1,000 € and secondly, worked as physicians at the time point of the survey. The first criterion was chosen to exclude those physicians who only rarely receive payments by pharmaceutical companies, and to focus on those physicians who are more likely to frequently receive payments. 19,267 HCPs with annual payment sums < 1,000 € were sorted out[13]. From the 8,963 HCPs that were left, possible participants were selected (see below). The second criterion was evaluated after selection: for each chosen HCP we verified by internet research whether they currently worked as a physician. If they did not work as physician or no information was available, another HCP with an annual payment

[13] Physicians who disclosed payments in both years were excluded if they disclosed < 1,000 € in both years and were included if they disclosed ≥ 1,000 € in at least one year.

sum ≥ 1,000 € was randomly selected and it was checked whether they worked as a physician. This was repeated until the planned sample size of 150 participants was reached.

3.2.1.2. Sample Stratification. The population from which the sample was drawn was divided into five exclusive groups:

- Group 1: HCPs who disclosed only 2015
- Group 2: HCPs who disclosed only 2016
- Group 3: HCPs who disclosed 2015 and 2016 with an approximately equal annual payment sum in both years
- Group 4: HCPs who disclosed 2015 and 2016 with a relevantly higher annual payment sum in the second year
- Group 5: HCPs who disclosed 2015 and 2016 with a relevantly lower annual payment sum in the second year.

A relevant increase or decline in the annual payment sum was defined as moving up or down at least 10 percentiles between 2015 and 2016. After excluding HCPs with annual payment sums smaller than 1,000 €, an equal number of participants was drawn for the study sample, which then consisted of 2,984 HCPs in group 1, 1,675 HCPs in group 2, 1,621 HCPs in group 3, 1,287 HCPs in group 4 and 1,396 HCPs in group 5.

3.2.1.3. Procedure and Sample Size. For the planned regression model, an analyzable sample size of 150 participants (30 per group) was determined a priori. We chose this sample size because no evidence was available to estimate the expected effect size, therefore we relied on rules of thumbs provided by Green (1991)

who proposes a minimum sample size of 104 + *k*, with *k* being the number of predictors. To reach the planned sample size, we sent out questionnaires in waves of 50 questionnaires per group. The first wave of questionnaires was sent out in summer of 2018. Questionnaires were sent by mail to the address stated in the Euros for Doctors database and accompanied by a cover letter and a reply envelope. To increase the response rate, a reminder letter was sent after two weeks. Two weeks after that, we phoned those with a publicly available phone number, offering to send the questionnaire by email or fax. Returned filled-in questionnaires were entered in a Microsoft-Excel sheet by a research assistant.

If the planned sample size was not reached a month after the last contact attempt (phone call), the next wave was started: For each group that did not have 30 filled-in questionnaires yet, the next 50 physicians were randomly selected, and contacted as described above. We stopped this procedure separately for each group after the 30th questionnaire was received, which in our case was after the third wave for all groups. All examinable questionnaires that we received until June 30, 2019 were also included in the data analysis.

3.2.2. Questionnaire

The two-page questionnaire includes demographic information, questions about disclosure, and questions about attitude towards transparency in general. The items were derived from literature research (Chimonas et al., 2017; Boytchev, 2016). Response formats include five-level Likert items, default categories, and open formats. The questionnaire with exact wording of items and response options as well as the cover letter can be found in Appendix A (Figures A1 – A3). Items and response options that are relevant for the present study are listed in Table 5.

Table 5

Translated List of Relevant Questionnaire Items With Response Format

Variable	Wording *Response format*
	Research question 1
Pleasantness of reactions	"If there were reactions, how did you perceive them?" *1-5: very unpleasant, rather unpleasant, neutral, rather pleasant, very pleasant*
Descriptive norm	"What percentage of German physicians do you estimate consented to disclose in the database?" ___ *% (open format in percent)*
Attitude	"To what extent do you agree with the following statement: In principle, I approve of transparency." *1-5: strongly disagree, disagree, undecided, agree, strongly agree*
	Research question 2
Frequency of reactions	"How many reactions did you get from patients / colleagues / your private surroundings?" *1-5: none, very few, rather few, rather many, many*
	Research question 3
Content of reactions	"If there were reactions, how was their content?" *1-5: very negative, somewhat negative, neutral, somewhat positive, very positive*
	Explorative question
	"Was there anything that bothered you about the reactions?" _____ *(open format)*
	Further items
Use of the database	„In the summer of 2016, the first round of data was disclosed. How much do you agree with the following statements?" - I looked at the database. - I followed media coverage regarding the database. *1-5: strongly disagree, disagree, undecided, agree, strongly agree* „Was your information about payments correctly reported in the Euros for Doctors database"? - in 2016 for 2015 - in 2017 for 2016 *yes / know / I don't know.*

Reasons for nondisclosure[a]	"You do not have an entry in the database in the year 2015 (2016). Why?" ▪ *I consciously decided against disclosure.* ▪ *I did not receive any payments by pharmaceutical companies.* ▪ *I was not asked for consent to disclose.* ▪ *I forgot to answer the request to disclose.* ▪ *Other reason.*
Aspects for conscious decision against disclosure	„In case you decided consciously against disclosure: Which aspects played a role in this decision?" - Others advised me not to disclose. - Consideration of the public view / media reporting. - Consideration of future reactions by patients. - Considerations of future reactions by colleagues. - Consideration of future reactions in the private surrounding. - Negative experiences with disclosure in 2016.[b] - Other reason. *1-5: strongly disagree, disagree, undecided, agree, strongly agree*
Attitude towards transparency	„To what degree do you agree with the following statements?" - Payments by pharmaceutical companies are a risk for the independence of clinical practice and research. - Collaboration with pharmaceutical companies and receiving payments from those companies is part of the medical profession. - Disclosure of payments should be more nuanced. - Disclosure of payments increases patients' trust in me. - Disclosure leads to a wrong impression in the public. - Transparency guidelines impede my scientific work. - I have been confronted with disclosures within the context of a published study at least once. - My research results were criticized because of my disclosures at least once. - The undifferentiated display of the disclosures brings science into disrepute. *1-5: strongly disagree, disagree, undecided, agree, strongly agree*

Note. The original questionnaire was in German and can be found in Appendix A.

[a] Only asked in groups 1 and 2.

[b] Only asked in group 1.

3.2.3. Outcomes

The predictors of interest for research questions 1–3 and their investigation are listed in Table 5. Regarding the questionnaire items about reactions, the following is to be noted:

First, all three questions regarding reactions (frequency, content and pleasantness of reactions) could be answered separately for the reactions of three groups of people: patients, colleagues and private surrounding. However, for the analysis of the main research questions, this differentiation was not important, so for simplification, an average value was calculated across the three groups of people.

Second, participants of the group who disclosed only 2016 were asked about reactions towards their disclosure 2016; all other participants were asked about reactions towards the disclosure 2015.

Third, regarding our investigation of descriptive norms, it is to be noted that we systematically excluded some data: To investigate participants' descriptive norm to disclose, we asked them to estimate the fraction of German HCPs who gave their consent to disclose in the course of the German transparency codex for 2015 and for 2016. In a second question, we asked them whether they had knowledge of the approximate fractions, e.g., from the media, which could be answered by "yes" or "no". Only those participants' estimates were considered in the analysis who said they had not known the approximate fraction.

3.2.4. Statistical Analysis

To investigate hypothesis 1, data from those participants who disclosed only once 2015[14] and those who disclosed in both years was used and a multiple logistic regression with the outcome variable *disclosure 2016* (0 = no disclosure, 1 = disclosure) was conducted. The two main predictors were how pleasant participants experienced reactions toward their disclosure (X_1 = *pleasantness of reactions*) and how high they estimated the percentage of disclosing physicians in Germany (X_2 = *descriptive norm*). Also, the moderating role of a positive attitude towards transparency was investigated (X_3 = *attitude*). Therefore, two interactions terms were added as predictors: *attitude*pleasantness of reactions* and *attitude*descriptive norm*. Predictor variables were z-standardized before analysis.

To test hypothesis 2 and 3, the frequency (hypothesis 2) and the content (hypothesis 3) of reactions 2015 were compared to the frequency and content of reactions 2016. Frequency and content of reactions 2015 were available from participants who disclosed only in 2015 and those who disclosed in both years (groups 1, 3, 4, 5). Frequency and content of reactions 2016 were available from participants who disclosed only in 2016 (group 2). In accordance with the hypotheses, directed tests for independent samples were conducted (more frequent reactions in 2015 than 2016; more negative reactions in 2015 than 2016). As data in all four groups were not normally distributed on the respective dependent variable, Wilcoxon tests were conducted. For these tests, effect sizes with respective 95% CI are given as rank-biserial correlations (r_b). A conservative alpha level of .01 was used for all tests. The Shapiro-Wilk test was used to test for normal distribution.

[14] A priori we had planned to only use data from participants who had consciously decided against disclosure in 2016. However, these were only $n = 21$. Of those 21 participants, only 16 provided information about the pleasantness of reactions (a necessary information for research question 1). We therefore decided to conduct the outcome variable independent of the reason for nondisclosure and included all participants who did not disclose in 2016.

Exploratory questions were investigated by descriptive analyses of the variables and a content analysis of the answers to the open question "Was there anything that bothered you regarding the reactions?". For the content analysis of participants' answers, two researchers (Marlene Stoll, Alexander Mancini) independently reviewed all answers and suggested categories. From the initially suggested categories, ten final categories were decided upon in a process of mutual consensus (see section 3.3.7.3.). MS and AM then independently categorized each answer. Overall interrater agreement was 93%. Diverging ratings were discussed until consensus was reached.

Statistical analyses were performed in in JASP version 0.10.2 (JASP Team, 2019), RStudio, R version 3.6.1 (R Core Team, 2019), and Microsoft Excel (2011).

3.3. Results

3.3.1. Sample

We contacted n = 750 physicians and received 236 filled-in questionnaires. Seventy-two questionnaires came back unopened because they were undeliverable, so the response rate was 35% (236/678). Of the 236 questionnaires, one was missing a page and could not be allocated to a group; another contained a note that the participant was not a medical doctor but a biologist. The remaining 234 questionnaires were allocated to the groups and analyzed. The flow chart of participants with the allocation to groups is depicted in Figure 6. Mean and median age of participants was 53 years (SD = 8.29, IQR = 10) with a range from 31–75. Sample characteristics are listed in Table 6.

Figure 6

Flow Chart of Participants

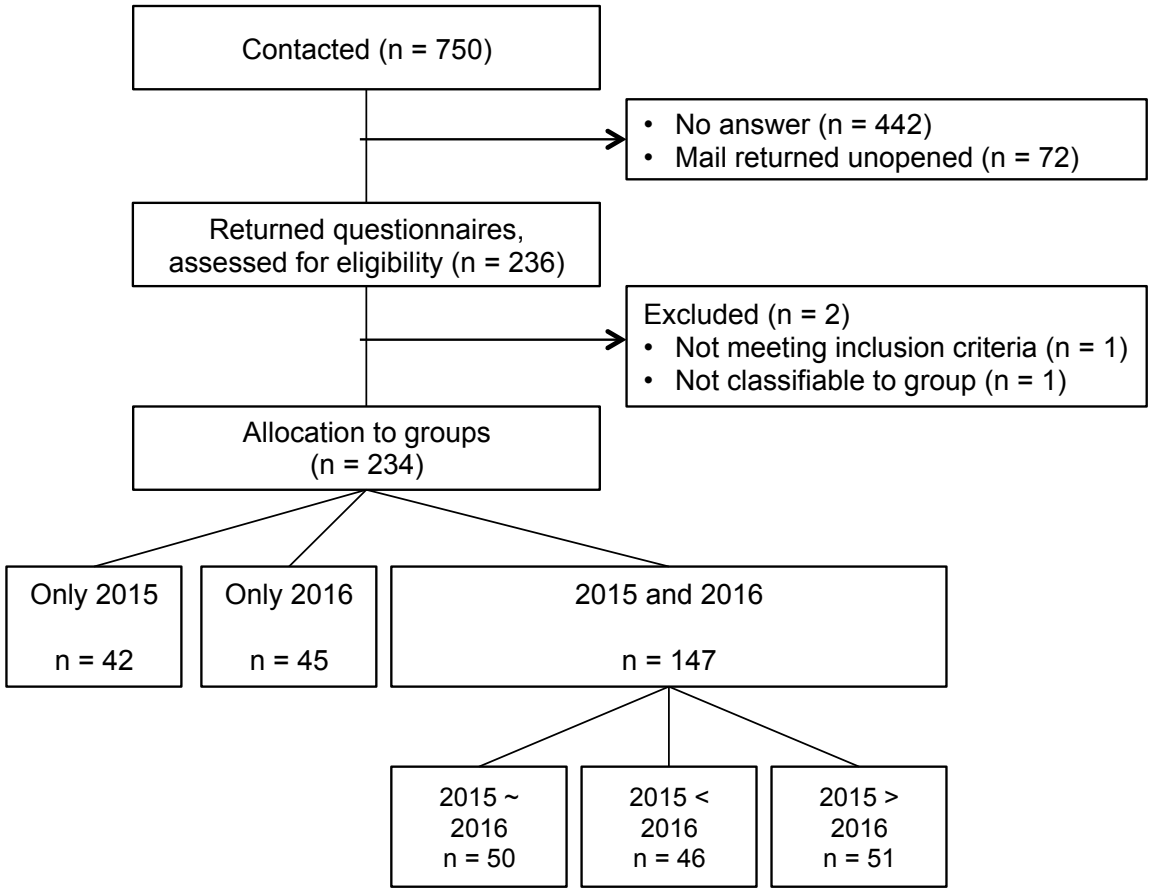


Table 6

Sample Characteristics

Characteristic	*n*	%
Gender		
Female	48	21
Male	185	79
NA	1	0
Field		
General and internal medicine	129	55
Psychiatry, neurology and psychosomatics	33	14
Surgery	31	13
Other	38	16
Workplace		
University hospital	67	29
Non-university hospital	51	22
Of which position: Head	*49*	*42*
Senior	*53*	*45*
Resident	*11*	*9*
NA	*5*	*4*
Practice	113	48
Of which: Licensed	*104*	*92*
Employed	*9*	*8*
NA	3	1

Note. $N = 234$

3.3.2. Participants' Use of Transparency Database

Of the 234 participants, 87 (37%) stated that they had not looked at the database[15], while 131 (56%) reported to have at least somewhat followed media coverage regarding the database[16]. When asked whether their payments had been correctly reported, most participants said they did not know: Of 189 participants who agreed to disclose payments in 2015, 91 (48%) did not know; 70 (37%) stated that their payments had been correctly reported, and 24 (13%) said they had been incorrectly reported. Of 192 participants who agreed to disclose payments in 2016, 105 (55%) did not know, 60 (31%) said their payments had been correctly reported and 23 (13%) said they had been incorrectly reported. In each group, four participants (2%) did not give an answer.

3.3.3. Reactions Participants Received

3.3.3.1. Reactions by Patients, Colleagues and in Private. Questions regarding frequency of reactions from patients, colleagues and in the private surrounding were answered by 231, 230 and 229 participants, respectively. Most participants stated they had not received any reactions from patients, colleagues or in private (190/234 (81%), 128/234 (55%), and 153/234 (65%)), so they were not able to answer questions regarding content and pleasantness of reactions. Therefore, response rates for the items regarding content and pleasantness of reactions were low: between 26% (60/234, pleasantness of patients' reactions) and 48% (113/234, content of colleagues' reactions). Answer frequencies to each item can be seen in Figure 7.

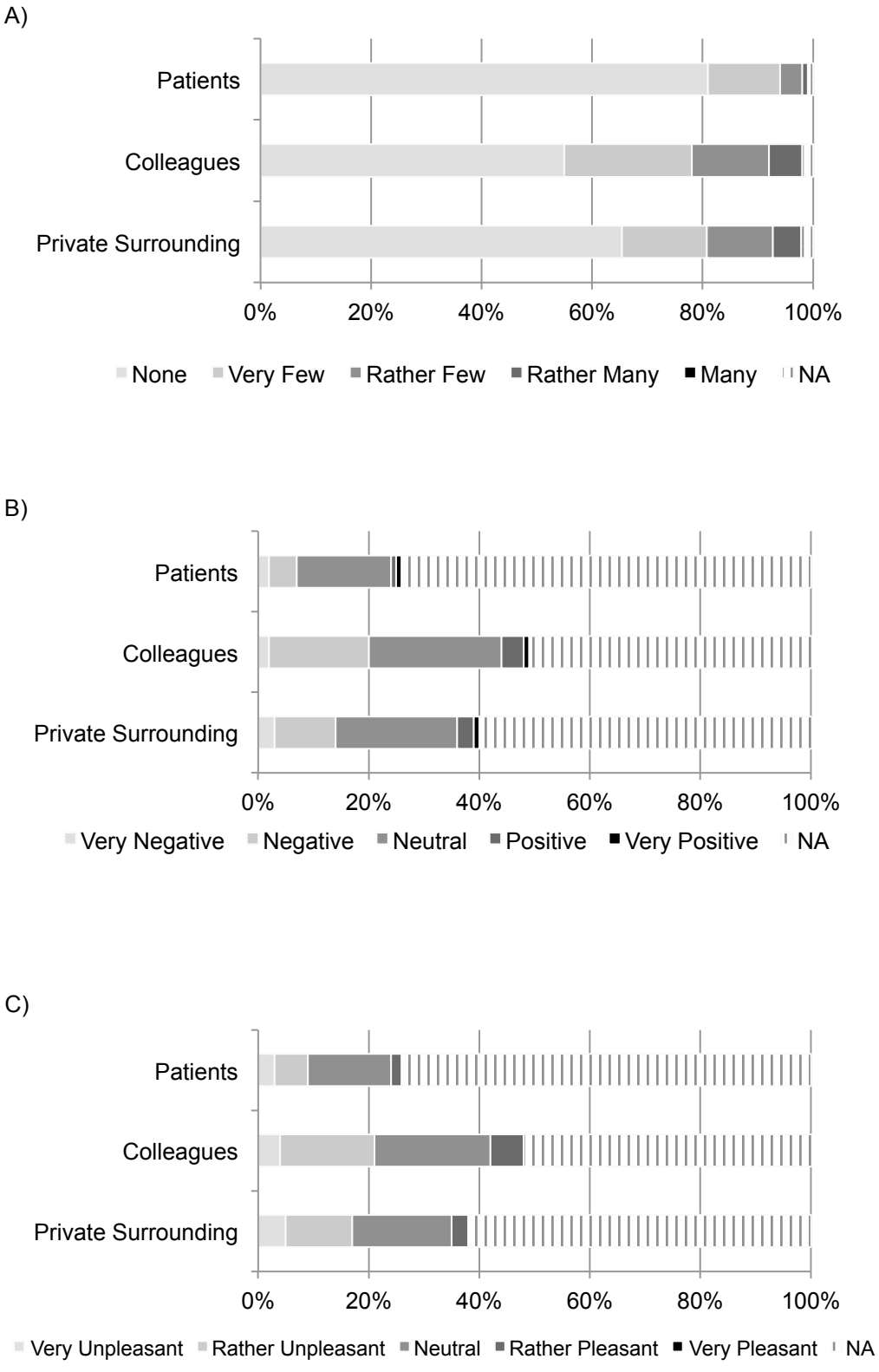
[15] Participants were asked how much they agreed to the statement „I looked into the database". Of the 234 participants, answers were: 87 (37%) strongly disagree, 22 (9%) disagree, 4 (2%) undecided, 44 (19%) agree, 72 (31%) strongly agree; 5 (2%) did not give an answer.

[16] Participants were asked how much they agreed to the statement „I followed media coverage regarding the database". Of the 234 participants, answers were: 54 (23%) strongly disagree, 35 (15%) disagree, 9 (4%) undecided, 81 (35%) agree, 50 (21%) strongly agree; 5 (2%) did not give an answer.

3.3.3.2. Mean Reactions. To answer the research questions 1–3, average values across the different groups (patients, colleagues, private surrounding) were calculated. The mean value for the total sample of *frequency of reactions* was 1.51 (*SD* = 0.64) and the median was 1.33 (*IQR* = 0.83). The mean value of *content of reactions* was 2.73 (*SD* = 0.71) and the median was 3 (*IQR* = 1), and the mean value of *pleasantness of reactions* was 2.58 (*SD* = 0.7) and the median was 2.67 (*IQR* = 1). Further descriptive data can be found in Appendix B, Table A1.

Figure 7

Relative Frequencies of Item Answers Regarding A) Frequency, B) Content, and C) Pleasantness of Reactions from Recipients, N = 234



3.3.4. Descriptive Norm

The descriptive norm to disclose was investigated by asking participants how high they estimated the percentage of German physicians who disclosed in the database in 2015 and 2016, respectively. We excluded data from $n = 18$ and $n = 16$ participants for the estimates 2015 and 2016, respectively, because those participants either stated that they knew the approximate percentage, e.g., from the media, or did not give an answer. Answers of the remaining 216 and 218 participants ranged between 0% and 100% for each year. For 2015, participants estimated on average that 33% of German physicians had agreed to disclose ($SD = 21$, $Mdn = 30$, $IQR = 30$) and for 2016, participants estimated on average that 31% of German physicians agreed to disclose ($SD = 20$, $Mdn = 25$, $IQR = 25$).

3.3.5. Investigating Nondisclosure

3.3.5.1. Hypothesis 1. Regarding research question 1, we hypothesized that participants are less likely to disclose in the second year the less pleasant they perceived the reactions in the first year and the lower they estimated the descriptive norm to disclose in the first year. A positive attitude towards transparency was hypothesized to moderate these relations.

To investigate this research question, we investigated data of those participants who disclosed in 2015 ($n = 189$) to predict whether they disclosed again in 2016 ($n = 147$, 78%) or did not disclose again in 2016 ($n = 42$, 22%). As outlined above, response rate per item differed: For the items *attitude*, *descriptive norm 2015*, and *pleasantness of reactions 2015*, data were available from 188, 174 and 107 participants, respectively. Notably, for *pleasantness of reactions 2015* we thus only had data of 22 people who did not disclose in 2016.

Variables, separated by *disclosure 2016,* were tested for deviation from a normal distribution. All variables were significantly non-normal: *pleasantness of reactions 2015* for those who disclosed 2016, $W = 0.90$, $p < .001$, and for those who did not disclose 2016, $W = 0.87$, $p = .006$; *descriptive norm* for those who disclosed 2016, $W = 0.91$, $p < .001$, and for those who did not disclose 2016, $W = 0.92$, $p = .008$; *attitude* for those who disclosed 2016, $W = 0.60$, $p < .001$, and for those who did not disclose 2016, $W = 0.52$, $p < .001$. The relationships between variables, described by Spearman's rank correlation coefficients, can be seen in the correlation matrix in Table 7.

Table 7

Correlation Matrix of Outcome and Predictor Variables with Spearman Rank Correlation Coefficients and 95% CI

Variable	1.	2.	3.
1. Disclosure 2016 [a]	-	-	-
2. Pleasantness of reactions	.06 [-.14, .24]	-	-
3. Descriptive norm	-.04 [-.19, .11]	-.02 [-.22, .18]	-
4. Attitude	-.08 [-.22, .06]	.12 [-.07, .31]	-.11 [-.26, .04]

[a] Disclosure 2016: 0 = no disclosure 2016; 1 = disclosure 2016.

In regression model 1, the predictors were the three variables *pleasantness of reactions*, *descriptive norm* and *attitude*. This model did not significantly improve the model fit compared to the null model, $\chi^2 = 1.0$, $p = .792$.

Regression model 2 included the three variables as well as the interaction terms *attitude*descriptive norm* as well as *attitude*pleasantness of reactions*. This second model significantly improved the model fit compared to the regression model 1, $\chi^2 = 11.63$, $p = .003$, but did not significantly improve the model fit compared to the null model, $\chi^2 = 12.66$, $p = .027$. Effect sizes, pseudo-R^2-values and variance inflation factors (*VIF*) of regression model 1 and model 2 can be seen in Table 8.

Table 8

Logistic Regression Coefficients and Effect Sizes of Regression Model 1 and 2

	B (SE)	*p*	*OR*
Regression model 1: Only main effects			
Intercept	1.54 (0.28)	.000	4.66
Pleasantness of reactions	0.24 (0.27)	.373	1.27
Descriptive norm	0.13 (0.37)	.717	1.14
Attitude	-0.10 (0.32)	.753	0.90
Regression model 2: Main effects and interaction terms			
Intercept	2.31 (0.60)	.000	10.11
Pleasantness of reactions	0.61 (0.42)	.142	1.84
Descriptive norm	-0.06 (0.46)	.891	0.94
Attitude	-1.57 (1.08)	.145	0.21
Attitude*pleasantness of reactions	-1.27 (0.64)	.048	0.28
Attitude*descriptive norm	0.98 (0.67)	.140	2.67

Note. Model fit regression model 1: R^2 = .01 (Hosmer-Lemeshow), .01 (Cox-Snell), .02 (Nagelkerke); model 1 compared to null model: $\chi^2(3) = 1.04$, $p = .792$, all *VIF* < 10*;* Model fit regression model 2: R^2 = .01 (Hosmer-Lemeshow), .01 (Cox-Snell), .02 (Nagelkerke); model 2 compared to null model: $\chi^2(5) = 12.66$, $p = .027$; model 2 compared to model 1: $\chi^2(2) = 11.63$, $p = .003$, all *VIF* < 10.

The pseudo-R^2-values, being very low, indicate that this prediction model is of poor quality. We therefore further explored the data by investigating whether participants who disclosed in 2016 had systematically different values on the main outcomes from the participants who did not disclose in 2016. Results from the performed Wilcoxon tests[17] provided no indication for systematic differences between the groups (see Table 9).

Table 9

Main Outcomes, Disclosure 2016 vs. no Disclosure 2016

					Discl. 2016[a]		
					r_b	95% CI	
Variable	Discl. 2016	*n*	*M (SD)*	*Mdn (IQR)*		LL	UL
Pleasantness of reactions 2015	no	22	2.39 (0.76)	2.58 (1)	.08	-0.15	∞
	yes	85	2.55 (0.67)	2.67 (1)			
Descriptive norm 2015	no	37	36% (23)	30% (30)	-.06	-0.26	∞
	yes	137	33% (21)	30% (30)			
Attitude	no	42	4.71 (0.64)	5 (0)	-.09	-0.25	∞
	yes	146	4.54 (0.85)	5 (1)			

[a] A positive effect size indicates higher values for those who disclosed 2016 compared to those who did not disclose 2016.

[17] under the alternative hypothesis that values of those who disclosed 2016 are higher than values of those who did not disclose 2016

3.3.5.2. Reasons for Nondisclosure. While research question 1 only focused on predictors for nondisclosure in the second year of the transparency database, we were further interested in the reasons for participants' nondisclosure in general. In our sample, two groups of participants did not disclose payments in one year: Group 1, consisting of 42 participants who have an entry in 2015 but not in 2016 (hereafter referred to as *no-more-group*), and group 2, consisting of 45 participants who have no entry in 2015 but in 2016 (hereafter referred to as *not-yet-group*). We asked these participants for the reason for the missing entry (see Table 5).

The most frequently chosen reason in the no-more-group was that they had consciously decided against disclosure (50%, 21/42), while this answer was chosen by 18% (8/45) in the not-yet-group. The most frequently chosen answer in the not-yet-group was that they were not asked for their consent to disclose (36%, 16/45) while this answer was chosen by 7% (3/42) in the no-more-group. The numbers for the remaining categories were: not having received any payments: 33% (14/42) of the no-more-group and 22% (10/45) of the not-yet-group; having forgotten to answer the pharmaceutical companies' request: 2% (1/42) of the no-more-group and 4% (2/45) of the not-yet-group. No answer was given by 3/42 (7%) in the no-more-group and 9/45 (20%) in the not-yet-group.

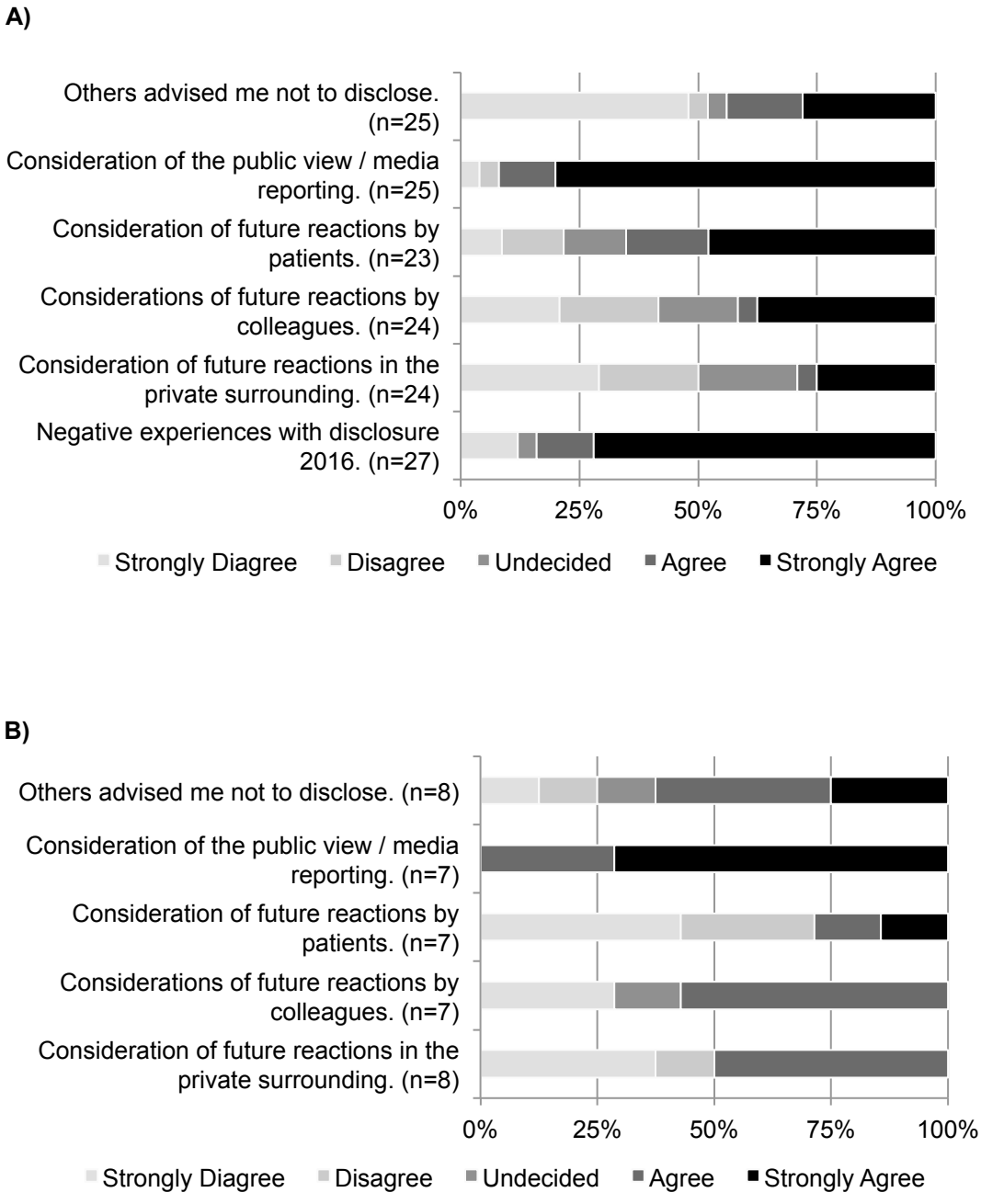
We further asked how several statements (see Figure 8) applied to the participants in case they consciously decided against disclosure[18]. Most participants reported that considerations of the public view or media reporting led to the decision against disclosure: 80% (20/25) in the no-more-group and 71% (5/7) in the not-yet-group (for further descriptive results, see Appendix B, Table A2). Interestingly, of

[18] These items were answered by 23-27 participants of the no-more-group and by 7-8 participants of the not-yet-group. Notably, this amount of answers does not match with the answers given to the question before, where only 21 participants of the no-more-group said they had consciously decided against disclosure.

those 20 participants in the no-more-group and 5 in the not-yet-group, 6 (30%) and 3 (60%) stated not to have received any reactions from patients, colleagues or in their private surrounding.

Figure 8

Relative Frequencies of Agreement Ratings on Statements Regarding Decision Against Disclosure by Participants A) Without Entry 2016 and B) Without Entry 2015



3.3.6. Year of Disclosure

To investigate research questions 2 and 3, we compared the frequency and content of reactions of participants who disclosed for the first time in 2015 (groups 1, 3, 4, 5) with frequency and content of reactions of participants who disclosed for the first time in 2016 (group 2). Data for frequency of reactions were available for 2015 from 187/198 (99%) participants and for 2016 from 44/45 (98%) participants; data for content of reactions were available for 2015 from 110/198 (60%) participants and for 2016 from 19/45 (42%) participants.

The variables frequency of reactions and content of reactions, separated by year, were tested for deviation from normal distribution. All variables were significantly non-normal: frequency of reactions, 2015: $W = 0.78$, $p < .001$ and *2016*: $W = 0.71$, $p < .001$; content of reactions, 2015: $W = 0.90$, $p < .001$, and 2016: $W = 0.82$, $p = .002$.

3.3.6.1. Hypothesis 2. Regarding research question 2 on the frequency of reactions 2015 vs. 2016, no statistically significant difference on the alpha-level of .01 was observed between *frequency of reactions 2015* ($M = 1.54$, $SD = 0.66$, $Mdn = 1.33$, $IQR = 1$, $n = 187$) and *2016* ($M = 1.36$, $SD = 0.53$, $Mdn = 1.00$, $IQR = 0.67$, $n = 44$), as evidenced by a Wilcoxon rank-sum test ($W = 3410$, $r_b = -.17$, 95% CI [-∞, -0.01], $p = .031$).

3.3.6.2. Hypothesis 3. Regarding research question 3 on the negativity of reactions 2015 vs. 2016, no statistically significant difference was observed between *negativity of reactions 2015* ($M = 2.69$, $SD = 0.71$, $Mdn = 3.00$, $IQR = 1$, $n = 110$) and *negativity of reactions 2016* ($M = 2.96$, $SD = 0.67$, $Mdn = 3.00$,

IQR = 0.33, *n* = 19) as indicated by a Wilcoxon rank-sum test (*W* = 1243, r_b =.19; 95% CI [-0.05, ∞], *p* = .085).

3.3.6.3. Descriptive Norm 2015 vs. 2016. We further looked at whether the descriptive norm for 2015 was different from the norm 2016. As was argued before, the descriptive norm may be related to disclosure behavior, therefore we looked for the differences between the years separately per group and conducted paired Wilcoxon signed-rank tests.

To explore this relation, we investigated differences between groups. The descriptive norm for 2015 distribution was significantly non-normal in all groups (W_1 = 0.92, *p* = .008; W_2 = 0.93, *p* = .02; W_3 = 0.92, *p* = .003; W_4 = 0.92, *p* = .004; W_5 = 0.87, *p* < .001). Also, the descriptive norm for 2016 distribution was significantly non-normal for all groups (W_1 = 0.83, *p* < .001; W_2 = 0.86, *p* < .001; W_3 = 0.93, *p* = .004; W_4 = 0.95, *p* = .005; W_5 = 0.87, *p* < .001).

As can be seen in Table 10, participants from group 1 (i.e., participants who disclosed 2015 but not 2016) estimate significantly higher descriptive norms for 2015 than for 2016 (2015: *M* = 36% (*SD* = 23), *Mdn* = 30% (*IQR* = 30); 2016: *M* = 25% (*SD* = 21), *Mdn* = 20% (*IQR* = 20). Such a difference between the years was not found in groups 2 - 5 who showed approximately equal descriptive norms 2015 and 2016. All descriptive values can be seen in Table 10.

Table 10

Descriptive Norm 2015 and 2016, Separated per Group

Group	Year	*n*	*M (SD)*	*Mdn (IQR)*	Descriptive Norm 2015 vs. 2016		
					r_b	95% CI	
						LL	UL
1							
	2015	37	36% (23)	30% (30)	.88**	.72	.95
	2016	40	25% (21)	20% (20)			
2							
	2015	42	29% (19)	25% (20)	-.39	-.69	.03
	2016	42	31% (20)	25% (19)			
3							
	2015	48	33% (18)	30% (30)	-.08	-.44	.31
	2016	48	33% (17)	30% (20)			
4							
	2015	42	34% (24)	30% (30)	-.12	-.52,	.32
	2016	41	35% (22)	30% (30)			
5							
	2015	47	32% (22)	25% (35)	-.06	-.45	.36
	2016	47	33% (22)	25% (25)			

Note. Groups: 1 = disclosed only 2016; 2 = disclosed only 2016; 3/4/5 = disclosed in both years with: equal payment sums / higher sum in 2016/ lower sum in 2016

** $p < .01$

3.3.7. Further Exploratory Investigations

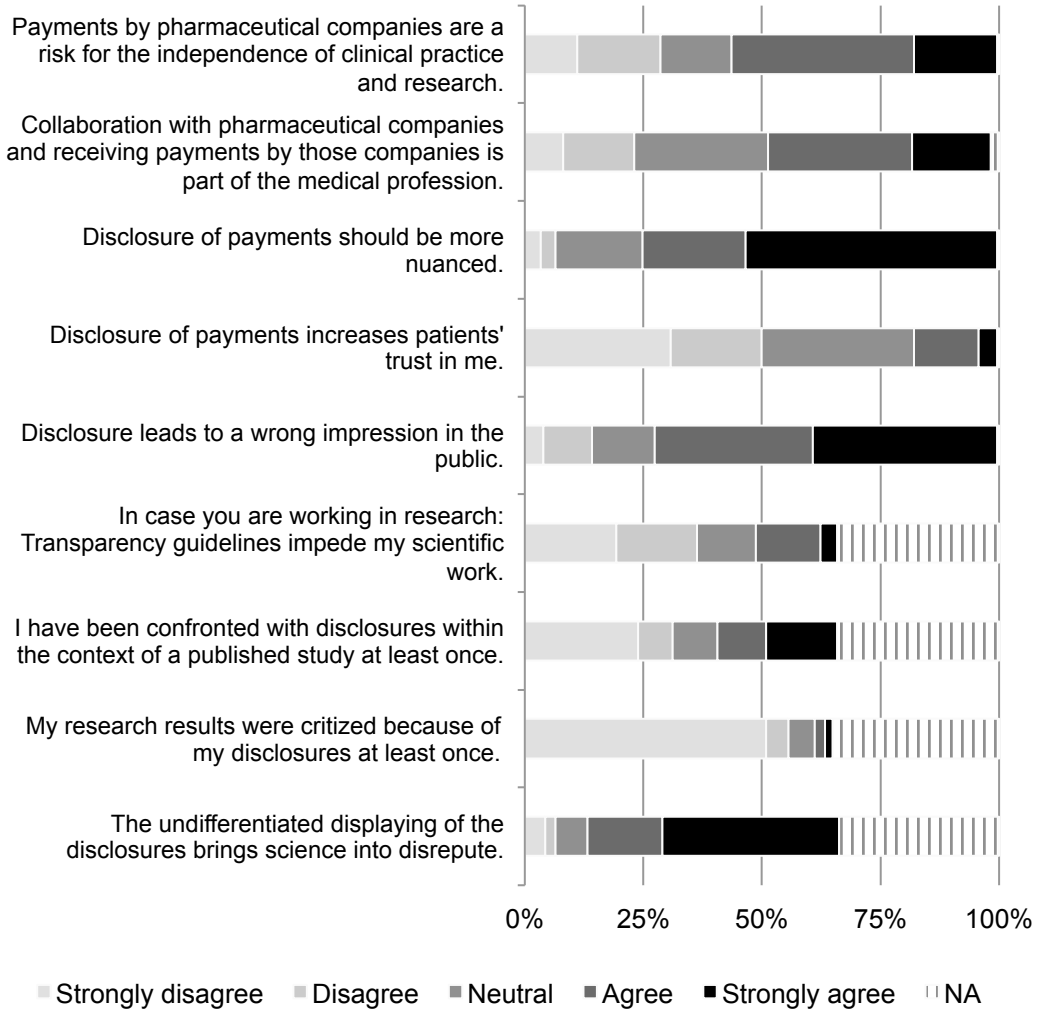
3.3.7.1. Participants' Attitude Toward Transparency. Participants were asked to indicate their agreement with several statements regarding disclosure. We also asked them—in case they were actively working in research—to indicate their agreement with some statements regarding disclosure regulations in their

research routine. These questions were answered by 152–155 participants, which is 65–66% of the main sample. Statements and answers can be seen in Figure 9.

The statements that participants agreed with most strongly were that disclosure of payments should be more nuanced (124/233, 53%), that the undifferentiated display of the disclosures brings science into disrepute (87/155, 56%) and that disclosure leads to a wrong impression in the public (91/233, 39%).

Figure 9

Relative Frequencies of Agreement Ratings on Statements Regarding Transparency, N = 234



3.3.7.2. Participants who Disclosed in Both Years. Participants in groups 3 – 5 disclosed payments in both years. Participants in group 3 disclosed approximately equal payment sums in 2015 and in 2016, participants in group 4 disclosed higher payment sums in 2016 than in 2015 and participants in group 5 lower payment sums in 2016 than in 2015. We exploratively looked at whether these three groups received different reactions in 2015 by conducting a Kruskal Wallis test. The results show that reactions did not significantly differ between the three groups on the alpha level of .01, as shown in Table 11.

Table 11

Descriptive Values of Reaction Frequency, Reaction Content and Reaction Pleasantness for Groups 3 – 5

	Group 3			Group 4			Group 5			Kruskal Wallis		
Outcome	*n*	*M (SD)*	*Mdn (IQR)*	*n*	*M (SD)*	*Mdn (IQR)*	*n*	*M (SD)*	*Mdn (IQR)*	*df*	*W*	*p*
Frequency of reactions[a]	49	1.67 (0.69)	1.67 (1)	46	1.36 (0.57)	1 (0.33)	50	1.55 (0.63)	1.33 (0.92)	2	7.11	.029
Content of reactions[a]	34	2.84 (0.76)	3 (1)	23	2.7 (0.78)	2.67 (0.83)	31	2.68 (0.63)	3 (1)	2	0.55	.757
Pleasantness of reactions[a]	32	2.58 (0.67)	2.67 (1)	21	2.54 (0.71)	2.67 (1)	32	2.51 (0.65)	2.5 (1)	2	0.34	.843

Note. Groups: 3 = disclosed equal payment sums 2015 and 2016; 4 = disclosed higher sum in 2016; 5 = disclosed lower sum in 2016.

[a] Summarized score for reactions of patients, colleagues, and private surrounding.

3.3.7.3. Free Answers: Bothersome Aspects of Reactions. Sixty-eight participants answered the question "Was there anything that bothered you regarding the reactions?". Following are the categories the answers were allocated to with the respective absolute and relative frequencies:

- negative media reporting (20/68, 29%)
- defamation / criminalization (17/68, 25%)
- dark figure of undisclosed information (12/68, 18%)
- disclosed information is not put into the context with the services rendered in return (12/68, 18%)
- misleading data representation (7/68, 10%)
- contacted by lawyer who aimed a class action against CORRECTIV (7/68, 10%)
- feeling of being dragged into the public eye (5/68, 7%)
- feeling of being treated unfairly (5/68, 7%)
- involvement of employer (4/68, 6%)
- others expressed lack of understanding for the disclosure (2/68, 3%).

Table 12 shows the five most frequent categories with translated example quotes.

Table 12

Examples Quotes and Categories of Answers to the Question „Was There Anything That Bothered you Regarding the Reactions?"

Category	Example quotes
Negative media reporting	„Public reporting very negative, mention of disclosing physicians' names, felt denunciated, no reporting about majority of physicians who do not disclose."
	„Instead of being praised, one is presented in the media as a corrupt pig?!?"
	„The representation in the SPIEGEL irritated me. Since then I do not disclose any more."
Defamation / criminalization	„Accusation of corruption. I felt criminalized."
	„In the SPIEGEL ONLINE release there was the headline 'Be embraced, millions'[a]. This denunciates physicians as corrupt. I merely received fees for work I performed, normally for talks. So this is a service for money, not contributions[b] for favors. Colleagues doing research at universities partly have third party funding with which they finance research positions, for example. Alas, all this is not presented like that, but the publication suggests that mercenary physicians line their own pockets with bribes from industry (…). Although I assumed transparency would be good, this only applies if data are correctly reported and not edited in a suggestive, tendentious and denunciating way."
Voluntariness of disclosure	„The problem lies in the 'random' disclosure! If at all, disclosure should apply for everyone."
	„Only those physicians are tackled who disclose payments, instead of speaking about and with those who do not disclose their payments."
Entry unrelated to service in return	"It seems as though money flowed without service in return[c]. I gave lectures that require abundant preparation time."
Misleading representation	„The problem lies in the (intended?) vagueness of the term contributions[b]. According to tax law, it is used for 'presents'. What is meant here is 'consideration'[c]."
	„Public reporting was completely undifferentiated and heavily outraged by emotions."

[a] German original expression: "Seid umschlungen, Millionen".

[b] German original expression: "Zuwendungen".

[c] German original expression: "Gegenleistung".

3.4. Discussion

3.4.1. Principal Findings

The aim of this study was to gain insight into the experiences of physicians with the German transparency regulation, investigate how these experiences affect future disclosure behavior (research question 1) and examine whether there is a difference in reactions to disclosures between the first and the second year of the database (research questions 2 and 3). Following, I will give the answers to the research questions and explore the possible reasons for our findings. Then, further findings are summarized and put into context. After that, I give a critical reflection of the strengths and weaknesses of this study and conclude with implications that can be drawn from our findings.

In regard to research question 1, data availability was poor, leading to an uninterpretable regression model. The exploration of rank differences between those who disclosed again and those who did not disclose again also did not provide any hints for systematic differences. In regard to research questions 2 and 3, the time point of disclosure, no significant differences between the experienced reactions—neither frequency nor content—was found on the alpha level of .01. So, this study neither provides evidence for predictors for future disclosure behavior, nor for differences regarding reactions as answer to the disclosure in the first compared to the second year of the database.

The poor data availability is closely related with our finding that most participants in our sample had not received any reactions towards their disclosure. The fewest reactions came from patients: Only every fifth physician stated they had received at least very few reactions by patients, while almost every third had received

at least very few reactions from their private surrounding and nearly every second had received at least very few reactions by colleagues.

In general, we found that nearly half of the participating physicians had not looked at the database and did not know whether their disclosed payment sum was correct. At the same time, more than half of them at least somewhat followed the media coverage about the database. The overall attitude towards transparency was very positive.

One further main object we aimed to look at was how normal the participants perceive disclosure to be. On average, they estimated that 32% of German physicians disclosed in the database. This average estimation is close to the actual consent rate, which was extrapolated by CORRECTIV at 31% for 2015 and 25% for 2016 (Grill & Wehrmeyer, 2017). Interestingly, this average estimation was similar across all groups and years with one exception: Group 1, which consisted of those who disclosed in the first, but not in the second year, estimated a higher percentage in the first year (M = 36%) than in the second year (M = 25%). Here, it appears that the perceived norm to disclose relates to the actual disclosing behavior. However, we do not know whether those participants drew their estimation about others based on their own behavior or whether they first had the impression that one does not disclose in the second year and therefore were more likely to not disclose either.

Another main objective of this study was the investigation of nondisclosures. The reasons for nondisclosures in our sample differed depending on whether the nondisclosure was in the first or in the second year of the database: Participants who had disclosed in the first but not in the second year more often said they had consciously decided against disclosure than those who had not disclosed in the first year, but had disclosed in the second year. The latter more often said that they had not

been asked for consent. Most who had consciously decided against disclosure said it was because they considered public opinion and media reporting. These subjects were also the most often named topics in the answers to the open question "Was there anything that bothered you regarding the reactions?".

3.4.2. Findings in Context

Our results show that, although transparency regulations are aimed to enlighten the public and, most of all, patients, physicians do not seem to receive many reactions towards the disclosed information. However, at the same time, they report high objections to public exposure. This can be interpreted according to the spotlight effect which describes that people overestimate the attention they receive by others (Loewenstein et al., 2014). The physicians in our sample stated concerns about the public impression and a feeling about being denunciated, which is in line with Chimonas and colleagues' observation that physicians are very concerned that disclosure of payments by pharmaceutical companies may damage their reputation (Chimonas et al., 2017). This tendency can be explained by the psychological heuristic that people do not like to be viewed as biased. Studies show that if people are able to avoid conflicts of interest, they may be motivated to avoid such conflicts so that they can disclose the absence of conflicts (Milinski et al., 2002; Sah & Loewenstein, 2014; Wang et al., 2009). In case of voluntary disclosure, however, people can simply decide against disclosure to avoid being viewed as biased. In Germany, a possibility to disclose absence of conflicts of interest exists since 2016 in form of the "Null-Euro-Ärzte Datenbank" [Zero-Euros-Doctors Database] by CORRECTIV (Grill & Wehrmeyer, 2017). Yet, it does not seem to be very popular, as only 531 German HCPs are listed (as of June 28, 2020).

3.4.3. Strengths and Weaknesses

The strength of this study is that it provides quantitative data on physicians' experiences with disclosure in a national disclosure database. To our knowledge, no such evidence exists for any European transparency regulation in medicine. Furthermore, the sample we investigated was stratified to their actual disclosing behavior. Due to the otherwise random selection of participants, our sample comprises a great band width of age, disciplines and workplaces.

The study has several limitations. First, a common problem in survey methods, answers may be skewed by social desirability (Barclay et al., 2002). However, the answers to a controversially discussed subject may be even more skewed: Physicians may be more motivated to respond to the survey if they have strong opinions on transparency, or if they experienced extreme reactions towards their disclosure. We tried to counter this by our efforts to increase the response rate. Another limitation of the method is that answers are retrospectively reported, which may also be a risk of bias.

Second, the questionnaire we used is not validated but consists of statements and questions we compiled from literature research, which were combined with Likert scale answering options. For this reason, our descriptive data cannot be directly compared to any other data.

Third, the studied observations are specific for this particular case, which is characterized by the following features: the voluntariness of disclosure, the self-regulation approach by pharmaceutical companies in Germany, with disclosed data collected by investigative journalists, accompanied by strong media coverage. Interpretation can nevertheless be transferred to other cases of voluntary disclosure.

3.4.4. Implications

While most physicians in our sample have a positive attitude towards transparency, they seem concerned that transparency may damage their reputation. Those who did not disclose payments had various reasons, which further differed depending on the year of the nondisclosure. This can mostly be traced back to the voluntary nature of the transparency regulation. Mandatory transparency could approach these issues in the following aspects: Firstly, if disclosure is mandatory, information on everyone is available and disclosure cannot be associated with being unfairly scrutinized. Secondly, if conducted in a standardized form, disclosed information is easier to compare and better to interpret and therefore of much higher use for the public, stakeholders and researchers.

From the results we observed in this study, we propose implications for clinicians and policymakers: The consent rate to disclose payments by pharmaceutical companies in Germany is, compared to other countries, low (see chapter 2) and even if participants gave their consent to disclose, they mainly seem not to have used the database nor checked their entry, as our data show. Clearly, more education for disclosers as well as recipients is needed. Disclosers need to be educated about the background of transparency regulations and the concept of conflicts of interest to raise commitment. Also, recipients need to be educated about the disclosed information and why it is disclosed to enable them to interpret the disclosed data correctly. Indeed, in a German survey of 765 patients in 2014, 74% stated that they would like physicians to verbally disclose their conflict of interest during a consultation (Riedl et al., 2016). Thacker et al. (2014) stress the importance of helping the public understand the disclosed information to tap the full potential of the U.S. Open Payments program. Whether this has been achieved is, in line with the current

evidence for the United States, questionable (Pham-Kanter et al., 2017, Young et al., 2018). Our data show that in the German case, there seems to be little dialogue. Beginning a conversation could lessen the "suspiciousness" of conflicts of interest and thereby improve the interaction of pharmaceutical companies and the health care sector.

3.4.5. Unanswered Questions and Future Research

In this sample, reasons for nondisclosure were heterogeneous. More research is needed regarding the reasons for voluntarily disclosing and especially declining to disclose to improve current transparency policies. The answers to our open questions convey the impression that there are more subjects that need to be considered regarding the experiences with transparency guidelines, e.g., insecurity about legal issues or the feeling of being denunciated. Broad evaluations of the current disclosure systems are needed to get a full picture of the current situation.

3.5. Conclusion

The study at hand was the first standardized survey of physicians who disclosed voluntarily in a nation-wide transparency database. With the available data, no significant predictors for future disclosure behavior could be found. Also, there was no statistically significant difference between reactions as answer to the disclosure in the first year compared to the second year of the database. The exploratory results of this study show preliminary evidence that although attitude towards transparency seems positive and only few reactions as answers to the disclosures were experienced, German HCPs are concerned that disclosing payments in a public database will result in reputational damage.

We propose that mandatory disclosure should be introduced to create a standardized environment for an open discussion. Also, either voluntary or mandatory, we recommend more education about the background of transparency guidelines, for (potential) disclosers as well as the public.

Chapter IV:

DisclEd: Advisors' Conflict of Interest Disclosure and Advisees' Education in an Advice-Giving Situation: Effects on Advisors' Bias

- an Experiment

4. DisclEd: Advisors' Conflict of Interest Disclosure and Advisees' Education in an Advice-Giving Situation: Effects on Advisors' Bias - an Experiment

4.1. Background

People seek advice if they need to make a decision but approach the limit of their own knowledge or skill. In such situations, advice-seekers are dependent on an expert who provides this knowledge or skill and helps them. Characteristic of such a situation is an information imbalance between the expert (advisor) and the advice-seeker (advisee), thereby creating a dependency structure. If advisors further have a secondary interest that could unduly influence the advice—e.g., their payment is dependent on the advisee's decision—a conflict of interest is present (Thompson, 1993). Additionally, advisees often do not know about the conflict of interest and even if they do, they lack knowledge about what the presence of a conflict of interest means regarding the independence of the advice. Therefore, such advice-giving situations are particularly susceptible for bias. Conflicts of interest and their disclosure are an important subject in this field (Cain et al., 2011; Loewenstein et al., 2014). In the present study, the effects of conflicts of interest disclosure in advice-giving situations are investigated. A specific aim of this study is to examine the effect of educating advisees on advisors' bias.

4.1.1. Advice, Conflicts of Interest, and Disclosure

Examples for advice-giving situations are, e.g., the interaction between lawyer and client, physician and patient, or consultant and customer. Primary interest of advisors is to give "true", independent advice that helps the advisee—at least if

professional codices are drawn upon. A conflict of interest appears if there is a secondary interest that creates a risk that the primary interest (in that case, independent advice) is unduly influenced (Thompson, 1993). For example, some consultants receive bonus payments if their clients decide for a specific product; or physicians receive payments if a patient decides for a specific treatment. Disclosure of this secondary interest is intended to inform advisees of potential bias and to enable them to make an informed decision (Loewenstein et al., 2014). Whether disclosure actually helps advisees to make informed decisions is mainly investigated in the field of behavioral economics.

4.1.2. Unintended Effects of Disclosure

Experiments have shown that disclosure sometimes backfires: Participants who have to disclose a financial conflict of interest in an advice-giving situation give more biased advice than participants who do not have to disclose their conflict of interest (Cain et al., 2005, 2011; Loewenstein et al., 2012; Sah, 2019; see also section 1.2.2.). There is also evidence using field data that shows that physicians who disclose a specialty bias more strongly recommend their patients to have the specialty treatment than physicians who do not disclose their specialty bias (Sah et al., 2016). So, although conflict of interest disclosure is intended to protect advisees, it may not necessarily fulfill this intention, which is described in more detail in the next section. Unintended consequences, even a risk for a backfiring effect of disclosure that leads to even more bias, are possible. However, studies have offered different explanations for these effects.

4.1.2.1. The Role of Advisors' Cognitions. Why does disclosure sometimes lead to increased bias? A possible contributing factor for this backfiring effect of disclosure is found in advisors' cognitions. One explanation given by Loewenstein et al. (2014) is the moral licensing effect. Moral licensing theory posits that people allow themselves to engage in less moral behavior after a prior good deed (Blanken et al., 2015). In case of disclosure, this means that while advisors with a conflict of interest may feel morally obliged to give unbiased advice, the disclosure of the conflict of interest could make them feel they are morally allowed to give biased advice (Cain et al., 2011; Loewenstein et al., 2014). In a survey conducted in 2011 by Cain et al., participants were asked to imagine giving advice while having a conflict of interest; half of the participants were told that their advisee was aware of this incentive and the other half was told that their advisee was not aware of this incentive. The participants judged it less unethical to give biased advice when the advisee was aware of the incentive, i.e., the conflict of interest was disclosed.

Another possible explanation for the backfiring effect of disclosure is strategic exaggeration: Advisors who disclose a conflict of interest may anticipate that the advisee will discount the advice; therefore, they strategically exaggerate the advice all the more (Cain et al., 2011; Loewenstein et al., 2012, 2014). Cain et al. (2011) conducted a study to investigate this effect but found that disclosure indeed leads to strategic exaggeration in some participants, however it also led to strategic restraint in other cases. Most participants reported that they would not shift their advice after conflict of interest disclosure (Cain et al., 2011). Later, Sah and Loewenstein (2015) reported that strategic exaggeration was unlikely to cause increase in advice-giving bias, at least in their studies in which a second advisor and thereby a second opinion for advice was present.

While these investigations provide inconclusive results, there is another possible consequence of conflict of interest disclosure discussed: the telltale heart effect, which describes that sometimes disclosure of information might lead people to change their behavior for the better (Loewenstein et al., 2014; see also sections 1.2.2.1., 1.3.2.2. and 3.1.2.). In these cases, disclosure might lead to less bias in advice-giving situations.

4.1.2.2. The Role of Advisors' Personality Structure. The psychological differential perspective focuses on how individuals differ from each other in comparable situations depending on their personality structure.

In the situations described in this study, a secondary interest, namely a financial incentive, is present besides a primary interest, namely providing unbiased advice, thereby creating a conflict of interest. So, the secondary interest is rather focused on the self, compared to the primary interest, which is rather focused on the other person. People differ in their self- or other-centered decision-making tendency: Certain personality patterns are associated with altruistic behavior (Ashton et al., 1998; Oda et al., 2014), while others had been associated with self-interested values and behavior (Brown et al., 2010; Brunell et al., 2014). This means for advice-giving situations with conflicts of interest, that people who tend to show more altruistic behavior may also give less biased advice because they focus on the other person, while people who tend to show more self-interested behavior may give more biased advice because they tend to neglect the other person's interest.

Additionally, conflict of interest disclosure might affect people differently depending on their personality structure. For example, people who are "strategic thinkers" may be more likely to tend to cognitions such as moral licensing or strategic

exaggeration and thus giving more biased advice after disclosure, while people who "think with their heart" might more likely show behavior explained by the telltale heart effect, thus showing less bias after disclosure.

Peoples' individual bias-tendency due to personality structure has not yet received much attention and neither has the interaction of personality structure with the backfiring effect of disclosure. Some evidence suggests that the Big Five personality trait extraversion is in general associated with more altruistic behavior, while the personality trait openness contributes to altruism particularly towards strangers (Oda et al., 2014). One study found that in a giving task, participants who showed most altruistic behavior were also high on the personality traits negative emotionality and extraversion, and low on conscientiousness and agreeableness (Ben-Ner & Kramer, 2011), and that altruistic empathy factors were positively related to participants' agreeableness and negatively to their emotional stability while altruistic forgiveness-factors were positively associated with both agreeableness and emotional stability (Ashton et al., 1998).

There is also evidence that personality structure and ethical decision-making could be related (Antes et al., 2007) and that in some cases, a higher sense of narcissistic entitlement negatively affected bias in counseling (Davis et al., 2008).

To conclude, the inconclusive evidence regarding bias after conflict of interest disclosure suggests that there might be other factors involved that affect whether or why conflict of interest disclosure leads to bias. In general, psychological mechanisms help explain why conflicts of interest sometimes lead to bias (Sah 2012; Felser & Klemperer, 2011) and why disclosure can backfire (Loewenstein et al., 2014). They help understand why these effects sometimes differ depending on the situation or other circumstances (Cain et al., 2011; Sah & Loewenstein, 2014). Evidence on

psychological mechanisms in advice-giving situations might provide insights into the etiology of bias. The particular role of personality dimensions, however, is only scarcely investigated.

4.1.3. Educating Advisees

The above-mentioned unintended effects of disclosure only focus on advisors, but conflict of interest disclosure in an advice-giving situation might also affect the advisor-advisee-relationship. Unintended consequences of disclosure that were found in studies are, e.g., that advisees trusted less in the advice when a conflict of interest was disclosed than when no conflict of interest was disclosed (Sah et al., 2013, 2018). An example from the medical field showed that patients judged their physician less honest and lower in fidelity when they saw they had disclosed payments by the pharmaceutical industry (Hwong et al., 2017). However, studies also have shown that disclosure has no effect on patients' trust in their physician (Rose et al., 2019), and that disclosure, under specific circumstances, even leads to increased trust in the advisor (Sah et al., 2018).

In line with that, experts emphasize the importance of education and elucidation in the context of conflicts of interest, particularly for the disclosure of financial conflicts of interest in the medical context (Ornstein, 2017; Rickert, 2015; Zuger, 2017) as well as for disclosure in general (Sah et al., 2016; Sah et al., 2018).

However, to our knowledge, it has not yet been investigated if advisees' education about bias risk affects advisors' bias in advice-giving situations and whether advisees' education affects the backfiring effect of conflict of interest disclosure.

In the present study, we aimed to fill this gap by investigating advisors' bias after conflict of interest disclosure to educated and uneducated advisees.

4.1.4. Aim of Study and Hypotheses

This study was preregistered in the Open Science Framework (www.osf.io/hvr2g). The study's aim was to examine the effects of conflict of interest disclosure and advisees' education on bias in advice-giving. Further, advisors' cognitions, their Big Five personality traits and narcissism was investigated on an exploratory basis. The study was built on the methods of Cain et al. (2011) and Sah (2019) and examines the hereafter outlined hypotheses.

In previous research, conflict of interest disclosure in experimental situations led to more bias after disclosure. We therefore hypothesized a main effect of conflict of interest disclosure on bias in advice:

H1: Advisors with conflicts of interest will give more biased advice with disclosure than without disclosure.

It is further argued that disclosure backfires because advisors strategically calculate advisees' reactions into their response or because they feel morally licensed to give biased advice. We expected a similar effect in cases where advisees are educated about risk of bias in advice. If advisors know that advisees are generally educated, they may suspect to be doubted in their independence and therefore also give more biased advice as they anticipate advisees' reactions, regardless of whether the conflict of interest has to be disclosed or not:

H2: Advisors with conflicts of interest will give more biased advice if they know the advisee is educated about bias risk than if they don't have his knowledge.

Lastly, we expected that the effect of knowledge about advisees' education about a general bias risk is smaller than the backfiring effect of disclosure because the knowledge about general education is much less direct than disclosure of a specific conflict of interest in the situation itself. Therefore, we hypothesized that education would moderate the backfiring effect of conflict of interest disclosure:

H3: Advisors with conflicts of interest will give less biased advice with disclosure if they know the estimator is educated than if they don't have this knowledge.

4.2. Methods

4.2.1. Sample Plan

Participants were recruited in collaboration with the Mainzer Behavioral and Experimental Laboratory (MABELLA) by use of a broad pool of students and non-students who had shown their interest in experiment participation. For recruitment, the software ORSEE was used (www.orsee.org). Inclusion criteria were that participants were older than 18 years and that they spoke German at native-speaker level. The recruiting e-mail that was sent to the MABELLA pool of participants stated that an experiment about advice-giving, lasting 40 minutes, will take place and that a representation allowance between 6 and 12 € will be paid depending on performance[19]. Based on a power analysis (see 4.2.4.2.), our aim was to recruit at least 240 participants.

[19] For experiments in MABELLA it is known that participants can earn on average about 9€ / hour.

4.2.2. Pilot Studies

Our experiment followed the methods of Cain et al. (2011), where participants had to give advice to advisees on the sale price of a real estate. In these experiments, advisors have more information about the real estate than advisees and advisors are paid more the higher advisees subsequently estimate the real estate sale value while advisees are paid more the more accurate they estimate the real estate sale value. Thereby, a conflict of interest on the part of the advisor arises.

A new approach in our experiment was that we varied advisees' reactions, which was different to Cain et al. (2011). To test the procedure, two pilot studies were conducted. For the first pilot study, we assigned $n = 10$ psychology students who had come to our lab to advise another person on the sale price of a real estate. Participants all had a conflict of interest and it was varied whether or not it had to be disclosed. The other person was a stooge who was instructed to either show attention to the conflict of interest by asking questions about the payment modalities or showing nonattention by looking at her mobile phone while the pilot participants disclosed the conflict of interest. Hereby, we faced two challenges: First, the conditions were difficult to vary and our solution to operationalize nonattention was interpreted as impoliteness by most pilot participants. Second, pilot participants were not able to focus on the task because they were overwhelmed by the stooge's reactions. All of them reported that they were not able to ponder over the task because they felt either caught in the act (in the attention-condition) or treated rudely (in the inattention-condition).

We therefore decided to modify the setting into a computer-based experiment so that conditions were easier to vary and participants could focus on the task. The computer-based experiment was pilot tested with $n = 27$ students who conducted the

experiment in situ. Pilot participants had the option to write anonymous comments directly in the survey and/or give direct feedback to the examiners. After the pilot testing, the examiners discussed the survey comments and feedback and made final adjustments.

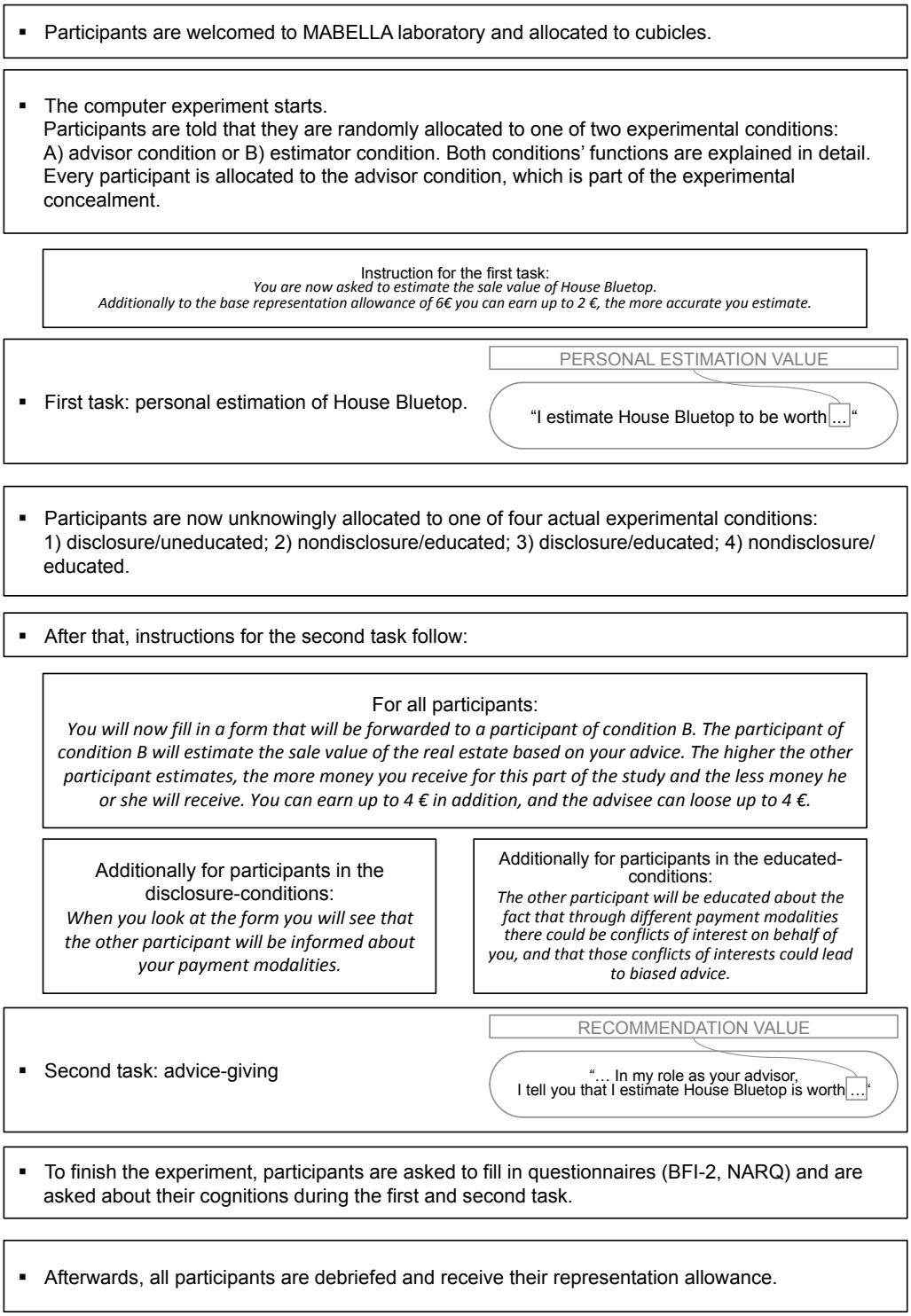
4.2.3. Final Experiment

The final experiment was computer-based and created with Sosci Survey (Leiner, 2019). It consisted of three parts: 1) explanation of the task and preparation for the advice-giving situation; 2) advice-giving situation; 3) further questions and personality questionnaires.

In the first part of the experiment, participants were asked to estimate the sale value of a real estate named "Haus Blaudach" [House Bluetop] by using information about the real estate's market value und the market values and sale values of comparable real estates. Afterwards, they learned that they would have to advice another participant ("advisee") who also had to estimate the sale value of this real estate but had less information. Participants were told that this advice will be given online by filling in a prewritten online form with a recommendation value and sending it to the advisee. Participants were told that advisees will thereafter give an estimation of the sale value of House Bluetop and that depending on the advisee's estimate, both representation allowances are calculated: The higher the advisee's estimation value for the real estate, the more money the advisor receives; the more accurate the advisee's estimate value for the real estate, the more money the advisee receives. To verify that participants had understood the task, they had to fill out a cloze test. The experiment only proceeded if they correctly filled in all the gaps. For the complete procedure, see Figure 10.

Figure 10

Flow Diagram of Experimental Procedure



Note. BFI-2 = Big Five Inventory 2 by Soto and John (2017); NARQ = Narcissistic Admiration and Rivalry Questionnaire by Back et al. (2013)

4.2.3.1. Material. The stimulus material used to give the participants information on the real estate was based on the material used in Cain et al. (2011). We modified one of the stimuli used in Cain et al.'s (2011) experiment by changing dollar signs into euro signs but adopted the values. Further, the real estate's location was changed into a German place nearby Mainz where this value is approximately realistic. Instead of a photo, an open-source illustration was used. The information form the participants received consisted of the illustration, general information about the real estate (e.g., number of rooms), and information regarding the real estate's market value as well as comparable real estates' market and sale values. Participants saw two versions of the document: In the first part of the experiment, they saw a version with much information where they had to insert their personal estimate (Figure 11). This document showed the illustration of the real estate, its market value (238,200 €), and information regarding comparable real estates ("comparable real estate 1" sale value: 179,000 € and market value 185,400 €; "comparable real estate 2" sale value: 215,000 € and market value: 235,000 €). The field indicating House Bluetop's sale value was empty and had to be filled to continue the experiment.

In the second part of the experiment, participants saw advisees' version of the document to illustrate the information imbalance between them and the advisees. The advisee's version was marked by a large lettering saying "estimation condition". This estimation condition document was the same as the version they had seen before except that all monetary values were blacked out and a note was added that "the person from the advice condition" would have access to this information (all material can be seen in Appendix D).

Figure 11

Information Form for Participants

Info Haus „Blaudach“

Verkaufsdatum: 03/11/2015
Verkaufspreis: € *Dies ist der zu schätzende Wert.*
Marktwert: 238.200 €

55496 Argenthal: Sofort freies Haus auf 2 Wohnebenen zum Bestpreis!

Information zum Objekt:

Haustyp: Einfamilienhaus (freistehend)
Etagenzahl: 2
Wohnfläche ca.: 200 m²
Grundstückfläche ca.: 300 m²
Garage / Stellplatz: 2 Außenstellplätze
Baujahr: 1924
Objektzustand: gut
Zimmer: 8
Schlafzimmer: 4
Badezimmer: 2
Kamin: 1
Heizung: Zentralheizung

Vergleichsimmobilie 1		**Vergleichsimmobilie 2**	
Adresse:	55496 Argenthal	Adresse:	55496 Argenthal
Baujahr:	1924	Baujahr:	1929
Verkaufsdatum:	26/10/2015	Verkaufsdatum:	01/03/2014
Verkaufspreis:	179.000 €	Verkaufspreis:	215.000 €
Marktwert:	185.400 €	Marktwert:	235.300 €

4.2.3.2. Design. In this experiment, the independent variables were the manipulated experimental conditions: disclosure and education. The dependent variable was bias in advice-giving, our main outcome. Several exploratory outcomes were measured. Experimental conditions and outcomes are described in detail in the following text section.

4.2.3.3. Conditions. All participants had a conflict of interest based on their payment modalities: They were informed to receive a higher representation allowance if their advisees estimated a higher sale value while advisees would receive a lower representation allowance if they estimated a higher sale value.

The two variables of interest were varied between subjects. There were two independent variables with two factor levels each: Disclosure (nondisclosure vs. disclosure) and education (uneducated vs. educated), leading to a 2x2 – between-design. Thus, there were four conditions:

- Condition 1: nondisclosure to uneducated advisee
- Condition 2: disclosure to uneducated advisee
- Condition 3: nondisclosure to educated advisee
- Condition 4: disclosure to educated advisee

Participants' assignment to one of the four conditions was performed by the survey program SoSci Survey. Depending on their condition, participants received different instructions (see Figure 10).

4.2.3.4. Main Outcomes. The dependent variable was bias in advice-giving, which was calculated as the difference between the recommended value (experimental task 2) and the personal estimation (experimental task 1) of the real estate sale value.

4.2.3.5. Exploratory Variables: Cognitions and Personality Traits. In the third part of the experiment, participants were asked to give demographic information regarding age, gender and study subject. Further, they were asked to answer questions about their cognitions during the task and fill out personality questionnaires to get a deeper understanding of individual differences regarding bias in advice-giving situations.

Participants were asked to answer the following questions in retrospection by writing bullet points in a text box:

- How did you come to the accurate estimation of the real estate's sale value?
- What were your thoughts in the advice task regarding the value you would tell?

After these questions, participants received personality questionnaires. To measure personality dimensions, the German version of the Big Five Inventory 2 (BFI-2; Soto & John, 2017) by Danner et al. (2016) was used. This inventory is designed to measure the five personality trait domains extraversion, agreeableness, conscientiousness, negative emotionality and openness with three facets each.

In total, the BFI-2 contains 60 items, with 12 items per personality trait. Each item is a short phrase that can be rated on a 5-point Likert scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). One example item for each personality trait is listed below.

- Extraversion: I am someone who is outgoing, sociable.
- Agreeableness: I am someone who is compassionate, has a soft heart.
- Conscientiousness: I am someone who is dependable, steady.
- Negative Emotionality: I am someone who worries a lot.
- Openness: I am someone who is complex, a deep thinker.

The BFI-2 shows good reliability coefficients, and construct and criteria validity have been shown for example by Danner et al. (2016).

To assess Narcissism, the German version of the Narcissistic Admiration and Rivalry Questionnaire (NARQ) by Back et al. (2013) was used. This questionnaire measures two dimensions of narcissism: narcissistic admiration and narcissistic rivalry, by 18 items (nine items for each dimension). Back et al. (2013) state the NARQ to be a reliable instrument that shows good internal consistencies and stabilities. Items are short, descriptive phrases that can be rated on a 6-point Likert scale ranging from 1 (*not agree at all*) to 6 (*agree completely*).

4.2.3.6. Procedure. At the start of the experiment, participants were invited to the MABELLA Laboratory at the campus of Johannes Gutenberg University Mainz, where they were welcomed in groups up to 25 and instructed in the formal procedure. Experiment sessions took place in February and March 2019. In the MABELLA premises, there are 25 cubicles with one computer each and visual covers to the cubicles next to it. Participants were allotted to a cubicle by chance and requested to begin the already opened experiment. Then, they were asked to provide informed consent, and worked on the given tasks through which they were guided by instructions on the screen. After having finished, they were debriefed and requested to

come to the examiners, where they received their allowance, were thanked and dismissed.

4.2.3.7. Participant Payment and Deception. Participants were deceived. At the beginning of the experiment, they were informed that they are randomized to one of two conditions: advisor or advisee. In fact, all participants took the role of the advisor. Thereafter, they were told that they have the chance to gain up to 2 € in addition to their representation allowance of 6 € if they estimate the real estate sufficiently accurate in the first part of the experiment, and that they have the chance to gain up to 4 € if their advisee estimates the real estate sufficiently high in the second part of the experiment. In fact, there were no advisees, the participants' representation allowance was not dependent on anyone's performance and all participants received the highest sum they could have possibly earned if the instructions had been true, which was 12 €. After the experiment, participants were fully debriefed. Ethics approval was given (see section 4.2.5. and Appendix C).

4.2.4. Analysis

4.2.4.1. Hypothesis Testing. To test the confirmatory hypotheses 1 - 3, a two-way independent analysis of variance (ANOVA) with the between factors disclosure (nondisclosure vs. disclosure) and education (uneducated vs. educated) was performed. The effect that was pertinent to hypothesis 3 was a moderation effect by the factor education on the effect of disclosure. An alpha level of 0.05 was used for the statistical tests. Confidence intervals (CI) are given on a 95% level.

For exploratory analyses of personality traits and bias, we calculated Spearman's correlation coefficients in general and separated by condition. For

exploratory analyses of advisors' cognitions, we categorized participants' answers to the two open questions regarding their cognitions during task performance. To explore whether there was a relation between experimental condition and participants' cognitions, χ^2-tests were conducted. To explore the relation between cognitions and bias in the advice-giving task, *t*-tests were performed.

4.2.4.2. Test Power and Sample Size. An a priori power analysis for a fixed effects, special, main effects and interactions ANOVA was performed in G*Power (Faul et al., 2007, 2009) with an alpha level of 0.05 and power value of 0.95. Based on the results by Cain et al. (2005, 2011), which revealed medium to high effect sizes in the difference of bias between disclosers and nondisclosers ($d = 0.45$; $d = 0.71$), effect size for this study's power analysis was estimated as $f = 0.25$. With four groups and two factor levels, this led to a total sample size of $n = 210$. So, we planned to recruit 240 participants, which equals 60 participants per group. This sample size would give approximately 95% power to detect medium effect sizes and 30% power to detect small effect sizes.

4.2.4.3. Handling of Outliers. The way outliers in a dataset are defined, identified and handled can have heavy implications on the absence or presence of an effect in quantitative research, and thus on the main conclusions (Aguinis et al., 2013). This issue had not been considered in the a priori registration and planning of the study. Confronted with extreme outliers in the data, we opted for a transparent approach: First, three typical ways to handle outliers in data such as the data collected in this study are identified. Then, a three-pronged analysis is conducted.

Afterwards, the possible implications of the different results on conclusions and what this means for our data are discussed.

Defining outliers especially in terms of already investigated data is rather subjective and therefore error-prone. This process is sensitive for bias as it requires that a normal region in the data has to be defined, which creates a risk of arbitrariness (Chandola et al., 2007). We therefore relied on established definitions given in literature that say that extreme values of data are either more than three standard deviations distant from the mean, or, in a non-parametric approach, more than three times the interquartile range (*IQR*) distant from the median (Martin & Roberts, 2014). In the present study, a distribution analysis showed deviation from normal distribution, so the latter approach was chosen. We identified 11 extreme outliers (i.e., values more than three times the *IQR* distant from the median) in the personal estimation values and seven extreme outliers in the recommendation values. After identifying outliers, the question arises how these outliers are handled in the statistical analysis. Various methods for handling outliers in statistical analyses can be found in the literature, depending on the type of outlier in the data. Different types of outliers can be distinguished by the causes for their extreme values, by the outliers' possible effects on the results of the analysis, or by the potential loss that might occur if outliers are excluded from the dataset (Reinboth, 2015).

In the present study's case, some outliers (mainly those for the personal estimations of the real estate's sale value) seem to be caused by typing errors, e.g., due to forgetting zeros. Other outliers (presumably some of the extreme recommendation values) may partly have been caused by the experimental manipulation. For example, this study's data shows two highly extreme outliers in the disclosure condition. As strategic exaggeration after disclosure of financial conflict of

interest is a theoretical possible explanation for extreme outliers, these outliers—despite not being in the "normal range" of the data—may contain valuable information because they might have arisen due to the experimental disclosure-condition. This valuable information can be included without biasing the whole analysis by trimming these extreme values to three times the *IQR* above or below the median (Reinboth, 2015). Given this theoretical consideration, we decided upon an exploratory three-pronged analysis strategy: Every planned analysis was conducted 1. with all data; 2. with outliers eliminated and 3. with outliers trimmed to the upper or lower border of extremeness (i.e., three times the *IQR* around the median).

Further, although our data was not normally distributed, we chose parametric analysis methods instead of non-parametric analysis methods because the groups were sufficiently big in a way that robustness of *F*-tests would outweigh the violation of assumptions for conducting the analyses. This last point was demonstrated by various big simulation studies (Blanca et al., 2017; Schmider et al., 2010). A theoretical argument can be found in Norman (2010).

4.2.4.4. Exploratory Analyses. For content analysis of the answers to the two open questions, two researchers (Alexander Mancini and Marlene Stoll) independently read all answers, suggested categories and discussed them to reach consensus (Stemler, 2000). The thereby created checklist of categories was then used to categorize participants' answers. AM and MS both independently categorized all answers and discussed in case of divergent classifications. One answer could be classified into several categories. Interrater agreement was 97% for the first and 96% for the second question.

To explore personality dimensions and their relation to bias, Spearman's rank correlation coefficients were calculated for Big Five personality dimensions, narcissism subscales and bias for the whole sample as well as split by condition.

4.2.5. Ethics

Research ethics approval was given in January 2019 by the ethics committee of the psychological institute of Johannes Gutenberg University Mainz (2018-JGU-psychEK-025). Informed consent was obtained as approved by the ethics committee. Participants were debriefed and afterwards had the opportunity to exclude their data from analyses. Ethics approval, informed consent form and debriefing form can be found in the Appendix C and Appendix D.

4.3. Results

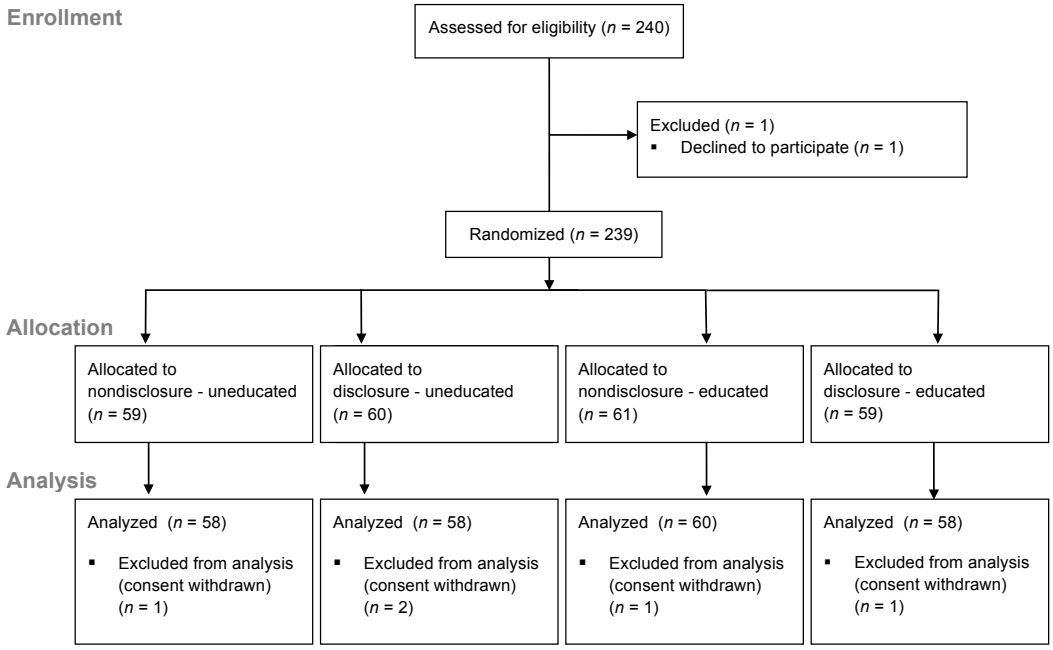
4.3.1. Sample

In all, 240 persons were assessed for eligibility. One person declined to participate; 239 started the experiment and were allocated to the four conditions (see Figure 12). At the end of the experiment, after debriefing, participants had to choose one of the two options: 1) "My data can be used for research purposes." or 2) "My data shall not be used.". Five participants ticked the latter, leading to a total analyzable sample of $n = 234$ participants. The age of these participants ranged from 18 to 47 years ($M = 23.39$, $SD = 4.18$); 65% ($n = 153$) were female, 31% ($n = 72$) male, 2% ($n = 4$) ticked the gender category "other", and 2% ($n = 5$) did not state their gender. All were registered students of the Johannes Gutenberg University Mainz from 12 different departments: The largest parts of the students were associated to the

faculties “social sciences, media and sport” (*n* = 126, 54%), “law and economics” (*n* = 44, 19%) and “philosophy and philology” (*n* = 42, 18%).

Figure 12

Flow Chart of Participants



4.3.2. Participants' Personal Estimations, Recommendations and Bias

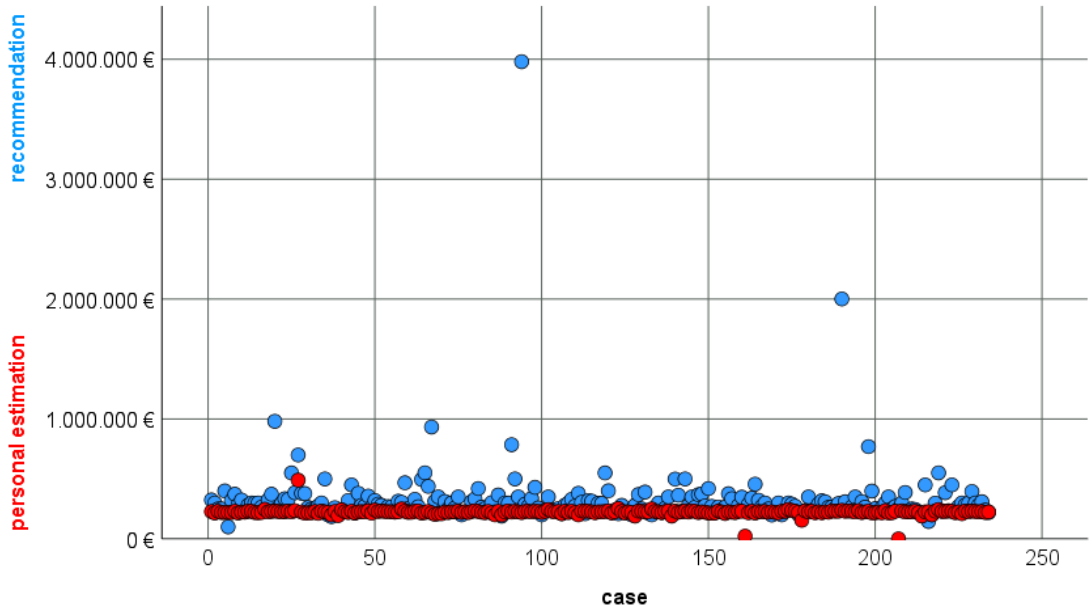
Mean personal estimation of the real estate was 223,849 € (*Mdn* = 225,000 €) with a range from 250 € to 490,000 € and a standard deviation of *SD* = 28,248 €. Mean recommendation was 329,313 € (*Mdn* = 280,200 €) with a range from 100,000 € to 3,980,000 €, *SD* = 285,963 €. In Figure 13, participants' personal estimated values and participants' recommendation values are depicted. Descriptive characteristics of the aggregated data separated by conditions can be seen in Table 13.

Bias, calculated as difference between recommendation and personal estimate, ranged from -120,000 € to 3,760,000 € with *M* = 105,464 € (*SD* = 284,661 €) and *Mdn* = 56,500 €.

Figure 13

Scatterplot of Participants' Personal Estimations and Recommendations, A) Complete Y-Axis and B) Y-Axis Cut-Out With Maximum at 1,000,000 €

A)



B)

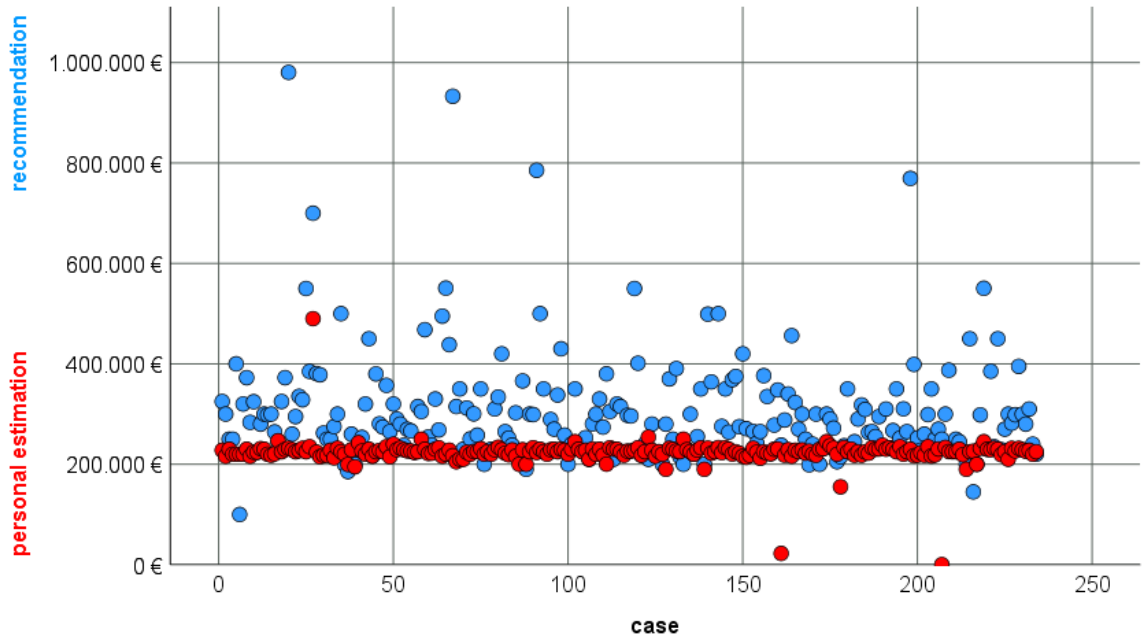


Table 13

Descriptive Values for Personal Estimations and Recommendations, Analysis With all Data, Separated by Conditions

	Nondisclosure - uneducated *n = 58*			Disclosure - uneducated *n = 58*			Nondisclosure - educated *n = 60*			Disclosure - educated *n = 58*		
	M (SD)	*Mdn*	*Min-Max*	*M (SD)*	*Mdn*	*Min-Max*	*M (SD)*	*Mdn*	*Min-Max*	*M (SD)*	*Mdn*	*Min-Max*
Pers. est.	221,001 € (27,721)	225,000 €	22,500 – 245,000 €	219,758 € (30,854)	225,000 €	250 – 245,000 €	228,151 € (36,673)	225,000 €	155,000 – 490,000 €	226,336 € (9,906)	225,800 €	190,000 – 254,000 €
Rec.	283,170 € (61,790)	268,500 €	190,000 – 499,000 €	391,550 € (50,154)	300,000 €	100,000 – 3,980,000 €	305,065 € (122,184)	270,000 €	199,000 – 980,400 €	338,301 € (238,006)	296,250 €	145,000 – 2,001,000 €
Bias	62,169 € (62,086)	51,000 €	-20,000 – 266,778 €	171,792 € (501,305)	75,750 €	-120,000 – 3,760,000 €	76,915 € (110,991)	46,100 €	-50,000 – 748,400 €	11,965 € (236,721)	65,250 €	-81,000 – 1,763,000 €

Note. Pers. est. = Personal estimation; Rec. = Recommendation.

4.3.3. Data Distribution

Variables were examined for distribution and outliers in detail, separated by conditions. Both variables (personal estimations, recommendations) were not normally distributed for either condition as assessed by the Shapiro-Wilk-test, all $p < .001$.

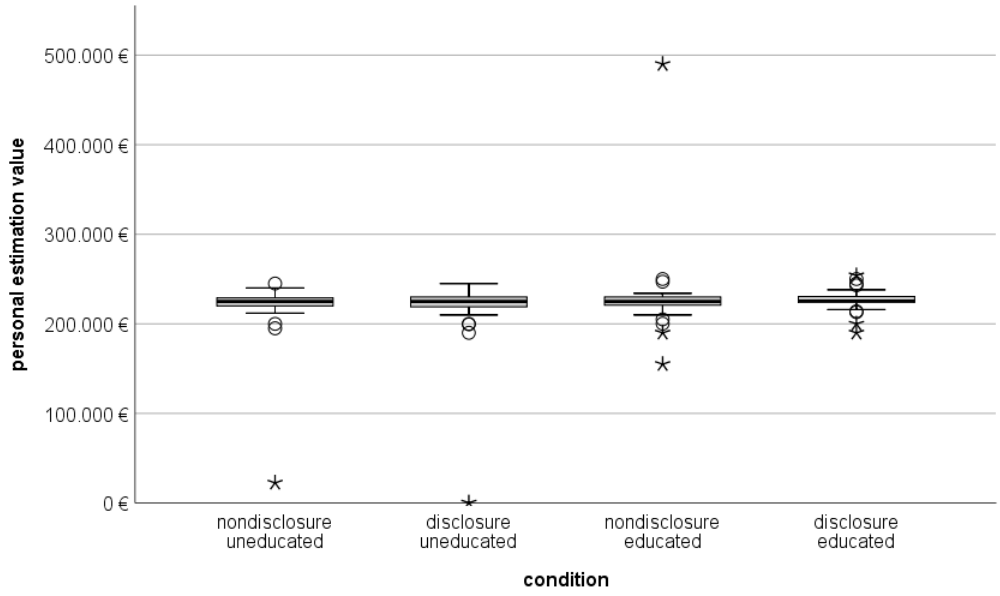
Figure 14 show boxplots of the variables separated for conditions. Outliers are categorized as mild outliers if $x \geq (Mdn \pm 1.5 * IQR)$ and as extreme outliers if $x \geq (Mdn \pm 3 * IQR)$.

Of all personal estimations, 11 data points were categorized as mild outliers and 11 were categorized as extreme outliers. Of all recommendations, six data points were categorized as mild outliers and seven were categorized as extreme outliers. Extreme outliers were trimmed to the median of the participant's condition ± 3 * *IQR*. All data points before and after trimming are listed in Table 14. For the three-pronged analysis, we used either 1) all data, 2) eliminated the extreme outliers or 3) trimmed the extreme outliers and calculated bias afterwards.

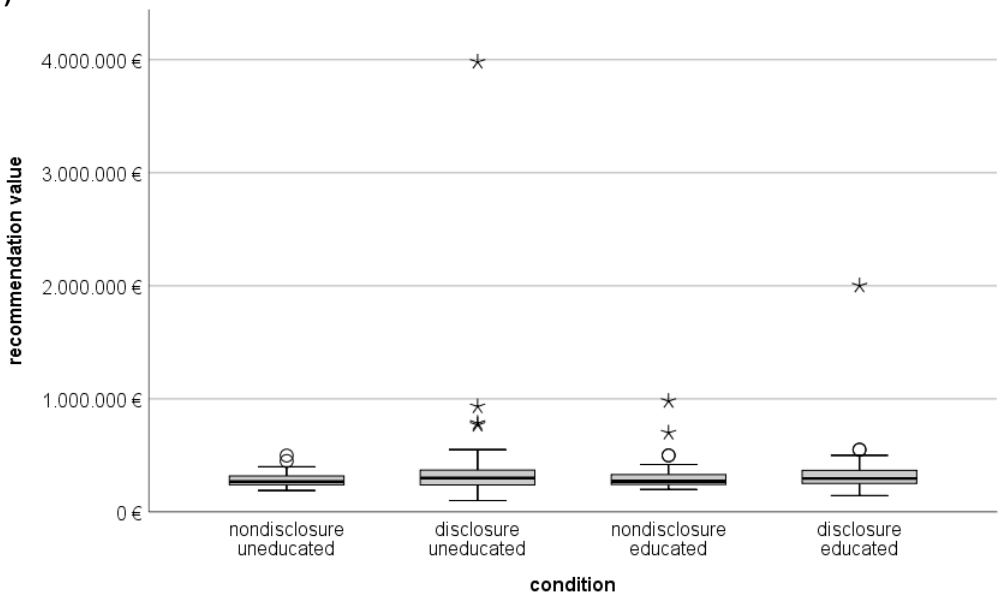
Figure 14

Boxplot of Participants' A) Personal Estimations and B) Recommendations, Separated by Conditions

A)



B)



Note. Circles: mild outliers (x ≥ (*Mdn* ± 1.5 * *IQR*)); stars: extreme outliers x ≥ (*Mdn* ± 3 * *IQR*).

Table 14

Outlier Values Before and After Trimming

Original value	Condition	*IQR* (condition)	*Mdn* (condition)	Trimmed value
Personal estimations				
195,000 €	1	9,000 €	225,000 €	198,000 €
22,500 €	1	9,000 €	225,000 €	198,000 €
250 €	2	11,250 €	225,000 €	191,250 €
190,000 €	2	11,250 €	225,000 €	191,250 €
490,000 €	3	9,188 €	225,000 €	252,564 €
190,000 €	3	9,188 €	225,000 €	197,436 €
155,000 €	3	9,188 €	225,000 €	197,436 €
250,000 €	4	7,413 €	225,800 €	248,039 €
254,000 €	4	7,413 €	225,800 €	248,039 €
190,000 €	4	7,413 €	225,800 €	203,561 €
200,000 €	4	7,413 €	225,800 €	203,561 €
Recommendations				
932,800 €	2	132,475 €	300,000 €	697,425 €
785,400 €	2	132,475 €	300,000 €	697,425 €
3,980,000 €	2	132,475 €	300,000 €	697,425 €
769,300 €	2	132,475 €	300,000 €	697,425 €
980,400 €	3	88,750 €	270,000 €	536,250 €
700,000 €	3	88,750 €	270,000 €	536,250 €
2,001,000 €	4	118,475 €	118,475 €	473,900 €

Note. Conditions: 1 = nondisclosure - uneducated; 2 = disclosure - uneducated;

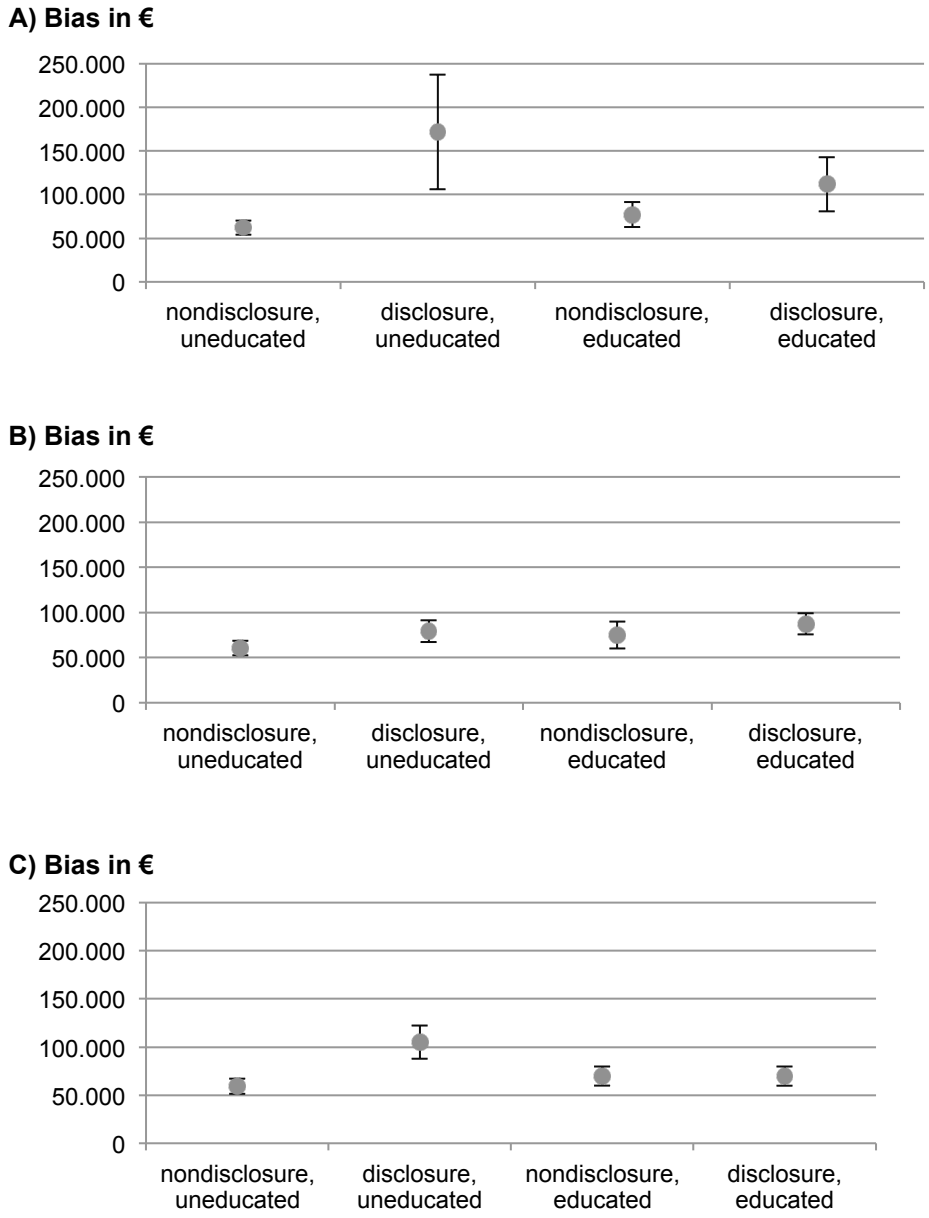
3 = nondisclosure - educated; 4 = disclosure - educated.

4.3.4. Hypotheses

Two-way between subjects ANOVAs were conducted to compare the effects of disclosure and education on bias. As described in 4.2.4.3., a three-pronged analysis was performed by running the ANOVA three times. Each time, the outcomes were treated differently: either they were treated as every other data point (normal analysis), or they were eliminated (eliminated analysis) or they were trimmed to three standard deviations around the mean (trimmed analysis). Means and standard errors of the means separated per condition are depicted in Figure 15.

Figure 15

Mean Bias With Standard Error of the Mean, Analysis A) of all Data, B) With Outliers Eliminated, and C) With Outliers Trimmed, Separated by Condition



For the variable *bias*, Levene's test showed homogeneity of variances between the four groups for the analysis with all data, $F_{all}(3, 230) = 1.78$, $p = .152$, and for the analysis with outliers eliminated, $F_{elim}(3, 213) = 1.11$, $p = .345$. If outliers were trimmed, variances were significantly different in the four groups, $F_{trim}(3, 230) = 4.07$, $p = .008$.

To test the first hypothesis, we examined whether advisors in disclosed-conditions showed higher bias than advisors in undisclosed-conditions. No statistically significant effect for disclosure on bias was found if outliers were ignored ($F_{all}(1, 230) = 3.81$, $p = .052$, $\eta^2_p = 0.02$) or eliminated ($F_{elim}(1, 213) = 1.70$, $p = .194$, $\eta^2_p = 0.02$). There was, however, a statistically significant difference between disclosed and undisclosed conditions on bias if outliers were trimmed ($F_{trim}(1, 230) = 6.45$, $p = .012$, $\eta^2_p = 0.03$).

For the second hypothesis, bias was hypothesized to be higher in the educated conditions compared to the uneducated conditions. No statistical main effect for education on bias was found, regardless of how outliers were treated ($F_{all}(1, 230) = 0.37$, $p = .544$, $\eta^2_p = 0.00$; $F_{elim}(1, 213) = 0.86$, $p = .354$, $\eta^2_p = 0.00$; $F_{trim}(1, 230) = 0.13$, $p = .718$, $\eta^2_p = 0.00$).

To answer the third hypothesis, a moderation effect of education and disclosure was investigated. No statistically significant interaction between the two factors was found, regardless of how the outliers were treated ($F_{all}(1, 230) = 1.01$, $p = .315$, $\eta^2_p = 0.00$; $F_{elim}(1, 213) = 0.07$, $p = .790$, $\eta^2_p = 0.00$; $F_{trim}(1, 230) = 1.57$, $p = .211$, $\eta^2_p = 0.01$). Group means with standard error of the mean are depicted in Figures 16, 17, and 18 for hypothesis 1, 2, and 3, respectively.

Figure 16

Mean Bias with Standard Error of the Mean, Analysis A) of all Data, B) With Outliers Eliminated, and C) With Outliers Trimmed, Nondisclosure vs. Disclosure

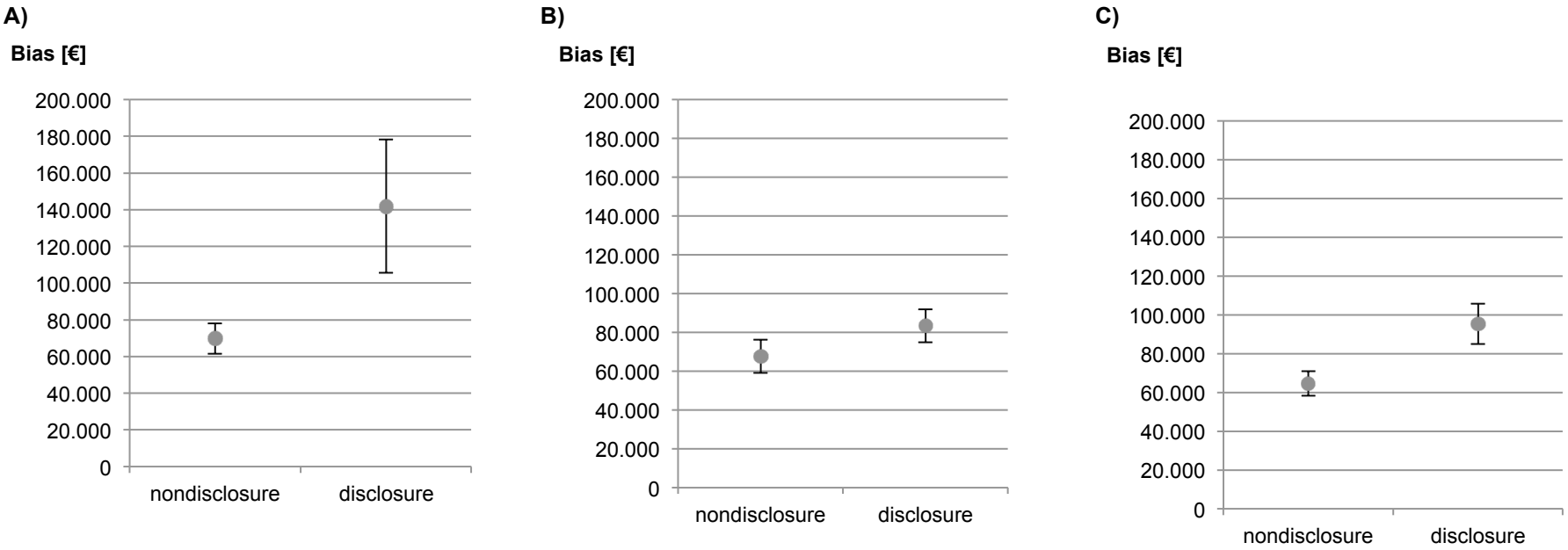


Figure 17

Mean Bias with Standard Error of the Mean, Analysis A) of all Data, B) With Outliers Eliminated, C) With Outliers Trimmed, Uneducated vs. Educated

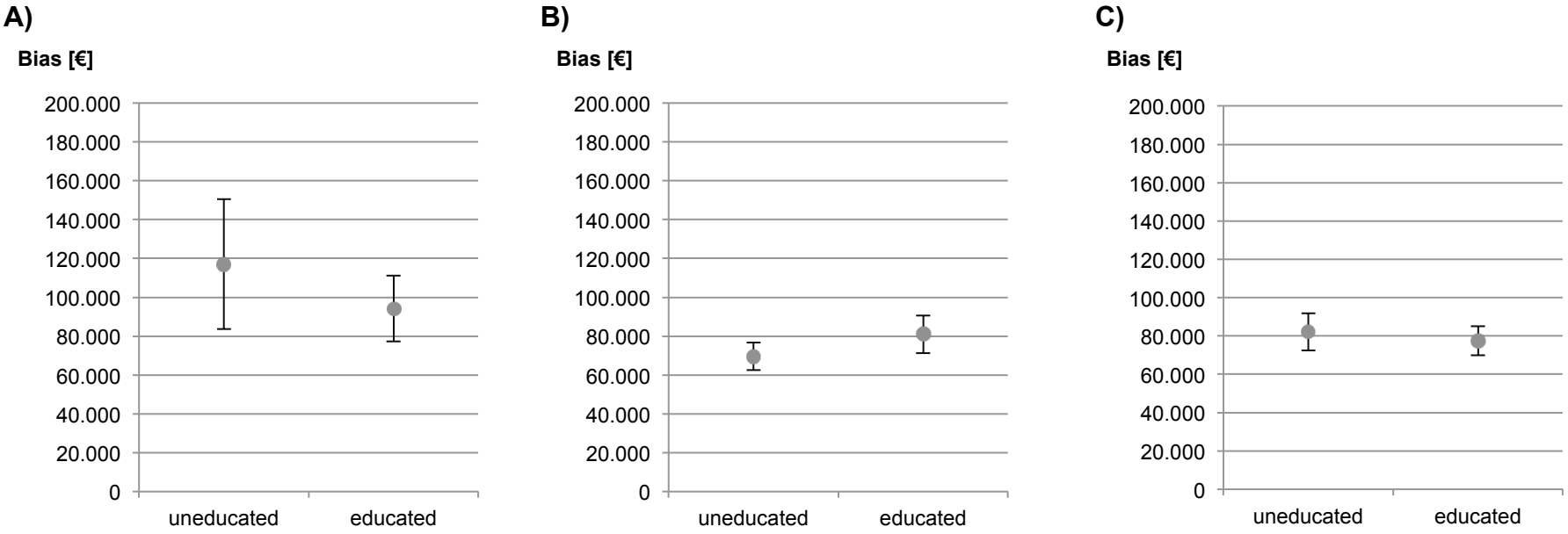
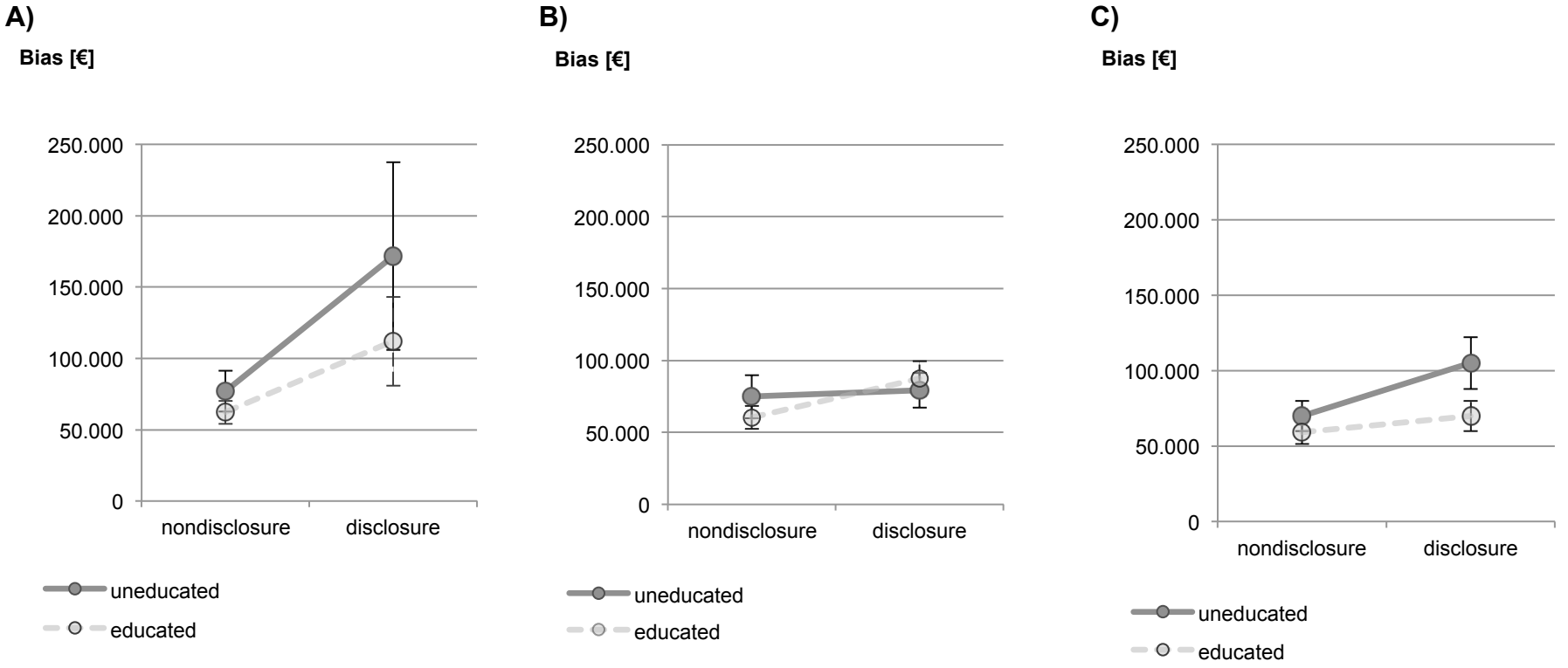


Figure 18

Interaction Plots of Mean Bias with Standard Error of the Mean, Analysis A) of all Data, B) With Outliers Eliminated, and C) With Outliers Trimmed, Disclosure- and Education-Conditions



Descriptively, participants in the disclosed-uneducated condition showed the highest mean bias with *M* = 171,792 € (*SD* = 501,305) and *Mdn* = 75,750 €; participants in the disclosed-educated condition showed the second highest bias with *M* = 111,965 € (*SD* = 236,721) and *Mdn* = 65,250 €, followed by those in the undisclosed-educated condition with *M* = 76,915 € (*SD* = 110,991) and *Mdn* = 46,100 €. Lowest mean bias was observed in participants in the undisclosed-uneducated condition with *M* = 62,169 € (*SD* = 62,086) and *Mdn* = 51,000 €. The rank order of the groups' mean biases does not change when outliers are trimmed. When outliers are eliminated, highest mean bias is observed in the disclosed-educated condition, followed by disclosed-uneducated condition. All descriptive values for bias can be found in Appendix E, separated by conditions (Table A5) as well as across disclosure- and educated-conditions (Table A3 and A4).

4.3.5. Exploratory Analyses

4.3.5.1. Personality Dimensions and Bias. On an exploratory mode, Spearman rank correlations between bias and the participants' scores on the Big Five dimensions (extraversion, agreeableness, conscientiousness, negative emotionality and openness) as well as between bias and their scores for narcissistic admiration and narcissistic rivalry were performed. The results can be seen in Table 15.

Looking at the relations between personality variables and bias in general, no remarkable relationships were found despite a small negative correlation between bias and agreeableness. This effect was consistent across all three analysis methods: $\rho_{all}(232) = -.15$; 95% CI [-.27, -.02], $p = .023$; $\rho_{elim}(215) = -.15$; 95% CI [-.28, -.02], $p = .024$; $\rho_{trim}(232) = -.15$, 95% CI [-.27, -.02], $p = .023$.

We further looked at the relation between personality variables and bias separately per condition (see Table 16). The hereafter described results have to be understood as explorative, as alpha error probability is high due to multiple testing. We found statistically significant negative relations between extraversion and bias in the disclosed-educated condition if outliers were eliminated ($\rho_{elim}(215) = -.29$; 95% CI [-0.52, .02], $p = .036$); between agreeableness and bias in the undisclosed-educated-condition independent of how outliers were treated ($\rho_{all}(232) = -.31$; 95% CI [-.52, -.06], $p = .015$; $\rho_{elim}(215) = -.32$; 95% CI [-.54, -.06], $p = .016$; $\rho_{trim}(232) = -.31$, 95% CI [-.52, -.06], $p = .018$) and a statistically significant positive relation between conscientiousness and bias in the disclosed-uneducated condition independent of how outliers were treated ($\rho_{all}(232) = .38$; 95% CI [.13, .58], $p = .004$; $\rho_{elim}(215) = .30$; 95% CI [.02, .52], $p = .037$; $\rho_{trim}(232) = .39$, 95% CI [.14, .59], $p = .003$).

Table 15

Personality Dimensions: Spearman's Correlation With Bias and 95% CI, Cronbach's Alpha and Descriptive Statistics

	Bias	Bias, Elim.	Bias, Trimm.	Extraversion	Agreeableness	Conscientiousness	Negative emotionality	Openness	Narcissistic admiration	Narcissistic rivalry
E.	-.09	-.10	-.08	*.87*						
	[-.21;.04]	[-.23;.04]	[-.20;.05]	*[.85;.90]*						
A.	**-.15***	**-.15***	**-.15***	.13	*.80*					
	[-.27;-.02]	**[-.28;-.02]**	**[-.27;-.02]**	[-.00;.25]	*[.75;.83]*					
C.	.07	.03	.06	.15*	.29***	*.88*				
	[-.06;.20]	[-.10;.17]	[-.07;.19]	[.02;.27]	[.17;.40]	*[.86;.90]*				
N.E.	.00	.03	.00	-.20**	-.43***	-.28***	*.82*			
	[-.12;.13]	[-.10;.17]	[-.13;.13]	[-.32;.07]	[-.53;-.32]	[-.40;-.16]	*[.79;.86]*			
O.	.02	.04	.01	.13	.09	.01	.03	*.72*		
	[-.11;.14]	[-.09;.18]	[-.12;.14]	[-.00;.25]	[-.04;.22]	[-.12;.13]	[-.10;.16]	*[.73;.82]*		
N.A.	-.06	-.04	-.05	.46***	-.04	-.01	-.07	.10	*.84*	
	[-.18;.07]	[-.17;.09]	[-.18;.08]	[.35;.55]	[-.16;.09]	[-.14;.12]	[-.20;.05]	[-.03;.22]	*[.80;.87]*	
N.R.	.04	.04	.05	-.10	-.46***	-.20**	.23***	-.22***	.31***	*.79*
	[-.09;.17]	[-.09;.18]	[-.08;.18]	[-.23;.03]	[-.56;.36]	[-.32;-.07]	[.10;.35]	[-.34;-.09]	[.19;.42]	*[.74;.82]*
M (SD)				3.47 (0.65)	3.88 (0.50)	3.52 (0.67)	2.94 (0.65)	3.54 (0.58)	2.96 (0.83)	1.96 (0.67)

Note. Italicized: Cronbach's Alpha; E. = extraversion; A. = agreeableness; C. = conscientiousness; N.E. = negative emotionality; O. = openness; N.A. = narcissistic admiration; N.R. = narcissistic rivalry; Elim. = outliers eliminated; Trim. = outliers trimmed.

* $p < .05$

*** $p < .001$

Table 16

Personality Dimensions: Spearman's Correlation With Bias and 95% CI, Separated per Condition

	Nondisclosure - uneducated			Disclosure - uneducated			Nondisclosure - educated			Disclosure - educated		
	Bias, all	Bias, Elim.	Bias, Trim.	Bias, all	Bias, Elim.	Bias, Trim.	Bias, all	Bias, Elim.	Bias, Trim.	Bias, all	Bias, Elim.	Bias, Trim.
E.	.05	.07	.09	-.14	-.23	-.15	-.00	.06	-.01	-.20	**-.29***	-.21
	[-.21;.30]	[-.20;.33]	[-.18;.34]	[-.39;.12]	[-.47;.05]	[-.39;.12]	[-.26;.25]	[-.21;.32]	[-.25;.25]	[-.44;.06]	**[-.52;.02]**	[-.44;.05]
A.	-.17	-.18	-.21	-.17	-.14	-.13	**-.31***	**-.32***	**-.31***	-.00	-.01	.00
	[-.41;.09]	[-.43;.08]	[-.45;.05]	[-.41;.09]	[-.40;.14]	[-.38;.13]	**[-.52;-.06]**	**[-.54;-.06]**	**[-.52;-.06]**	[-.26;.26]	[-.28;.26]	[-.26;.26]
C.	.05	.02	.02	**.38****	**.30***	**.39****	-.08	-.12	-.07	-.12	-.09	-.12
	[.21;.30]	[-.24;.28]	[-.24;.27]	**[.13;.58]**	**[.02;.52]**	**[.14;.59]**	[-.32;.18]	[-.32;.15]	[-.32;.19]	[-.37;.14]	[-.35;.18]	[-.37;.14]
N.E.	-.04	-.07	-.03	-.01	.14	.00	.00	.02	-.01	.08	.09	.08
	[-.30;.22]	[-.33;.19]	[-.29;.23]	[-.26;.25]	[-.14;.39]	[-.26;.26]	[-.25;.26]	[-.24;]	[-.27;.24]	[-.18;.33]	[-.19;.35]	[-.18;.33]
O.	-.09	-.09	-.12	-.13	-.04	-.11	.12	.10	.09	.16	.18	.16
	[-.34;.18]	[-.34;.18]	[-.36;.15]	[-.37;.13]	[-.31;.24]	[-.36;.16]	[-.14;.36]	[-.17;.36]	[-.17;.34]	[-.10;.40]	[-.09;.43]	[-.10;.40]
N.A.	.17	.18	.20	-.06	-.12	.22	-.20	-.16	-.21	-.09	-.02	-.09
	[-.09;.41]	[-.09;.42]	[-.06;.44]	[-.31;.20]	[-.16;.38]	[-.04;.45]	[-.43;.06]	[-.41;.11]	[-.44;.04]	[-.34;.18]	[-.29;.25]	[-.34;.17]
N.R.	.02	.02	.04	.22	.12	.22	.04	.07	.05	-.06	.03	-.05
	[-.24;.27]	[-.24;.28]	[-.23;.29]	[-.04;.46]	[-.16;.38]	[-.04;.45]	[-.22;.29]	[-.20;.33]	[-.21;.30]	[-.32;.20]	[-.25;.29]	[-.31;.21]

Note. E. = extraversion; A. = agreeableness; C. = conscientiousness; N.E. = negative emotionality; O. = openness; N.A. = narcissistic admiration; N.R. = narcissistic rivalry; Elim. = outliers eliminated; Trim. = outliers trimmed.

* $p < .05$

** $p < .01$

4.3.5.2. Cognitions and Bias. Answers to the first question ("How did you come about the accurate estimation of the sale price?") followed two main objectives: comparison or calculation. Participants either solely told they compared the different given values or they reported that they calculated the mean of values. Some reported both. All categories and according frequencies can be found in Appendix E, Table A6.

Answers given to the second open question ("What were your thoughts in the advice task regarding the value you would tell?") were classified into 14 categories, which can be seen with according frequencies in Table 17. Multiple classification of answers was possible.

Table 17

Cognitions During Advice-Giving: Absolute and Relative Frequencies of Answer Categories

	All	Condition			
Category		1	2	3	4
1) I need to recommend a high value.	84/234 (36%)	21/84 (25%)	23/84 (27%)	17/84 (20%)	23/84 (27%)
2) I was thinking about my own profit.	67/234 (29%)	19/67 (28%)	16/67 (24%)	16/67 (24%)	16/67 (24%)
3) I was thinking about how the advisee might react.	57/234 (24%)	11/57 (19%)	16/57 (28%)	12/57 (21%)	18/57 (32%)
4) I strategically exaggerated the value because of the reactions I anticipated.	35/234 (15%)	4/35 (11%)	12/35 (34%)	7/35 (20%)	12/35 (34%)
5) I distrusted my own abilities in this task.	23/234 (10%)	5/23 (22%)	9/23 (39%)	4/23 (17%)	5/23 (22%)
6) I wanted to behave fairly.	22/234 (9%)	7/22 (32%)	2/22 (9%)	8/22 (36%)	5/22 (23%)
7) Random comment on real estate.	20/214 (9%)	4/20 (20%)	5/20 (25%)	6/20 (30%)	5/20 (25%)
8) I wanted the value to sound realistic.	19/234 (8%)	2/19 (11%)	5/19 (26%)	5/19 (26%)	7/19 (37%)
9) There was a moral dilemma.	16/234 (7%)	4/16 (25%)	5/16 (31%)	3/16 (19%)	4/16 (25%)
10) I searched for a compromise.	10/234 (4%)	5/10 (50%)	1/10 (10%)	1/10 (10%)	3/10 (30%)
11) I did not know what to do.	9/234 (4%)	0/9 (0%)	3/9 (33%)	3/9 (33%)	3/9 (33%)
12) I need to recommend a low value.	7/234 (3%)	1/7 (14%)	2/7 (29%)	2/7 (29%)	2/7 (29%)
13) I wanted to avoid loss.	4/234 (2%)	3/4 (75%)	0/4 (0%)	1/4 (25%)	0/4 (0%)
14) I doubt there is another experimental condition.	2/234 (1%)	1/2 (50%)	0/2 (0%)	1/2 (50%)	0/2 (0%)

Note. Conditions: 1 = nondisclosure - uneducated; 2 = disclosure - uneducated; 3 = nondisclosure - educated; 4 = disclosure - educated.

For cognition categories that were named by more than 10 participants, we further explored whether the observed frequency distribution of a specific cognition category across conditions differed from the expected distribution. Therefore, frequencies of cognition categories between main conditions (disclosure vs. nondisclosure conditions; educated vs. uneducated conditions) were tested by binomial test and between all experimental groups by χ^2-tests[20]. We found one indication for a significant difference between groups, namely that participants more frequently reported to have strategically exaggerated in the disclosure conditions compared to the nondisclosure conditions: Of all participants who reported to have thought about strategic exaggeration, 69% were in a disclosure condition und 41% were in nondisclosure conditions. Tested against an expectation of 49.6% to be in a disclosure condition (116/234: proportion of disclosure condition-participants in whole sample), the observed proportion was significantly different from expected frequencies (p = .028, 95% CI [51, 83]). For further results, see Table 18.

[20] χ^2-test were only performed if all cells contained an expected count > 5.

Table 18

Cognitions During Advice-Giving: Comparison of Frequencies

Category	Binomial test comparison	Observed	LL	UL	χ^2-test comparison	Expected[c]	Observed	LL	UL	$\chi^2(3)$
1) I need to recommend a high value	Disclosure-conditions	55% [a]	44%	66%	nondiscl. – uned.	25%	25%	16%	36%	1.52
	Educated-conditions	48% [b]	37%	59%	discl. – uned.	25%	27%	18%	38%	
					nondiscl. – ed.	26%	20%	12%	30%	
					discl. – ed.	25%	27%	18%	38%	
2) I was thinking about my own profit	Disclosure-conditions	48% [a]	35%	60%	nondiscl. – uned.	25%	28%	18%	41%	0.40
	Educated-conditions	48% [b]	35%	60%	discl. – uned.	25%	24%	14%	36%	
					nondiscl. – ed.	25%	24%	14%	36%	
					discl. – ed.	25%	24%	14%	36%	
3) I was thinking about how the advisee might react.	Disclosure-conditions	60% [a]	46%	72%	nondiscl. – uned.	25%	19%	10%	32%	2.67
	Educated-conditions	53 [b]	39%	66%	discl. – uned.	25%	28%	17%	42%	
					nondiscl. – ed.	26%	21%	11%	34%	
					discl. – ed.	25%	32%	20%	45%	
4) I strategically exaggerated the value because of the reactions I anticipated.	Disclosure-conditions	**69%** [a]*	**51%**	**83%**	nondiscl. – uned.	25%	11%	3%	27%	5.34
	Educated-conditions	54% [b]	37%	71%	discl. – uned.	25%	34%	19%	52%	
					nondiscl. – ed.	25%	20%	8%	37%	
					discl. – ed.	25%	34%	19%	52%	
5) I distrusted my own abilities in this task.	Disclosure-conditions	61% [a]	39%	80%	nondiscl. – uned.	25%	22%	1%	44%	2.57
	Educated-conditions	39% [b]	20%	62%	discl. – uned.	25%	39%	2%	62%	
					nondiscl. – ed.	25%	17%	1%	39%	
					discl. – ed.	25%	22%	1%	44%	
6) I wanted to behave fairly.	Disclosure-conditions	32% [a]	14%	55%	nondiscl. – uned.	24%	32%	14%	55%	3.08
	Educated-conditions	59% [b]	36%	79%	discl. – uned.	24%	9%	1%	29%	
					nondiscl. – ed.	29%	36%	17%	59%	
					discl. – ed.	24%	23%	8%	45%	

7) Random comment on real estate.	Disclosure-conditions	50% [a]	27%	73%	nondiscl. – uned.	25%	20%	6%	44%	0.40
	Educated-conditions	55% [b]	32%	77%	discl. – uned.	25%	25%	9%	49%	
					nondiscl. – ed.	25%	30%	12%	54%	
					discl. – ed.	25%	25%	9%	49%	
8) I wanted the value to sound realistic.	Disclosure-conditions	63% [a]	38%	84%	nondiscl. – uned.	25%	11%	1%	33%	2.68
	Educated-conditions	63% [b]	38%	84%	discl. – uned.	25%	26%	9%	51%	
					nondiscl. – ed.	25%	26%	9%	51%	
					discl. – ed.	25%	37%	16%	62%	
9) There was a moral dilemma.	Disclosure-conditions	56% [a]	30%	80%	- [d]	-	-	-	-	-
	Educated-conditions	44% [b]	20%	70%	- [d]	-	-	-	-	-

[a] Observed proportion tested against expected proportion 49.57% (116/234).

[b] Observed proportion, tested against expected proportion 50.43% (118/234).

[c] Proportions don't always add to 100% because of rounding.

[d] Test not performed as expected cell count was < 5

* $p < .05$

Additionally, we explored whether there was a difference in mean bias in advice-giving between participants who reported a particular category compared to participants who did not report this category. All results can be seen in Appendix E, Table A7. Only in the analyses with outliers eliminated or trimmed, we found indications for significant mean differences:

Those participants who reported to mainly have thought about communicating a high value in the advice-giving situation indeed showed higher mean bias (M_{elim} = 98,889 €, SD = 96,937; M_{trim} = 100,615 €, SD = 87,807) than participants who did not report to have thought about a high value (M_{elim} = 61,753 €, SD = 80,880; M_{trim} = 68,145 €, SD = 95,117; $t_{elim}(215)$ = -3.02; d = -0.43; 95% CI [-0.71,-0.15]; $t_{trim}(232)$ = -2.57; d = -0.35 [-0.62,-0.08]). This effect also occurred for participants who reported that they were mainly concerned about their own profit: They showed a higher mean bias (M_{elim} = 95,255 €, SD = 117,732; M_{trim} = 101,626 €, SD = 109,062) than participants who did not mention to have thought about their own profit (M_{elim} = 67,279 €, SD = 72,893; M_{trim} = 71,045 €, SD = 85,552; $t_{elim}(215)$ = -2.12; d = -0.32 [-0.61,-0.02]; $t_{trim}(232)$ = -2.28; d = -0.33 [-0.61,-0.04]).

Further, participants who reported that they tried to behave fairly showed lower mean bias (M_{elim} = 33,707 €, SD = 42,162; M_{trim} = 32,973 €, SD = 41,289) than participants who did not report to have thought about behaving fairly (M_{elim} = 79,726 €, SD = 91,223; M_{trim} = 84,660 €, SD = 96,274; $t_{elim}(215)$ = 2.28; d = 0.52 [0.07,0.98]; $t_{trim}(232)$ = 2.49; d = 0.56 [0.12,1.00]).

Only if outliers were trimmed, there was a further difference between those who reported to have experienced a moral dilemma and others who did not report this: Participants with moral dilemma showed higher mean bias (M_{trim} = 124,423 €,

SD = 130,721) than participants who did not report a moral dilemma (M_{trim} = 76,526 €, *SD* = 89,911; $t_{trim}(232)$ = -1.99; *d* = -0.52 [-1.02,-0.00]).

4.4. Discussion

This study aimed to investigate the effects of conflict of interest disclosure and education on bias in advice-giving in a randomized experiment with *n* = 234 participants in Germany.

4.4.1. Principal findings

4.4.1.1. Disclosure, Education and Bias. No statistically significant effects were found in the main analysis. We had expected that advisors give more biased advice with conflict of interest disclosure than with nondisclosure (hypothesis 1). This hypothesis could not be supported, which differs from previous research where a statistically significant difference between disclosers and nondisclosers had been found (Cain et al., 2011; Sah, 2019). We further had hypothesized that advisors give more biased advice if they know the advisee to be generally educated than if they don't (hypothesis 2), an effect that had not been investigated before. This hypothesis could also not be supported. Hypothesis 3 stated a moderation effect of education and disclosure and could also not be supported.

A main issue in the collected data were extreme outliers. One reason for these outliers could be erroneous entries, e.g., through forgetting or typing too many zeros. Another possible explanation is that some participants may have seen the experiment as a game while others saw a simulation of a real-life situation. In our pilot rounds of the experiment, one pilot participant reported that he recommended an extremely high value (4,000,000 €) because he had nothing to lose and this would maximize his

chance to gain more money. So, extreme recommendations could well be a deliberate choice by some. As described in 4.2.4.3., we therefore performed a three-pronged analysis: First, we conducted the planned main analysis with all data; second, we used data after excluding extreme outliers; and third, we used all data but trimmed extreme outliers to ± 3 * *IQR* from the median. Only the results of the third analysis with trimmed outliers showed a significant main effect of disclosure, indicating more bias with disclosure than with nondisclosure. None of the other analyses reached statistical significance. In regard to our data, some outliers were possibly due to typing errors, while others contained significant meaning for the results (i.e., strategic exaggeration of values). The analysis with trimmed outliers did exclude the possible errors from distorting the results while at the same time the exaggerated values and their meaning for the data was not completely lost. Yet our study was not powered to conduct three different analyses and treatment of outliers had not been considered in the planning but post-hoc, therefore these results have to be interpreted with caution.

Why are our hypotheses not supported? We built this experiment on the studies by Cain et al. (2011). In the meantime, Sah (2019) was able to replicate the effects found in Cain et al. (2011). Our results are similar in the direction of the observed data: Participants in our experiment showed more bias if they disclosed a conflict of interest than if not. However, this effect did not reach statistical significance. Moreover, in our study, mean bias in disclosed conditions with all data was 141,879 € (*SD* = 391,457, *n* = 116) for disclosed and 69,667 € (*SD* = 90,249, *n* = 118) for undisclosed conditions. This is much higher than in Cain et al. (2011) who had found mean bias was $51,562 (*SD* = 52,682, *n* = 41) for disclosed and $31,351 (*SD* = 33,393, *n* = 36) for undisclosed conditions, and Sah (2019), who had found mean bias of $43,539 (*SD* = 66,232, *n* = 35) for disclosed and $17,176

(*SD* = 33,393, *n* = 40) for undisclosed conditions. The differences from our study's to Cain et al.'s (2011) and Sah's (2019) results might be due to our modified experimental design, namely that we conducted the experiment in a computer setting where advisors never met their advisees, while Cain et al. (2011) chose a face-to-face setting. Previous research has found that psychological distance (e.g., through anonymity) increases bias in advice (Sah & Loewenstein, 2012; Sah & Loewenstein, 2014). So maybe the anonymity in our setting increased the overall tendency for bias because of the conflict of interest, thereby diminishing the backfiring effect of disclosure on bias. A further possible cause for differences between the studies' results could be a different handling of outliers. However, Cain et a al. (2011) do not mention outliers in their study, and Sah (2019) states that "seven advisors were removed prior to analyses for either indicating that they did not understand the study or giving responses that were extreme outliers, e.g., house sale prices of less than $35,000" (Sah, 2019, p.3), so no information is available to compare results with consideration of outliers and how they were handled in the analysis.

4.4.1.2. Participants' Cognitions and Bias. The exploratory analysis of participants' cognitions showed that for more than a third of participants, the most noteworthy consideration in the advice-situation was that they needed to give a high recommendation—this was apparent in either condition, but most frequent in the disclosed-conditions (see also Table 17). Second often, participants named that they thought about their own profit. About a quarter of all participants noted that they considered their advisees' reaction into their recommended advice value. That they strategically exaggerated the recommended value was reported by 15% of all participants. Across conditions, strategic exaggeration was descriptively more

frequent in the disclosed-conditions (n = 12 each) compared to the undisclosed-conditions (n = 4 and n = 7). Some kind of moral dilemma was mentioned by 7% of all participants.

These results show that most of participants' deliberations in the context of the recommended value were related to strategically maximizing the own profit and fewer were related to moral considerations.

Previous research on cognitions surrounding conflict of interest behavior had found a moral licensing effect and a strategic exaggeration effect. These studies used closed questions, whereas we used open questions. We thereby intended to gain a first inductive look into the thoughts participants are occupied with. As in the studies by Cain et al. (2011), we found that they strategically thought about increasing the advice to counter advisees' discounting, but this pattern can be observed in all conditions. Most of all, the answers in our study show that participants were very occupied by the task and mostly thinking about increasing their own value and only some thought about a moral dilemma, which we interpret as a sign for the perceived artificialness of the task and the experiment.

4.4.1.3. Personality Structure and Bias. Further, this study aimed to give a first insight into the relationship between personality and bias in advice-giving. We exploratorily investigated individual differences between participants regarding their tendency for bias and found a small effect indicating that bias was lower the more agreeable the participants were (ρ = -.15). Looking at the relationship between personality and bias separately in the experimental conditions, we observed further specific relations: Participants' agreeableness only was significantly negatively correlated with bias in the undisclosed-educated condition (ρ = -.31), but not in the

remaining three conditions. Participants' extraversion was negatively correlated with bias in the disclosed-educated condition (ρ = -.29), indicating that more extroverted participants give less biased advice if the conflict of interest needs to be disclosed but advisees are known to be educated. Further, only for the disclosed-uneducated condition it was observed that conscientiousness correlated positively with bias (ρ = .39) indicating that more conscientious participants gave more biased advice when the conflict of interest had to be disclosed but advisees were not known to be educated. These results can only cautiously be interpreted because our sample was too small for valid conclusions. Yet they provide first exploratory evidence that bias in advice-giving situations may not only depend on the specific situation, but also on advisors' individual personality structure. For example, it could be speculated that highly extroverted people may be more sensitive for advisees' perspective and therefore education leads to a moderation of the backfiring effect of disclosure. Our observation that participants with higher conscientiousness gave more biased advice seems counterintuitive, as one might associate conscientiousness with moral behavior, which in our study could mean to give less biased advice. However, one possible explanation is that conscientious people also desire to perform a task well. For example, conscientiousness has been related to better performance in an integrity task (Murphy & Lee, 1994); participants with high conscientiousness in our study therefore may have performed "better" in the task of maximizing their profit and dutifully increased the advice value to perform well in the task they were given. A final example that might illustrate the possible relevance of the observed results is that participants who had a higher tendency for agreeableness gave less biased advice—but only in the undisclosed-educated condition. This could be a hint for a relation between the tendency to seek a harmonized relationship with the advisee and less

bias, which might only be there if there is no conflict of interest disclosure that could impair the harmony while advisors are aware that they meet an informed advisee with whom a dialogue at eye level is possible.

4.4.2. Strengths and Limitations

A strength of this study is that it followed the methodological line of previously conducted experiments (Cain et al., 2011). This allows for useful comparisons and reflections. The study's design was piloted and followed a controlled procedure. A further strength is the exploratory attempt to investigate individual differences on the basis of personality dimensions as well as cognitions in an open question format. The results provide a new perspective on the subject and may give inspiration to future researchers.

Limitations of this study can be divided into three sections: firstly, the skewed data, which complicated interpretation of the results. It is a general challenge of this kind of research that some participants see the experiment as a game and others behave as if they are in a real-life situation. In our example, this is mirrored in the cognitions the participants describe: whereas some focused on the highest win for themselves, others focused to find a compromise. A second limitation is the neglect of advisees' perspectives. Due to its design, this study cannot provide information about how conflict of interest disclosure and education affects the advisees' decisions after they received the conflicted advice. A third limitation is the complexity of the task. Although a cloze was worked in to check whether participants had understood the task, some participants afterwards reported that they have felt overstrained and were not sure whether they had done it properly. This could also have something to do with

the artificialness of the task—if it would have felt more natural, participants would maybe have shown less strategical behavior and behaved more intuitively.

The experiment surely did not depict actual behavior in disclosing situations. But situations where conflicts of interest are to be disclosed vary in a lot of factors (e.g., mandatory vs. voluntary; written vs. oral; person feels conflicted vs. does not feel conflicted). The aim of the experiment was not to show how biased someone in a specific situation is; instead, the experiment was designed to depict the psychological mechanisms that may be relevant regarding the disclosure of conflicts of interest. It is therefore beyond the scope of this study to make assumptions about real-life behavior but to point out indications for effects on a mechanistic level and give impulses for further research, evaluation and improvement of disclosure regulations.

4.4.3. Implications

From this study's results, no clear conclusions regarding the research questions posed a priori can be drawn, which is why we cannot make direct assumptions for implications. However, we believe that the observed data from this study provide impulses or ideas for policy makers and future research. These ideas are outlined in the following section of this chapter.

4.4.3.1. Implications for Policy Makers and Advisees. The data resulting from this study descriptively provide a pattern that had previously been found—that disclosure in some situations changes people's behavior, possibly through explicit cognitive processes. Other research had shown that such effects can occur and are measurable (Cain et al., 2011; Sah, 2019). We therefore recommend policy makers to pay appropriate attention to possible unintended consequences of

conflict of interest disclosure when developing and implementing guidelines that include disclosure. Furthermore, we encourage policy makers and people who are responsible for guideline implementation to spend time on the appropriate education for all people involved. Such education could include explanations of the basic financial interaction on the particular market where the guideline is implemented and of related evidence for bias risk in research. Further, real-life examples should be given to show possible strategies to handle the disclosures. This would also meet another unintended consequence of disclosure, namely that conflict of interest disclosure leads to a decrease of advisees' trust (Sah et al., 2019). Educating all involved parties might help to strengthen the relationship between the conflicted person and the recipient by bringing them on the same information level and providing a basis for a dialogue of equals. We therefore want to encourage patients and other advice-seekers to inform themselves about possible conflicts of interests, to ask questions and to seek the dialogue with their advisor.

4.4.3.2. Implications for Future Research. The main challenge we experienced in developing the study design was to find a good balance between internal (experimental) and external (real-life) validity. Following the taxonomy on disclosure research methodologies that was introduced in Loewenstein et al. (2014), our study falls between categories IV and VI (see section 1.4., Table 2) because it is a laboratory experiment with real payoffs and mostly focuses on the demand side while somehow also including the supply side. Future research could further explore the subject of conflict of interest disclosure by developing study designs that vary in the balance between internal and external validity (see also Loewenstein et al., 2014).

To our knowledge, this study was one of the first to explore personality traits in the context of conflict of interest disclosure. We observed promising relations in our data which future studies could examine in more detail, with bigger samples and higher statistical test power.

4.5. Conclusion

In conclusion, this study did not find statistically significant effects of disclosure and education in experimental advice-giving situations. Explorative results indicate that personality traits could somehow play a role in the context of conflict of interest disclosure and are recommended to be investigated in future research.

Chapter V:

General Discussion

5. General Discussion

This chapter aims to integrate the results of this work. After a short summary of the overall results of the conducted studies, I will first reflect the methods I used to investigate conflict of interest disclosure and then summarize overall implications I draw from the results of my findings in relation to current evidence.

5.1. Principal Findings

Aim of this work was to examine unintended effects of conflict of interest disclosure. I conducted three studies: a database analysis, a survey and an experiment. None of the alternative hypotheses could be accepted based on the studies' results, thus none of my research questions could be answered based on the statistical analyses. However, the investigated data provide valuable information: I was able to give a detailed description of the German transparency database, gain insights into physicians' experiences with this transparency database and I found first indications for individual psychological differences in bias tendency after conflict of interest disclosure. In short, the results of this thesis provide evidence for the following:

First, the database analysis in chapter 2 showed that in the German voluntary transparency regulation, financial interactions between HCPs and the pharmaceutical industry are merely fragmentarily disclosed. Looking over the course of the years 2015 and 2016—the only years for which analyzable data was available—, it became clear that only a quarter of German HCPs disclosed in both years 2015 and 2016. Consent to disclose as well as the overall disclosed amount of money decreased from 2015 to 2016.

Second, the survey of physicians who disclosed in this voluntary disclosure database in chapter 3 showed that these physicians received only few reactions by

patients, colleagues or in their private surrounding regarding the disclosure, independent of their disclosing behavior. Reasons for nondisclosure appeared to vary between 2015 and 2016. An exploratory analysis showed that many physicians in our sample were afraid of reputational damage because of the disclosed information.

Third, in the randomized experiment described in chapter 4, neither conflict of interest disclosure nor advisees' education regarding bias risk had a statistically significant effect on advisors' bias in advice-giving. An exploratory analysis of participants' cognitions in the advice-giving situation showed that most of them had thought about maximizing their own profit, e.g., through strategic deliberations, and some reported moral deliberations. Further, an exploratory analysis of personality dimensions showed first indications that—dependent on the experimental condition—particular personality traits were associated with bias.

5.2. Reflection of Methods

In the following section, I will reflect the methods I used to investigate the research questions and reflect my experiences.

5.2.1. Methodological Reflection of the Database Analysis

This thesis' first study was a database analysis. Several other studies before have analyzed transparency databases (Mantsch et al., 2016; Mulinari & Ozieranski, 2018; Tringale et al., 2017) and these database analyses can further be differentiated regarding the conclusions one can draw. Mandatory transparency regulations, as for example in the United States (Tringale et al., 2017), provide complete data of all financial interactions—therefore, conclusions about the overall interaction between the pharmaceutical industry and the health care system is possible. Contrastingly,

voluntary transparency regulations as in Great Britain (Mulinari & Ozieranski, 2018) or in Germany provide only parts of the overall financial interactions—therefore, conclusions can only be drawn regarding the disclosed data.

In my process of analyzing the German voluntary database, I realized that a) from such a database, no predications about the underlying population can be drawn because it is not known whether the disclosed information is complete; b) the only secure information such a database contains is the number of persons who agreed to disclose and the amount of money those persons agreed to disclose. Importantly, one does not know whether persons without disclosure entries consciously decided against disclosure or whether they did not receive any payments. Moreover, pharmaceutical companies varied in their approach to obtain consent, so not only HCPs, but also pharmaceutical companies might play a role in the context of disclosure commitment. Methodically, I therefore decided to focus on the development of disclosure behavior over two years of the database.

In conclusion, my efforts to analyze the data show that a distinct conclusion regarding all payment data—disclosed and undisclosed—obviously is not possible. Therefore, it needs to be concluded that such a voluntary database cannot provide new knowledge about the total interactions between the pharmaceutical companies and HCPs, and thus, this kind of policy does not fulfill the aim to educate the public about potential conflicts of interests in the health care sector in general (see section 1.2.4.3.).

5.2.2. Methodological Reflection of the Survey

The second study of this thesis was a survey to investigate disclosers' experiences with the Euros for Doctors database. One other study that had

investigated disclosers' experiences with transparency regulations took a qualitative approach by conducting focus groups (Chimonas et al., 2017). This qualitative approach had the advantage that it provided a first impression of physicians' experiences with transparency and identified general problems (e.g., physicians reported not to like being the object of scrutiny). These data have hypothesis-generating quality as they are not standardized and, thus, not comparable. So, in my study I aimed to pick up these first impressions and by conducting a quantitative survey, I aimed to provide data that is standardized, and therefore comparable and analyzable. Simultaneously, a higher number of participants could be reached. The disadvantage of a survey, however, is that it is not adaptable and the formulation of question and answering format can affect the way participants answer. In our study, we were faced with floor effects that made discrimination among the participants difficult. For example, 81% (190/234) of participants answered the question "How many reactions did you receive by patients?" with the lowest answer option out of five, namely that they did not receive any reactions. Consequently, all these participants were not able to answer the subsequent questions regarding quality or content of reactions. A further common issue in paper-pencil-surveys is non-response bias, i.e., that those participants who respond to the survey are systematically different from those who do not respond to the survey. In our case it is possible that mostly physicians with a strong opinion towards transparency participated in the survey. However, we tried to encounter this bias by a thorough acquisition strategy (see section 3.2.1.3.) and thereby reached a high response rate of 35%.

So, the survey method came with limitations that would not have existed in a more flexible qualitative approach, but it provided valuable and standardized data about physicians' attitude towards disclosure and their normative beliefs. I was thus

able to compare participants' answers dependent on their disclosure behavior and dependent on disclosure year. Moreover, through this method we were able to reach a relatively high number of participants that constituted a diverse sample of German physicians.

5.2.3. Methodological Reflection of the Experiment

The third study was a behavioral experiment and followed an established method that had already been used in a previous experiment (Cain et al., 2011) which meanwhile has also been used for a replication study by Sah (2019). In the present work, this method was slightly adapted to the investigated research question. It provided the opportunity to randomly allocate participants to groups and expose them to different experimental conditions. Thereby, I was able to manipulate the independent variable and measure its effect on the dependent variable—namely, examining whether conflict of interest disclosure and advisees' education causes differences in advice-giving bias. While an experimental approach generally provides high internal validity of the data, it comes with the disadvantage that behavior is investigated in a rather artificial situation and, thus, external validity is low and there is a risk that unnatural behavior is measured.

In my study, I tried to counteract this risk by relating the experimental manipulation to participants' actual payoffs, thereby creating a personal commitment to the experimental task. Moreover, I applied established methods not only for the experiment itself but also for investigating participants' personality structure. However, I could not replicate the findings by Cain et al. (2011), although the pattern of data descriptively looks similar. One explanation is that although the experimental task and values were comparable, I switched the setting to an online setting, thereby

modifying the level of anonymity, which was shown to impact bias in advice-giving (Sah & Loewenstein, 2011, 2014). I was also confronted with extreme outliers in the data, of which I cannot be sure whether they arose due to the methodological or other factors.

In all, this experimental approach provided the opportunity to investigate causal effects of disclosure, but no significant effects were found. However, with the standardized setting I was able to explore personality variables and participants' cognitions and their relation to advice-giving bias, and the results could function as impulses for future research.

5.2.4. Summarizing Methodological Reflection

In all, the methods applied in this work to approach the subject of conflict of interest disclosure cover a great part of the spectrum of psychological methods: the database analysis, which can be seen as a observational case study of the transparency regulation in Germany, provided a wide-eyed and data-driven perspective; the survey enabled an investigation of individuals' perspectives; and the experiment manipulated concrete behavior in a situation, thereby enabling the investigation of direct relationships between cause and effect. Loewenstein et al. (2014) discuss that studies on conflict of interest disclosure can vary regarding the studied focus (demand side, supply side, or both) and regarding the applied method (hypothetical choice, laboratory experiment with payoffs, case studies, or field experiments). The investigations in this thesis considered the demand side as well as the supply side. The applied methods covered a spectrum of perspectives, and in the terminology of Loewenstein et al.'s (2014) taxonomy of disclosure research methodologies (see section 1.4. and Table 2), there was a laboratory experiment (chapter 4) and a case

study, namely the case of the German transparency regulation (chapter 2), and the survey of disclosing physicians could also be seen as case study or even a field experiment (chapter 3).

To conclude the reflections of methods applied in this thesis, I was able to consider different components of disclosure by using various perspectives that complement to a balanced view on the psychological background of conflict of interest disclosure.

5.3. Implications

This work has shown that psychological mechanisms might play an important role in the context of conflict of interest disclosure. I could show that there are individual differences regarding disclosure consent in a voluntary database (see chapter 2). Further, the survey results showed that recipients of disclosure do not seem to address the disclosed information, at least in our sample of German physicians while at the same time, physicians felt unfairly treated, resembling the spotlight effect, whereby also social norms might play a role (see chapter 3). Lastly, the pattern of data observed in the experiment provide first indications that advisees' increased attention towards bias in advice could moderate the backfiring effect of disclosure. Further, it became apparent that—at least in the conducted experiment—strategic exaggeration in advice-giving is a more frequent cognition than moral considerations and that there were differences regarding unintended effects of conflict of interest disclosure dependent on participants' personality structure (see chapter 4).

In the following section, I provide suggestions on how psychological mechanisms could receive more attention in future research as well as in the implementation of guidelines.

5.3.1. Implications for Future Research

First, my observations in the survey reported in chapter 3 show that participating physicians were worried about reputational damage resulting from conflict of interest disclosure and some complained about the media reporting leading to a wrong impression in the public. Yet, conflict of interest disclosures in a public database could also be appreciated as new information about the interactions between systems that was previously unknown rather than used for finger-pointing at single persons. A database of conflict of interest disclosures provides a valuable opportunity to conduct research on the interactions between HCPs and pharmaceutical industry. Future research should explore data disclosed in transparency databases of different health care contexts, e.g., extensive national and international databases as well as specific databases such as guideline panel members' disclosures. On its own, the database is useful to learn more about the actual situation in the field and to take stock about the current norm. Combined with an external outcome (e.g., prescription behavior or guideline panel decision), such research can reveal positive and negative effects of the interactions between the pharmaceutical industry and the health care sector.

Second, my investigation showed indications of various unintended effects of conflict of interest disclosure, such as subsequent decision against disclosure (chapter 2 and 3), or that physicians felt severely criticized and negatively affected by media attention (chapter 3), or that under certain circumstances, disclosure comes with the risk of backfiring and thereby creating even more bias in advice-giving (chapter 4). Such consequences should receive further attention and should be considered in the development of conflict of interest regulations. For example, evaluation of transparency guidelines should receive more attention, e.g., by interviewing HCPs

about their experiences with the administrative processes, or by evaluating the accessibility of the data for the public. Thereby, investigation of all persons involved in the regulated system could be valuable: disclosers, the public, policy makers and those who cause the conflict of interest by providing a secondary interest.

Third, I experienced that experiments about disclosure in advice-giving situations can lead to non-normal distributed data, presumably because participants vary in their strategic handling of the task. As experimental research is needed to investigate the basic mechanism behind disclosure, future research could further enhance the external validity of the experiments, e.g., by adjusting the experimental task towards more realistic behavior. Our studies show that situational as well as individual factors might be worth a more detailed examination. For example: Is there a difference in bias after disclosure in a setting with informational disbalance (e.g., physician and patient) compared to a setting with two comparably similar informed persons (e.g., two researchers)? Does disclosure affect advisors from different professions differently, depending on the professional sector (e.g., social sector vs. financial sector)? Different psychological mechanisms might be at work in a real-life situation, which is why field experiments may further contribute a valuable perspective to the current state of evidence.

5.3.2. Implications for Policy Makers and Medical Training

Transparency guidelines come with good intentions: Their aim is, in medical terms, to enlighten and educate patients (Fabbri et al., 2018; Grundy, Habibi, et al., 2018; MHE, 2019), or, in economic terms, to address failures arising from asymmetric information or misaligned incentives (Loewenstein et al., 2014). However, unintended effects can come along with intended effects, just like a drug's

side effects. Therefore, transparency guidelines should, from time to time, be evaluated regarding their aim achievement and whether unintended side effects occur, and subsequently be revised if needed. For example, conflict of interest statement forms in medical journals have been improved and standardized (Iqbal et al., 2016), and they are an ongoing subject in several task forces, as for example in the evidence-based medicine community (Heneghan, 2019). In the process of feedback loops and evaluation of the guideline's benefits, several perspectives can be taken, and different parties can be brought into focus. In my work, I looked from a psychological perspective and focused on disclosers. Following, I want to summarize my main conclusions from this work for the implication of transparency guidelines[21].

One main subject of this work were psychological mechanisms in the context of disclosure. These mechanisms can lead to a backfiring effect of disclosure, that is, more bias in advice with conflict of interest disclosure than without disclosure of the conflict; and they can also lead to unwillingness to disclose conflicts of interest. These findings provide arguments for my following conclusions regarding disclosure and, accordingly, transparency guidelines:

- Disclosure needs to be mandatory.
- The disclosed information needs to be meaningful for the recipient.
- Education about the psychological mechanisms in the context of conflict of interest and its disclosure is needed.

[21] As I mainly concentrated on transparency guidelines in medicine, the following part is written with those guidelines in mind. However, the reasoning might well be translated on transparency guidelines in other contexts.

5.3.2.1. Disclosure Should be Mandatory. Disclosure needs to be mandatory because individual persons are due to mechanisms like the bias blind spot or confirmation bias not able to judge whether their conflict of interest is worthy of disclosure (Felser & Klemperer, 2011). Therefore, those persons who are at risk to be conflicted cannot be responsible to decide whether a conflict of interest is relevant and therefore needs to be disclosed. Our analysis of a voluntary conflict of interest disclosure regulation in a public database has shown that only about 25% of the total amount of payments from pharmaceutical companies to HCPs was disclosed which is in line with the current view that conflicts of interest in biomedical research are underreported (Dunn et al., 2016). Voluntary transparency regulations will thus lead to fractional data availability. Fractional disclosure is meaningless because there is no reference value: The single disclosed data cannot be compared to other disclosed data or fit into the overall context. Mandatory disclosure will thus minimize loss of transparent data (Parker et al., 2019).

Another point for mandatory disclosure in medicine is that we still lack knowledge about the actual impact of conflicts of interest. As long as the relation between industry and HCPs are not entirely open, a general picture of benefit and potential damage of these interactions is impossible. Although interaction between the pharmaceutical industry and the health care sector has grown to be a system that seems “normal” and indispensable, nondisclosure of interactions makes the system inevaluatable and immune to criticism. Full disclosure enables communication about concrete information and provides a base for dialogues at eye level. On the long run, this may contribute to a transformation of the culture that values every party included in the system—industry, health care provider and health care receiver—and that never

stops asking the question of whether everyone is still in the right angle with the other parties.

In accordance with German (Bundesärztekammer, 2019) and international experts (Feldman et al., 2018; Mulinari & Ozieranski, 2018; Vassar et al., 2019), we suggest that respective governments should consider legislation on a national level, similar to the Open Payments Database in the United States.

5.3.2.2. Education About Conflicts of Interest and Disclosure is Needed.

When confronting people with a new, mandatory regulation, putting this regulation into context and providing explanations could increase collaboration and commitment. Transparency regulations should be accompanied not only by education about the disclosed information, but also about the context, namely the underlying system and its inherent impact on all parties.

In the database analysis part of this work, I not only noticed that the disclosed data in the Germany transparency database is hard to interpret, but I also observed that disclosure consent is low. Of course, it is possible that German HCPs are well informed and made a conscious decision against disclosure. However, in line with the impression I gained from the conducted survey, I believe that there is a chance that many German HCPs are not entirely informed about the aim of transparency and its background as they seem very insecure about the public opinion of the disclosed data. So, disclosers should be educated about the psychological mechanisms that may contribute to the effects of conflict of interest on professional behavior, which further will strengthen their commitment towards transparency. My survey results are in line with the report of Chimonas et al. (2017) about U.S. physicians who seemed not to be able to relate to the intention of the Open Payments transparency guideline. Following

Chimonas et al. (2017), I suggest that efforts must be expanded to educate HCPs about conflicts of interest and the present transparency guideline and to put the present transparency guideline into practice. Hospital-intern guidelines for conflict of interest management might additionally increase awareness and encourage a more critique opinion in regard to pharmaceutical industry and advertising behavior (Gundermann et al., 2010). Indeed, physicians who attended a medical school with a gift restriction policy showed reduced prescribing rates of newly introduced psychotropic medications in a study of 14 U.S. medical schools with an active gift restriction policy (King et al., 2013).

Education about conflicts of interest should start in medical training because already in their first training years, medical students come in contact with pharmaceutical companies (Austad et al., 2011; Lieb & Koch, 2013; Sierles et al., 2005). Later in their training, when they make first practical experiences, they come in contact with the culture of industry collaborations—also named a *hidden curriculum* (Hafferty, 1998). However, most German medical schools do not have any regulation policies that govern the interactions between pharmaceutical companies and students (Grabitz et al., 2019; Lieb & Koch, 2014). Although students seem to have interest in education about this subject (Lieb & Koch, 2014), most medical schools do not consider education about collaboration with the pharmaceutical industry, conflicts of interest, and conflict of interest management, in their curricula, as was shown in studies by Grabitz et al. (2019) and Lieb and Koch (2013). Also, research on such curricula is rare (Weißkircher et al., 2017). One example for medical education about conflicts of interest is the curriculum by Koch et al. (2020) that was conducted in an evidence-based approach and thoroughly evaluated in a randomized controlled study.

5.3.2.3. Disclosed Information Should be Meaningful. Regarding recipients, disclosure should provide information that is useful, i.e., understandable and easily interpretable for recipients. In the database analysis I experienced by myself that the disclosed information is hard to interpret, even for someone literate in the field of conflicts of interest. In the survey, it became clear that physicians themselves are afraid that the disclosed information could be interpreted wrongly, which sometimes even made them decide against disclosure. Lastly, the participants in our experiments showed less bias if they knew that recipients were educated about bias risk—so the disclosed information had more meaning to them. These points indicated that the interpretability of disclosed data is of importance. Disclosing information that is meaningful compared to disclosure that is hard to interpret could thus provide one solution to the backfiring effect of disclosure (Cain et al., 2011; Sah, 2019) but more research is needed to verify this effect.

In order to enhance information content and make disclosure work, recommendations are that disclosure needs to be meaningfully integrated (Rose et al., 2019) and that the disclosed information needs to be simplified, standardized and comparable (Loewenstein et al., 2014). For a transparency regulation, this could mean that the disclosed data is easy to find (for example with a searchable interface); that one physician's disclosed payments are not scattered across many different websites, but are collected at one place, preferably condensed into one value that can be compared with other HCPs' values—e.g., all payments of one year summed up. It is also proposed that in some cases it might help to increase vividness of information because it triggers emotions (Loewenstein et al., 2014). For transparency regulations, this could mean that the disclosed payment data is accompanied with explanations and some contextual information, e.g, descriptions of the situations in which

pharmaceutical companies pay HCPs. Lastly, Loewenstein et al. (2014) propose that disclosed information could be communicated by expert intermediaries to help recipients make informed decisions. For example, if a patient needs to decide whether or not they participate in a clinical trial as proposed by their physician, they could approach a neutral third person or organization who will provide the essential information about the physician's possible conflict of interest. The neutral party could provide an evaluation as to whether the physician might be biased because they receive money for each participant and provide contextual information so that the patient can subsequently make an informed decision.

5.3.3. Summary of Recommendations for Conflict of Interest Disclosure

Conflict of interest disclosure is only one part of conflict of interest management. To put this work's implications into context, I will now first summarize current suggestions regarding disclosure and its place in conflicts of interest management. Afterwards, I will summarize specific recommendations regarding conflict of interest disclosure in transparency regulations.

5.3.3.1. General Recommendations. To make conflict of interest regulations work, experts argue that transparency alone is not sufficient (Goldberg, 2019; Grundy et al., 2020; IOM, 2009; Lieb, 2015; MHE, 2019; PloS Medicine Editors, 2012).

It is argued that the term disclosure dominates the academic discussion on conflicts of interest interventions (Goldberg, 2019), and that policy conversation should not get lost in details of the disclosure system but focus concretely on how to deal with relationships that threaten research integrity, not only but also because of

the backfiring effect of disclosure (Goldberg, 2019; Grundy et al., 2020; PloS Medicine Editors, 2012).

To end up with beneficial instead of unintended effects of conflicts of interest management, the MHE report (2019) recommends:

- mandatory and complete transparency of conflicts of interest of all kinds in important areas;
- supporting initiatives that aim to reduce conflicts of interest or offer independent possibilities for continuing medical education or conferences;
- mandatory rules for dealing with conflicts of interest;
- conducting more research about conflicts of interest, their mode of action, transparency and management (MHE, 2019).

Specifically for conflict of interest management at institutions—including conflict of interest identification as well as monitoring the implementation of management recommendations—the IOM report (2009) recommends to create a conflicts of interest committee. This committee should, fitted to the particular situation, use a full range of management tools, e.g., the elimination and prohibition of conflicts of interest as well as the restriction of involving a conflicted individual in particular processes (IOM, 2009).

Specifically for guideline panels, it is the development process of clinical guidelines that is vulnerable to industry influence and it is argued that the responsibility to create such guidelines should be with those who are free of conflicts of interest (Elder et al., 2020; Schott et al., 2015). Nevertheless, conflicts of interest among panel members cannot always be completely excluded which is why it is of high importance that panel members fully disclose their conflicts of interest (Häuser et al., 2017; Strech & Koch, 2011). With full disclosure of all financial ties,

assessment of relevant conflicts of interest is possible and panel members can be selected in a well-balanced way that provides the best possible requirements for the guideline development process. Further recommendations include independent oversight committees and voting exclusions for panelists with relevant conflicts of interest (Elder et al., 2020; IOM, 2009; Schott et al., 2013; Strech & Koch, 2011).

To summarize, transparency is said to be an incomplete solution to the challenges of financial conflicts of interest in medicine, a "politically expedient and low-cost remedy for the problems caused by conflict of interest" (Kanter & Loewenstein, 2019, p. 402). Moreover, conflict of interest disclosure can also backfire. Transparency regulations should not hinder more effective action from being taken to address the problem of industry influence and other conflicts of interest (Kanter & Loewenstein, 2019). Nevertheless, disclosure is one important part of conflict of interest management. To work efficiently in this conflict of interest management system, disclosure in transparency regulations need to be implemented with awareness and by considering several recommendations which I will summarize in the next section.

5.3.3.2. Specific Recommendations. To make disclosure work, experts have proposed several recommendations for public transparency registers as well as for disclosure as part of conflict of interest policies in institutions. These recommendations are summarized in Table 19. They can be categorized into recommendations regarding the quality of disclosed information, e.g., that disclosed information needs to be complete, accessible and analyzable (Grundy, Habibi, et al., 2018). An overlapping category is the standardization of disclosed information, e.g., that information is disclosed in regular intervals (Fabbri et al., 2018). Further

recommendations concern the disclosing persons, e.g., that administrative burden is decreased for the disclosers (Chimonas et al., 2017; IOM, 2009).

Table 19

Considerations Regarding Transparency Regulations

Recommendation	Source
Quality and standardization of disclosed information	
Sufficient specificity	IOM (2009)
Comprehensiveness, with no minimum threshold	Fabbri et al. (2018); IOM (2009); Grundy, Habibi, et al. (2018)
Assessment of relevance of disclosed conflict of interest	Lieb et al. (2011)
Disclosure of non-payment[a]	Fabbri et al. (2018)
More context information about the payment (e.g., on related product)[a]	Fabbri et al. (2018)
User-friendliness: accessibility and analyzability[a]	Dunn et al (2016); Fabbri et al. (2018); Grundy, Habibi, et al. (2018)
On an annual basis or when an individual's situation changes significantly	Fabbri et al. (2018); IOM (2009)
Mandates for ensuring researchers keep their records up to date[a]	Dunn et al. (2016)
Accessibility in various languages[a]	Fabbri et al. (2018)
Consistent taxonomy to describe different classes of conflicts of interest[a]	Dunn et al. (2016); Grundy et al. (2020)
Broad-based consensus among national organizations on development process to establish standards for financial conflicts of interest disclosure	IOM (2009)
Harmonization of legislation among countries, e.g., across Europe, with one big database instead of many small ones[a]	Fabbri et al. (2018)
Disclosers	
Decrease administrative burden for disclosers	IOM (2009); Chimonas et al. (2017)
Provision of a function to automatically generate conflicts of interest statements for use in published articles[a]	Dunn et al. (2016)
Development of a public, author centric database of financial interests that can for example be used by journals[a]	Grundy et al. (2020)
Assistance for physicians in disputing data[a]	Chimonas et al. (2017)
Inclusion of any HCP and health student, and also other actors and institutions (e.g., professional associations, patient advocates, academic journals)[a]	Grundy, Habibi, et al. (2018)

[a] specific recommendation for public transparency registers.

Of course, disclosure of financial conflicts of interest in research is not only an issue in the medical field but it is also discussed, for example, regarding psychological research (Greenwald, 2009) and, more recently, regarding research on psychosocial interventions (Chivers, 2019; Cristea & Ioannidis, 2018) and nutrition research (Alexander et al., 2015; Ioannidis & Trepanowski, 2018). A solid, effective transparency regulation is seen as the first step for diverse disciplines. The following quote by Cristea and Ioannidis (2018) regarding transparency in research on psychosocial interventions could well be translated onto other disciplines: "A more transparent landscape may help understand who in this large market is doing what, how, and why" (Cristea & Ioannidis, 2018, p. E2). In the medical field, the subject of conflicts of interest is an ancient one—quasi already discussed by Hippocrates around 400 BC—and medicine could be a pioneer in managing such risks for the independence of health care or research.

Conclusion

During my work on this dissertation, I learned a lot about conflict of interest disclosure, about unintended second order effects and about conducting research in general. The objective of this work was to investigate second order effects of conflict of interest disclosure in medicine from a psychological perspective, but the hypothesized relationships could not be supported by the data in the studies.

However, beyond the statistically investigated hypotheses, the data conducted in this work provide valuable information regarding the unintended effects of conflict of interest disclosure. As was derived in the theoretical chapter 1, the first order effect of disclosure is the provision of information, and therefore unintended second order effects are closely related to how the disclosed information is interpreted and whether or not someone pays attention to the disclosed information. This applies not only to those who receive the information (i.e., the recipients) but also to those whose information is provided (i.e., the disclosers). The database analysis in chapter 2 showed that the currently disclosed information in the course of the German voluntary transparency codex provides only a fragmental picture of the actual interactions between German pharmaceutical companies and HCPs. Thereby, the single HCP's disclosed information cannot be brought into context, thus creating a risk of misinterpretation, and subsequently other unintended effects may follow. While the database analysis showed a decrease in HCPs' consent to disclose, the survey study described in chapter 2 did not provide statistical support for the investigated model that aimed to predict nondisclosure. The physicians who participated in the survey reported to have experienced very few reactions by patients, colleagues or in their private surrounding; at the same time, they reported concerns about negative media reports and that they feared the disclosed data could be misunderstood and their

reputation might suffer. So, with these two studies I was able to answer the question who discloses what in the German database by analyzing the disclosed information, but I was not able to provide a statistical model that predicts whether a physician decides for or against disclosure in the subsequent year after having disclosed information in one year. The experimental study described in chapter 4, although diligently prepared and pilot tested, provided data with extreme outliers. Here, I was not able to answer the investigated research question regarding the effects of disclosure and recipients' education on bias in advice-giving—at least not in the a priori registered way. But the need to deal with this challenge provided an insight into how such outliers might also be a valuable information for the investigated research question and that experimental designs in that context might benefit from a closer look at the what and why of data distribution. In this experiment, I also explored individual differences, and the results showed that the subject of personality-related factors provides a promising perspective on bias after disclosure that could be investigated in future, large-scale studies.

Lastly, I discussed my experiences with the used methods in chapter 5 of this work, and put it into context with current recommendations regarding conflict of interest management. The main points to be drawn are that unintended effects such as consequences of data misinterpretation (and, thereby, physicians' worries about their reputation) could be met by thoughtful education of all involved in the transparency regulation. Moreover, the disclosed information needs to be meaningful so that it can be understood and classified into a greater context. Meaningfulness comes, e.g., through complete transparency, which is why another main conclusion is that many unintended effects of disclosure could become irrelevant the moment transparency is regulated by law or in another mandatory way.

CORRECTIV had titled their news story “Seid umschlungen, Millionen!” [Be embraced, millions!] (Elmer et al., 2016) and meant the millions of euros disclosed in the context of the transparency codex. But the grown system of interactions between pharmaceutical companies and health care also involves millions of different people, each with their own worries and behavioral patterns. With that, countless possible factors emerge that contribute to how conflict of interest regulation is experienced. We may never be able to fully understand this system, so one solution is to act openly and investigate one possible step after the other, which is where this work makes a relevant contribution.

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APPENDIX

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APPENDIX A

Survey: Accompanying Letters and Questionnaires

Figure A1

Accompanying Letter and Questionnaire, Group 1

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Mainz, 30. Juli 2018

„Euros für Ärzte" - Ihre Erfahrungen mit der Offenlegung von Zuwendungen der Industrie

Sehr geehrter Herr Dr. Muster,

im Rahmen des Forschungsprojektes „*SOCIReM: Second order effects of conflict of interest regulations in medicine*" untersuchen wir die erwünschten und unerwünschten Effekte der Offenlegung von Interessenkonflikten, um daraus Empfehlungen für die zukünftige Transparenz von Interessenkonflikten abzuleiten. Ihre Erfahrung ist von großer Bedeutung für unser Projekt.

Aus der öffentlich zugänglichen Datenbank „*Euros für Ärzte*" konnten wir entnehmen, dass Sie **2016** Daten über die Zuwendungen von pharmazeutischen Unternehmen offengelegt haben, **2017** jedoch nicht mehr. Haben Sie Reaktionen auf die erste Offenlegung erfahren? Waren diese eher negativ oder positiv? Mithilfe solcher Fragen wollen wir mehr über die Bedeutung der Offenlegung von den Offenlegenden selbst erfahren. Wir haben dafür einen kurzen **Fragebogen** vorbereitet, dessen Ausfüllen **ca. 5 Minuten** in Anspruch nimmt. Wir wären Ihnen sehr dankbar, wenn Sie uns diesen Fragebogen ausgefüllt im beigelegten frankierten Rückumschlag zukommen lassen würden.

Die Teilnahme an der Befragung ist freiwillig. Ihre Daten werden selbstverständlich **anonymisiert** verarbeitet und aggregiert veröffentlicht. Ihren Eintrag in der Datenbank haben wir lediglich genutzt, um sie per Post zu kontaktieren und einem Studienarm zuzuordnen. Eine Zuordnung des ausgefüllten Bogens zu Ihrem Eintrag in der Datenbank ist uns damit **nicht möglich.**

Bei Fragen können Sie meine Mitarbeiterinnen Marlene Stoll (E-Mail: marlene.stoll@unimedizin-mainz.de; Tel.: 06131 173753) oder Lara Hubenschmid (lara.hubenschmid@unimedizin-mainz.de) oder auch mich persönlich kontaktieren.

Vielen Dank schon im Voraus für Ihre Unterstützung!

Mit freundlichen Grüßen

K. Lieb

Univ.-Prof. Dr. Klaus Lieb

Anlagen:
2-seitiger Fragebogen

Bitte um Rücksendung per Post (frankierter Rückumschlag liegt bei).
Zögern Sie nicht, uns bei Fragen zu kontaktieren: ☎ 06131 173753.

UNIVERSITÄTSmedizin. MAINZ

Demografisches

Fachrichtung: _____	Geschlecht: ☐ weibl. ☐ männl.	Alter: _____

Arbeiten Sie in einem Klinikum / einem Krankenhaus? ☐ ja, und zwar: ☐ universitär ☐ nicht universitär ☐ nein

Falls ja: Welche Position haben Sie? ☐ Chefarzt / -ärztin ☐ Oberarzt / -ärztin ☐ Assistenzarzt/ -ärztin

Falls nein: Wie arbeiten Sie? ☐ niedergelassen ☐ angestellt ☐ anders: _____

Wie viel Prozent Ihrer Arbeitszeit verbringen Sie derzeit mit **Patientenversorgung**? *ca.* ____ %	Wie viel Prozent Ihrer Arbeitszeit verbringen Sie derzeit mit **Forschung**? *ca.* _____ %

Bitte kreuzen Sie an, in welchem Bereich Sie in den letzten fünf Jahren wissenschaftlich tätig waren.
Mehrfachantworten sind möglich.

☐ Anwendungs-beobachtungen (AWB) ☐ Auftrags-studien der Industrie ☐ eigeninitiativ durchgeführte klinische Studien (IIT) ☐ eigene, universitäre Forschung ☐ anderer: _____ _____ ☐ ich bin nicht wissenschaftlich tätig

Wie hoch schätzen Sie den Anteil aller ÄrztInnen in Deutschland, die der Offenlegung ihrer Daten im Rahmen des Transparenzkodex (später zusammengefasst in der Datenbank „Euros für Ärzte“) zugestimmt haben?

In 2016 für die Daten von 2015 _____ %	*Wissen* Sie den tatsächlichen prozentualen Anteil annäherungsweise, z.B. aus den Medien?	2016: ☐ ja ☐ nein
In 2017 für die Daten von 2016 _____ %		2017: ☐ ja ☐ nein

Wurden Ihre Angaben von Zuwendungen in der Datenbank „Euros für Ärzte“ korrekt wiedergegeben?

In 2016 für die Daten von 2015 ☐ ja ☐ nein ☐ weiß nicht

Im Sommer 2016 wurden die Daten der ersten Offenlegungsrunde veröffentlicht.

Wie sehr treffen die folgenden Aussagen auf Sie zu?	*trifft überhaupt nicht zu*	*trifft weniger zu*	*weder noch*	*trifft etwas zu*	*trifft vollkommen zu*
Ich habe mir die Datenbank angesehen.	☐	☐	☐	☐	☐
Ich habe die Berichterstattung über die Datenbank in den Medien verfolgt.	☐	☐	☐	☐	☐
Ich habe nach Personen in der Datenbank gesucht.	☐	☐	☐	☐	☐

In welchem Bereich liegt der von Ihnen offengelegte Betrag im Vergleich zu den anderen offengelegten Beträgen schätzungsweise?	*eindeutig unter dem Durchschnitt*	*eher unter dem Durchschnitt*	*im Durchschnitt*	*eher über dem Durchschnitt*	*eindeutig über dem Durchschnitt*
	☐	☐	☐	☐	☐

Sie haben sich 2016 für eine Offenlegung der Daten aus dem Jahr 2015 entschieden. Wir sind daran interessiert, ob und wie Ihr Umfeld auf diesen ersten Eintrag reagiert hat.
Bitte beziehen Sie sich bei den Antworten auf den gesamten Zeitraum zwischen der ersten (Sommer 2016) und zweiten (Sommer 2017) Offenlegung.

Wie viele Reaktionen (rein subjektiv) kamen von ...	*keine*	*sehr wenige*	*eher wenige*	*eher viele*	*sehr viele*
Patienten	☐	☐	☐	☐	☐
Kollegen	☐	☐	☐	☐	☐
Persönliches Umfeld	☐	☐	☐	☐	☐
Falls es Reaktionen gab: Wie waren sie inhaltlich?	*sehr negativ*	*eher negativ*	*neutral*	*eher positiv*	*sehr positiv*
Die Reaktionen von Patienten waren überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen von Kollegen waren überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen aus dem persönlichen Umfeld waren überwiegend	☐	☐	☐	☐	☐
Falls es Reaktionen gab: Wie empfanden Sie diese?	*sehr unangenehm*	*eher unangenehm*	*neutral*	*eher angenehm*	*sehr angenehm*
Die Reaktionen von Patienten empfand ich als überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen von Kollegen empfand ich als überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen aus dem persönlichen Umfeld empfand ich als überwiegend …	☐	☐	☐	☐	☐

Bitte um Rücksendung per Post (frankierter Rückumschlag liegt bei).
Zögern Sie nicht, uns bei Fragen zu kontaktieren: ☎ 06131 173753.

UNIVERSITÄTSmedizin. MAINZ

Gab es etwas, was Sie an den Reaktionen sehr beschäftigt hat?

_____

2017 ist kein Eintrag von Ihnen in der Datenbank vorhanden. Warum?

☐ Ich habe keine Zuwendungen erhalten.
☐ Ich habe vergessen, auf die Anfrage zur Offenlegung zu antworten.
☐ Ich wurde nicht gefragt, ob die Zuwendungen offengelegt werden dürften.
☐ Ich habe mich bewusst gegen die Offenlegung entschieden.

Falls Sie sich bewusst gegen eine Offenlegung entschieden haben: Welche Aspekte spielten dabei eine Rolle?	*trifft überhaupt nicht zu*	*trifft weniger zu*	*weder noch*	*trifft etwas zu*	*trifft vollkommen zu*
Andere haben mir abgeraten.	☐	☐	☐	☐	☐
Bedenken bzgl. Öffentlichkeit / Berichterstattung	☐	☐	☐	☐	☐
Bedenken bzgl. zukünftiger Reaktionen von Patienten	☐	☐	☐	☐	☐
Bedenken bzgl. zukünftiger Reaktionen von Kollegen	☐	☐	☐	☐	☐
Bedenken bzgl. zukünftiger Reaktionen im persönlichen Umfeld	☐	☐	☐	☐	☐
Negative Erfahrungen mit Offenlegung 2016	☐	☐	☐	☐	☐
Anderer Grund: _____	☐	☐	☐	☐	☐

Wie sehr stimmen Sie den folgenden Aussagen zum jetzigen Zeitpunkt zu?	*stimme überhaupt nicht zu*	*stimme weniger zu*	*neutral*	*stimme etwas zu*	*stimme vollkommen zu*
Zuwendungen durch pharmazeutische Unternehmen (pU) stellen ein Risiko für die Unabhängigkeit von Klinik und Forschung dar.	☐	☐	☐	☐	☐
Die Offenlegung der Zuwendungen führt dazu, dass mir Patienten mehr vertrauen.	☐	☐	☐	☐	☐
Zuwendungen sind in Ordnung, wenn Regulierungsmaßnahmen (z.B. Offenlegung, Ausschluss aus Gremien) ergriffen werden.	☐	☐	☐	☐	☐
Ich halte Transparenz grundsätzlich für etwas Gutes.	☐	☐	☐	☐	☐
Durch die Offenlegungen entsteht in der Öffentlichkeit ein falscher Eindruck.	☐	☐	☐	☐	☐
Die Zusammenarbeit mit pU und damit auch die Zuwendungen von pU anzunehmen, gehört zum Arztberuf dazu.	☐	☐	☐	☐	☐
Manche Zuwendungen sollten vermieden werden, während andere nicht wegzudenken sind.	☐	☐	☐	☐	☐
Ohne gute Alternativen in Forschung, Fortbildung usw. wird sich im medizinischen Sektor bzgl. der Annahme von Zuwendungen nichts ändern.	☐	☐	☐	☐	☐
Die Offenlegung von Zuwendungen sollte differenzierter erfolgen.	☐	☐	☐	☐	☐

In welchem Bereich ist die Offenlegung von finanziellen Zuwendungen Ihrer Meinung nach wichtiger?	*eindeutig Patientenversorgung*	*eher Patientenversorgung*	*gleich wichtig*	*eher Forschung*	*eindeutig Forschung*
	☐	☐	☐	☐	☐

Falls Sie wissenschaftlich tätig sind: Wie sehr stimmen Sie den folgenden Aussagen zu?	*stimme überhaupt nicht zu*	*stimme weniger zu*	*neutral*	*stimme etwas zu*	*stimme vollkommen zu*
Transparenzrichtlinien erschweren meine wissenschaftliche Arbeit.	☐	☐	☐	☐	☐
Ich wurde schon einmal auf Offenlegungen im Rahmen einer Publikation angesprochen.	☐	☐	☐	☐	☐
Meine Forschungsergebnisse wurden schon einmal auf Basis meiner Offenlegungen kritisiert.	☐	☐	☐	☐	☐
Wenn ich keine Kooperationen mit der Industrie eingehe, fehlen mir Gelder für die Forschung, die mir wichtig ist.	☐	☐	☐	☐	☐
Die undifferenzierte Darstellung der Offenlegungen bringt die Wissenschaft in Misskredit.	☐	☐	☐	☐	☐

Figure A2

Accompanying Letter and Questionnaire, Group 2

UNIVERSITÄTSmedizin. MAINZ
Klinik für Psychiatrie und Psychotherapie

Universitätsmedizin Mainz · Untere Zahlbacher Straße 8 · 55131 Mainz

Vertraulich
Klaus Muster
Musterstraße 123
01234 Musterstadt

Univ.-Prof. Dr. Klaus Lieb

Direktor der Klinik für Psychiatrie und Psychotherapie
Untere Zahlbacher Straße 8
55131 Mainz

Telefon: +49 (0) 6131 17-7335
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E-Mail: klaus.lieb@unimedizin-mainz.de

Mainz, 30. Juli 2018

„Euros für Ärzte“ - Ihre Erfahrungen mit der Offenlegung von Zuwendungen der Industrie

Sehr geehrter Herr Dr. Muster,

im Rahmen des Forschungsprojektes „*SOCIReM: Second order effects of conflict of interest regulations in medicine*“ untersuchen wir die erwünschten und unerwünschten Effekte der Offenlegung von Interessenkonflikten, um daraus Empfehlungen für die zukünftige Transparenz von Interessenkonflikten abzuleiten. Ihre Erfahrung ist von großer Bedeutung für unser Projekt.

Aus der öffentlich zugänglichen Datenbank „*Euros für Ärzte*“ konnten wir entnehmen, dass Sie **2017** Daten über die Zuwendungen von pharmazeutischen Unternehmen offengelegt haben, **2016** aber nicht. Haben Sie Reaktionen auf die Offenlegung erfahren? Waren diese eher negativ oder positiv? Mithilfe solcher Fragen wollen wir mehr über die Bedeutung der Offenlegung von den Offenlegenden selbst erfahren. Wir haben dafür einen kurzen **Fragebogen** vorbereitet, dessen Ausfüllen **ca. 5 Minuten** in Anspruch nimmt. Wir wären Ihnen sehr dankbar, wenn Sie uns diesen Fragebogen ausgefüllt im beigelegten frankierten Rückumschlag zukommen lassen würden. Bitte beachten Sie, dass in dieser Befragung die Offenlegung 2018 noch nicht berücksichtigt wird.

Die Teilnahme an der Befragung ist freiwillig. Ihre Daten werden selbstverständlich **anonymisiert** verarbeitet und aggregiert veröffentlicht. Ihren Eintrag in der Datenbank haben wir lediglich genutzt, um sie per Post zu kontaktieren und einem Studienarm zuzuordnen. Eine Zuordnung des ausgefüllten Bogens zu Ihrem Eintrag in der Datenbank ist uns damit **nicht möglich.**

Bei Fragen können Sie meine Mitarbeiterinnen Marlene Stoll (E-Mail: marlene.stoll@unimedizin-mainz.de; Tel.: 06131 173753) oder Lara Hubenschmid (lara.hubenschmid@unimedizin-mainz.de) oder auch mich persönlich kontaktieren.

Vielen Dank schon im Voraus für Ihre Unterstützung!

Mit freundlichen Grüßen

Univ.-Prof. Dr. Klaus Lieb

Anlagen:
2-seitiger Fragebogen

Bitte um Rücksendung per Post (frankierter Rückumschlag liegt bei).
Zögern Sie nicht, uns bei Fragen zu kontaktieren: ☎ 06131 173753.

UNIVERSITÄTSmedizin. MAINZ

Demografisches

Fachrichtung: _____	Geschlecht: ☐ weibl. ☐ männl.	Alter: _____

Arbeiten Sie in einem Klinikum / einem Krankenhaus? ☐ ja, und zwar: ☐ universitär ☐ nicht universitär ☐ nein

Falls ja: Welche Position haben Sie? ☐ Chefarzt/-ärztin ☐ Oberarzt / -ärztin ☐ Assistenzarzt/ -ärztin

Falls nein: Wie arbeiten Sie? ☐ niedergelassen ☐ angestellt ☐ anders: _____

Wie viel Prozent Ihrer Arbeitszeit verbringen Sie derzeit mit **Patientenversorgung**? *ca.* ____ %	Wie viel Prozent Ihrer Arbeitszeit verbringen Sie derzeit mit **Forschung**? *ca.* ____ %

Bitte kreuzen Sie an, in welchem Bereich Sie in den letzten fünf Jahren wissenschaftlich tätig waren.
Mehrfachantworten sind möglich.

☐ Anwendungs-beobachtungen (AWB) ☐ Auftrags-studien der Industrie ☐ eigeninitiativ durchgeführte klinische Studien (IIT) ☐ eigene, universitäre Forschung ☐ anderer: _____ _____ ☐ ich bin nicht wissenschaftlich tätig

Wie hoch schätzen Sie den Anteil aller ÄrztInnen in Deutschland, die der Offenlegung ihrer Daten im Rahmen des Transparenzkodex (später zusammengefasst in der Datenbank „Euros für Ärzte“) zugestimmt haben?

In 2016 für die Daten von 2015 _____ %	*Wissen* Sie den tatsächlichen prozentualen Anteil annäherungsweise, z.B. aus den Medien?	2016: ☐ ja ☐ nein
In 2017 für die Daten von 2016 _____ %		2017: ☐ ja ☐ nein

Wurden Ihre Angaben von Zuwendungen in der Datenbank „Euros für Ärzte“ korrekt wiedergegeben?

In 2016 für die Daten von 2015 ☐ ja ☐ nein ☐ weiß nicht

2016 ist kein Eintrag von Ihnen in der Datenbank vorhanden. Warum?

☐ Ich habe keine Zuwendungen erhalten.
☐ Ich wurde nicht gefragt, ob die Zuwendungen offengelegt werden dürften.
☐ Ich habe vergessen, auf die Anfrage zur Offenlegung zu antworten.
☐ Ich habe mich bewusst gegen die Offenlegung entschieden.

Falls Sie sich bewusst gegen eine Offenlegung entschieden haben: Welche Aspekte spielten dabei eine Rolle?	*trifft überhaupt nicht zu*	*trifft weniger zu*	*weder noch*	*trifft etwas zu*	*trifft vollkommen zu*
Andere haben mir abgeraten.	☐	☐	☐	☐	☐
Bedenken bzgl. Öffentlichkeit / Berichterstattung	☐	☐	☐	☐	☐
Bedenken bzgl. zukünftiger Reaktionen von Patienten	☐	☐	☐	☐	☐
Bedenken bzgl. zukünftiger Reaktionen von Kollegen	☐	☐	☐	☐	☐
Bedenken bzgl. zukünftiger Reaktionen im persönlichen Umfeld	☐	☐	☐	☐	☐
Anderer Grund: _____	☐	☐	☐	☐	☐

Im Sommer 2016 wurden die Daten der ersten Offenlegungsrunde veröffentlicht.

Wie sehr treffen die folgenden Aussagen auf Sie zu?	*trifft überhaupt nicht zu*	*trifft weniger zu*	*weder noch*	*trifft etwas zu*	*trifft vollkommen zu*
Ich habe mir die Datenbank angesehen.	☐	☐	☐	☐	☐
Ich habe die Berichterstattung über die Datenbank in den Medien verfolgt.	☐	☐	☐	☐	☐
Ich habe nach einzelnen Personen in der Datenbank gesucht.	☐	☐	☐	☐	☐

Bitte um Rücksendung per Post (frankierter Rückumschlag liegt bei).
Zögern Sie nicht, uns bei Fragen zu kontaktieren: ☎ 06131 173753.

UNIVERSITÄTSmedizin. MAINZ

Wir sind daran interessiert, ob und wie Ihr Umfeld auf Ihre Offenlegung 2017 reagiert hat.
Bitte beziehen Sie sich bei den Antworten auf den Zeitraum nach der Offenlegung (Sommer 2017 bis heute).

Wie viele Reaktionen (rein subjektiv) kamen von ...	*keine*	*sehr wenige*	*eher wenige*	*eher viele*	*sehr viele*
Patienten	☐	☐	☐	☐	☐
Kollegen	☐	☐	☐	☐	☐
Persönliches Umfeld	☐	☐	☐	☐	☐

Falls es Reaktionen gab: Wie waren sie inhaltlich?	*sehr negativ*	*eher negativ*	*neutral*	*eher positiv*	*sehr positiv*
Die Reaktionen von Patienten waren überwiegend ...	☐	☐	☐	☐	☐
Die Reaktionen von Kollegen waren überwiegend ...	☐	☐	☐	☐	☐
Die Reaktionen aus dem persönlichen Umfeld waren überwiegend ...	☐	☐	☐	☐	☐

Falls es Reaktionen gab: Wie empfanden Sie diese?	*sehr unangenehm*	*eher unangenehm*	*neutral*	*eher angenehm*	*sehr angenehm*
Die Reaktionen von Patienten empfand ich als überwiegend ...	☐	☐	☐	☐	☐
Die Reaktionen von Kollegen empfand ich als überwiegend ...	☐	☐	☐	☐	☐
Die Reaktionen aus dem persönlichen Umfeld empfand ich als überwiegend ...	☐	☐	☐	☐	☐

Gab es etwas, was Sie an den Reaktionen sehr beschäftigt hat?

_____

Wie sehr stimmen Sie den folgenden Aussagen zum jetzigen Zeitpunkt zu?	*stimme überhaupt nicht zu*	*stimme weniger zu*	*neutral*	*stimme etwas zu*	*stimme vollkommen zu*
Zuwendungen durch pharmazeutische Unternehmen (pU) stellen ein Risiko für die Unabhängigkeit von Klinik und Forschung dar.	☐	☐	☐	☐	☐
Die Offenlegung der Zuwendungen führt dazu, dass mir Patienten mehr vertrauen.	☐	☐	☐	☐	☐
Zuwendungen sind in Ordnung, wenn Regulierungsmaßnahmen (Offenlegung, Ausschluss aus Gremien) ergriffen werden.	☐	☐	☐	☐	☐
Ich halte Transparenz grundsätzlich für etwas Gutes.	☐	☐	☐	☐	☐
Durch die Offenlegungen entsteht in der Öffentlichkeit ein falscher Eindruck.	☐	☐	☐	☐	☐
Die Zusammenarbeit mit pU und damit auch die Zuwendungen von pU anzunehmen, gehört zum Arztberuf dazu.	☐	☐	☐	☐	☐
Manche Zuwendungen sollten vermieden werden, während andere nicht wegzudenken sind.	☐	☐	☐	☐	☐
Ohne gute Alternativen in Forschung, Fortbildung usw. wird sich im medizinischen Sektor bzgl. der Annahme von Zuwendungen nichts ändern.	☐	☐	☐	☐	☐
Die Offenlegung von Zuwendungen sollte differenzierter erfolgen.	☐	☐	☐	☐	☐

In welchem Bereich ist die Offenlegung von finanziellen Zuwendungen Ihrer Meinung nach wichtiger?	*eindeutig Patientenversorgung*	*eher Patientenversorgung*	*gleich wichtig*	*eher Forschung*	*eindeutig Forschung*
	☐	☐	☐	☐	☐

Falls Sie wissenschaftlich tätig sind: Wie sehr stimmen Sie den folgenden Aussagen zu?	*stimme überhaupt nicht zu*	*stimme weniger zu*	*neutral*	*stimme etwas zu*	*stimme vollkommen zu*
Transparenzrichtlinien erschweren meine wissenschaftliche Arbeit.	☐	☐	☐	☐	☐
Ich wurde schon einmal auf Offenlegungen im Rahmen einer Publikation angesprochen.	☐	☐	☐	☐	☐
Meine Forschungsergebnisse wurden schon einmal auf Basis meiner Offenlegungen kritisiert.	☐	☐	☐	☐	☐
Wenn ich keine Kooperationen mit der Industrie eingehe, fehlen mir Gelder für die Forschung, die mir wichtig ist.	☐	☐	☐	☐	☐
Die undifferenzierte Darstellung der Offenlegungen bringt die Wissenschaft in Misskredit.	☐	☐	☐	☐	☐

Figure A3

Accompanying Letter and Questionnaire, Group 3

JG|U UNIVERSITÄTSmedizin. MAINZ
Klinik für Psychiatrie und Psychotherapie

Universitätsmedizin Mainz · Untere Zahlbacher Straße 8 · 55131 Mainz

Vertraulich
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Untere Zahlbacher Straße 8
55131 Mainz

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E-Mail: klaus.lieb@unimedizin-mainz.de

Mainz, 30. Juli 2018

„Euros für Ärzte“ - Ihre Erfahrungen mit der Offenlegung von Zuwendungen der Industrie

Sehr geehrter Herr Dr. Muster,

im Rahmen des Forschungsprojektes „*SOCIReM: Second order effects of conflict of interest regulations in medicine“* untersuchen wir die erwünschten und unerwünschten Effekte der Offenlegung von Interessenkonflikten, um daraus Empfehlungen für die zukünftige Transparenz von Interessenkonflikten abzuleiten. Ihre Erfahrung ist von großer Bedeutung für unser Projekt.

Aus der öffentlich zugänglichen Datenbank „*Euros für Ärzte*“ konnten wir entnehmen, dass Sie einer Veröffentlichung Ihrer Daten über die Zuwendungen von pharmazeutischen Unternehmen 2016 und 2017 zugestimmt haben. Haben Sie Reaktionen auf die erste Offenlegung erfahren? Waren diese eher negativ oder positiv? Mithilfe solcher Fragen wollen wir mehr über die Bedeutung der Offenlegung von den Offenlegenden selbst erfahren. Wir haben dafür einen kurzen **Fragebogen** vorbereitet, dessen Ausfüllen **ca. 5 Minuten** in Anspruch nimmt. Wir wären Ihnen sehr dankbar, wenn Sie uns diesen Fragebogen ausgefüllt im beigelegten frankierten Rückumschlag zukommen lassen würden.

Die Teilnahme an der Befragung ist freiwillig. Ihre Daten werden selbstverständlich **anonymisiert** verarbeitet und aggregiert veröffentlicht. Ihren Eintrag in der Datenbank haben wir lediglich genutzt, um sie per Post zu kontaktieren und einem Studienarm zuzuordnen. Eine Zuordnung des ausgefüllten Bogens zu Ihrem Eintrag in der Datenbank ist uns damit **nicht möglich.**

Bei Fragen können Sie meine Mitarbeiterinnen Marlene Stoll (E-Mail: marlene.stoll@unimedizin-mainz.de; Tel.: 06131 173753) oder Lara Hubenschmid (lara.hubenschmid@unimedizin-mainz.de) oder auch mich persönlich kontaktieren.

Vielen Dank schon im Voraus für Ihre Unterstützung!

Mit freundlichen Grüßen

Univ.-Prof. Dr. Klaus Lieb

Anlagen:
2-seitiger Fragebogen

Bitte um Rücksendung per Post (frankierter Rückumschlag liegt bei).
Zögern Sie nicht, uns bei Fragen zu kontaktieren: ☎ 06131 173753.

UNIVERSITÄTSmedizin. MAINZ

Demografisches

Fachrichtung: _____	Geschlecht: ☐ weibl. ☐ männl.	Alter: _____

Arbeiten Sie in einem Klinikum / einem Krankenhaus? ☐ ja, und zwar: ☐ universitär ☐ nicht universitär ☐ nein

Falls ja: Welche Position haben Sie? ☐ Chefarzt / -ärztin ☐ Oberarzt /-ärztin ☐ Assistenzarzt/ -ärztin

Falls nein: Wie arbeiten Sie? ☐ niedergelassen ☐ angestellt ☐ anders: _____

Wie viel Prozent Ihrer Arbeitszeit verbringen Sie derzeit mit **Patientenversorgung**? *ca.* ____ %	Wie viel Prozent Ihrer Arbeitszeit verbringen Sie derzeit mit **Forschung**? *ca.* _____ %

Bitte kreuzen Sie an, in welchem Bereich Sie in den letzten fünf Jahren wissenschaftlich tätig waren.
Mehrfachantworten sind möglich.

☐ Anwendungs-beobachtungen (AWB) ☐ Auftrags-studien der Industrie ☐ eigeninitiativ durchgeführte klinische Studien (IIT) ☐ eigene, universitäre Forschung ☐ anderer: _____ _____ ☐ ich bin nicht wissenschaftlich tätig

Wie hoch schätzen Sie den Anteil aller ÄrztInnen in Deutschland, die der Offenlegung ihrer Daten im Rahmen des Transparenzkodex (später zusammengefasst in der Datenbank „Euros für Ärzte“) zugestimmt haben?

In 2016 für die Daten von 2015 _____ %	*Wissen* Sie den tatsächlichen prozentualen Anteil annäherungsweise, z.B. aus den Medien?	2016: ☐ ja ☐ nein
In 2017 für die Daten von 2016 _____ %		2017: ☐ ja ☐ nein

Wurden Ihre Angaben von Zuwendungen in der Datenbank „Euros für Ärzte“ korrekt wiedergegeben?

In 2016 für 2015 ☐ ja ☐ nein ☐ weiß nicht	In 2017 für 2016 ☐ ja ☐ nein ☐ weiß nicht

Im Sommer 2016 wurden die Daten der ersten Offenlegungsrunde veröffentlicht.
Wie sehr treffen die folgenden Aussagen auf Sie zu?

	trifft überhaupt nicht zu	*trifft weniger zu*	*weder noch*	*trifft etwas zu*	*trifft vollkommen zu*
Ich habe mir die Datenbank angesehen.	☐	☐	☐	☐	☐
Ich habe die Berichterstattung über die Datenbank in den Medien verfolgt.	☐	☐	☐	☐	☐
Ich habe nach Personen in der Datenbank gesucht.	☐	☐	☐	☐	☐

In welchem Bereich liegt der von Ihnen offengelegte Betrag im Vergleich zu den anderen offengelegten Beträgen schätzungsweise?	*eindeutig unter dem Durchschnitt*	*eher unter dem Durchschnitt*	*im Durchschnitt*	*eher über dem Durchschnitt*	*eindeutig über dem Durchschnitt*
	☐	☐	☐	☐	☐

Sie haben sich 2016 für eine Offenlegung der Daten aus dem Jahr 2015 entschieden. Wir sind daran interessiert, ob und wie Ihr Umfeld auf diesen ersten Eintrag reagiert hat.
Bitte beziehen Sie sich bei den Antworten auf den gesamten Zeitraum zwischen der ersten (Sommer 2016) und zweiten (Sommer 2017) Offenlegung.

Wie viele Reaktionen (rein subjektiv) kamen von ...	*keine*	*sehr wenige*	*eher wenige*	*eher viele*	*sehr viele*
Patienten	☐	☐	☐	☐	☐
Kollegen	☐	☐	☐	☐	☐
Persönliches Umfeld	☐	☐	☐	☐	☐

Falls es Reaktionen gab: Wie waren sie inhaltlich?	*sehr negativ*	*eher negativ*	*neutral*	*eher positiv*	*sehr positiv*
Die Reaktionen von Patienten waren überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen von Kollegen waren überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen aus dem persönlichen Umfeld waren überwiegend	☐	☐	☐	☐	☐

Falls es Reaktionen gab: Wie empfanden Sie diese?	*sehr unangenehm*	*eher unangenehm*	*neutral*	*eher angenehm*	*sehr angenehm*
Die Reaktionen von Patienten empfand ich als überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen von Kollegen empfand ich als überwiegend …	☐	☐	☐	☐	☐
Die Reaktionen aus dem persönlichen Umfeld empfand ich als überwiegend …	☐	☐	☐	☐	☐

Bitte um Rücksendung per Post (frankierter Rückumschlag liegt bei).
Zögern Sie nicht, uns bei Fragen zu kontaktieren: ☎ 06131 173753.

UNIVERSITÄTSmedizin. MAINZ

Gab es etwas, was Sie an den Reaktionen sehr beschäftigt hat?

_____

_____

Sie haben 2017 ein zweites Mal Ihre Einwilligung zur Offenlegung der Daten gegeben. *Bitte kreuzen Sie an, wie sehr Sie die Aussage auf Sie zutrifft.*	*trifft überhaupt nicht zu*	*trifft weniger zu*	*weder noch*	*trifft etwas zu*	*trifft vollkommen zu*
Die Entscheidung, die Daten offenzulegen, fiel beim zweiten Mal leichter als beim ersten Mal.	☐	☐	☐	☐	☐
Wie sehr stimmen Sie den folgenden Aussagen zum jetzigen Zeitpunkt zu?	*stimme überhaupt nicht zu*	*stimme weniger zu*	*neutral*	*stimme etwas zu*	*stimme vollkommen zu*
Zuwendungen durch pharmazeutische Unternehmen (pU) stellen ein Risiko für die Unabhängigkeit von Klinik und Forschung dar.	☐	☐	☐	☐	☐
Die Offenlegung der Zuwendungen führt dazu, dass mir Patienten mehr vertrauen.	☐	☐	☐	☐	☐
Zuwendungen sind in Ordnung, wenn Regulierungsmaßnahmen (Offenlegung, Ausschluss aus Gremien) ergriffen werden.	☐	☐	☐	☐	☐
Ich halte Transparenz grundsätzlich für etwas Gutes.	☐	☐	☐	☐	☐
Durch die Offenlegungen entsteht in der Öffentlichkeit ein falscher Eindruck.	☐	☐	☐	☐	☐
Die Zusammenarbeit mit pU und damit auch die Zuwendungen von pU anzunehmen, gehört zum Arztberuf dazu.	☐	☐	☐	☐	☐
Manche Zuwendungen sollten vermieden werden, während andere nicht wegzudenken sind.	☐	☐	☐	☐	☐
Ohne gute Alternativen in Forschung, Fortbildung usw. wird sich im medizinischen Sektor bzgl. der Annahme von Zuwendungen nichts ändern.	☐	☐	☐	☐	☐
Die Offenlegung von Zuwendungen sollte differenzierter erfolgen.	☐	☐	☐	☐	☐
In welchem Bereich ist die Offenlegung von finanziellen Zuwendungen Ihrer Meinung nach wichtiger?	*eindeutig Patientenversorgung*	*eher Patientenversorgung*	*gleich wichtig*	*eher Forschung*	*eindeutig Forschung*
	☐	☐	☐	☐	☐
Falls Sie wissenschaftlich tätig sind: **Wie sehr stimmen Sie den folgenden Aussagen zu?**	*stimme überhaupt nicht zu*	*stimme weniger zu*	*neutral*	*stimme etwas zu*	*stimme vollkommen zu*
Transparenzrichtlinien erschweren meine wissenschaftliche Arbeit.	☐	☐	☐	☐	☐
Ich wurde schon einmal auf Offenlegungen im Rahmen einer Publikation angesprochen.	☐	☐	☐	☐	☐
Meine Forschungsergebnisse wurden schon einmal auf Basis meiner Offenlegungen kritisiert.	☐	☐	☐	☐	☐
Wenn ich keine Kooperationen mit der Industrie eingehe, fehlen mir Gelder für die Forschung, die mir wichtig ist.	☐	☐	☐	☐	☐
Die undifferenzierte Darstellung der Offenlegungen bringt die Wissenschaft in Misskredit.	☐	☐	☐	☐	☐

Note. Additionally to the item „Die Entscheidung, die Daten offenzulegen, fiel beim zweiten Mal leichter als beim ersten Mal.“, we added the followig items in group 4: „Meine Zuwendungen haben sich verändert, weil das Angebot der pharmazeutischen Unternehmen sich verändert hat.“ and „Meine Zuwendungen haben sich verändert, weil ich bewusst weniger Zuwendungen angenommen habe.“; for group 5 we added: „Meine Zuwendungen haben sich verändert, weil das Angebot der pharmazeutischen Unternehmen sich verändert hat.“ and „Meine Zuwendungen haben sich verändert, weil ich bewusst mehr Zuwendungen angenommen habe.“

APPENDIX B

Survey: Further Results

Table A1

Descriptive Values of Main Outcomes

	n	*M (SD)*	*Mdn (IQR)*	*Min-Max*
Frequency of reactions, 2015 and 2016				
All recipients	231	1.51 (0.64)	1.33 (0.83)	1–3.67
Patients	231	1.23 (0.56)	1 (0)	1–4
Colleagues	230	1.73 (0.97)	1 (1)	1–5
Private Surrounding	229	1.56 (0.90)	1 (1)	1–4
Frequency of reactions, only 2015				
All recipients	189	1.49 (0.62)	1.33 (0.67)	1–3.67
Patients	189	1.23 (0.56)	1 (0)	1–4
Colleagues	188	1.69 (0.93)	1 (1)	1–5
Private Surrounding	187	1.54 (0.88)	1 (1)	1–4
Frequency of reactions, only 2016				
All recipients	42	1.6 (0.73)	1.17 (1)	1–3
Patients	42	1.24 (0.53)	1 (0)	1–3
Colleagues	42	1.90 (1.12)	1 (2)	1–4
Private Surrounding	42	1.64 (1.01)	1 (2)	1–4
Content of reactions, 2015 and 2016				
All recipients	129	2,73 (0,71)	3 (1)	1–5
Patients	61	2.77 (0.80)	3 (1)	1–5
Colleagues	113	2.68 (0.79)	3 (1)	1–5
Private Surrounding	92	2.72 (0.79)	3 (1)	1–5
Content of reactions, only 2015				
All recipients	107	2.78 (0.71)	3 (0.83)	1–5
Patients	51	2.88 (0.74)	2 (0)	1–5
Colleagues	92	2.72 (0.80)	3 (1)	1–5
Private Surrounding	75	2.75 (0.81)	3 (1)	1–5

	n	*M (SD)*	*Mdn (IQR)*	*Min-Max*
Content of reactions, only 2016				
All recipients	22	2.48 (0.65)	2.75 (1)	1–3.5
Patients	10	2.2 (0.92)	2.5 (1.75)	1–3
Colleagues	21	2.52 (0.75)	3 (1)	1–4
Private Surrounding	17	2.59 (0.71)	3 (1)	1–3
Pleasantness of reactions, 2015 and 2016				
All recipients	126	2,58 (0,70)	2,67 (1)	1–5
Patients	60	2.57 (0.81)	3 (1)	1–4
Colleagues	110	2.6 (0.80)	3 (1)	1–4
Private Surrounding	90	2.52 (0.86)	3 (1)	1–5
Pleasantness of reactions, only 2015				
All recipients	104	2.26 (0.69)	2.67 (1)	1–5
Patients	49	2.71 (0.71)	3 (1)	1–4
Colleagues	89	2.65 (0.76)	3 (1)	1–4
Private Surrounding	72	2.49 (0.86)	3 (1)	1–5
Pleasantness of reactions, only 2016				
All recipients	22	2.39 (0.76)	2.58 (1)	1–3.5
Patients	11	1.91 (0.94)	2 (2)	1–3
Colleagues	21	2.38 (0.97)	3 (1)	1–4
Private Surrounding	18	2.67 (0.91)	3 (0.75)	1–4
Descriptive norm for 2015	228	33% (21)	30% (30)	0–100%
Descriptive norm for 2016	229	31% (20)	25% (20)	0–100%
Attitude	233	4.59 (0.82)	5 (1)	1–5

Table A2

Reasons for Nondisclosure, Separated by Year of Nondisclosure

	No entry 2016			No entry 2015		
Statement	*n*	*M* (*SD*)	*Mdn* (*IQR*)	*n*	*M* (*SD*)	*Mdn* (*IQR*)
Others advised me not to disclose.	25	2.72 (1.82)	2 (4)	8	3.50 (1.41)	4 (1,5)
Consideration of the public view / media reporting.	25	4.60 (1.0)	5 (0)	7	4.71 (0.49)	5 (0)
Consideration of future reactions by patients.	23	3.83 (1.40)	4 (2)	7	2.29 (1.60)	2 (2)
Considerations of future reactions by colleagues.	24	3.17 (1.63)	3 (3)	7	3.0 (1.41)	4 (2)
Consideration of future reactions in the private surrounding	24	2.75 (1.57)	2.5 (3.25)	8	2.63 (1.51)	3 (3)
Negative experiences with disclosure 2016.	27	4.37 (1.31)	5 (0.5)	-	-	-

Note. Answers were given on a 5-point-Likert scale from 1 = *strongly disagree* to 5 = *strongly agree*.

APPENDIX C

Experiment: Ethics Approval

JOHANNES GUTENBERG UNIVERSITÄT MAINZ

JOHANNES GUTENBERG-UNIVERSITÄT MAINZ D-55099 Mainz

Frau
Marlene Stoll
Klinik für Psychiatrie und Psychotherapie der
Universitätsmedizin Mainz

im Hause

Betreff Antrag **2018-JGU-psychEK-025**
„Disclosure and Education: Effekt der Offenlegung eines Interessenkonflikts und Aufklärung der zu beratenden Person auf Bias im Beratungsverhalten der beratenden Person"

Sehr geehrte Frau Stoll,

die Ethikkommission hat über Ihren Antrag beraten und es wurden keine ethischen Einwände gesehen, die gegen die Durchführung des von Ihnen geplanten empirischen Forschungsprojekts sprechen.

Bitte beachten Sie, dass sich dieser positive Bescheid nur auf das in Ihrem Antrag beschriebene Vorgehen bezieht. Bei substantiellen Abweichungen vom im Antrag beschriebenen Vorgehen verliert dieser Bescheid seine Gültigkeit.

Mit freundlichen Grüßen,

(Vorsitzender der Ethikkommission)

Mitglieder der Ethikkommission:
Prof. Dr. Stefan Berti (Vorsitzender; Psychologisches Institut)
Univ.-Prof. Dr. Margarete Imhof (Psychologisches Institut)
Univ.-Prof. Dr. Michael Witthöft (Psychologisches Institut)
Univ.-Prof. Dr. Roland Imhoff (Psychologisches Institut)
Jun.-Prof. Dr. Aileen Oeberst (Psychologisches Institut)

Fachbereich 02 – Sozialwissenschaften, Medien und Sport

Psychologisches Institut - Ethikkommission

apl. Prof. Dr.
Stefan Berti
Vorsitzender

Johannes Gutenberg-
Universität Mainz
Psychologisches Institut
Wallstr. 3
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Binger Str. 14-16
55122 Mainz

Tel. +49 6131 39-39185
Fax +49 6131 39-39196

www.psychologie.uni-mainz.de

Datum: 04.01.2019

Ihre Zeichen/Nachricht

Unsere Zeichen/Nachricht
2018-JGU-psychEK-025

APPENDIX D

Experiment: Survey Pages as Seen by Participants

Herzlich willkommen bei unserer DISCLED-Studie zu Schätz- und Beratungsverhalten!

Wir danken Ihnen für Ihr Interesse an dieser Studie.

Wir untersuchen mit der Studie, inwiefern sich die Schätzungen zum finanziellen Wert eines Objektes individuell unterscheiden und wie sich Personen in bestimmten Beratungssituationen verhalten. Zur Bearbeitung benötigen Sie in etwa 40 Minuten.

Aufwandsentschädigung

Für die Teilnahme an der Studie erhalten Sie eine Aufwandsentschädigung in Höhe von 6 - 12 €.

Die Höhe dieser Aufwandsentschädigung ist abhängig von Ihrer im Experiment erbrachten Leistung, beträgt jedoch mindestens 6 €.

Klicken Sie auf „**Weiter**“, um weitere Informationen zu erhalten und mit der Studie zu beginnen.

Weiter

Marlene Stoll, Johannes Gutenberg Universität Mainz – 2019

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Allgemeine Hinweise und Datenschutz

DISCLED-Studie zu Schätz- und Beratungsverhalten

Freiwilligkeit und Anonymität

Die Teilnahme an der Studie ist **freiwillig**. Alle Informationen, die gesammelt werden, werden für **wissenschaftliche Zwecke** genutzt. Sie können jederzeit und ohne Angabe von Gründen die Teilnahme an dieser Studie beenden, ohne dass Ihnen daraus Nachteile entstehen.
Die Erhebung der Daten sowie die Veröffentlichung der Ergebnisse der Studie erfolgt in **anonymisierter Form**. Das heißt, dass Ihre Daten Ihrer Person nicht zugeordnet werden können.

Datenschutz

Die Erhebung der Daten erfolgt vollständig **anonymisiert**, es wird an keiner Stelle Ihr Name oder ein Code erfragt. Das heißt, es ist niemandem möglich, Ihre Daten mit Ihrem Namen in Verbindung zu bringen. Sie können also nach Ablauf des Experiments nicht mehr die Löschung Ihrer Daten verlangen.

Kontakt der Studienleitung der Johannes Gutenberg-Universität Mainz:
Marlene Stoll
Fachbereich 02: Sozialwissenschaften, Medien und Sport
Psychologisches Institut, Binger Straße 14-16, 55122 Mainz
Marlene.Stoll@unimedizin-mainz.de

Kontakt des Datenschutzbeauftragten der Johannes Gutenberg-Universität Mainz:
Claus-Toni Bertram
Abteilung Zentrale Dienste
Forum 3, EG 01631/3925382
Claus-toni.bertram@uni-mainz.de

Aufbewahrungsfrist für die anonymisierten Daten

Die anonymisierten Daten werden mindestens 10 Jahre gespeichert.
Die vollständig anonymisierten Daten aller Teilnehmenden werden über die Internet-Datenbank open science framework öffentlich zugänglich gemacht. Dieses Vorgehen dient der Sicherstellung guter wissenschaftlicher Arbeit. Andere Forschende können dadurch beispielsweise die Auswertung nachvollziehen oder eine alternative Auswertung testen.

Beschwerderecht bezüglich Datenschutz

Außerdem möchte ich Sie auf Ihr Beschwerderecht aufmerksam machen.
Im Falle einer Beschwerde bezüglich des Datenschutzes wenden Sie sich bitte an:

Landesbeauftrager für den Datenschutz und die Informationsfreiheit Rheinland-Pfalz
Hintere Bleiche 34
55116 Mainz
06131/2082449
poststelle@datenschutz.rlp.de
www.datenschutz.rlp.de

Aufwandsentschädigung

Für die Teilnahme an der Untersuchung erhalten Sie eine Aufwandsentschädigung zwischen 6 - 12 €. Die Aufwandsentschädigung wird Ihnen in bar, direkt im Anschluss an die Untersuchung, ausgezahlt.

Sollten Sie die Untersuchung abbrechen, erhalten Sie je angefangener halben Stunde eine Aufwandsentschädigung von 3€.

Einwilligung zur Teilnahme an der DISCLED-Studie zu Schätz- und Beratungsverhalten

Ich bin über Wesen, Bedeutung und Tragweite der DISCLED -Studie aufgeklärt worden.

Ich hatte **genügend Zeit** für eine Entscheidung und bin bereit, an der oben genannten Studie teilzunehmen.

Ich weiß, dass die Teilnahme an der Studie **freiwillig** ist und ich die Teilnahme **jederzeit ohne Angaben von Gründen beenden** kann.

Meine Muttersprache ist Deutsch.

- ○ ja
- ○ nein

Ich habe obige Informationen und Datenschutzhinweise gelesen, bin mindestens 18 Jahre alt und stimme der freiwilligen Teilnahme an der Studie zu. Meine Angaben dürfen zu Forschungszwecken anonymisiert genutzt werden.

- ○ ja
- ○ nein

Zurück Weiter

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[Info]

Aufbau des Experiments [E]

In diesem Experiment gibt es zwei Versuchsbedingungen (Expertenbedingung und Schätzbedingung).

Im Folgenden werden die Bedingungen abgekürzt:
Expertenbedingung = ExB, Schätzbedingung = SB

Die Aufgabe in beiden Bedingungen ist jeweils das Schätzen des Verkaufswertes einer Immobilie.
Sie werden per Zufall einer der folgenden Bedingungen zugeordnet:

Sie bekommen viele Informationen, auf deren Basis Sie den Verkaufswert einer Immobilie schätzen können.
Im Anschluss „beraten" Sie eine Versuchsperson aus der Schätzbedingung hinsichtlich des Verkaufswertes der Immobilie.

ExB

SB

Sie bekommen wenig Informationen zu derselben Immobilie.
Zusätzlich erhalten Sie jedoch die Beratung einer Versuchsperson aus der Expertenbedingung.
Mithilfe dieser Informationen schätzen Sie dann den Verkaufswert der Immobilie.

Indem Sie auf "**Weiter**" klicken, werden Sie per Zufall einer Versuchsbedingung zugeordnet.

Weiter

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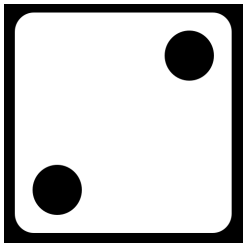
[Info]

Zuordnung einer Bedingung

Ihr Würfelergebnis ordnet Sie per Zufall einer Versuchsbedingung zu.



Sie wurden **der Expertenbedingung** zugeordnet.

Klicken Sie auf **"Weiter"**, um weitere Informationen zu erhalten.

Zurück Weiter

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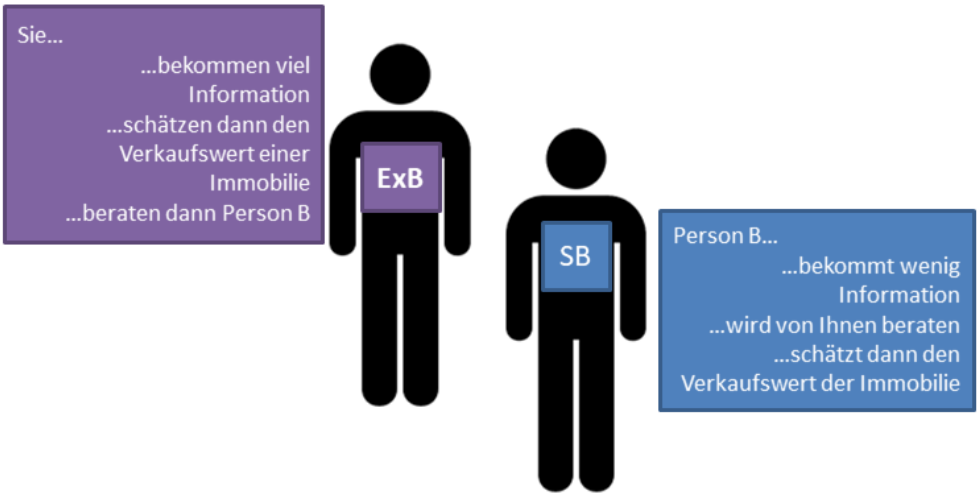
[Info]

Information zu Ihrer Bedingung

Sie sind in der Expertenbedingung
Das bedeutet für Sie:



Klicken Sie auf **"Weiter"**, um weitere Informationen zu erhalten.

Weiter

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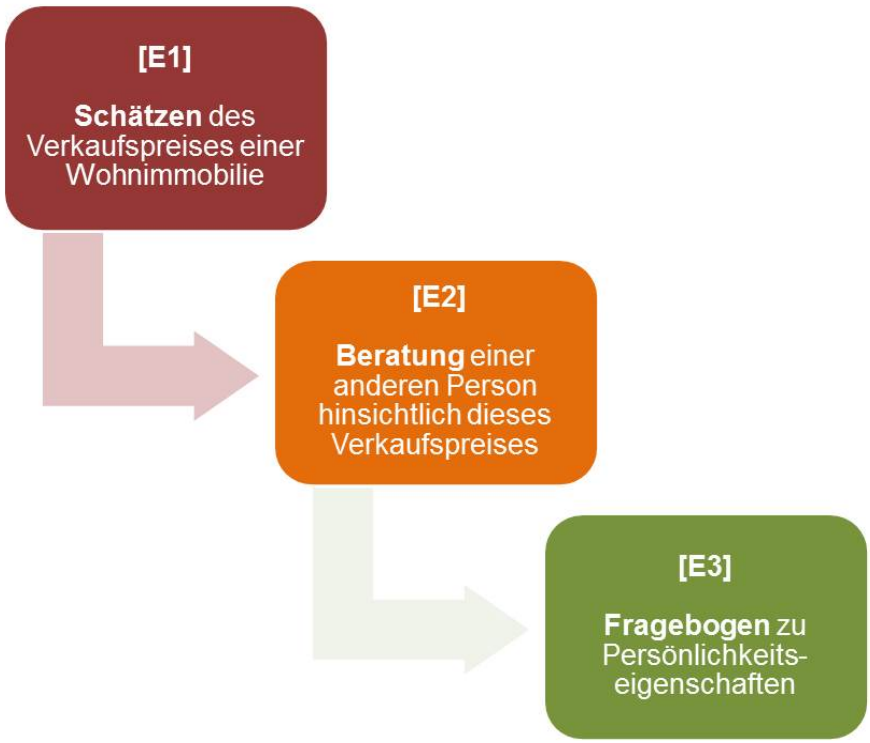
[Info]

Ablauf des Experiments [E]

Das Experiment gliedert sich in **drei Teile** und dauert insgesamt ca. 40 Minuten.



Für das Schätzen der Immobilie ist kein besonderes Vorwissen notwendig.

Zurück Weiter

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[E1]

Schätzen des Verkaufspreises einer Wohnimmobilie

[€]

Sie haben an zwei Stellen im Experiment die Möglichkeit, Ihre Aufwandsentschädigung zu beeinflussen.

Dies ist die erste von zwei Möglichkeiten:

Je genauer Sie den Verkaufswert von Haus Blaudach schätzen, desto mehr Geld bekommen Sie für diesen Teil der Studie.
Sie können bis zu 2 € dazuverdienen, wenn Ihre Schätzung hinreichend genau ist.

Zurück Weiter

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[E1]

Schätzen des Verkaufspreises einer Wohnimmobilie

Insgesamt gibt es in diesem Experiment zwei Bedingungen: die Expertenbedingung (ExB) und die Schätzbedingung (SB). Sie sind in der _____. Das bedeutet: Sie bekommen _____ Informationen, auf deren Basis Sie den Verkaufswert einer Immobilie schätzen können. Sie haben in diesem Experiment an zwei Stellen die Möglichkeit Ihre Aufwandsentschädigung zu beeinflussen: Die erste Möglichkeit wurde Ihnen bereits vorgestellt. Sie besteht darin, dass Sie _____ Geld erhalten, je _____ Sie den Verkaufswert von Haus Blaudach schätzen (bis zu 2 €).

Die folgenden Worte kommen in die Lücken: (*Achten Sie beim Ausfüllen auf Groß- und Kleinschreibung.)*

viele, Expertenbedingung, mehr, genauer

Haben Sie den Lückentext ausgefüllt?

Klicken Sie auf **"Weiter".**

Sie können jederzeit mit dem Weiter- oder Zurück-Button zwischen den Seiten hin- und herspringen.

Zurück Weiter

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[E1]

Schätzen des Verkaufspreises einer Wohnimmobilie

Schauen Sie sich die folgende Grafik **"Info Haus Blaudach - Expertenbedingung"** genau an.

Sie informiert über die zu schätzende Immobilie (Haus Blaudach) und zwei Vergleichsimmobilien. Der **Marktwert** entspricht dem Wert, den das Haus momentan auf dem Markt hat, und der **Verkaufspreis/Verkaufswert** entspricht dem Wert, zu dem das Haus verkauft wird.

Info Haus „Blaudach“

Verkaufsdatum: 03/11/2015
Verkaufspreis: € *Dies ist der zu schätzende Wert.*
Marktwert: 238.200 €

55496 Argenthal: Sofort freies Haus auf 2 Wohnebenen zum Bestpreis!

Information zum Objekt:

Haustyp: Einfamilienhaus (freistehend)
Etagenzahl: 2
Wohnfläche ca.: 200 m²
Grundstückfläche ca.: 300 m²
Garage / Stellplatz: 2 Außenstellplätze
Baujahr: 1924

Objektzustand: gut
Zimmer: 8
Schlafzimmer: 4
Badezimmer: 2
Kamin: 1
Heizung: Zentralheizung

Vergleichsimmobilie 1		**Vergleichsimmobilie 2**	
Adresse:	55496 Argenthal	Adresse:	55496 Argenthal
Baujahr:	1924	Baujahr:	1929
Verkaufsdatum:	26/10/2015	Verkaufsdatum:	01/03/2014
Verkaufspreis:	179.000 €	Verkaufspreis:	215.000 €
Marktwert:	185.400 €	Marktwert:	235.300 €

Nach Durchsicht der **Informationen** zu Haus Blaudach komme ich zu folgendem Schluss:

Der Verkaufspreis von Haus Blaudach liegt schätzungsweise bei …

€

Zurück Weiter

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[E2]

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Sie sind in der Expertenbedingung und beraten nun als nächstes eine Person aus der Schätzbedingung. Das bedeutet: Sie befinden sich bereits im zweiten Teil dieses Experiments - in der Beratung.

Folgende Aspekte sind bei dieser Aufgabe zu beachten:

1. Ihre Aufgabe ist die Beratung einer Person aus der Schätzbedingung,
   das heißt: Sie geben einen Wert (für das Haus Blaudach) an diese Person weiter, auf dessen Basis sie dann den Verkaufswert schätzt.
2. Die Person aus der Schätzbedingung hat weniger Informationen als Sie (und muss deswegen von Ihnen beraten werden bzw. einen Hinweis über den Verkaufswert von Ihnen bekommen).
3. Sie werden anhand der *Höhe* des Schätzwertes der Person aus der Schätzbedingung bezahlt,
   die Person aus der Schätzbedingung wird anhand der *Genauigkeit* der eigenen Schätzung bezahlt.

Diese Aspekte werden Ihnen im Folgenden Schritt für Schritt genau erläutert.

Klicken Sie hierfür auf **"Weiter".**

Sie können jederzeit mit dem Weiter- oder Zurück-Button zwischen den Seiten hin- und herspringen .

Zurück Weiter

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[E2]

[a] Wie sieht die Beratung konkret aus?

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Sie werden später in diesem Experiment dazu aufgefordert, *Ihre Empfehlung* für eine Schätzung des Verkaufswertes von Haus Blaudach weiterzugeben. Diesen Wert dürfen Sie anhand dessen bestimmen, welchen Wert sie der Person aus der Schätzbedingung nennen wollen. *Dieser Wert dient als Beratung für die Person aus der Schätzbedingung.*

Dabei wird es kein "freies" Beratungsgespräch geben, denn dies ist in einem Befragungsportal nicht möglich. Das bedeutet für Sie:

- Es wird in der "Beratung" keine weitere Person aus der anderen Bedingung *"live"* oder *in Echtzeit* geben, somit bekommen Sie *kein direktes Feedback* auf Ihre Angaben.
- Die Person, die von Ihnen "beraten" wird, wird zu einem späteren Zeitpunkt, nachdem Sie Ihre Angaben gemacht haben, am Experiment teilnehmen.
- Ihre Angaben in der "Beratung" werden gespeichert und gehen per Zufall an eine*n andere*n Versuchsteilnehmer*in, die/der an dieser Umfrage teilnimmt und der Schätzbedingung zugeordnet wurde.
- Diese Person wird ihre Schätzung für Haus Blaudach aufgrund der Informationen, die ihr vorliegen, und Ihrer Beratung abgeben.

In etwa folgendermaßen wird das Feld aussehen, in das Sie Ihren Wert später eingeben dürfen:

„Hallo, ich werde dich in diesem Experiment als Experte / Expertin beraten.

Meine Aufgabe ist es, dich zu dem Verkaufspreis einer Immobilie zu beraten, das heißt, dir auf Basis der Informationen, die ich habe, einen Wert mitzuteilen.

Dieser Wert soll dir helfen, wenn du deine Schätzung für die Immobilie abgeben musst.

Dafür hatte ich mehr Informationen zur Verfügung als die, die dir gegeben wurden.“

Geben Sie in das Feld bitte den Wert ein, den Sie der Versuchsperson aus der anderen Bedingung (Schätzbedingung) nennen wollen.

€

Sofern Sie diese Information verstanden haben, können Sie auf "**Weiter**" klicken.

Sie können jederzeit mit dem Weiter- oder Zurück-Button zwischen den Seiten hin- und herspringen.

Weiter

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[E2]
[b] Wer hat welche Informationen?
Beratung einer anderen Person hinsichtlich des Verkaufspreises

Wie Sie bereits erfahren haben, besteht zwischen Ihnen und der Person aus der Schätzbedingung ein **Informationsungleichgewicht**.

Ihnen stehen die Informationen aus der Grafik "Info Haus Blaudach - Expertenbedingung" zur Verfügung. Sie dürfen gerne drei Seiten zurückblättern, um Ihre Informationen nochmal anzuschauen.

Der anderen Person aus der Schätzbedingung wird folgende Grafik gezeigt:

Info Haus „Blaudach“

Verkaufsdatum: 03/11/2015
Verkaufspreis: € *Dies ist der zu schätzende Wert.*
Marktwert*: € *(Ihr/e Berater/in aus der Expertenbedingung hat diese Information)*

55496 Argenthal: Sofort freies Haus auf 2 Wohnebenen zum Bestpreis!

Information zum Objekt:

Haustyp: Einfamilienhaus (freistehend)
Etagenzahl: 2
Wohnfläche ca.: 200 m²
Grundstückfläche ca.: 300 m²
Garage / Stellplatz: 2 Außenstellplätze
Baujahr: 1924
Objektzustand: gut
Zimmer: 8
Schlafzimmer: 4
Badezimmer: 2
Kamin: 1
Heizung: Zentralheizung

Vergleichsimmobilie 1		**Vergleichsimmobilie 2**	
Adresse:	55496 Argenthal	Adresse:	55496 Argenthal
Baujahr:	1924	Baujahr:	1929
Verkaufsdatum:	26/10/2015	Verkaufsdatum:	01/03/2014
Verkaufspreis:	€*	Verkaufspreis:	€*
Marktwert:	€*	Marktwert:	€*

**Ihr/e Berater/in aus der Expertenbedingung hat diese Information.*

(VP = Verkaufspreis; MW = Marktwert)

Wenn Sie das verstanden haben, klicken Sie bitte auf **"Weiter".**

Sie können jederzeit mit dem Weiter- oder Zurück-Button zwischen den Seiten hin- und herspringen.

Weiter

soSci
Erfolg der onlineFragebogen

[E2]
[b] Wer wird wie bezahlt?

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Wie Ihnen bereits am Anfang gesagt wurde, können Sie in diesem Experiment einen Geldbetrag in Höhe von **6 - 12 €** verdienen.

[€]

An zwei Stellen des Experiments können Sie die Höhe Ihrer Aufwandsentschädigung beeinflussen:

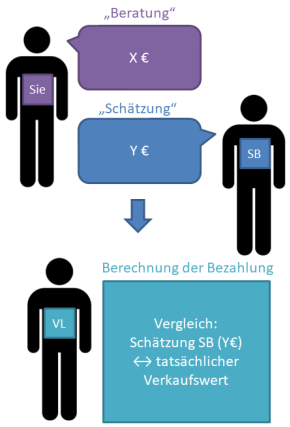
- Die erste Möglichkeit hatten Sie bereits durch die hinreichend genaue Schätzung des Verkaufswerts der Immobilie Haus Blaudach.
- **Die zweite Möglichkeit besteht im nun folgenden Beratungsteil dieses Experiments:**
  - **Je höher die andere Person aus der Schätzbedingung den Verkaufswert von Haus Blaudach schätzt, desto mehr Geld verdienen Sie (bis zu 4 € zusätzlich).**
  - **Schätzt die andere Person aus der Schätzbedingung den Verkaufswert von Haus Blaudach sehr genau, können Sie bis zu 2 € verlieren.***

* Sie erhalten jedoch insgesamt mindestens 6 €, wenn Sie alle Felder ausgefüllt haben.

Wie Sie in der Grafik (unten) sehen können, wird die Höhe Ihrer Bezahlung berechnet, indem ein **Vergleich zwischen der Schätzung von der Person aus der Schätzbedingung und dem tatsächlichen Verkaufswert** (den Sie selbst auch nicht kennen) gemacht wird. Dieser Vergleich erfolgt durch den Versuchsleiter (VL).

Ein weiterer wichtiger Punkt ist, dass **Ihre Bezahlung und die der Person aus der Schätzbedingung sich unterscheiden**.

Somit verfolgen Sie und die Person aus der Schätzbedingung unterschiedliche Ziele. Wie diese Unterscheidung in der Bezahlung genau aussieht, können Sie den beiden Tabellen (weiter unten auf dieser Seite) entnehmen.



Hier sehen Sie tabellarisch aufgelistet, wie Ihr **Geldbetrag** und der Geldbetrag der Person aus der Schätzbedingung in Abhängigkeit von der Schätzung dieser Person **steigt oder sinkt**:

Ihre Bezahlung:

Liegt der von der Person aus der Schätzbedingung geschätzte Wert im Bereich...	...wird **Ihnen** zusätzlich berechnet...
Tatsächlicher Wert + min. 40.000€ oder höher	4€
Tatsächlicher Wert + min. 35.000€	3€
Tatsächlicher Wert + min. 30.000€	2€
Tatsächlicher Wert + min. 25.000€	1€
Tatsächlicher Wert + min. 20.000€	0€
Tatsächlicher Wert + min. 15.000€	-0,5€
Tatsächlicher Wert + min. 10.000€	-1€
Tatsächlicher Wert + min. 5.000€	-1,5€
Tatsächlicher Wert	-2€

Die Bezahlung der anderen Person:

Liegt der von der Person aus der Schätzbedingung geschätzte Wert im Bereich...	...wird **ihr/ihm** zusätzlich berechnet...
Tatsächlicher Wert ± min. 20.000€ oder höher	-2€
Tatsächlicher Wert ± min. 17.500€	-1,5€
Tatsächlicher Wert ± min. 15.000€	-1€
Tatsächlicher Wert ± min. 12.500€	-0,5€
Tatsächlicher Wert ± min. 10.000€	0€
Tatsächlicher Wert ± min. 7.500€	1€
Tatsächlicher Wert ± min. 5.000€	2€
Tatsächlicher Wert ± min. 2.500€	3€
Tatsächlicher Wert	4€

Auf der nächsten Seite erhalten Sie **Beispiele für Ihre Bezahlung**. Klicken Sie auf **"Weiter"**.

Sie können jederzeit mit dem Weiter- oder Zurück-Button zwischen den Seiten hin- und herspringen.

Weiter

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oFb - der onlineFragebogen

[E2]
[b] Wer wird wie bezahlt?

Beratung einer anderen Person hinsichtlich des Verkaufspreises

z.B.: Die Schätzung der Person aus der Schätzbedingung ist höher als der tatsächliche Verkaufspreis

- Je höher die Schätzung der Person aus der Schätzbedingung, desto mehr Geld für Sie (bis zu +4€)
- Je weiter weg die Schätzung der Person aus der Schätzbedingung vom tatsächlichen Verkaufspreis, desto weniger Geld für diese Person (bis zu -2€)

z.B.: Die Schätzung der Person aus der Schätzbedingung ist nahe am tatsächlichen Verkaufspreis

- Je näher die Schätzung der Person aus der Schätzbedingung am tatsächlichen Wert, desto weniger Geld für Sie (bis zu -2€)
- Je näher die Schätzung der Person aus der Schätzbedingung am tatsächlichen Wert, desto mehr Geld für diese Person (bis zu +4€)

z.B.: Die Schätzung der Person aus der Schätzbedingung ist niedriger als der tatsächliche Verkaufspreis

- Je niedriger die Schätzung der Person aus der Schätzbedingung (also je weiter weg vom tatsächlichen Verkaufspreis), desto weniger Geld für Sie (-2€)
- Je niedriger die Schätzung der Person aus der Schätzbedingung (also je weiter weg vom tatsächlichen Verkaufspreis), desto weniger Geld für diese Person (bis zu -2€)

Zurück Weiter

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[E2]

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Nochmal zur Wiederholung: Sie sind in der **Expertenbedingung**. Das bedeutet: Sie haben **viele** Informationen bekommen, auf deren Basis Sie den Verkaufswert einer Immobilie bereits geschätzt haben.

Bitte füllen Sie den folgenden Lückentext aus.

Nun beraten Sie eine Person aus der _____. Die Person aus der Schätzbedingung hat _____ Informationen als Sie zur Verfügung und schätzt mithilfe Ihrer Beratung dann den Verkaufswert der Immobilie. Sie haben in diesem Experiment an zwei Stellen die Möglichkeit, Ihre eigene Aufwandsentschädigung zu beeinflussen: Die zweite Möglichkeit besteht darin, dass Sie mehr Geld _____, je _____ die andere Person aus der Schätzbedingung den Verkaufswert von Haus Blaudach schätzt. Schätzt die andere Person aus der Beratungsbedingung den Verkaufswert von Haus Blaudach sehr genau, können Sie bis zu 2 € _____. Sie werden anhand der _____ des Schätzwertes der Person aus der Schätzbedingung bezahlt, die Person aus der Schätzbedingung wird anhand der _____ der eigenen Schätzung bezahlt.

Die folgenden Worte kommen in die Lücken: (*Achten Sie beim Ausfüllen auf Groß- und Kleinschreibung.*)

verlieren, Höhe, weniger, Genauigkeit, Schätzbedingung, verdienen, höher

Haben Sie den Lückentext ausgefüllt?
Klicken Sie auf **"Weiter".**

Sie können jederzeit mit dem Weiter- oder Zurück-Button zwischen den Seiten hin- und herspringen.

Zurück Weiter

The following page appeared in one of four variations, dependent on the experimental condition the participant had been allocated to.

Variation 1 was seen by participants in the condition *disclosure – educated*.

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[E2]

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Das untenstehende Formular wird nach Ihrer Bestätigung an eine Versuchsperson aus der Schätzbedingung weitergeleitet. Diese Person schätzt mit Hilfe Ihres Eintrages den Verkaufspreis der Immobilie. Auf Basis der Schätzung wird dann Ihre Bezahlung berechnet. Je höher die andere Person schätzt, desto mehr Geld bekommen Sie für diesen Teil der Studie.

Wenn Sie sich das Formular ansehen, werden Sie feststellen, dass die andere Versuchsperson über Ihre Bezahlungsmodalitäten informiert wird. Zusätzlich wird diese Person im Vorhinein darüber aufgeklärt, dass sich durch die Unterschiede in der Bezahlung Interessenkonflikte Ihrerseits ergeben könnten, die wiederum eine gebiaste (das heißt verzerrte) Angabe im Formular zur Folge haben könnte.

Bitte machen Sie sich jetzt Gedanken darüber, welchen Wert Sie der anderen Person nennen wollen. Sie können dafür gerne zu den vorherigen Seiten zurückblättern. Der Wert muss nicht mit dem zuvor genannten Schätzwert übereinstimmen.

„Hallo, ich werde dich in diesem Experiment als Experte / Expertin beraten.

*Meine Aufgabe ist es, dich zu dem **Verkaufspreis einer Immobilie zu beraten**, das heißt, dir auf Basis der Informationen, die ich habe, einen Wert mitzuteilen.*

Dieser Wert soll dir helfen, wenn du deine Schätzung für die Immobilie abgeben musst.

***Dafür hatte ich mehr Informationen zur Verfügung als die, die dir gegeben wurden**."*

„Als dein Berater / deine Beraterin muss ich dir mitteilen, dass ich einen Zuschlag auf die Aufwandsentschädigung bekomme, je höher deine Schätzung ist.

Ich bekomme also mehr Geld, je höher du schätzt."

Geben Sie in das Feld bitte den Wert ein, den Sie der Versuchsperson aus der anderen Bedingung (Schätzbedingung) nennen wollen.

€

Weiter

Marlene Stoll, Johannes Gutenberg Universität Mainz – 2019

57% ausgefüllt

Variation 2 was seen by participants in the condition *disclosure – uneducated*.

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[E2]

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Das untenstehende Formular wird nach Ihrer Bestätigung an eine Versuchsperson der Schätzbedingung weitergeleitet. Diese Person schätzt mit Hilfe Ihres Eintrages den Verkaufspreis der Immobilie. Auf Basis der Schätzung wird dann Ihre Bezahlung berechnet. Je höher die andere Person schätzt, desto mehr Geld bekommen Sie für diesen Teil der Studie.

Wenn Sie sich das Formular ansehen, werden Sie feststellen, dass die andere Versuchsperson über Ihre Bezahlungsmodalitäten informiert wird.

Bitte machen Sie sich jetzt Gedanken darüber, welchen Wert Sie der anderen Person nennen wollen. Sie können dafür gerne zu den vorherigen Seiten zurückblättern. Der Wert muss nicht mit dem zuvor genannten Schätzwert übereinstimmen.

„Hallo, ich werde dich in diesem Experiment als Experte / Expertin beraten.

*Meine Aufgabe ist es, dich zu dem **Verkaufspreis einer Immobilie zu beraten**, das heißt, dir auf Basis der Informationen, die ich habe, einen Wert mitzuteilen.*

Dieser Wert soll dir helfen, wenn du deine Schätzung für die Immobilie abgeben musst.

***Dafür hatte ich mehr Informationen zur Verfügung als die, die dir gegeben wurden**.“*

„Als dein Berater / deine Beraterin muss ich dir mitteilen, dass ich einen Zuschlag auf die Aufwandsentschädigung bekomme, je höher deine Schätzung ist.

Ich bekomme also mehr Geld, je höher du schätzt.“

Geben Sie in das Feld bitte den Wert ein, den Sie der Versuchsperson aus der anderen Bedingung (Schätzbedingung) nennen wollen.

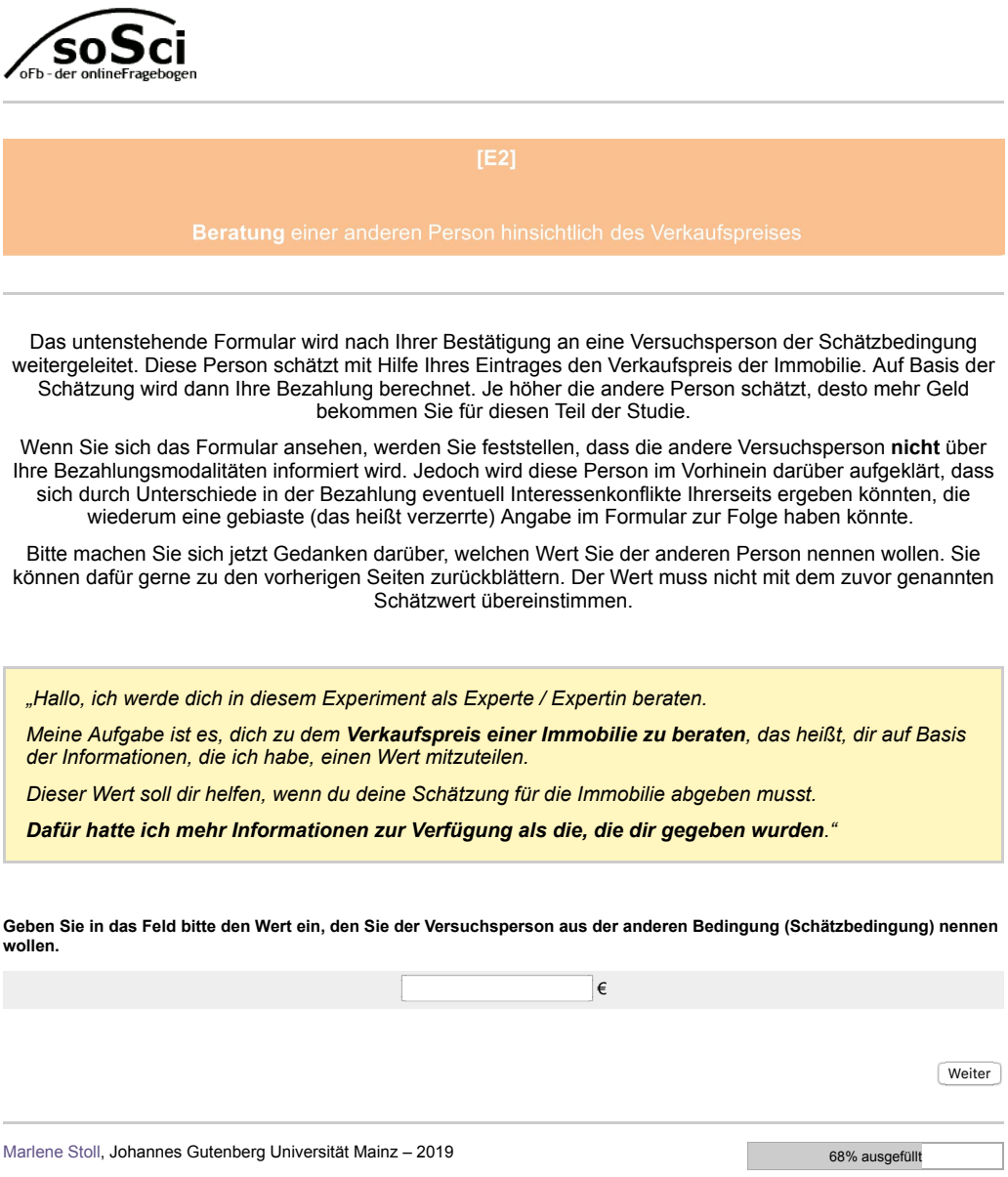
€

Weiter

Marlene Stoll, Johannes Gutenberg Universität Mainz – 2019

61% ausgefüllt

Variation 3 was seen by participants in the condition *nondisclosure – educated*.



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[E2]

Beratung einer anderen Person hinsichtlich des Verkaufspreises

Das untenstehende Formular wird nach Ihrer Bestätigung an eine Versuchsperson der Schätzbedingung weitergeleitet. Diese Person schätzt mit Hilfe Ihres Eintrages den Verkaufspreis der Immobilie. Auf Basis der Schätzung wird dann Ihre Bezahlung berechnet. Je höher die andere Person schätzt, desto mehr Geld bekommen Sie für diesen Teil der Studie.

Wenn Sie sich das Formular ansehen, werden Sie feststellen, dass die andere Versuchsperson **nicht** über Ihre Bezahlungsmodalitäten informiert wird. Jedoch wird diese Person im Vorhinein darüber aufgeklärt, dass sich durch Unterschiede in der Bezahlung eventuell Interessenkonflikte Ihrerseits ergeben könnten, die wiederum eine gebiaste (das heißt verzerrte) Angabe im Formular zur Folge haben könnte.

Bitte machen Sie sich jetzt Gedanken darüber, welchen Wert Sie der anderen Person nennen wollen. Sie können dafür gerne zu den vorherigen Seiten zurückblättern. Der Wert muss nicht mit dem zuvor genannten Schätzwert übereinstimmen.

„Hallo, ich werde dich in diesem Experiment als Experte / Expertin beraten.

*Meine Aufgabe ist es, dich zu dem **Verkaufspreis einer Immobilie zu beraten**, das heißt, dir auf Basis der Informationen, die ich habe, einen Wert mitzuteilen.*

Dieser Wert soll dir helfen, wenn du deine Schätzung für die Immobilie abgeben musst.

***Dafür hatte ich mehr Informationen zur Verfügung als die, die dir gegeben wurden**.“*

Geben Sie in das Feld bitte den Wert ein, den Sie der Versuchsperson aus der anderen Bedingung (Schätzbedingung) nennen wollen.

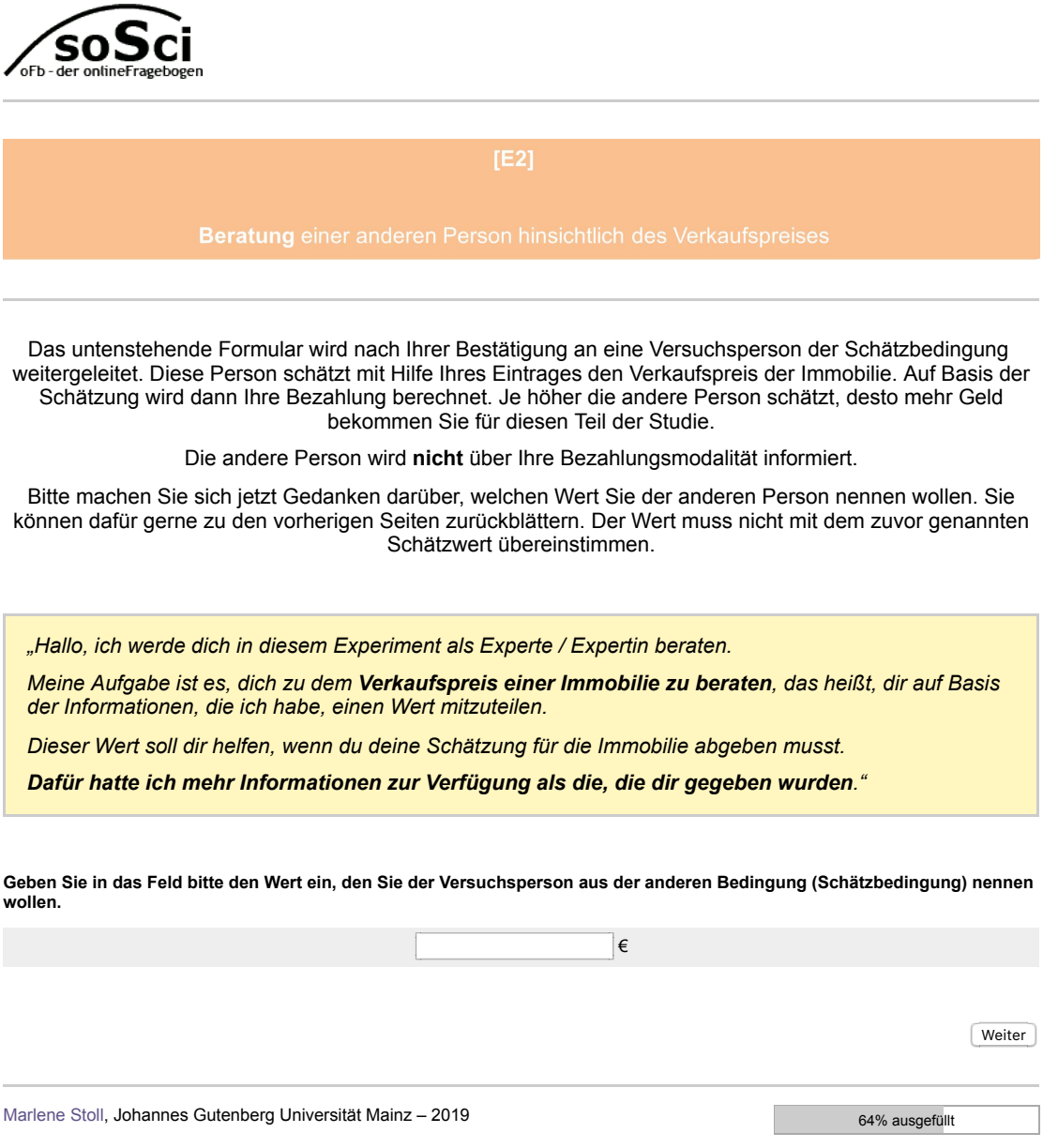
€

Weiter

Marlene Stoll, Johannes Gutenberg Universität Mainz – 2019

68% ausgefüllt

Variation 4 was seen by participants in the condition *nondisclosure – uneducated*.



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oFb - der onlineFragebogen

[E3]

Fragebogen zu Persönlichkeitseigenschaften

Nun sind Sie bei dem letzten Teil dieses Experimentes angelangt.
Auf den folgenden Seiten werden Ihnen abschließend noch einige Fragen gestellt.

Geschlecht

[Bitte auswählen]

Alter Jahre

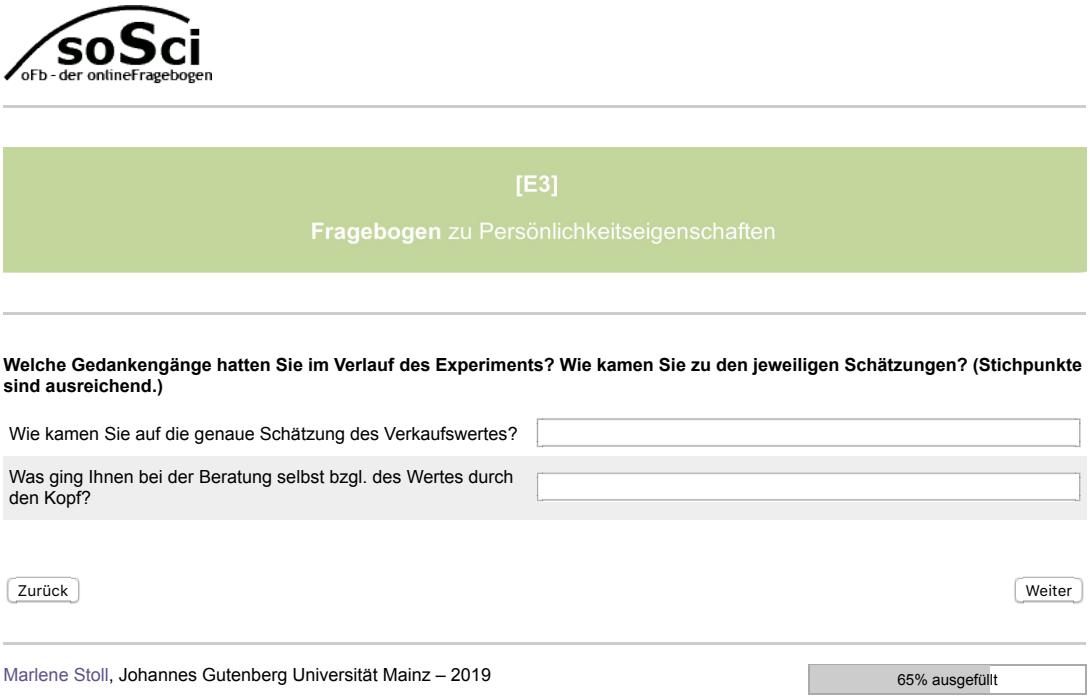
Beschäftigung

studierend (bitte Studienfach angeben)		☐ nicht zutreffend
Beruf		☐ nicht zutreffend
andere		☐ nicht zutreffend

Zurück Weiter

Marlene Stoll, Johannes Gutenberg Universität Mainz – 2019

60% ausgefüllt


soSci
oFb - der onlineFragebogen

[E3]

Fragebogen zu Persönlichkeitseigenschaften

Welche Gedankengänge hatten Sie im Verlauf des Experiments? Wie kamen Sie zu den jeweiligen Schätzungen? (Stichpunkte sind ausreichend.)

Wie kamen Sie auf die genaue Schätzung des Verkaufswertes?

Was ging Ihnen bei der Beratung selbst bzgl. des Wertes durch den Kopf?

Zurück Weiter

Marlene Stoll, Johannes Gutenberg Universität Mainz – 2019 65% ausgefüllt

At this point, pages with the items from the personality questionnaires BFI-20 (Danner et al., 2016) and NARQ (Back et al., 2013) appear.

soSci
oFb - der onlineFragebogen

Postexperimentelle Information für Teilnehmende der DISCLED-Studie

Psychologisches Institut

Vielen Dank für die Unterstützung bei DISCLED!

Wissenschaft und Forschung dienen dazu, Wissen zu produzieren. In der psychologischen Forschung strebt man danach, Muster in menschlichen Gedanken und Verhalten zu erkennen und messbar zu machen.

Menschliches Verhalten ist sehr komplex und kann nicht immer über einen Fragebogen gemessen werden - um ein bestimmtes interessierendes Verhalten zu messen, müssen psychologisch Forschende manchmal kreativ werden. Dazu gehört auch, dass Teilnehmer und Teilnehmerinnen an psychologischen Experimenten zu Beginn nicht über alle Vorgänge im Experiment informiert werden können oder sogar getäuscht werden.

Das Verhalten, das wir in dieser Studie untersuchen wollen, ist **Bias, also Verzerrung im Beratungsverhalten**. Die konkrete Fragestellung lautet: **Wie verändert sich Bias im Beratungsverhalten durch die Offenlegung eines Interessenkonflikts? Beraten Menschen in solchen Situationen anders, wenn diesem Interessenkonflikt Aufmerksamkeit geschenkt wird, als wenn er übergangen, ignoriert wird?** Diese Fragestellung ist von hoher gesellschaftlicher Relevanz gerade im Hinblick auf Transparenzrichtlinien im medizinischen oder politischen Bereich.

Um möglichst standardisiert zu manipulieren, ob einem Interessenkonflikt Aufmerksamkeit geschenkt wird oder nicht, war es für uns notwendig, eine **weitere Versuchsbedingung, die Schätzbedingung, vorzutäuschen**, in der Sie ein/e ProbandIn in einer weiteren Bedingung "beraten". Sie wurden im Vorhinein bei den folgenden Punkten getäuscht:

- es gibt **keine weitere zu beratende Person in einer zweiten Versuchsbedingung**; Ihre Aufwandsentschädigung ist nicht abhängig von deren Schätzung
- daher kann Ihre Aufwandsentschädigung nicht abhängig von der Schätzung einer anderen Person aus einer zweiten Versuchsbedingung gemacht werden
- **aus Gründen der Fairness bekommen daher alle TeilnehmerInnen den Maximalbetrag von 12 € ausgezahlt.**

Für die weitere reibungslose Durchführung der Studie ist es unbedingt notwendig, dass andere VersuchsteilnehmerInnen keinerlei Kenntnis über die Ziele dieser Untersuchung oder die tatsächliche Bezahlung erhalten. Daher möchten wir Sie bitten, abgesehen von der Information, dass in der Studie ein Beratungsgespräch durchgeführt wird und Fragebögen zu bearbeiten sind, keine weiteren Informationen bezüglich der Untersuchung nach außen zu tragen.

Wir möchten nochmals betonen, dass alle Daten anonymisiert weiterverarbeitet werden und kein Rückschluss auf Ihre Person möglich ist. Sie haben jetzt noch die Möglichkeit, die Einwilligung zur Verwendung Ihrer Daten zurückzuziehen. In diesem Falle haben Sie dennoch Anspruch auf die volle Aufwandsentschädigung.

- ◯ Meine Daten können für rein wissenschaftliche Zwecke verwendet werden.
- ◯ Meine Daten sollen nicht verwendet werden.

Wir bedanken uns schon jetzt für Ihre Teilnahme an der Studie!

Weiter

Vielen Dank für Ihre Teilnahme!

Wir möchten uns ganz herzlich für Ihre Mithilfe bedanken.

Kontakt der Studienleiterin:

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Ihre Antworten wurden gespeichert, Sie können das Browser-Fenster nun schließen.

APPENDIX E

Experiment: Further Results

Table A3

Descriptive Values of Bias, Disclosure vs. Nondisclosure Conditions

	Disclosure			Nondisclosure		
	n	*M* (*SD*)	*Mdn* (*IQR*)	*n*	*M* (*SD*)	*Mdn* (*IQR*)
All	116	141,879 € (391,457)	69,000 € (123,863)	118	69,667 € (90,249)	49,000 € (81,500)
Outliers Eliminated	105	83,401 € (86,974)	67,500 € (97,500)	112	67,652 € (89,959)	48,000 € (80,500)
Outliers Trimmed	116	95,272 € (111,737)	67,750 (122,125) €	118	64,592 € (68,804)	46,100 € (82,327)

Table A4

Descriptive Values of Bias, Educated vs. Uneducated Conditions

	Educated			Uneducated		
	n	*M* (*SD*)	*Mdn* (*IQR*)	*n*	*M* (*SD*)	*Mdn* (*IQR*)
All	118	94,143 € (183,907)	58,500 € (85,150)	116	116,981 € (359,864)	55,000 € (93,750)
Outliers Eliminated	109	80,935 € (100,899)	57,000 € (82,000)	108	69,557 € (74,376)	53,050 € (82,300)
Outliers Trimmed	118	77,561 € (82,872)	56,981 (86,800) €	116	82,079 € (103,840)	53,550 € (88,100)

Table A5

Descriptive Values of Bias, Separated by Conditions

	Nondisclosure Uneducated[a]		Disclosure Uneducated[b]		Nondisclosure Educated[c]		Disclosure Educated[d]	
	M (*SD*)	*Mdn* (*IQR*)	*M* (*SD*)	*Mdn* (*IQR*)	*M* (*SD*)	*Mdn* (*IQR*)	*M* (*SD*)	*Mdn* (*IQR*)
All	62,169 € (62,086)	51,000 € (75,250)	171,792 € (501,305)	75,750 € (126,875)	76,915 € (110,991)	46,100 € (84,375)	60,448 € (59,194)	65,250 € (108,088)
Elim.	60,448 € (59,194)	51,000 € (71,750)	79,367 € (87,396)	69,100 € (102,574)	74,857 € (112,795)	43,975 € (84,250)	87,358 € (87,210)	66,000 € (115,450)
Trim.	59091 € (58,704)	49,000 (67,500) €	105,067 € (131,274)	70,850 € (125,500)	69,909 € (77,459)	43,975 € (84,375)	85,477 € (88,098)	65,250 € (108,087)

[a] $n_{all} = 58$, $n_{elim} = 56$, $n_{trim} = 58$.

[b] $n_{all} = 58$, $n_{elim} = 52$, $n_{trim} = 58$.

[c] $n_{all} = 60$, $n_{elim} = 56$, $n_{trim} = 60$.

[d] $n_{all} = 58$, $n_{elim} = 53$, $n_{trim} = 58$.

Table A6

Frequencies of Answer Categories to Open Question „How did you Come About the Accurate Estimation of the Sale Price?

Category	Absolute frequency	Relative frequency
Comparison with other examples	207/234	88%
Consideration of example market and sale value	100/234	43%
Consideration of build year	39/234	17%
Consideration of sale year	28/234	12%
Calculation of the mean	20/234	9%
Consideration of example sale value	14/234	6 %
Calculation of percentage values	14/234	6%
Consideration of real estate condition	7/234	6%
Intuition	10/234	4%
Experience or a priori knowledge	9/234	4%
Consideration of example market value	7/234	3%
Consideration of market development	14/234	3%
Consideration of location	4/234	2%
Own profit	3/234	1%

Table A7

Comparison of Mean Bias [€], Participants Without vs. Participants With Cognition

	Analysis of all, *df* = 232						Analysis with outliers eliminated, *df* = 215						Analysis with outliers trimmed, *df* = 232					
	M_0 (*SD*)				95% CI		M_0 (SD)				95% CI		M_0 (*SD*)				95% CI	
	M_1 (*SD*)	*n*	*T*	*d*	LL	UL	M_1 (*SD*)	*n*	*T*	*d*	LL	UL	M_1 (*SD*)	*n*	*T*	*d*	LL	UL
1	104,067 €	150	-0.10	-0.01	-0.28	0.25	61,753 €	138	-3.02	**-0.43****	-0.71	-0.15	68,145 €	150	-2.57	**-0.35***	-0.62	-0.08
	(345,004)						(80,880)						(95,117)					
	107,959 €	84					98,889 €	79					100,615 €	84				
	(117,421)						(96,937)						(87,807)					
2	101,814 €	167	-0.31	-0.05	-0.33	0.24	67,279 €[a]	155	-2.12	**-0.32***	-0.61	-0.02	71,045 €[a]	167	-2.28	**-0.33***	-0.61	-0.04
	(324,048)						(72,893)						(85,552)					
	114,526 €	67					95,255 €[a]	62					101,626 €[a]	67				
	(147,784)						(117,732)						(109,062)					
3	108,228 €	177	0.26	0.04	-0.26	0.34	73,958 €	166	-0.39	-0.06	-0.38	0.25	74,742 €	177	-1.46	-0.22	-0.52	0.08
	(321,650)						(95,187)						(91,464)					
	96,882 €	57					79,550 €	51					95,509 €	57				
	(109,065)						(63,596)						(99,444)					
4	108,006 €	199	0.33	0.06	-0.30	0.42	74,691 €[a]	184	-0.23	-0.04	-0.41	0.38	78,181 €[a]	199	-0.63	-0.12	-0.48	0.24
	(306,475)						(94,412)						(96,047)					
	91,010 €	35					78,517 €[a]	33					89,012 €[a]	35				
	(89,809)						(45,697)						(79,462)					
5	111,321 €	211	0.95	0.21	-0.22	0.64	78,063 €	194	1.35	0.30	-0.14	0.73	82,860 €	211	1.52	0.33	-0.10	0.76
	(298,617)						(91,151)						(96,215)					
	51,735 €	23					51,735 €	23					51,735 €	23				
	(60,537)						(60,537)						(60,537)					
6	112,787 €	212	1.22	0.27	-0.17	0.71	79,726 €[a]	196	2.28	**0.52***	0.07	0.98	84,660 €[a]	212	2.49	**0.56***	0.12	1.00
	(297,886)						(91,223)						(96,274)					
	34,902 €	22					33,707 €[a]	21					32,973 €[a]	22				
	(41,526)						(42,162)						(41,289)					

7	90,250 € [a] (158,285)	214	-2.71	-0.63	-1.10	-0.17	73,695 € (88,991)	200	-0.90	-0.23	-0.72	0.27	77,579 € (90,725)	214	-1.19	-0.28	-0.74	0.18
	268,254 € [a] (826,033)	20					93,828 € (85,187)	17					103,575 € (121,215)	20				
8	106,763 € (296,624)	215	0.23	0.06	-0.41	0.52	73,867 € (91,197)	199	-0.78	-0.19	-0.67	0.29	78,895 € (96,563)	215	-0.50	-0.12	-0.59	0.35
	90,766 € (51,072)	19					78,895 € (90,052)	18					90,052 € (51,178)	19				
9	96,664 € [a] (269,822)	218	-1.75	-0.45	-0.96	0.06	74,154 € (88,665)	203	-0.71	-0.20	-0.74	0.35	76,526 € [a] (89,911)	218	-1.99	**-0.52***	-1.02	-0.00
	225,365 € [a] (434,745)	16					91,489 € (90505)	14					124,423 € [a] (130,721)	16				

Note. See Table 17 for wording of respective categories; M_0 = mean bias of participants who did not report this cognition; M_1 = mean bias of participants who did report this cognition.

[a] Levene's test indicates inequality of variances.

* $p < .05$

** $p < 01$

ERKLÄRUNG

Gemäß § 10 Abs. 5 und Abschnitt F des fachspezifischen Anhangs für Psychologie werden die folgenden Teile der Dissertation als in einer wissenschaftlichen Fachzeitschrift publiziert kenntlich gemacht.

Kapitel 2 basiert auf dem folgenden Manuskript:

Stoll, M., Hubenschmid, L., Koch, C., Lieb, K. (2020). Voluntary disclosures of payments from pharmaceutical companies to healthcare professionals in Germany: a descriptive study of disclosures in 2015 and 2016. *BMJ Open*, Article e037395. https://doi.org/10.1136/bmjopen-2020-037395

Die Kontribution zu diesem Manuskript war Folgende:

Marlene Stoll war für Studienkonzeption und Design, für Titel, Abstract und den Volltext, sowie für die Datenextraktion und –validierung mitverantwortlich, analysierte und interpretierte die Ergebnisse, und erarbeitete den Entwurf für das Manuskript. Wie alle Autor*innen hat sie das finale Manuskript kritisch gelesen und bestätigt.

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