OPINION LEADERS AS BRAND ADVOCATES IN THE MEDICAL INDUSTRY – HOW MEDICAL PROFESSIONALS PERCEIVE SOURCE CREDIBILITY AND COMPANY AFFILIATIONS

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ABSTRACT

Opinion leaders are experts in their domain of interest that share their experience with others. Opinion seekers, on the other hand, value the opinion leader's knowledge and use them as a source of information to form an opinion about a service or a product. Marketers in the healthcare industry have recognized this information flow and have begun to use leading experts as a valuable third party who can take over the role of brand advocates or endorsers of a particular product. This research examines the marketing concept of opinion leaders advocating a product and persuading medical professionals. In two experimental studies, the influence of opinion leaders on medical students and practicing physicians and their perceived credibility of the message, as well as their attitude towards the company, is examined. The second focus of this research is how medical professionals cope with this form of persuasion attempt and whether their persuasion knowledge is activated. The influence on medical students and physicians through a peer expert - a skilled expert without any reputation – represents the point of comparison in both studies. The results demonstrate that there are no significant differences in terms of perceived credibility between peer experts and opinion leaders, and that there are no differences regarding their influence on message credibility or attitude toward the company either. Moreover, disclosing company affiliations lead to the correction of attitudes toward the company. However, disclosing conflicts of interest can also be beneficial as it boosts the credibility of the source and helps to increase the perceived credibility of the corporation.

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LIST OF ABBREVIATIONS

AD_SKEP	Ad skepticism
APK	Activation of persuasion knowledge
ATT_COMP	Attitude towards the company
B2B	Business-to-Business
B2C	Business-to-Consumer
CEE	Celebrity Expert Endorser
COI_A	Absent conflict of interest
COI_P	Present conflict of interest
CORP_CRED	Credibility of the corporation
CORP_EXPERT	Expertise of the corporation
CORP_TRUST	Trustworthiness of the corporation
ESD	Endoscopic Submucosal Dissection
FAM_BRAND	Familiarity with the brand
M_CRED	Credibility of the message
MEDEXP	Medical expertise
OL	Opinion leader
OR	Operating room
PE	Peer expert
PEE	Peer Expert Endorser
PKM	Persuasion Knowledge Model
RPI	Recognition of persuasion intent
S_CRED	Credibility of the source
S_EXPERT	Expertise of the source
S_TRUST	Trustworthiness of the source
ULT_M	Ulterior Motive

1 INTRODUCTION AND STATEMENT OF OBJECTIVES

When Nike broadcasted an ad in 2018 featuring Colin Kaepernick, the initiator of the NFL anthem protests, a media frenzy was created that went on for weeks and led to skyrocketing stock prices (Abad-Santos, 2018). The marketing campaign was controversial and discussed on various media platforms (Kelner, 2018) but eventually became a big success and an excellent example of effective celebrity endorsement. Nike made a strong statement with its ad, as Kaepernick embodied the protest against the discrimination of African Americans and minorities in the US. Kaepernick, as endorser, transferred meaning to the brand, which made the campaign ultimately successful.

In the healthcare industry, another form of endorsement is observable. It is common practice for medical and pharmaceutical manufacturers to attempt to influence physicians and their purchase decisions using *key opinion leaders*. Key opinion leaders are experts in their field of research and are well known due to their academic contributions and, consequently, exude credibility in regards to their opinion (Nair, Manchanda, & Bhatia, 2010). Manufacturers began to see leading experts as a valuable third party who could take over the role of brand advocates or endorsers of a particular product. Presumably, opinion leaders influence other doctors and surgeons in the same field, albeit indirectly, by using specific products in published research studies or while presenting research at conferences. The company attempts to increase brand awareness through published research studies conducted with their instruments and seeks benefits from the reputation of an opinion leader using their products. In exchange, some doctors receive funding for their research, whereas others hold obliging contracts as guest speakers during workshops or symposiums.

This research proposes that the marketing strategy of using opinion leaders in the healthcare industry is best understood by drawing on multiple theories: Opinion Leadership Theory, the Persuasion Knowledge Model and the concept of endorsement (Friestad & Wright, 1994; Horai, Naccari, & Fatoullah, 1974; Weimann, 1991). While there has been a great deal of research on these separate theories, previous studies have disregarded the similarities and potential combinations of the theories in practice. Therefore, the purpose of this research is to address the cooperation of opinion leaders and manufacturers in the healthcare industry and its potential benefits for the company or the opinion leader. This research seeks to answer the following research questions:

RQ_1: Can an opinion leader be perceived as an agent of persuasion?

RQ_2: Under which conditions are experts without public recognition as influential as opinion leaders?

By answering these questions, this research can contribute to the current literature of opinion leadership, endorsement and persuasion. Research results will reveal the influence of opinion leaders acting as brand advocates and how persuasive the tactic can be. The research will uncover how effective expert endorsements are among other experts, and if company affiliations negatively affect opinion leaders. Moreover, this research also contributes to the empirical research of opinion leadership in the healthcare industry. As a consequence of this research, other related questions such as *To what extend do opinion leaders enhance the credibility of a corporation?* and *What are the effects on persuasion but also on reputation if an opinion leader is affiliated with a company?* can be answered.

Given that the research questions are explored in the healthcare context, this research concentrates on the influence of practicing physicians and medical students. Its focus anchors the research to the business-to-business (B2B) setting with physicians being part of a healthcare facility including other professional personnel and customers of medical or pharmaceutical companies. Yet, this research draws on consumer research literature to specifically examine medical professionals and their persuasion coping behaviour as a central figure of the purchase decision-making for medical products in healthcare facilities. Hence, in the healthcare context of the literature review, physicians are referred to as customers or consumers in a B2B setting.

The literature review is presented in the following three chapters. Chapter 2 covers opinion leadership theory, including the roles of opinion leaders, opinion seekers and the dissemination of information. Chapter 3 discusses the different types of endorsers ,and how companies can take advantage of opinion leaders as brand advocates. The endorsement chapter ends with the explanation of Source Model Theory that explains which factors contribute to the credibility of the source as well as how endorsements are processed. Chapter 4 covers the Persuasion Knowledge Model, the agent-target relationship, and how opinion leaders can act as agents of persuasion. The hypotheses are presented in Chapter 5 and then scrutinized in a pretest and two main studies in chapter 6. The empirical findings are discussed in chapter 7, including managerial and regulatory implications. This research closes with the limitations of the experiments and a conclusion.

2 OPINION LEADERS AS MARKETING INSTRUMENT

In 1948, Lazarsfeld, Berelson and Gaudet published their work "The people's choice: How the voter makes up his mind in a presidential campaign" and thereby laid the foundations for the following decades of research in the field of opinion leadership (Lazarsfeld, Berelson, & Gaudet, 1968). In their seminal work, they proposed the term "opinion leader." During the 1940 presidential election, they found that the flow of information originated in mass media, which was then spread by opinion leaders to other parts of the population. The idea of a few individuals channelling information became the focal point for academics in communications, innovations and marketing research in the ensuing 50 years (Chan & Misra, 1990; Engel, Kegerreis, & Blackwell, 1969; Rogers, 2003; Weimann, 1991). As research progressed, the phenomenon became later known as theories of opinion leadership.

2.1 Opinion Leaders

In 1996, Flynn, Goldsmith, and Eastman published a paper in which they defined opinion seekers as well as opinion leaders and developed a new scale to measure opinion leadership traits of individuals. Other scales had been used before, but Flynn et al. presented a robust measure that became widely used by many other scholars (Gnambs & Batinic, 2012; Shoham & Ruvio, 2008; Vishwanath, 2006). They proposed that opinion leadership occurs when "individuals try to influence the purchasing behaviour of other consumers in specific product fields" (Flynn et al., 1996, 138). This definition sets opinion leaders and their influence in the context of purchase decisions of consumers. Other scholars in the previous years have focused on the context of purchase decisions, which has led to the conceptualization of opinion leadership as part of consumers' product information search (Clark & Goldsmith, 2005; Shoham & Ruvio, 2008). This definition represents an exclusive marketing perspective and does not comprise the view on opinion leadership from a communications or innovations research standpoint. Rogers and Cartano (1962, 435), however, defined opinion leaders earlier as "individuals who exert an unequal amount of influence on the decisions of others." This definition does not specify the context of opinion leadership but emphasizes the influence of opinion leaders on the decision-making processes of opinion seekers in general. Hence, the information receiver does not need to be in a state of making a purchase decision. Instead, the definition suggests that the information receiver is already influenced before a decision is made. The definition by Rogers and Cartano emphasizes the information flow and underlines the direction from the information provider to the information receiver. This approach originates from innovation diffusion research but can likewise be applied in a marketing

context. Based on Baggozzi's marketing as exchange paradigm from 1975, the opinion leader's influence described by Rogers and Cartano represents one step in a sequence of exchange. It is referred to as "generalized exchange" (Bagozzi, 1975, 33), where a minimum of three parties interact but do not directly benefit each other. This concept signifies that the opinion leader contributes to a marketing exchange indirectly without a typical (and direct) quid pro quo. Therefore, Rogers and Cartano's definition can be adopted for this research.

Regardless of the context, researchers have different perspectives on the central element of opinion leadership. While some scholars see the opinion leader's influence as the pivotal aspect of opinion leadership (Flynn et al., 1996; Rogers, 2003), others emphasize the knowledge that opinion leaders possess as most important (Assael, 1992; Gilly, Graham, Wolfinbarger, & Yale, 1998). Some scholars, however, stress that the dissemination of information is a central element of theories of opinion leadership (Chan & Misra, 1990). Depending on the discipline of the researcher, the purpose and goals of opinion leaders are seen to vary. Empirical evidence has supported the claim that some individuals − the opinion leaders – feel obligated to be informed and gather the information they think might be relevant to others (L. F. Feick & Price, 1987). Further, it is assumed that individuals providing information for others fulfill an inherent contract with the information receiver, which in turn compensates the information provider, either financially or emotionally, by expressing appreciation for the opinion leader (Sieber, 1974). It can be concluded that all opinion leaders are rewarded for providing information with other consumers, but that they have different motivations for fulfilling their role. By broadcasting their opinions, opinion leaders follow their intrinsic (Chan & Misra, 1990) and, in some instances, their extrinsic motivation to disseminate information as a way to reap financial and professional rewards. Additionally, it should be noted that opinion leadership is only exerted if more than one opinion seeker acquires information or follows the opinion of an opinion leader (Rogers, 2003).

Over the years, a considerable amount of research has been carried out in an attempt to determine the boundaries of opinion leadership. While some studies suggest opinion leadership is a domain-specific or monomorphic concept of consumer influence (Flynn et al., 1996; King & Summers, 1970), other research indicates that opinion leadership can also be polymorphic (Clark & Goldsmith, 2005; L. F. Feick & Price, 1987). Polymorphic opinion leaders have an influence on others over a broad range of domains (Gnambs & Batinic, 2012). They do not possess product-specific knowledge but can be portrayed as experienced consumers with

advanced marketplace expertise (Clark & Goldsmith, 2005; Gnambs & Batinic, 2012). Feick and Price (1987, 85) define these opinion leaders as market mavens and characterize them as "individuals who have information about many kinds of products, places to shop, and other facets of markets, and initiate discussions with consumers and respond to requests from consumers for market information." In contrast to market mavens, domain-specific opinion leaders possess particular expertise in clearly delineated areas (Gnambs & Batinic, 2012). King and Summers (1970), for example, examined opinion leadership in the context of purchase decisions of various households, pharmaceutical and cosmetic products and found that opinion leadership varied for each product. In the healthcare sector, one can assume that opinion leaders are also domain-specific. Medical personnel such as physicians, pharmacists, nurses and surgeons often specialize in a specific area; opinion leadership, therefore, can develop within disciplines like internal medicine, family medicine or gynecology. In addition, anecdotal evidence from medical manufacturers and pharmaceutical companies confirms that opinion leadership even varies within specialties. For example, in specialties such as gastroenterology or pulmonology, treatments and techniques can vary depending on the physician due to different medical approaches and philosophies. These domain-specific opinion leaders consequently hold product-specific knowledge and exert their influence on others only within their domains (Gnambs & Batinic, 2012).

Another concept in marketing used to denote an exertion of influence on others is the *influencer*. The term influencer, however, is almost exclusively used in the context of social media (Chae, 2018; Cocker & Cronin, 2017; Freberg, Graham, Mcgaughey, & Freberg, 2011; Lee & Watkins, 2016; Uzunoglu & Kip, 2014). A comparison of recent definitions of the term influencer revealed that scholars emphasize the connectedness of influencers with their peers (Chae, 2018; Cocker & Cronin, 2017; Khamis, Ang, & Welling, 2017; Lee & Watkins, 2016) and their ability to influence others (Booth & Matic, 2011; Freberg et al., 2011; Uzunoglu & Kip, 2014). According to Lee and Watkins (2016), influencers' follower counts can reach millions, which is why some scholars identify influencers also as micro-celebrities (Cocker & Cronin, 2017; Khamis et al., 2017). Further, influencers desire to share their opinions with their peers (Cocker & Cronin, 2017), and social media represents their communication vehicle. The following definition by Freberg (2010, 90) reflects these two characteristics: an influencer is "a new type of independent third-party endorser who shapes audience attitudes through blogs, tweets, and the use of other social media." This research argues that the influencer's connectedness, that is their willingness as well as the ability to influence others, reflects opinion

leadership. Opinion leaders, just like influencers, want to share their opinion with others, are well connected to peers and the industry, and may even be considered micro-celebrities within their domain. Due to the opinion leader's credible and reputable standing within their field of expertise, passing on favourable recommendations about a company or a product may be seen as brand promotions; albeit neither opinion leaders nor influencers are necessarily being paid for such engagements. Consequently, one can argue that influencers are opinion leaders, but primarily known for their activities on social media platforms. Henceforth, for this research, the term opinion leaders will also refer to influencers, unless explicitly stated.

In summary, opinion leaders are either influential individuals with extensive knowledge in one specific domain or market mavens who apply their expertise in various domains of the market. Both types of opinion leadership, however, have the inherent desire to gather and disseminate information. In medical science, opinion leaders are domain-specific influencers who have in-depth knowledge in their respective specialties. This research concentrates on domain-specific opinion leaders and their influence on medical professionals. Whether opinion leaders engage in some form of endorsement is discussed further in chapter 3.2.

2.2 Opinion Seekers

According to Flynn et al. (1996, 138), "Opinion leaders cannot exist without opinion seekers," thereby implying that opinion leadership is tied to a process of exchange between two parties: the opinion leader and the opinion seeker. Although a considerable body of research exists on opinion leadership, less attention has been paid to opinion seeking. Flynn et al. (1996) conceptualize opinion seeking within the context of purchase decisions. They state that opinion seeking represents one step of the product information search process and define opinion seekers as individuals who "search out advice from others when making a purchase decision" (Flynn et al. 1996, 138). Jung and Kim (2016, 4440) defined opinion seekers simply as "those influenced by opinion leaders," indicating the dichotomy of opinion leadership and opinion seeking. Since scholars argue about the dichotomous concept of opinion leadership (Clark & Goldsmith, 2005; L. Feick, Price, & Higie, 1986; Flynn et al., 1996), the definition of opinion seekers by Feick et al. (1986, 302) is adopted for this research: opinion seekers are "individuals who seek information or opinions from interpersonal sources in order to find out about and evaluate products, services, current affairs, or other areas of interest." This definition of opinion seeking includes the purpose of information collection and also indicates the influence of the opinion seeker. Opinion seekers acquire information and seek input to come

to a decision (Flynn et al., 1996). In doing so, opinion seekers attempt to reduce risks in decision-making processes (Flynn et al., 1996). This behaviour results from consumers' assumption of greater objectivity of word-of-mouth advice from third parties than from advertisements or sales representatives (L. F. Feick & Price, 1984). Opinion seekers, therefore, search for interpersonal contact with opinion leaders and follow their advice (Flynn et al., 1996). Gilly et al. (1998) further describe opinion seekers as less confident in their ability to make good product choices, while Vishwanath (2006) emphasizes their lower tendency to initiate new ideas or activities. The reduced confidence may result from a lack of knowledge and interest in a domain, which leads to consumers acquiring information from opinion leaders (Shoham and Ruvio 2008).

To summarize, opinion seekers in a business-to-consumer (B2C) context can be characterized as individuals with limited knowledge in a specific domain that leads individuals to take measures of information acquisition during a pending decision-making process. By acquiring information from interpersonal sources like opinion leaders, opinion seekers attempt to reduce risks when a decision is to be made. In the healthcare industry, however, opinion seekers are professional personnel of private practices that routinely seek opportunities for improvement. They have a better understanding of the matter as well as possible solutions than typical consumers. Nonetheless, their motivation of reducing risks during a decision-making process is similar to opinion seekers in the B2C context (B. P. Brown, Zablah, Bellenger, & Johnston, 2011). In the healthcare industry, such opinion seekers are represented by nurses, medical hospital technicians or physicians. Yet, this research focuses on physicians as opinion seekers as marketing efforts in the healthcare industry often mainly target this group. Henceforth, the term "opinion seeker" will refer to physicians, residents or medical students for the remainder of this research.

2.3 The Communication Flow Through Opinion Leaders

An area of disagreement within the opinion leadership literature is the role of opinion leaders vis a vis opinion seekers. Some researchers, such as Clark and Goldsmith (2005), indicate that opinion leadership is a dichotomous construct; that is, opinion leaders represent one side of the concept and opinion seekers the opposite side. However, opponents of this perspective, such as Rogers (2003), point out that an opinion leader's influence should be considered as a continuous variable. Shoham and Ruvio (2008) analyzed the distinction of opinion leadership and opinion seeking and found evidence that the two concepts are not

opposing points on a continuum. Instead, they state that opinion leaders are also opinion seekers (Shoham & Ruvio, 2008). Because of their interest in a topic or a product, opinion leaders seek information and reach out to other people. Thus, opinion leaders are – to a certain degree – also opinion seekers.

Regardless of the differing perspectives on the constructs of opinion leadership, it is generally agreed that a form of information exchange between the opinion seeker and opinion leader takes place. The process of information exchange contains the component of opinion leaders exerting influence and passing on their opinions to other consumers (Clark & Goldsmith, 2005; Venkatraman, 1989), as well as the component of opinion seekers searching for advice (Flynn et al., 1996). This concept corresponds with the idea of the "two-step flow of communication" which describes how influential individuals first gather their own information and then disseminate this information to advice-seekers, thereby shaping the opinions of a large number of people (Flynn et al., 1996; Watts & Dodds, 2007). Opinion seekers, on the other hand, not only communicate with opinion leaders but are also connected with other consumers searching for advice (Vishwanath, 2006). Simulations have shown that once a critical mass of influenceable individuals is reached, the influence process is driven by those interactions between consumers searching for advice triggering a cascade of information (Watts & Dodds, 2007).

The information dissemination process should not be regarded as static with clearly allocated roles. Instead, the roles of opinion leaders and opinion seekers are dynamic and evolving, depending on information, relationship and market domains. This means, that every opinion leader can also be an opinion seeker (Shoham & Ruvio, 2008), depending on the situation or the topic. However, not every opinion seeker can be an opinion leader (Flynn et al., 1996). Rich expertise or access to expert knowledge is a pivotal factor in becoming an opinion leader that not everyone has. Additionally, there seems to be a link between character traits such as social orientation and communicative behaviour with opinion leadership (Gnambs & Batinic, 2012). Opinion seekers exhibit these character traits to a much lesser degree and do not have the same intrinsic motivation to disseminate their opinions as opinion leaders. Hence, not every opinion seeker is able or willing to become an opinion leader.

2.4 Opinion Leaders as a Non-Objective Source

The vast majority of research on opinion leadership has focused on issues such as identifying characteristics of opinion leaders (Chan & Misra, 1990; Gnambs & Batinic, 2012),

information exchange between opinion leaders and opinion seekers (Jung & Kim, 2016; Shoham & Ruvio, 2008) and the motivation behind opinion leadership (Sieber, 1974). Even though scholars recommend taking advantage of an opinion leader's influence for marketing purposes (L. F. Feick & Price, 1987), it remains unclear under which conditions an opinion leader exerts influence on others. Shoham and Ruvio (2008), for example, hypothesize that the factor product involvement might play an essential role in moderating the influence of opinion leaders on opinion seekers. Further, it is unknown in what ways opinion leaders influence others or under which conditions an opinion leader loses credibility.

Additionally, it should be noted that opinion leaders are often presented as a third party without any company affiliations who simply redistribute and share information with opinion seekers. But opinion leaders receive their information in part from salespersons (Shoham & Ruvio, 2008). Their relationship to company representatives enables access to additional or new information, which would not be available through other sources. In long-term relationships between company representatives and opinion leaders such information exchanges may lead to forms of (unspoken) reciprocities that influence opinion leaders themselves in what information they pass on and which opinions they hold back. They are, just like others, biased, subjective and influenced due to their connectedness with other market participants. Some opinion leaders may even be affiliated with various corporations or manufacturers as a result of their information search or their endeavour to network. Others are approached by companies for research purposes, to give talks about particular topics or to cooperate for medical studies (Elliott, 2010; Flanagin et al., 1998; Nair et al., 2010). As a consequence, it has to be emphasized that opinion leaders are just as subjective as opinion seekers. It remains the question, if opinion seekers are aware of the opinion leader's subjectivity and how they cope with biased information. Because of the proximity of some opinion leaders to industry partners when conducting research, it further warrents discussion about how much proximity is accepted by opinion seekers without negative repercussions on credibility. This implies the assumption that company affiliations provoke a tipping point resulting in different perceptions of a source's credibility. These questions are sought to be answered in this research.

To be able to make inferences about opinion leaders, their influence on future customers and the consequences of company affiliations, this research draws on the endorsement literature. Scholars have scrutinized the different types of endorsers, the respective merits and

disadvantages of endorsers, and how customers perceive such endorsements. The literature of endorsement is appropriate to draw on as opinion leaders often “endorse” companies or products when passing on information to opinion seekers.

3 ENDORSEMENTS WITH OPINION LEADERS

Companies have long pursued the goal of setting themselves apart from competitors by demonstrating a unique selling point or emphasizing competitive advantages over other players on the market. Endorsement has been one marketing strategy commonly used to evoke positive associations with a company or a brand from a consumer's perspective (Erdogan, 1999). Employing an endorser strategy positively influences consumers' brand recall (Atkin & Block, 1983; Petty, Cacioppo, & Schumann, 1983) or supports brand recognition (Petty et al., 1983), but it may also affect purchase intentions of consumers and purchase behaviour (M. A. Belch & Belch, 2013). These effects may be because endorsements enhance the effectiveness of the ad as well as the credibility of the message (Munnukka, Uusitalo, & Toivonen, 2016). To put it differently, endorsement enhances advertising in general with different influential effects on the consumer (Spry, Pappu, & Cornwell, 2011).

In the healthcare industry, many companies act in cooperative agreements with well-known physicians – opinion leaders of a particular specialty – to attract the attention of future customers (Elliott, 2010). These cooperative agreements represent a marketing tactic with financial incentives for the opinion leader (e.g. in terms of remuneration) as well as for the company (e.g. to grow brand awareness and increase sales). This common practice combines the theoretical concepts of opinion leadership and endorsements. Apart from cooperations, endorsements by opinion leaders also occur when no contractual obligations between the opinion leader and the advocated company or product exist. As opinion leaders share their opinions, including company or product recommendations, with others, such voluntary endorsements may occur. The target audience of medical professionals, however, may not be able to differentiate among voluntary endorsements and paid cooperations, which explains the fine line when opinion leaders engage in some form of endorsement.

An extensive literature on endorsement has developed examining when and how endorsement can be useful. In the following section, endorsement as a marketing concept will be further discussed by introducing the various endorser types. These types are then compared with endorsements through opinion leaders. Afterwards, the theories of source credibility and source attractiveness are presented, which embody the general characteristics of endorsement independent of the endorser type.

3.1 Types of Endorsers

Batra, Myers, and Aaker (1996) provide one of the few definitions of endorsers. They define endorsers as individuals who influence the acceptability of the message that comes with the product, which is endorsed or demonstrated. The definition emphasizes the product's message that the endorser is influencing, whereas other scholars highlight the credibility that endorsers evoke. Friedman, Termini, & Washington (1976), for example, argued that the advantage of endorsers is their ability to enhance the credibility of a message and to affect consumers' buying intentions to a degree not possible without endorsement. For this research, endorsers are defined as individuals who act on behalf of a company to endorse a product, a brand or the firm itself to support a predetermined marketing objective such as the increase of attitude toward the brand. In general, endorsement tactics include product endorsements in ads, on conferences, demonstrations in shopping centres or endorsements in TV ads. It also encompasses the different endorsement types such as explicit (e.g. I endorse this product), implicit (e.g. I use this product), imperative (e.g. You should use this product) or co-presentational (e.g. an endorser is seen with the product) (Seno & Lukas, 2007). The latter three endorsement types can also be found in the healthcare industry and will be discussed in the following chapter.

In the literature on endorsement, there seems to be a general agreement that there are three major types of endorsers: celebrity endorsers, peer endorsers and expert endorsers. A peer endorser is unknown to the public but represents “a typical satisfied customer who endorses or demonstrates a product or service and acts as a source of information” (Munnukka et al., 2016, p. 182). This form of endorsement can signal credibility to other customers and enhance advertising effectiveness. Munnukka et al. (2016) demonstrate that the credibility of a peer endorser depends on the factors of trustworthiness, similarity, attractiveness and expertise with the latter as the least contributing factor. These results are not surprising, as Friedman et al. (1979) found out that peer endorsers are effective for ordinary low-risk products where no or limited expertise is involved. Their findings suggest that the use of peer endorsements for marketing purposes can be very effective but is limited to B2C relationships.

In contrast to the peer endorser, a celebrity endorser is a person who “enjoys public recognition and who uses this recognition on behalf of a consumer good by appearing with it in an advertisement” (McCracken, 1989, p. 310). Celebrity endorsement appears to be the field of study that has received the most attention, which is why there is extensive knowledge about

the pros and cons of celebrity endorsement. Celebrities have been shown to set certain ads apart from other advertisements, hence increasing the attention of potential customers (Sherman, 1985). Celebrity endorsement is further helpful in positioning a brand or repositioning a company in order to establish or evoke the desired meaning or message (Erdogan, 1999). The flipside of celebrity endorsement is that consumers link the endorser with the endorsed product so that negative news about the endorser also influences the perception of the product (Till & Shimp, 1995). Another disadvantage is that sometimes celebrity endorsers attract too much attention so that the celebrity overshadows the ad, and the endorsed product is less perceived (Metha, 1994).

Expert endorsers are the third type of endorsers. Expert endorsers can be defined as individuals who have gathered an extensive amount of knowledge and whose assertions are supported by empirical studies and analyses (Birnbaum & Stegner, 1979; Hovland, Janis, & Kelley, 1966; McGuire, 1969). Expert endorsements are useful for complex products or when functionalities and features are primarily endorsed (Munnukka et al., 2016). According to Maddux and Rogers (1980), the credibility that experts evoke augments the believability of the ad. The expertise that consumers attribute to the expert endorser and its relevance for the ad is crucial as this determines the perceived credibility of the endorser (G. E. Belch & Belch, 1994; Ohanian, 1990).

The concepts of expert endorsers and celebrity endorsers overlap since some types of celebrities have gained a certain level of expertise, such as in sports or arts (Kahle & Homer, 1985; Ohanian, 1990). However, expertise does not necessarily lead to fame, albeit some experts become widely known due to their standing in their field (Biswas, Biswas, & Das, 2006). The overlap between expert endorsers and celebrity endorsers reflects opinion leadership in the healthcare industry in part. Opinion leaders have gathered extensive expertise in one area and often published their work in top journals, making them known among other medical doctors. They unify attributes of experts as well as celebrities and can be referred to as *celebrity experts*. Opinion leaders or celebrity experts act as independent authorities in the market who form their opinion and draw their conclusions based on their experiences, knowledge and information from medical manufacturers. Such experts are in a unique position, which makes them very interesting to medical and pharmaceutical firms. Companies hope to convince them of their brands and products to benefit from their influence on others (Nair et

al., 2010). If opinion leaders cooperate with a manufacturer on a contractual basis for marketing purposes, they are, henceforth, referred to as *celebrity expert endorsers (CEE)*.

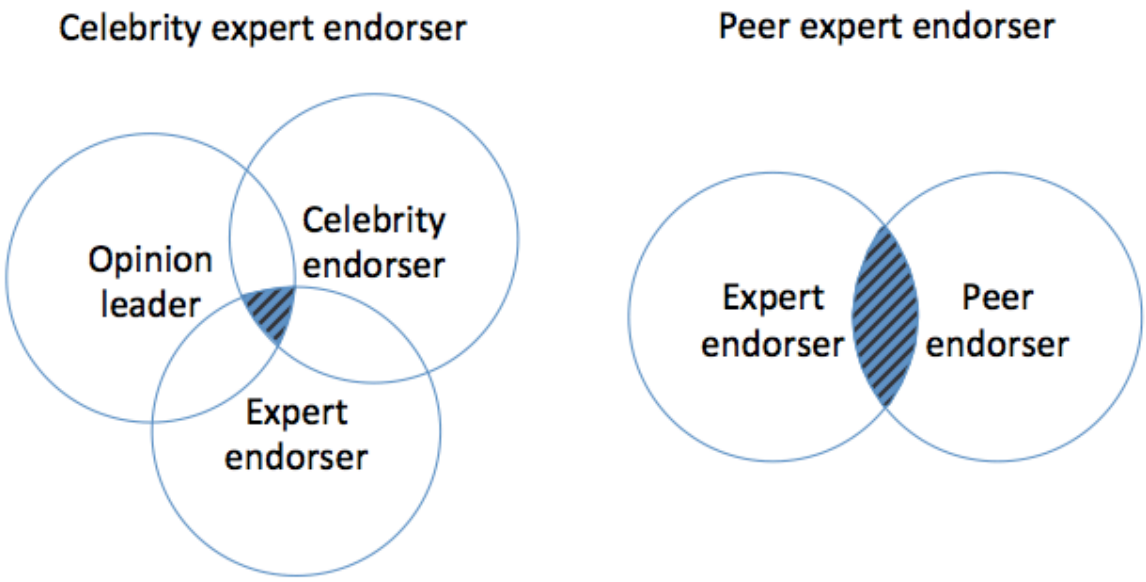

Figure 3.1 The Two Different Concepts of Endorsers Used in The Medical Healthcare Industry, The Celebrity Expert Endorser and The Peer Expert Endorser

Besides the celebrity expert endorser, there is an additional endorser type in the healthcare industry. Some manufacturers also cooperate with physicians that do not have the same reputation as an opinion leader but who have gathered enormous practical expertise in their field. These physicians do not have celebrity status and are therefore perceived as peers who have set themselves apart through their practical experience. In this research, these physicians are called *peer experts.* Such peer experts probably unify the advantages of expert endorsers and peer endorsers. A peer expert under contractual obligations with a manufacturer will be referred to as a *peer expert endorser (PEE).* The marketing potential of peer experts and opinion leaders will be investigated in study 1. Cooperation between celebrity experts and manufacturers of the healthcare industry, and the potential repurcussions, are discussed in the following chapter.

3.2 The Celebrity Expert Endorser in the Healthcare Industry

The healthcare industry, represented by pharmaceutical companies and medical manufacturers, has shown an increasing desire to cooperate with with physicians for marketing purposes. These cooperations can be categorized into co-presentational endorsements and implicit endorsements. Co-presentational endorsements are when physicians give a

presentation on behalf of a medical manufacturer at regulatory meetings, conferences or training seminars. The appearance of the physician in brochures or collaborations for other marketing materials are also considered co-presentational endorsements. Such endorsements represent a marketing strategy to convince future customers through the physician (the endorser) and attempt to evoke more credibility (Seno & Lukas, 2007).

The second form of marketing cooperation between physicians and healthcare marketers is referred to as implicit endorsement. In the healthcare industry, implicit endorsements can be found in the form of peer-reviewed articles of research sponsored by pharmaceutical companies or medical manufacturers. In these articles, products and brand names are often explicitly mentioned to ensure reliability of the results. If a reputable scholar publishes research results that are linked to specific products, these publications can be seen as promotions or endorsements for the manufacturer. Given that academic journals have an enormous reach and share the same target audience as the manufacturer, such publications are implicit endorsements. By funding specific research projects or scholars, marketers can take influence on the dissemination of information. It includes financial support for specific research projects or providing the equipment, for instance, a new medication or surgical device (Elliott, 2010). However, companies are not only sponsoring research projects that are in favour of the company's products. It is also known that corporations financially support research that generates unfavourable results for a competitor (Elliott, 2010; Fugh-Berman, 2005). Regardless of the objective, sponsoring peer-reviewed publications has become a common practice by pharmaceutical firms and medical manufacturers to control the dissemination of product information. Researchers have found evidence that ghost authors write a considerable proportion of medical journal articles and that companies make use of honorary authorships to cover this tactic up (Flanagin et al., 1998). Ghost authors are individuals who have contributed substantially to an article but do not claim authorship, whereas honorary authors have not contributed but are named as authors nonetheless.

Opinion leaders in the healthcare industry are sought out by manufacturers as partners on research (Elliott, 2010; Nair et al., 2010) as they presumably attract more potential customers (Nair et al., 2010). For this reason, opinion leaders are courted by the industry for cooperations in the form of publications (Elliott, 2010). A new product or medication featured in a scientific publication in a top journal written by a reputable physician and favourable results represents the holy grail for pharmaceutical companies or medical manufacturers. Hence, some opinion

leaders are no longer third party individuals sharing their opinions but have become a celebrity expert endorser with contractual obligations.

The CEE's contractual obligations to a company and the resulting bias from cooperative agreements are the only difference between an opinion leader and a celebrity expert endorser. Despite their company affiliations, CEEs are still characterized by their intrinsic motivation to collect information and pass on their opinions, regardless of their duties as endorsers. After all, CEEs are a form of opinion leaders as others seek their opinion. This similarity with opinion leaders is a primary distinction to the typical endorser types (celebrity, expert, peer). One has to keep in mind that opinion seekers might not perceive any company affiliations of CEEs; that is, CEEs can be perceived as opinion leaders without any affiliations, even though they are collaborating with a corporation. Given that opinion leaders in the healthcare industry are researchers, who typically disseminate information by publishing studies and presenting their outcomes, opinion seekers might find it difficult to evaluate brand- or product-related statements in public. An opinion leader who does not actively cooperate with a company and is not sponsored or reimbursed for "advocating" a product, may still recommend it to others due to his or her personal experiences. Endorsements of CEEs are similar, but their intentions are different; that is, CEEs are paid for endorsements, whereas opinion leaders are truly convinced or genuinely like the product. The similarity makes it difficult for consumers to differentiate between the two types. It has to be assumed that CEEs walk a fine line between being perceived as a credible opinion leader or as a paid spokesperson for a company when their company affiliations become too self-evident.

3.3 The Credibility of Endorsers

Marketing campaigns with endorsers attempt to enhance the effectiveness of the marketing activity as well as to boost the credibility of the message (Munnukka et al., 2016). Empirical evidence appears to confirm the notion that the type of endorsement is an influential factor determining the credibility of the message and the attitude towards the ad (Biswas et al., 2006). Perceived ad credibility is affected by the consumer's attitude toward the endorser, according to Clow, James, Kranenburg, and Berry (2006). They state that the attitude toward the endorser is the pivotal component of an endorsement marketing campaign. Previous research contends that any form of endorsement is worthwhile in terms of improving the credibility of the message or influencing consumers' buying intentions compared to marketing campaigns without endorsers (Friedman et al., 1976).

Several studies have explored the relationship between the credibility of an endorser and the effectiveness of a message. Especially in situations where the consumer has little or no information regarding a product or service, the endorser's credibility becomes the driving factor of the effectiveness of an ad (Jain & Posavac, 2001). Hovland et al. (1966) was among the first scholars to investigate source credibility and found that credibility consists of two factors: *trustworthiness* and *expertise*. *Trustworthiness* depends on the consumer's perceptions and is described by the level of believability and authenticity that the endorser conveys (Erdogan, 1999). *Expertise*, on the other hand, refers to the competence of an endorser and whether his/her statements appear to be valid to the audience (Munnukka et al., 2016). The underlying theory explaining the interrelation between trustworthiness, expertise and credibility is Source Credibility Theory (Kelman, 1961).

Empirical evidence has supported the claim that endorsers in advertising make ad messages more believable and positively influence consumers' purchase intentions in comparison to ads without endorsement (Friedman et al., 1976). Peer endorsers, for example, were identified as useful in ads for products associated with low-risk and a low level of complexity as they possess similar characteristics as the consumer (Friedman, Termini, & Friedman, 1979; Munnukka et al., 2016). Celebrity endorsers, on the other hand, were proven to be effective in low involvement contexts and are helpful to grasp the audience's attention (Petty et al., 1983). Expert endorsers were found to influence believability positively when the product is more complex and sophisticated (Maddux & Rogers, 1980; Munnukka et al., 2016).

Source Model Theory combines elements of Source Credibility Theory and Source Attractiveness Theory (Ohanian, 1990), providing a robust theory of how an endorser influences through both, perceived credibility and perceived attractiveness, which in turn, influences the effectiveness of a message. Attractiveness in the context of endorsement should not be equated with the physical attractiveness of the endorser. Instead, it stands for the perception of the endorser's characteristics as a source (Erdogan, 1999). In particular, attractiveness is defined as a combination of perceived *likability*, *familiarity* and *similarity* with the endorser (McGuire, 1969). *Likability* describes the consumer's affection for the endorser, which is based on his/her physical appearance. *Familiarity*, on the other hand, can be defined as the extent of knowledge of the endorser through exposure (McGuire, 1969). Lastly, *similarity* describes the subjective judgment of the degree of resemblance between the endorser

and the consumer in terms of values and background and drives advertising effectiveness (McGuire, 1969; Morimoto & La Ferle, 2008).

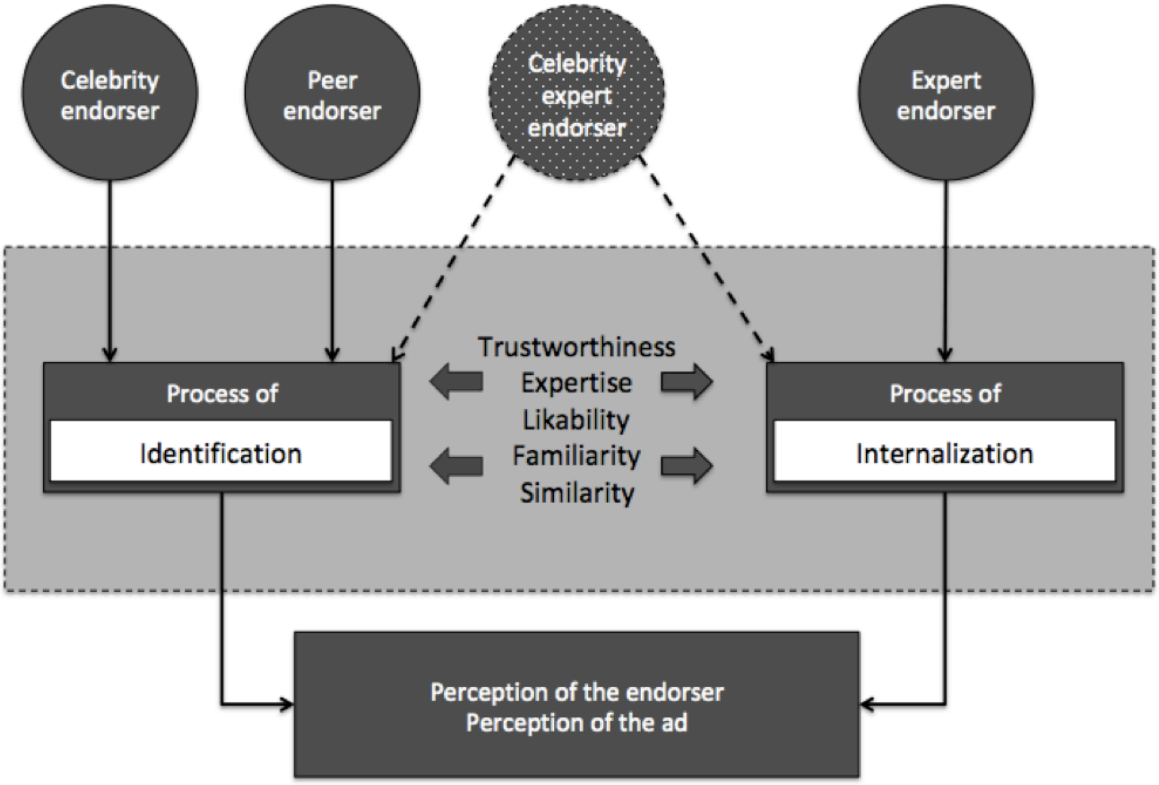

Figure 3.2 Visual Depiction of The Source Model Theory Described by Biswas et al. (2006), Erdogan (1999), Kelman (1961) And Mcguire (1969)

Source Model Theory distinguishes between two processes of influence on the consumer, the process of *identification* and the process of *internalization* (Biswas et al., 2006). *Internalization* describes the process of the customer accepting the influence of an endorser, which only occurs if the influence appears to be beneficial at solving the given problem and if the endorser's influence is congruent with the consumer's belief system (Kelman, 1961). The process of *identification* is defined as the coping behaviour of customers who believe the image portrayed in an ad and attempt to establish the identity evoked by the endorser (Biswas et al., 2006). Subsequently, celebrity or peer endorsers often trigger the process of identification, whereas consumers internalize the information provided by an expert endorser. These behaviours explain the findings of Munnukka et al. (2016), who note that a higher degree of similarity between the endorser and the consumer leads to more positive attitudes toward the

advertised brand. The visual depiction of the Source Model Theory in Figure 3.2 supports this notion and illustrates that the endorser selection plays a primary role in how information is processed.

In the case of an opinion leader, the process of influence on the consumer can only be conjectured. Presumably, for complex, expensive and involving products, consumers process information through internalization. Information processing through identification (Petty et al., 1983) appears unlikely if the opinion leader's expertise is the influential factor. In contrast, the process of identification is presumably triggered when customers are only peripherally processing the ad information provided by an opinion leader.

4 OPINION LEADERS AS PERSUADERS

Opinion leaders share the inherent desire to provide others with information (Chan & Misra, 1990), whereas opinion seekers reach out to opinion leaders to gather additional information (Flynn et al., 1996). Opinion leaders, as well as celebrity expert endorsers, engage in a form of persuasion when attempting to convince persuasion targets to listen to their opinions. The Persuasion Knowledge Model (PKM) by Friestad and Wright (1994) proposes the idea that consumers' responses to persuasion attempts differ depending on their level of knowledge about persuasion. The PKM provides a framework that depicts the persuasion attempt, its factors, and how they influence consumers in their coping behaviour. The components of the framework are persuasion knowledge, topic knowledge and the knowledge consumers possess about the persuasion agent (Friestad & Wright, 1994).

Persuasion knowledge is gained over time and results from either direct experiences with persuasion attempts or indirect experiences through media or other individuals (Friestad and Wright 1994). It describes a consumer's ability to identify and assess persuasion attempts, to select the desired persuasion coping behaviour and recall the interaction in a later stage (Friestad & Wright, 1994). Likewise, it describes how a consumer cognitively processes persuasion as well as how they physically act and react to persuasion attempts before, during and after an interaction (Kirmani & Campbell, 2004). *Topic knowledge* describes how much a consumer knows about a subject and how informed the individual is when a persuasion attempt occurs (Friestad & Wright, 1994). The range of topic knowledge varies from very little to highly informed consumers, depending on their previous experience. *Agent knowledge* refers to the consumer's beliefs and judgments about an identified persuasion agent (Friestad & Wright, 1994). Besides characteristics and competencies, agent knowledge also includes the perceived motives, strategies and persuasion targets of the agent (Campbell & Kirmani, 2000) as well as the agent's persuasive tactics and goals.

The following chapters describe the concepts of persuasion agents as well as persuasion targets more in detail. Further, possible persuasion attempt responses and factors that influence the response are explained before comparing opinion leaders with agents of persuasion. Lastly, the merits of opinion leaders acting as persuasion agents are demonstrated.

4.1 Persuasion Agents

Friestad and Wright (1994, 2) define persuasion agents as "whomever a target identifies as being responsible for designing and constructing a persuasion attempt." A persuasion

attempt is described as any form of information presented to affect someone's decisions, actions or attitudes in the eyes of the targeted individual (Friestad & Wright, 1994). According to this definition, a salesperson, ad designer or any other person trying to influence others could represent a persuasion agent. Even physicians can be perceived as persuasion agents of pharmaceutical companies by their patients when branded promotions are present in the office (Wei & Delbaere, 2015). This example points out that consumers can perceive anyone as a persuasion agent, even when the perceived persuasion agent acts independently and has no contractual obligations with a company.

The goals of persuasion attempts are diverse and depend on the relationship between the persuasion agent and the persuasion target. The study carried out by Rule et al. (1985) revealed that consumers perceive the following actions as the principal goals of persuasion agents: to get the target to do something, to change the target's opinion, to acquire a physical object or to get the target to assist the persuasion agent. Further, the work of Rule et al. (1985) demonstrated that persuasion attempts are often reciprocal processes in close relationships between the agent and the target (such as friendships or father-son relationships). In contrast, persuasion attempts taking place between less known individuals (such as salespeople and customers) are more one-sided processes. To elicit targets' cooperation, agents choose among different tactics, such as asking directly or hinting indirectly, arguing with a personal reason relevant to the target, entreating and pleading or providing evidence (Rule et al., 1985).

Opinion leaders represent a form of persuasion agents. This statement can be made due to the similarities between the two concepts and the definition by Friestad and Wright (1994). When opinion leaders disseminate information and their knowledge (Clark & Goldsmith, 2005; Venkatraman, 1989), they attempt to persuade and thereby convince the opinion seeker of an opinion, a fact or a viewpoint. Consumers could identify this interaction as a persuasion attempt to influence their opinions. Both opinion leaders as well as persuasion agents share the goal to affect a target's opinion or decision-making process (L. F. Feick & Price, 1987; Rule et al., 1985). Consequently, it can be stated that every opinion leader engages in some form of persuasion.

4.2 The Persuasion Target During a Persuasion Attempt

Persuasion targets can be defined as "those people for whom a persuasion attempt is intended" (Friestad and Wright 1994,2). As persuasion occurs in various circumstances, persuasion targets could be customers (e.g. being persuaded by a salesperson), parents (e.g.

being persuaded by their children to buy candy) or opinion seekers when reaching out to opinion leaders. Depending on the persuasion agent, individuals may be targeted who, in turn, can activate their persuasion knowledge (Friestad & Wright, 1994). Friestad and Wright (1994) call the activation of a consumer's persuasion knowledge the change-of-meaning principle. It describes the moment during an interaction with a persuasion agent when consumers regard the situation no longer as a neutral but instead as an active attempt of persuasion (Friestad & Wright, 1994). Regardless of the agent's intention in that situation, the change-of-meaning can still occur and may affect the target's behaviour (Friestad & Wright, 1994). In other words, the change-of-meaning principle is based on the consumer's perception only. It may even occur in situations when the persuasion agent is not trying to persuade the consumer. Kirmani and Campbell (2004) argue that instead of being passive recipients of persuasion, consumers are often goal-oriented individuals who attempt to control a persuasion episode to achieve their own goals. By contending and competing with persuasion agents, some targets actively direct the persuasion attempt towards their desired outcome (Kirmani & Campbell, 2004). Hence, consumers can be active participants or merely reactive during a persuasion attempt. According to Kirmani and Campbell (2004, 573), a persuasion target can take the role of a goal seeker, "who attempts to utilize the agent to achieve his or her own goals," or the role of a persuasion sentry, "who guards against unwanted marketing persuasion." Drawing on the work of Kirmani and Campbell (2004), the strategies used by both roles of persuasion targets are presented in the following paragraphs.

Seeker strategies include *ask*, *establish personal connection*, *reward*, *test*, *direct* and *accept assistance*, which are all conducive for pursuing the target's own goals. *Ask* as well as *direct* describe the target asking directly for expertise or explaining the target's needs to the agent to get the agent to cooperate. While sometimes the agent's expertise is *accepted* without any previous interactions, goal seekers may also wish to *test* the agent's knowledge first or *establish a personal connection* before revealing one's actual intentions. The latter is not only a goal seeker strategy but also contributes to a deeper understanding of the persuasion agent (Friestad and Wright 1999). *Rewarding* the agent with positive comments or word-of-mouth referrals reflects another strategy of the target to achieve his or her goals.

Sentry strategies, on the other hand, reflect the target's behaviour to prevent the agent's successful persuasion. Possible strategies are *forestall*, *deceive*, *resist assertively*, *confront*, *punish*, *withdraw*, *prepare*, and *enlist a companion. Forestall* and *deceive* are indirect means

of either ignoring the agent or not revealing real thoughts and feelings, while the *resist assertively* strategy represents a clear and direct intervention of the persuasion attempt in a polite form. *Confronting* the agent reflects a blunt interruption of the persuasion attempt that can also result in *punishing* the agent by negative word-of-mouth or filing a complaint. *Withdrawing* from the interaction refers to the most drastic way of persuasion sentry strategies to end a persuasion attempt. The sentry strategies *prepare* and *enlist a companion* are based on the assumption that persuasion attempts are likely to occur during the following interaction with an agent. In these cases, persuasion targets either prepare themselves by researching before the encounter or by involving a trustworthy third party that supports the target during the interaction with the persuasion agent.

Bargaining is both a seeker and a sentry strategy to either achieve a better deal or to prevent oneself from paying too much (Kirmani & Campbell, 2004). One has to emphasize that the target's role during one single interaction may change continually. Targets may switch between the roles and apply multiple strategies during an interaction or a series of interactions with persuasion agents (Kirmani & Campbell, 2004). Hence, lines are blurred, and the persuasion coping behaviour may vary enormously depending on the persuasion target.

The target's experience with interpersonal persuasion and the target-agent relationship are moderating variables during a persuasion attempt (Kirmani & Campbell, 2004). These moderators influence the application of persuasion strategies regardless of the target's goal when interacting with an agent. Relationships, however, are multidimensional, with each dimension affecting potential strategies taken by the persuasion target (Poppe, van der Kloot, and Valkenberg 1999). The relationship dimensions contain the (1) cooperative-competitive stance, (2) the dependency and (3) the orientation between the involved parties (Kirmani & Campbell, 2004; Poppe et al., 1999). The orientation dimension describes whether the relationship between individuals is utilitarian and, therefore, more formal (e.g. a salesperson and a customer) or social-emotionally based (e.g. two friends) that conveys trust and commitment (Poppe et al., 1999). Dependency refers to the target's perception of how strong the consumer needs to rely on the agent to achieve his or her goals (Kirmani & Campbell, 2004). If the consumer, for example, is depending on the agent's expertise or needs the agent as an intermediary, the target's perceived dependency can increase and affect the selection of strategies. Lastly, the cooperative-competitive stance during an interaction refers to the benefits involved in the interaction (Kirmani & Campbell, 2004). Cooperative relationships describe

interactions that are beneficial for both parties, while competitive relationships can be characterized as win-loss situations. Persuasion targets tend to respond with seeker strategies when agents are cooperative and with sentry strategies if the relationship is perceived as competitive (Kirmani & Campbell, 2004).

One can conclude that if the target identifies an interaction as a persuasion attempt, there are multiple strategies available to respond. The selection of an appropriate strategy depends on the target's persuasion experience and the relationship with the agent. The target's perception of the relationship between the agent and a company is reflected in the target's persuasion experience. Consequently, persuasion attempts are not necessarily perceived as unfavourable, and persuasion agents can even serve as helpers to achieve the target's own goals.

4.3 Opinion Leaders Versus Persuasion Agents in a Marketing Context

Persuasion occurs in various situations of daily life and is not limited to commercial interactions between a consumer and a salesperson. For example, a child attempting to persuade his/her mother to get candy in the store represents a persuasion agent who pursues his or her own goals (the purchase of candy) solely. A salesperson at a retailer selling TVs also represents a persuasion agent. This agent, however, acts on behalf of an agency or a company and is identifiable as such due to the workplace (the store), the behaviour (e.g. asking customers for help) or outfit (e.g. a name tag). The latter example represents a persuasion attempt in a typical marketing context where persuasion agents are perceived as individuals who are paid to persuade (Kirmani & Campbell, 2004). Opinion leaders, on the other hand, are not paid for their actions, but similarly engage in some form of persuasion. They share their opinions with their peers and attempt to convince others to adopt their perspectives. Despite persuasion attempts, opinion leaders are regarded as trustworthy and knowledgeable sources in the market (Flynn et al. 1996).

Even though opinion leaders attempt to persuade opinion seekers of their opinion, there are two principal differences between a persuasion agent in a marketing context and an opinion leader. First, opinion seekers actively approach opinion leaders for advice, whereas persuasion agents often approach the consumer. Some persuasion agents are in an intermediary position such as a salesperson in a store or a financial advisor in a bank. In their position, these persuasion agents have the goal of making a sale on behalf of the company. This conduct is presumably one reason why opinion leaders are rather regarded as an independent third party to seek advice from. Conversely, persuasion agents in the marketing context are affiliated with

the company that they represent. Consumers keep this affiliation in mind and behave according to their personal persuasion knowledge (Friestad & Wright, 1994, 1999). Second, opinion leaders not only share positive information but also do not hesitate to share negative aspects (Schiffman & Kanuk, 1991). This behaviour implies that opinion leaders do not have any conflicting interests with marketers, manufacturers or corporations due to relationships with these parties and therefore have an independent opinion. Presumably, this reflects the consumer's expectation who thinks that opinion leaders do not personally benefit from their recommendations or are financially compensated for disseminating their opinion. Consequently, opinion leaders are not expected to "sugar-coat" as they have no reason to not share their real thoughts in the eyes of the consumers. Contrary to this, a typical persuasion agent, such as a salesperson, is assumed to avoid mentioning less favourable aspects of a product to make the sale (Campbell & Kirmani, 2000; Lexchin, 1997).

These aspects underline the consumers' different perceptions of opinion leaders and persuasion agents in the marketing context. The consumer's perceptions, however, become distorted if opinion leaders are not entirely neutral in the process of information dissemination such as CEEs in the healthcare industry. These opinion leaders are no longer an entirely independent party in the market who pursue their own goals. Instead, they have become the earlier defined celebrity expert endorsers advocating a product and being financially reimbursed. It has to be assumed that CEEs are not as easy to identify as persuasion agents since their role in the market has not changed and their affiliations with manufacturers is not always disclosed. In essence, they are still operating in their capacity as an opinion leader and act accordingly. As a consequence, the majority of opinion seekers presumably fail to identify opinion leaders as CEEs and misconceive the CEEs' intentions to share information with others.

The perception of opinion leaders who are affiliated with a company will be explored in the study 2. The following chapter discusses the merits of employing a CEE to persuade opinion seekers.

4.4 Avoiding Sentry Strategies Through Celebrity Expert Endorsers

The previously identified seeker strategies of targets during a persuasion attempt indicate that consumers do not necessarily perceive the interaction with a persuasion agent as unfavourable. It shows how consumers can cope with the situation and can take advantage of the agent to pursue their own goals (Kirmani & Campbell, 2004). Nonetheless, it also

demonstrates the coping mechanisms when the target is aware of the persuasion attempt and does not agree with the agent. In this case, sentry strategies are applied, which makes it difficult for the agent to succeed. Celebrity expert endorsers appear to be a valid alternative to prevent targets from applying sentry strategies. As opinion seekers wish to reduce risks in decision-making processes (Flynn et al., 1996) and prefer interpersonal sources instead of impersonal marketing material (J. J. Brown & Reingen, 1987), CEEs are expected to increase the credibility of the information provided. Moreover, they attract opinion seekers and, therefore, possibly increase a marketer's usual range of information dissemination.

The change of meaning, which describes identifiable persuasion attempts during interactions, may be less evident through CEEs than through traditional persuasion agents. Two aspects of opinion leadership support this assumption: the setting and word-of-mouth as a credible source. Consumers are presumably able to quickly identify persuasion agents in a marketing context due to the environment in which the persuasion attempt takes place (e.g. in a shop, at a fair). The surrounding environment can be a signal that the interaction is a persuasion attempt, even when a company affiliation is not assumed at first glance. Unlike persuasion agents, CEEs persuade through channels that are less associated with selling products, such as presenting research on conferences, publishing research and giving lectures. Additionally, as targets perceive word-of-mouth as a credible source (Shoham & Ruvio, 2008), the information provided through the CEE becomes more trustworthy, and the persuasion attempt less evident. This simplifies the dissemination of marketing information and makes it presumably more successful than usual marketing activities.

Finally, based on the trust-conveying interactions between CEEs and opinion seekers (Flynn et al., 1996), the target-agent relationship is presumably positive. Interactions with opinion leaders as well as CEEs are, by nature, perceived as more cooperative than competitive as opinion seekers are looking for help, recommendations and personal opinions. Additionally, the interactions with CEEs are also more social-emotional laden than interactions with a persuasion agent. Opinion seekers are familiar with the CEE as a person and his/her work and contributions. This presumably creates a less formal atmosphere. Likewise, it can be assumed that opinion seekers perceive the degree of dependency as lower in interactions with CEEs than with persuasion agents. As CEEs and opinion leaders are characterized by their willingness to share the information they possess, they are less likely to act as an information gatekeeper. Unlike persuasion agents, opinion leaders and CEEs are perceived as neutral information

sources that share their expertise (Clark & Goldsmith, 2005). Persuasion agents are assumed to withhold negative aspects or disadvantages of a product in order to make a sale (Lexchin, 1997). Hence, opinion seekers do not have to rely exclusively on the statements made by the persuasion agent but can instead reach out to CEEs to receive additional information. Such opportunities lead to a presumably lower perceived degree of dependency between the opinion seeker and the CEE in comparison with a traditional persuasion agent.

For these reasons, it can be assumed that opinion seekers apply seeker strategies instead of sentry strategies when interacting with a CEE and identifying the interaction as a persuasion attempt. Regardless of the advantageous positions of opinion leaders and CEEs in the market, the consumer's perception of interactions as persuasion attempts has to be emphasized as the pivotal factor. It means that also CEEs can evoke sentry strategies and lose their attributed credibility. The link between source credibility and perceived company affiliations is further explained in the following chapter and investigated in study 2.

5 HYPOTHESES DEVELOPMENT

Kang and Herr (2006) developed the source effects model to explain under which conditions and how endorsers can successfully influence consumers. The framework is based on dual-process theories as well as the Elaboration Likelihood Model (Petty et al., 1983). According to the source effects model, three central components determine the processing of information and the influence of the source: the consumer's ability and motivation to process information, whether the source is relevant when advocating a product, and whether consumers perceive and correct for source biases. If consumers are not able to process information, source effects were found to be positive. In contrast, source effects can be detrimental if consumers' ability to process information is high, and consumers correct for source bias. If consumers do not correct for source bias and find the source to be relevant for the product, source effects were found to be positive (Kang & Herr, 2006). One can assume that medical students are not able to process the presented information properly due to a lack of experience and medical expertise. Accordingly, derived from the source effects model, positive source effects are expected to be found with medical students. Physicians and residents, on the other hand, are expected to have the ability to process the presented information. This research anticipates positive source effects due to the emphasized expertise of the source to evoke relevance to the product.

Another line of researchers have investigated the effectiveness of advertisements using different types of endorsers but did not find significant differences in the expected selling price (Friedman et al., 1976). They indicate, though, that the believability among endorsers varies. Other scholars found that expert endorsers are used for advertising more sophisticated products as they evoke greater believability of the ad (Maddux & Rogers, 1980; Munnukka et al., 2016). Similar effects are expected for the opinion leader and peer expert. Even though opinion leaders and peer experts are both characterized as specialists with expertise, the peer expert is unknown to the public and, therefore, presumably lacks believability. Combining the empirical findings in regards to source effects and believability, this research hypothesizes that there is a difference in perception between an opinion leader and a peer expert; that is, peer experts are predicted to be more influential on experienced physicians than on medical students. Conversely, opinion leaders are presumably more influential when interacting with medical students than with experienced physicians. Physicians that have gathered expertise in the operating room (OR) know about the difficulties, complications and pitfalls of procedures, techniques and treatments. This group of people is sensitive to such OR problems and can only

be convinced if the source offering a solution is trustworthy and experienced. Peer experts were defined as knowledgeable physicians with extensive practical experience. It can therefore be assumed that physicians accept the influence of such peer experts, described as the process of internalization in Source Model Theory (Kelman, 1961). The assumption is additionally backed by the findings of Biswas et al. (2006), who found that expert endorsements are more effective in reducing perceived risks when the consumer is highly knowledgeable about the product. In contrast to practicing physicians, medical students are expected to cope with a source's influence through the process of identification. Medical students lack topic knowledge and are therefore likely to believe the message of the source. This coping behaviour is triggered by celebrity endorsers (Kelman, 1961) and presumably, reputable opinion leaders. Based on these assumptions, the following hypothesis is presented:

> *H_1: Medical expertise moderates the relationship between message source and perceived source credibility such that medical students perceive opinion leaders as more credible compared to peer experts, whereas experienced physicians perceive peer experts as more credible than opinion leaders.*

The consumer's persuasion knowledge presumably explains the relationship between the type of source and the perceived credibility of the source. Since the Persuasion Knowledge Model determines the three components topic knowledge, persuasion knowledge and agent knowledge to influence a person's coping behaviour to guard against unwanted persuasion, this research anticipates different outcomes for medical students compared to experienced physicians. *Topic knowledge* describes how much a consumer knows about a subject (Friestad & Wright, 1994) is expected to be used by experienced medical doctors when evaluating a persuasion attempt. They might question statements, results or recommendations of the source. Medical students, on the other hand, have less topic knowledge that they can draw on to assess the agent's claims. Additionally, they are somewhat new to the field and have limited understanding of persuasion tactics and marketing approaches of medical manufacturers. As *persuasion knowledge* is gained over time (Friestad and Wright 1994), experienced physicians are assumed to consider this more than medical students. Lastly, *agent knowledge* refers to the consumer's beliefs and judgments about an identified persuasion agent (Friestad & Wright, 1994). Besides characteristics and competencies, it also includes the perceived motives and strategies (Campbell & Kirmani, 2000). In the experiment, the participants will be provided with fictitious biographies to manipulate the type of source. In line with H_1, medical students

are expected to assess the opinion leader as a more credible source than experienced physicians. As a consequence, medical students will have more favourable agent knowledge towards the opinion leader than physicians. Therefore, the following hypotheses are presented:

H_{2a}: Medical expertise moderates the relationship between source type and persuasion knowledge, while persuasion knowledge mediates source type to perceived credibility of the source.

H_{2b}: Medical students activate less persuasion knowledge than experienced physicians when confronted with an opinion leader as a source, whereas physicians activate less persuasion knowledge than medical students when confronted with a peer expert.

Opinion leaders who cooperate with companies unify aspects of celebrity endorsements as well as expert endorsements. From previous studies, it is known that a form of meaning transfer can occur with celebrity endorsers (Batra et al., 1996; McCracken, 1989). Meaning transfer depicts the transfer of positive characteristics from the endorser to the company, product or brand from a consumer perspective (Batra et al., 1996). Nevertheless, celebrities may also transfer unwanted meanings that are not intended to be conveyed due to their significance in a society (McCracken, 1989). Hence, marketers have to make sure that the celebrity endorser only evokes favourable meanings by creating ads with relevant context and supporting ad copy (McCracken, 1989). Spry et al. (2011), for example, found evidence that endorser credibility significantly influences brand credibility. Hence, there is a positive relationship between endorser credibility and brand credibility, and the transfer of positive meaning is successful. Mackenzie and Lutz (1989) found a significant relationship between the credibility of the source of an advertisement and the credibility of the ad. Drawing on the concept of meaning transfer, opinion leaders and peer experts are expected to influence the perceived credibility of the message. However, in line with hypothesis H_1, opinion leaders are expected to be perceived as more credible than peer experts due to their credible standing in the market (Flynn et al., 1996). As a consequence, this research anticipates higher perceived credibility of the message when an opinion leader is the source of the message compared with a peer expert as the source.

H_3: Opinion leaders enhance the perceived credibility of the message more than peer experts.

Friedman and Friedman (1979) found that the type of endorser influences the effectiveness of product advertisements. Their findings show that peer endorsers are more effective for non-complex products than expert or celebrity endorsements. Conversely, they demonstrate that there is a significant product-by-endorser interaction for complex products and expert endorsers. These results suggest that the complexity of a product needs to be considered in order to select the most effective endorser. As medical science is a complex domain with multiple treatment options and varying influencing factors, the demonstrated expertise of endorsers appears to be an essential aspect. Following hypothesis H_1, medical professionals are expected to perceive opinion leaders as more knowledgeable and experienced than peer experts. Opinion leaders have proven their expertise in scientific articles and on conferences and, hence, profit from exceptional public standing. Peer experts, on the other hand, have not yet proven their expertise to the general public. As a consequence, opinion leaders are expected to have a stronger influence on medical profesionals' attitudes toward the company than peer experts.

H_4: Endorsements of a company and its products by an opinion leader enhance attitudes toward the company more than endorsements by a peer expert.

In addition to being perceived as more credible than peer experts, celebrity expert endorsers may also trigger fewer persuasion sentry strategies than a typical persuasion agent, such as a salesperson. This assumption is based on findings of Poppe et al. (1999) who identified that influence in social relationships varies depending on the structural dimensions of stance, orientation and dependency. If these dimensions are applied to an opinion-seeker-opinion-leader-relationship, one can infer a cooperative and socio-emotional relationship. Otherwise, opinion seekers would not be motivated to reach out to opinion leaders or try to imitate them (Shoham & Ruvio, 2008).

Furthermore, it is known that the nature of a relationship determines the range of persuasion strategies that can be applied without the persuasion target considering them as inappropriate or unacceptable (Rule et al., 1985). Kirmani and Campbell (2004) confirmed those findings in a marketing context and state that persuasion targets are more likely to counter persuasion attempts with seeker strategies in cooperative relationships and with sentry strategies in competitive relationships, respectively. Hence, in a presumably cooperative relationship between opinion seekers and opinion leaders, this research expects opinion seekers to apply fewer sentry strategies during a persuasion attempt by an opinion leader.

The degree of cooperation between a consumer and a peer expert is expected to be similar to an opinion-seeker-opinion-leader relationship; however, consumers are expected to perceive the expertise of an opinion leader as higher than that of a peer expert (H_1). According to Gilly et al. (1998), the perceived expertise of a source is the pivotal factor that determines the influence of the source on someone. Further, the results demonstrate that opinion seekers underestimate how much they are influenced by someone they perceive as very experienced and skilled (Gilly et al., 1998). As a consequence, this research hypothesizes the opinion leader to be more influential than the peer expert when interacting with a medical professional. Considering these results, it is expected that not only the influence of opinion leaders will be greater than that of peer experts, but also that persuasion attempts by opinion leaders are more likely to be accepted. Conversely, persuasion attempts by peer experts are less likely to be accepted and will provoke medical professionals to react with more sentry strategies.

H_5: Opinion leaders are less likely to provoke the use of sentry strategies as a form of persuasion coping behaviour than peer experts.

Research has revealed that medical articles are regularly published whose content has been heavily influenced by manufacturers or whose authors are closely affiliated with the sponsor of the research (Flanagin et al., 1998; Fugh-Berman, 2005). Depending on the requirements of the journal or the involvement of the manufacturer in the research project, authors have to disclose conflicts of interest as part of the publication process. The disclosure of conflicts of interest, however, does not prevent marketers from using journal articles as a marketing vehicle (Flaherty, 2013). Hence, readers of medical peer-reviewed journal articles can be confronted with covert marketing strategies.

Due to the lack of literature regarding advertisements or endorsements in scientific literature, this research draws on studies from native advertising and online marketing. Just like readers of medical journal articles, social media users are facing covert marketing strategies in the form of influencer endorsements and native advertising campaigns that require the user to cope with persuasion attempts. Native advertising, which describes a form of advertisement in social media channels that imitates characteristics of real postings by users, has made it more difficult for consumers to discern content from ads (Boerman, Willemsen, & Aa, 2017). Specifically, identifying the intent of social media content posted by celebrities can be challenging for consumers. Boerman et al. (2017) demonstrate that consumers have difficulties assessing celebrities' postings and categorizing them as commercial or non-commercial

content. To help consumers distinguish between commercial and non-commercial social media content, the US Federal Trade Commission, for example, has established regulations that oblige marketers and celebrities to disclose ads with the label "sponsored" (Electronic Code of Federal Regulation, 2016). What happens when native advertising ads are labelled as such has been researched by multiple scholars (Boerman et al., 2017; Campbell, Mohr, & Verlegh, 2013; Reijmersdal et al., 2016). Campbell et al. (2013) found that sponsorship disclosure can help consumers to resist persuasion attempts. In their experiment, they show that consumers correct their brand attitudes when sponsorship is disclosed after a 20-minute TV show containing product placements.

Based on these results, one can expect even more difficulties for readers of medical journals than social media users to identify the author's intent or to discern commercial comments within the article from non-commercial statements. If research projects received funding from external parties, this is disclosed at the end of the article in a section labelled "Disclosure of conflicts of interest," "Funding" or "Role of the funder". This disclosure of funding is expected to help medical profesionals resist persuasion attempts similar to the results of Campbell et al. (2013). Consequently, the following hypothesis is proposed:

H_6: There will be greater resistance to a persuasion attempt when a conflict of interest is disclosed.

Hovland et al. (1966) state that the credibility of the source can be negatively affected if consumers know that the source benefits from recommending a product or a service. This effect is congruent with findings from the sponsoring disclosure literature. Campbell, Mohr, and Verlegh (2013) demonstrate that sponsorship disclosure after product placement leads to correction mechanisms of consumers who adjust their brand judgements and attitudes. As attitude toward the brand and corporate credibility are linked through the relationships of attitude toward the advertiser and attitude toward the ad (Mackenzie & Lutz, 1989), this line of research suggests negative consequences for the source and the company. Based on these findings, it is hypothesized that corporate credibility and the perceived credibility of the source are negatively affected when the source is closely affiliated with the company it is endorsing.

Another line of research, however, has investigated the so-called correspondence bias, which would suggest unchanged corporate or source credibility regardless of the source's company affiliation. The correspondence bias describes the mistaken conclusion that an

observed behaviour of a person is the result of the person's current dispositions (Gilbert & Malone, 1995). Inferences solely based on these dispositions, however, can be misleading. For example, even though George Clooney has advertised the coffee brand Nespresso in many commercials throughout many years, concluding that George Clooney likes coffee or even prefers the brand Nespresso over other brands is not necessarily correct. The commercial should not exclusively be taken into consideration to infer that an individual is predisposed to follow the anticipated behaviour (Gilbert & Malone, 1995). Cronley, Kardes, Goddard, and Houghton (1999) have investigated the role of the correspondence bias in celebrity advertising. They found that even when celebrities are known to be paid a high salary for an endorsement, consumers still assume that the celebrity's personal attitude toward the endorsed product is favourable and, in turn, consumers hold a favourable attitude toward the product themselves (Cronley et al., 1999). Findings from Cronley et al. also demonstrate a positive correlation between the attitude toward the endorsed product and attitude toward the endorser, the brand and the ad. As the attitude toward the ad is linked to advertiser credibility (Mackenzie & Lutz, 1989), the findings by Cronley et al. suggest that a source's company affiliation will not negatively affect corporate credibility. Given the conflicting findings from the literature on the influence of a source's company affiliation on credibility, the following research question RQ_3 is posed in addition to RQ_1 and RQ_2 which are sought to answer by this research:

RQ_3: How do company endorsements by a closely affiliated sorce influence corporate credibility?

6 RESEARCH METHODOLOGY

The influence of opinion leaders and peer experts on medical professionals and medical students was tested in two studies. A two study design was chosen to investigate the differences between the two source types with and without the potential influence of disclosed company affiliations. Additionally, a second study including experienced physicians enabled scrutinizing if medical expertise affects the participants coping behaviour. A pretest was used to check the experimental manipulations. The Behavioural Research Ethics Board at the University of Saskatchewan assessed these experiments, which received approval on October, 28th, 2019 (File number 1480; see Appendix A).

A scientific journal article was used to compare the influential effects of medical opinion leaders with peer experts in a controllable context. Medical professionals, as well as medical students, read peer-reviewed journal articles regularly throughout their career and their medical training at university. Reading a peer-reviewed journal article represents, therefore, a natural context for the study participants. The healthcare industry makes regular use of scientific articles and celebrity expert endorsers to disseminate information (Fugh-Berman, 2005; Nair et al., 2010); therefore, this approach mirrors actual practice. A mock-up journal article served as a stimulus to investigate the influence of opinion leaders reliably and realistically. This stimulus also offered the advantage of allowing the manipulation of single components of the article, such as the author, product naming within the text or conflicts of interest while keeping everything else constant. The fact that manufacturers and brands are in medical articles always explicitly mentioned to ensure the result's reliability helped to investigate the repercussions on participating companies in particular.

6.1 Stimulus Development

For the experiment, a fictitious journal article describing the procedure of an endoscopic submucosal dissection (ESD) was chosen as the topic. Even though the article described a specific procedure in gastroenterology, the content, as well as the fictitious study results, were easy to understand even without having specialized in internal medicine. Additionally, the procedure only required a limited amount of equipment, which was crucial for the realistic manipulation of the independent variable company affiliation and for measuring the dependent variable attitude toward the company reliably. Therefore, all company references made in the article were references regarding Olympus Inc. and its equipment. Other manufacturers were not mentioned to prevent any influence. The mock-up article was based on peer-reviewed

papers within the domain of endoscopic submucosal dissections. Participants were only provided with an extended abstract of the mock-up journal article to reduce the time required to read the information and thus positively influence the completion rate of the study. The extended abstract contained the following sections: *Background, Objective, Methods, Results* and *Conclusion*. The sections *Declaration of conflicting interests, Funding/Support, Role of the Funder/ Sponsor, Ethics approval and Informed consent* were added to accommodate the manipulation of company affiliations.

The medical manufacturer Olympus Inc. was judged to be an appropriate and realistic company to refer to. This manufacturer is a dominant player in gastroenterology and offers most of the equipment needed to perform an ESD. As a consequence, it made repeated company namings within the abstract less suspicious and linked the article with the company. To further emphasize a potential link to the company, the extended abstract contained equipment-specific details and would, therefore, benefit the company the most. The approach represented a realistic scenario to manipulate the company affiliation and a convincing reason for Olympus Inc. to fund the research described in the abstract. However, the abstract also remained vague enough to use it as a credible manipulation without disclosure of conflicts of interest. For the remainder of this research, these conditions will be referred to as COI_A when a conflict of interest was absent and COI_P when a conflict of interest was disclosed, thus present.

In addition to the extended abstract, two fictitious biographies, one for a fictitious opinion leader and one for a fictitious peer expert, were developed to manipulate the independent variable type of source. The biographies were written in the same style as a biography of a practicing physician that one would find on a hospital's website with text blocks and content applicable for both treatment conditions. The structure of both biographies was kept similar and differed only in aspects such as hospital affiliations, job title and academic career. The majority of the fictitious biography was held constant, except for one paragraph to highlight either academic achievements or practical work experience. For the opinion leader condition, the public reputation was emphasized, including the number of published journal articles and prestigious academic appointments as well as the medical training at a renowned American school of medicine. The fictitious peer expert biography, on the other hand, emphasized the years of experience performing the procedure described in the mock-up article, the commitment to the operating room and the practical expertise in the field of gastroenterology

in general. Both biographies ended with a list that underlined either academic achievements or practical experiences. In the case of the opinion leader, a list of selected publications was appended, whereas, in the peer expert condition, the author's memberships in related associations and quality circles were listed. For the remainder of this research, these two conditions will be referred to as the OL and PE conditions. The OL condition refers to the group of participants who saw the opinion leader biography, while the PE condition describes the participants who saw the biography of the peer expert.

The extended abstract and the biographies were validated by a group of experts, including a practicing gastroenterologist, a consultant for endoscopic instruments and a former marketing manager for gastroenterology of a medical manufacturer. This validation process allowed the incorporation of feedback from a potential target of such marketing strategies (the physician) as well as the integration of comments from a marketer's perspective (the consultant and the marketing manager). Moreover, the validation process ensured the authenticity of the experimental stimuli and manipulations.s

6.2 Dependent and Independent Variables

For study 1, the independent variables represented source type as well as medical expertise. Participants self-identified as either a medical student, a resident or a physician and were asked to indicate their medical experience in years. The third independent variable company affiliation was introduced in the pretest as well as in study 2. Participants were randomly assigned to a study condition. In the pretest, participants were exposed to both conditions as part of the experimental design.

The measured dependent variables were perceived credibility of the source (S_CRED), perceived credibility of the message (M_CRED) as well as attitude towards the company (ATT_COMP). The mediating variables were persuasion intent (PI) as well as perceived ulterior motive (ULT_M). The relationship between the variables was based on the assumption the distinctive characteristics of the sources affect the target audience's assessment of the interaction with the source differently, resulting in the activation of persuasion knowledge in different magnitudes. Additionally, the perception of ulterior motives was measured to identify if the participants perceived the source specifically as a persuasion agent or not.

To measure if participants activate their persuasion knowledge, two scales were used. First, the scale from Kirmani and Zhu (2007) was employed to measure the participants ability

to recognize a persuasion intent (EPI). This scale measures persuasion knowledge on three seven-point items encompassing the dimensions believability, truthfulness and deceptiveness. The scale was reverse coded so that a higher score on the scale signified more persuasion knowledge being activated. Scholars have used the Kirmani and Zhu scale multiple times, which supports its use in this research (Hossain & Saini, 2014; Isaac & Grayson, 2017). Apart from the RPI scale, a second scale measuring persuasion knowledge was used; the perceived ulterior motive (ULT_M) was measured using the scale developed by DeCarlo, Laczniak, and Leigh (2013). They use three items with a seven-point scale ranging between "strongly disagree" to "strongly agree" regarding the statements "Dr. Holmberg has an ulterior motive for publishing the results stated in the article," "Dr. Holmberg's comments in the article are suspicious" and "Dr. Holmberg is motivated to exaggerate the performance of Olympus Inc." Although both scales measure persuasion knowledge, the items of the ulterior motive scale refers to the source of the message and measures attitudinal persuasion knowledge by asking participants explicitly about their suspiciousness (Ham, Nelson, & Das, 2015). The scale measures if and how much participants trust the persuasion attempt. In contrast, the items of the RPI scale refers to the message or the content of the ad and measures conceptual persuasion knowledge (Ham et al., 2015). The scale helps to understand if participants recognize a persuasion attempt. Therefore, it was decided to include both scales to investigate the participants' activation of persuasion knowledge more in detail. In addition to the two scales, an open-ended question was included that instructed participants to write down any thoughts and feelings they had about the source and the article. These responses allowed for scrutinizing skepticism or any suspicions that the participants might have had. Moreover, time spent reading the biographies was also used as a measure for persuasion knowledge activation. Kirmani and Campbell (2004) identified *preparation* as a form of persuasive coping behaviour that stands for persuasion targets conducting additional research prior to the expected persuasion episode (Kirmani & Campbell, 2004). Applying this strategy means that the persuasion target can foresee a persuasion attempt and collects extra information to guard against it. However, it is possible that external research can also be conducted after a persuasion attempt has occurred. The persuasion target requires the same analytical thinking in the post-persuasion stage as in the pre-persuasion stage. Therefore, this research assumed that participants who decide to read the author's biography thoroughly and, hence, spend more time reading are doing so for the same reason an individual would prepare before a persuasion attempt. To test whether participants apply this persuasion sentry strategy and purposefully inform themselves about the source of the article, an extended portrait of the author was available by clicking on an

“extended biography” button below the short description. Reading the extension was optional, and participants were able to skip this step by clicking on the “next” button instead. The extended portrait contained an additional fictitious paragraph about the career steps and medical training of the author as well as a selection of publications. Participants who did not choose to see the extended version are assumed to have not applied this form of persuasion sentry strategy.

The dependent variable perceived credibility of the source (S_CRED) was measured with the trustworthiness-expertise-attractiveness scale, developed by Ohanian (1990). It measures endorser credibility with a 15-item scale and uses a seven-point semantic differential scale to measure the three factors trustworthiness, expertise and attractiveness. The scale was adjusted, and the items referring to attractiveness were removed. For this research, the factor attractiveness was irrelevant as peer-reviewed articles do not provide an image of the source. Hence, the scale resulted in a measure containing only ten items. The first five items represented the factor perceived trustworthiness of the source (S_TRUST), the second 5 items referred to the perceived expertise of the source (S_EXPERT). Since Ohanian kept the two factors separate to measure the perceived credibility of the source, this approach was adopted for this research.

A 3-item measure with a 7-point bipolar scale (bad-good, negative-positive, unfavourable-favourable) was used to determine the attitude toward the company (Muehling, 1987). Additional data such as the field of expertise (e.g. general surgery, internal medicine, anesthesia and emergency medicine), gender, age, as well as the current hospital/ university affiliations were collected. Additionally, advertising skepticism (AD_SKEP), corporate credibility (CORP_CRED) and familiarity with the brand (FAM_BRAND) were measured in the experiment. Controlling for FAM_BRAND was necessary as a real company, brand and product names were used in the mock-up abstract for authenticity purposes. Participants were, therefore, asked to indicate on a seven-point scale how familiar they were with the company Olympus Inc. in the medical field. Advertising skepticism was measured using the scale from Obermiller and Spangenberg (1998). The corporate credibility scale from Newell and Goldsmith (2001) was adjusted to measure corporate trustworthiness (CORP_TRUST) and corporate expertise (CORP_EXPERT) with two four-item 7-point Likert scales

Lastly, two questions regarding the (expected) year of graduation and the degree-granting institution were included in the questionnaire.

6.3 Pretest

A pretest was conducted to determine whether the manipulations of the treatments were successful. Participants in the pretest were German medical students studying in Hungary. The participants were first shown the extended abstract of the journal article under the COI_A condition. Next, they saw the extended version of either the opinion leader or of the peer expert biography. The order of the biographies was randomized to account for possible practice or carry-over effects due to the within-subjects design. After reading the biography, participants were prompted to rate the author's credibility in terms of perceived trustworthiness and expertise as well as their attitude towards the company. Additionally, the participants were asked to assess four different statements describing the author on a 7-point Likert scale. The statements were definitions of the earlier described concepts of celebrity endorsers, expert endorsers, peer endorsers and opinion leaders. Participants were then shown the second extended author biography of either the opinion leader or the peer expert. Questions regarding the perceived credibility and the assessment of the definitions followed the biography. Before a last set of questions, participants saw another version of the extended abstract. In this version, a conflict of interest was disclosed, and Olympus Inc. was presented as a research partner. The following questions measured the perceived credibility of the message, the activation of the participant's persuasion knowledge and the attitude towards the company again.

Due to the small sample size (n = 10), no statistical analyses were conducted. Nonetheless, a difference in perception between the OL and PE condition was identified. The participants rated the opinion leader as more trustworthy (M = 5.12) and more experienced (M = 5.68) than the peer expert's trustworthiness (M = 4.76) and expertise (M = 4.86). Accounting for the order of biographies, opinion leaders were rated as more trustworthy (M = 5.26) and more experienced (M = 6.09) when they saw the PE condition first (compared with the peer expert's trustworthiness, M = 4.94, respectively expertise, M = 5.09). Consequently, participants adjusted their assessment in favour of the opinion leader. Likewise, the group that saw the OL condition first corrected their perception of the peer expert also in favour of the opinion leader. In particular, opinion leaders were perceived as more trustworthy (M = 4.80) and experienced (M = 4.73) than the peer expert (trustworthiness, M = 4.33; expertise, M = 4.33). These results suggest that participants perceive the opinion leader and the peer expert differently. Notably, the opinion leader’s experience is perceived as higher. The participants' assessments of definitions also confirmed this finding. Opinion leaders were more likely to be seen as a celebrity endorser (OL M = 5.00; PE M = 4.33), an expert endorser (OL M = 5.56;

PE M = 4.44) and an opinion leader (OL M = 4.67; PE M = 4.11) than the peer expert. Both, however, were equally viewed as peer endorsers (OL M =4.89 vs. PE M = 4.89). The final aspect of the pretest was to investigate attitude towards the company. Participants saw the extended abstract with the COI_A condition first. On average, the attitude towards the company was rated as favourable (M = 5.07). Once they were exposed to the COI_P condition, participants changed their opinion, and their attitude towards the company decreased by 1 unit (M = 4.07).

Based on these results, it was decided that the manipulations were successful and could be used in the main studies.

6.4 Study 1

The primary purpose of study 1 was to test hypotheses H_1 to H_5; that is, whether participants perceive opinion leaders and peer experts differently in terms of their credibility and whether the activation of persuasion knowledge differs for the two sources. The experiment was a 2 (type of source: peer expert versus opinion leader) x 2 (medical expertise: pre-clerkship versus clerkship) between-subjects design. Participants were given a 7€ Amazon e-gift card in exchange for participating in the study.

Study 1 was an online experiment designed with the questionnaire software Voxco. After the participants clicked on the hyperlink to the online study, they were prompted to answer a few screener questions regarding their university affiliations, the current status of medical training and (expected) year of graduation. To qualify for participation, respondents needed to be medical students and currently studying at a German university. Participants were then shown a copy of the consent form before the main part of the experiment began. They were shown the extended abstract of the mock-up journal article before they were provided with the shortened biography of either the opinion leader or the peer expert "Dr. Gregory Holmberg." The extended abstract represented the COI_A condition for all participants of Study 1. Hence, the sections *Disclosure of conflicting interests, Funding* and *Role of the Funder*, stated no involvement of an external party. However, participants were randomly assigned to the OL and PE condition and, thus, were either shown the opinion leader biography or the peer expert biography. By checking a box, participants were able to view an extended version of the respective biography. After having seen the biography or the optional extension, participants were prompted to answer the questionnaire. On average, participants needed 17 minutes to complete the study. The questionnaire is provided as Appendix G.

6.4.1 Participants and Samples

Prospective participants were initially approached through personal communications. In total, 11 medical students from 9 different universities were asked to disseminate the invitation to participate in the experiment among their peers. Additional participants were then recruited through snowball sampling. In total, 642 participants followed the invitation to participate and clicked on the study link. Among those 642 participants, 464 only partially completed the questionnaire, four were ineligible, and 84 were automatically screened out as the target number of 100 participants was already met. To participate in study 1, respondents were required to study medicine in Germany at the time of the study. Six students were excluded after the data collection due to their affiliations with universities outside of Germany. As a result, the sample size was 94 completed questionnaires.

Table 6.1 Overview Participants per Treatment in Study 1

Medical expertise	Number of participants	Condition	Number of participants
Novice	33	OL	15
		PE	18
Advanced	61	OL	30
		PE	31

The participating students were categorized into two groups: Participants in the pre-clerkship group were students with two years of medical training or less. This cut-off point was chosen because German medical students have their first state exam after two years of studies. Until this point, the curriculum includes foundational classes such as chemistry, physics, biology, physiology and anatomy.They are referred to as novices. Students with more than two years of experience were categorized into the second group, clerkship. During their clerkship, students focus more on medical content and learn about diseases, diagnostics and healing methods. They are, henceforth, referred to as advanced students. The numbers of participants per treatment are stated in Table 6.1

64.9% of participants were in their clerkship, whereas 35.1% were currently in their pre-clerkship or had just finished it. The expected year of graduation reflects these numbers. Participants indicated they expected to graduate between 2020 and 2025 (M = 2022). The participants' age ranged from 20 to 32 years. On average, the participants were 23.9 years old. Fifty-four of the participating medical students were female (57.4%), 36 indicated they were male (38.3%), and 4 participants did not disclose their gender (4.3%). On average, participants

were somewhat unfamiliar with the Olympus brand (M = 1.700), with responses ranging from a minimum of 1 to a maximum of 7. In regards to advertising skepticism, the sample reflected the full range from a non-skeptical stance towards advertising to a very skeptical point of view, which was measured on a 5-item scale. On average, however, the sample mean was M = 3.229, which represented a slightly skeptical attitude towards advertising.

6.4.2 Data Analysis

The data was analyzed using SPSS 26. For in-depth analyses and detailed mediation as well as moderated mediation analyses, the SPSS macro PROCESS was used, which is based on Hayes (2017).

Before analyzing the data, the dimensionality of the scales, as well as their reliability, were tested. The measures *attitude towards the company, source credibility, message credibility, recognition of persuasion intent, ulterior motive perception, corporate credibility,* as well as *advertising skepticism*, were tested. The limited sample size did not allow for conducting a confirmatory factor analysis with all survey items in one model. Instead, principal components analyses with rotation were conducted to confirm the dimensionality of the scales. Eigenvalues greater than one were used to determine if the measured variables were unidimensional or composed of multiple factors (Courtney & Gordon, 2013). Based on these results, the two variables, corporate credibility and source credibility, were both composed of two factors which confirmed the result of other scholars (Goldsmith, Lafferty, & Newell, 2000; Lafferty, Goldsmith, & Newell, 2002; Newell & Goldsmith, 2001; Ohanian, 1990). The factor analyses for the remaining variables indicated that the scales were unidimensional. Additionally, for each variable, Cronbach's alpha was calculated to determine the reliability of scales with multiple item (Churchill & Peter, 1984; Panayides, 2013). A Cronbach's alpha value of .7 represented the threshold level for acceptable reliability (Churchill & Peter, 1984). As shown in Table 6.2, all variables had a Cronbach's alpha greater than .7 and were therefore reliable measures.

Table 6.2 Factor Analysis and Reliability for Study 1 Measures

Variable	Construct	Items	Factor Loadings	Cronbach's α
Source credibility	Trustworthiness of the source (S_TRUST)	Dependable - undependable	.811	.919
		honest – dishonest	.905	
		Reliable - unreliable	.874	

		Sincere - insincere	.880	
		Trustworthy - untrustworthy	.892	
	Expertise of the source (S_EXPERT)	Expert – not an expert	.886	.945
		Experienced - inexperienced	.915	
		Knowledgeable - unknowledgeable	.913	
		Qualified - unqualified	.946	
		Skilled - unskilled	.875	
Attitude towards the company	(ATT_COMP)	Reaction towards company bad - good	.898	.900
		Negative - positive	.947	
		Unfavourable - favourable	.900	
Credibility of the message	(M_CRED)	Content of the abstract: accurate	.899	.888
		authentic	.917	
		believable	.901	
Recognition of Persuasion intent	(RPI)	Content of the abstract: believable	.922	.723
		truthful	.914	
		Deceptive (R)	.549	
Corporate Credibility	Corporate Expertise (CORP_EXPERT)	Olympus Inc. has a great amount of experience in the medical field	.862	.774
		Olympus Inc. is skilled in what they do.	.885	
		Olympus Inc. has great experience.	.860	
		Olympus Inc. does not have much experience in the medical field. (R)	.527	
	Corporate trustworthiness (CORP_TRUST)	I trust Olympus Inc.	.829	.876
		Olympus Inc. makes truthful claims	.860	
		Olympus Inc. is honest	.912	
		I do not believe what Olympus Inc. tells me. (R)	.829	

Ulterior Motive	(ULT_M)	Dr. Gregory Holmberg has an ulterior motive for publishing the results stated in the article.	.796	.774
		Dr. Gregory Holmberg's comments in the article are suspicious	. 796	
		Dr. Gregory Holmberg is motivated to exaggerate the performance of Olympus Inc.	.904	
Advertising Skepticism	(AD_SKEP)	We can depend on getting the truth in most advertising.	.788	.963
		Advertising's aim is to inform the consumer.	.841	
		I believe advertising is informative.	.817	
		Advertising is generally truthful.	.915	
		Advertising is a reliable source of information about the quality and performance of products.	.906	
		Advertising is truth well told.	.905	
		In general, advertising presents a true picture of the product being advertised.	.937	
		I feel I've been accurately informed after viewing most advertisements.	.935	
		Most advertising provides consumers with essential information.	.862	
(R) = reverse coded				

6.4.3 Empirical Findings of Study 1

Hypothesis H_1 stated that there is an interaction effect between *source type* and medical *expertise*. Results of the omnibus ANOVA showed that the interaction effect is not statistically different on perceived *trustworthiness of the source*, $F(1,90) = .253$, $p = .617$. The results indicate that neither less experienced students in their pre-clerkship nor advanced students in

their clerkship perceive the trustworthiness of an opinion leader and a peer expert differently. A second omnibus ANOVA assessing whether there was an interaction

Table 6.3 ANOVA Table Summarizing the Interaction Effects of Source Type and Medical Expertise on Trustworthiness of the Source, and Expertise, Respectively

Dependent Variable	Source type	Novice	Advanced	Interaction
Trustworthiness of the source (S_TRUST)	OL	M = 5.093 ± SD = 1.193	M = 5.127 ± SD = 1.224	$F(1,90) = .253$; $p = .617$
	PE	M = 5.567 ± SD = .978	M = 5.342 ± SD = 1.248	
Expertise of the source (S_EXPERT)	OL	M = 5.760 ± SD = 1.618	M = 6.027 ± SD = 1.096	$F(1,90) = .397$; $p = .530$
	PE	M = 6.111 ± SD = .687	M = 6.045 ± SD = 1.342	

effect between source type and medical expertise on perceived *expertise of the source* was also not significant, $F(1,90) = .397$, $p = .530$. Hence, students do not distinguish significantly between the expertise of an opinion leader or a peer expert, regardless of the students' medical experience. As a consequence, H_1 is not supported.

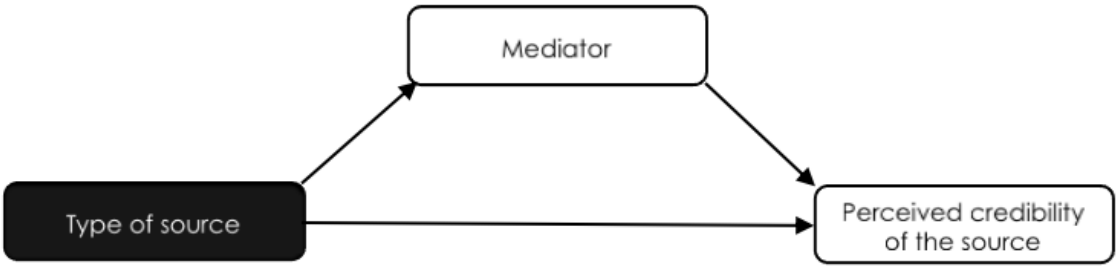

Figure 6.1 Mediation Analysis for Perceived Credibility of the Source

Hypothesis H_{2a} stated that persuasion knowledge mediates the relationship between source type and perceived source credibility. Mediation analyses were conducted with Hayes' PROCESS model 4 and 5,000 bootstrap resamples to investigate whether participants' perceived trustworthiness or expertise of the source is mediated by activation of persuasion knowledge (using the variables RPI or ULT_M). The model is illustrated in Figure 6.3. The results are provided in Table 6.4. No significant mediations were found. Hypothesis H_{2a} is therefore not supported.

Table 6.4 Results of the Mediation Analysis for Perceived Credibility of the Source

Mediator	Dependent Variable	Mediation result
RPI	S_TRUST	indirect = -.100, *SE* = .066, 95% CI [-.251, .005]
	S_EXPERT	indirect = -.074, *SE* = .063, 95% CI [-.227, .016]
ULT_M	S_TRUST	indirect = -.109, *SE* = .121, 95% CI [-.088, .390]
	S_EXPERT	indirect = .024, *SE* = .086, 95% CI [-.137, .205]

To examine whether there was an interaction effect between source type and medical expertise on activation of persuasion knowledge (H_{2b}) a factorial ANOVA was conducted using the *recognition of persuasion intent* variable. The omnibus ANOVA indicated that the variables did not significantly interact with one another, $F(1,90) = .141$, $p = .709$. This means that novice students and advanced students do not activate their persuasion knowledge differently, regardless of the source of the article. The variables source type, medical expertise and *ulterior motive* were similarly analyzed. Again, the results of the omnibus ANOVA indicated no interaction effect between source type and medical expertise on perceived ulterior motive, $F(1,90) = .197$, $p = .658$. Consequently, H_{2b} is not supported. However, an unplanned exploratory analysis of source type influencing perceived ulterior motive revealed a main effect after Bonferroni correction, $F(1,90) = 10.649$, $p<.05/2 = .002$. As the scale was reverse coded, the findings show that participants are more suspicious about the ulterior motive of the peer expert (M = 4.721 ± SD = .973) than of the opinion leader (M = 3.830 ± SD = 1.408).

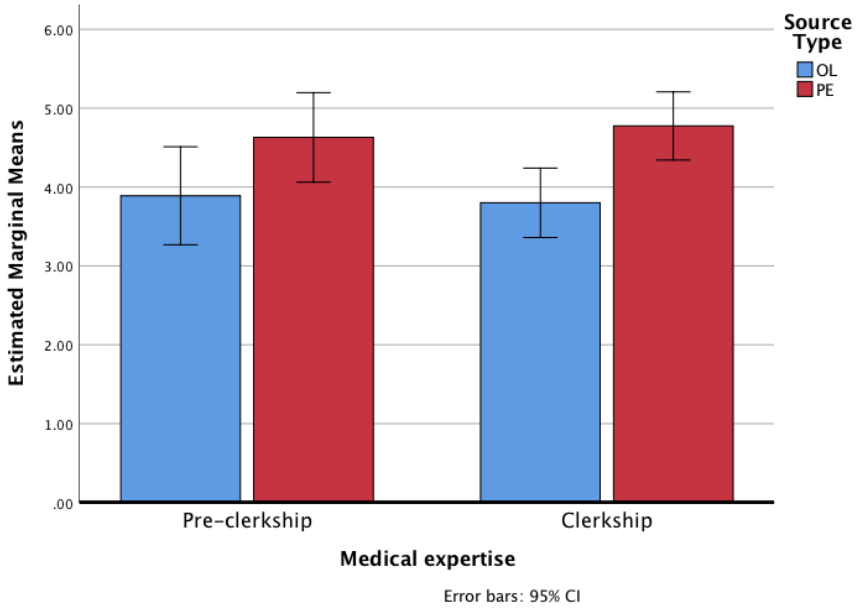

Figure 6.2 Estimated Marginal Means of Perceived Ulterior Motive

The finding is surprising as the results of the first ANOVA indicate that there is no difference on activation of persuasion knowledge depending on the source types. In contrast, the second result indicates that the peer expert is more likely to be perceived as having an ulterior motive. These outcomes require further analyses. Presumably, participants do not recognize a persuasion attempt regardless of the author of the article, and, therefore, don't activate their persuasion knowledge. Yet, when participants are asked about their attitudinal persuasion knowledge they become more skeptical about the peer expert.

A one-way ANOVA was conducted to examine whether there was a difference on the perceived *credibility of the message* between the OL condition and the PE condition (H_3). Even though the results for perceived credibility of the message were higher under the PE condition (M = 3.435 ± SD = 1.401) than under the OL condition (M = 3.044 ± SD = 1.278), the ANOVA indicated that there was no significant difference between the group means $F(1,92) = 1.985$, $p = .162$. Thus, no evidence was found that opinion leaders enhance perceived credibility of the message more than peer experts. Therefore H_3 is not supported.

Hypothesis H_4 stated that opinion leader endorsements enhance attitudes toward the company more than endorsements by peer experts. Results of a one-way ANOVA indicated that there was no significant difference on attitude towards the company between the the OL condition and the PE condition, $F(1,92) = .764$, $p = .384$. Thus, there is no evicende to support H_4.

To examine whether participants were more suspicious about a peer expert compared with a reputable opinion leader (H_5), participants were given the option to read an extended abstract about the source of the article. A Chi-Square test was conducted to examine how the source type influences participants in regards to making use of the extended biography. Interestingly, the distribution between opening and not opening the extended version among participants under the PE condition was almost equal (not extended: n = 23, 46.9%; extended: n = 26, 53.1%). Participants under the OL condition were more likely to ignore the extended version (extended: n = 15, 33.3%; not extended: n = 30, 66.7%). Even though differences were identifiable, the results are only significant if one accepts a lower confidence interval than 95%, $x2$ (1,94) = 3.712, $p = .054$. Consequently, H_5 cannot be supported.

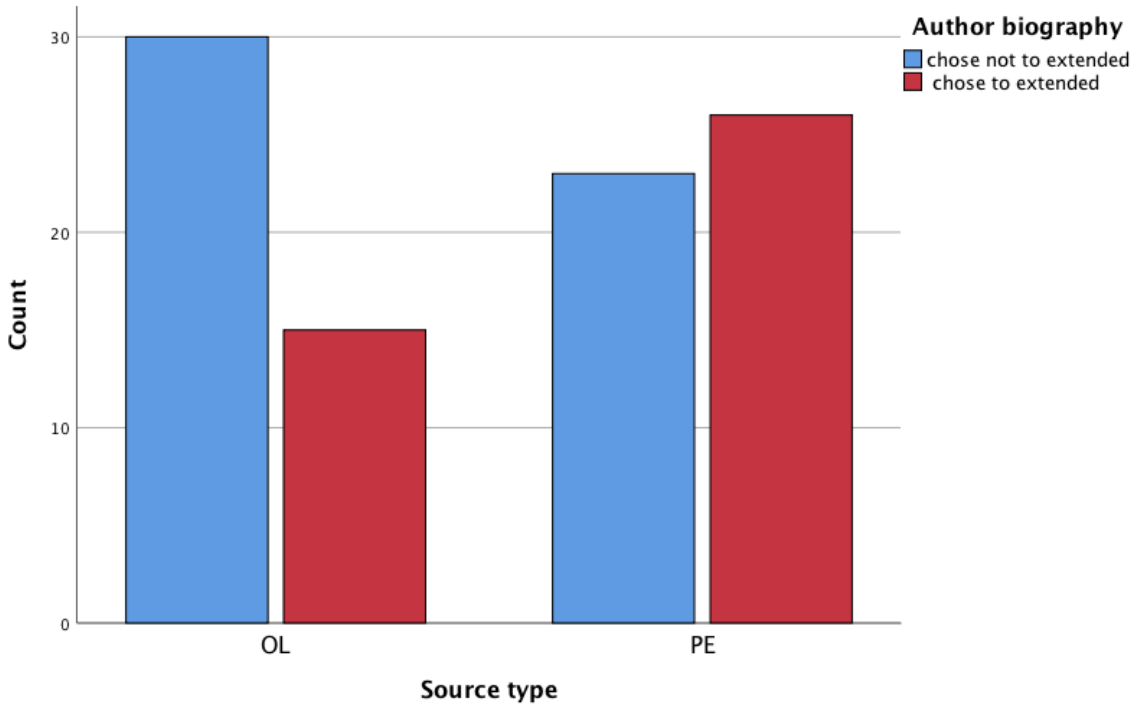

Figure 6.3 Bar Chart of Participants' Choices of Reading The Extended Author Biography

Additionally, the time spent reading the biography versions was analyzed with an independent samples t-test comparing the reading time of the biography under the OL condition and PE condition. No significant differences were found. Hence, neither the time spent reading the short biographies nor the time spent reading the extended versions are significantly influenced by the two source types.

Table 6.5 Results of the Independent Samples t-Test

Biography version	Condition	Average time spent reading	Independent samples t-test
Short biography	OL	35.98 (± SD = 19.369)	$t(1,92) = .059$, $p = .809$
	PE	32.41(± SD = 17.352)	
Extended biography	OL	45.00 (± SD = 21.527)	$t(1,39) = 1.734$, $p = .196$
	PE	70.88 (± SD = 24.804)	

6.4.4 Thematic Analysis of Open-Answered Questions of Study 1

The first question of study 1 asked participants to, "Please provide any thoughts that crossed your mind after having read the abstract: How did you form your opinion on the journal article? Why is this your opinion?". The purpose of this question was to record the participants'

thoughts and feelings without any external influences through directed questions. Responses were coded for comments on the abstract content, the company, including the brand or product, or the source of the abstract. Further, it was coded whether those comments were of a supportive nature, an opposing opinion, or whether the participants were neutral or undecided. The majority of all comments were related to the abstract (n=48, 82.8 %), whereas only a minority of the comments were coded as company related (n=5, 8.6 %) or source related (n=5, 8.6 %). The latter two were, therefore, not further analyzed. Results of a chi-square analysis revealed that the type of source did not affect whether participants were in favour of, opposed to or undecided towards the abstract, $x2$ (2, N=48) = 1.141, p = .565. Under the OL condition, 20 % were coded as being in favour, 36 % as being opposed and 44 % as being neutral. In contrast, 30.4 % of the participants under the PE condition were in favour, 39.1 % were opposed, and 30.4 % were undecided. The differences between the two conditions were not significant. Consequently, without being nudged, the majority of participants thought about the information presented in the abstract, which had no significant influence whether participants were in favour or opposed to the article. Only a minority mentioned the source or the company meaning that these factors had almost no relevance to the participants' first thoughts.

Table 6.6 Chi-Square Analysis Summary of Both Open-Ended Questions

Open-ended question	Condition	Codes	Frequency	Justification
participants' first thoughts about the abstract	OL	In favour	n = 9, 36%	
		opposed	n = 5, 20%	
		neutral	n = 11, 44%	
	PE	In favour	n = 9, 30.1%	
		opposed	n = 7, 30.4%	
		neutral	n = 7, 30.4%	
participants' evaluation of the source's ulterior motive	OL	skeptical	n = 10, 50%	study design & content (n = 8, 80%)
		Not skeptical	n = 8, 40%	Various reasons such as biography of the source, company affiliations, study content
		undecided	n = 2, 10%	

PE	skeptical	n = 5, 27.7%	study design & content (n = 4, 80%)
	Not skeptical	n = 10, 55.5%	biography of the source (n = 7, 70%)
	undecided	n = 3, 16.6%	

In a second open-ended question, the participants were asked to comment on their evaluation of the source's ulterior motive. In particular, the participants were asked, "Please provide any thoughts on your responses to the question above. How did you form your opinion on Dr. Holmberg? Why is this your opinion? Please state any thoughts." The comments were coded for the mention of skepticism or suspiciousness and the justification. Skepticism was coded as present when participants' responses indicated that they believed the source of the message was trying to persuade them or questioned the message in general. Justification was coded if participants indicated that they were influenced by *the source* (e.g. "I think Dr. Holmberg's background tells me that he is worth to trust"), the *company affiliations* (e.g. "he appears to have a conflict of interest"), the *presented study* and *its design* (e.g. "some statements sounded like advertising") or by *other reasonings* (e.g. "I'm always careful"). Results of a chi-square analysis revealed that the type of source did not have an effect on whether participants expressed their skepticism or not $x2$ (2, N=38) = 1.989, p = .370. Under the OL condition, 50% were coded as not skeptical, 40% as skeptical, and 10% as neutral. In contrast, 55.5% of the participants under the PE condition were not skeptical, 27.7% were skeptical, and 16.6% were undecided. Again, these two conditions did not differ significantly. Interestingly, the participants justified their responses differently. That is, under the OL condition, the responses indicate a wide range of reasons why participants do not feel skeptical about the source. Under the PE condition, however, the majority of participants indicate that the biography, hence the experience, gives reason to trust the source. These results convey that even though the outcome is similar, the thought process of forming an opinion is different.

6.4.5 Discussion Study 1

According to the results of study 1, the medical expertise of participants has no influence on recognizing a persuasion intent, regardless of the source. However, these results completely change when participants are asked about potential ulterior motives of the author; that is, participants expect the peer expert to have an ulterior motive, whereas the opinion leader evokes less suspicion. An explanation for these results may be the fact that the RPI scale

measures the activation of conceptual persuasion knowledge which translates into whether participants perceive a persuasion intent (Ham et al., 2015). In contrast, to measure the perceived ulterior motive of the source, the participants were asked *explicitly* to evaluate *the author* and to assess whether the author has been exaggerating or had an ulterior motive. This approach may have prompted the participants to think about their attitude toward the source. As one participant states,

> "*Dr. Holmberg's biography gives grounds to judge him as an expert who endeavours objectivity. […]. Instead, the question above raises doubts, at least for me*" (Participant ID 145, under OL condition).

The empirical findings suggest that participants are more suspicious about the peer expert when they were prompted to think about ulterior motives. These questions resulted in a less favourable perception of the peer expert's motives. Based on these results, it appears that the reputation of the author plays a significant role in making a considered decision about the motivation of the author, as everything else was held constant. Though, due to a limited sample, it is not possible to conclude the reasonings that participants provided. The thought process will, therefore, be examined further in study 2.

Many participants mentioned the potential of conflicts of interest as an important element to evaluate the author's ulterior motive. In study 1, no conflicts of interest were disclosed, which in turn influenced the participants' judgement:

> "*As common in the medical field, it has to be assumed that Dr. Holmberg has worked for some time together with Olympus in the past, maybe even received some funding. Nevertheless, as no conflict of interest or funding is stated, this study seems to be (at least mostly) influence-free of the med device company*" (Participant ID 127, under OL condition).

In study 2, a disclosed conflict of interest is introduced to investigate the influence of disclosure on participants' thought processes.

No significant difference concerning the perceived credibility of the message was found. Moreover, the perceived credibility of the source did not mediate the perceived credibility of the message. Presumably, a meaning transfer of the source's credibility traits did not take place or was not strong enough to influence the perceived credibility of the message, which is why

the results remained insignificant. No significant differences between the source type and attitude towards the company was found. Neither acted the variable source credibility as a mediator between source type and attitude towards the company. Previous research has demonstrated that the effectiveness of endorsements is related to the complexity of the products and the expertise of the endorser (Friedman & Friedman, 1979). As the participants made no difference between the opinion leader's and peer expert's expertise, the insignificant mediation effect can be explained.

Lastly, when looking into applied sentry strategies more in detail, participants under the opinion leader condition were far more likely to ignore the extended biography of the author, whereas half of the participants in the peer expert condition read the extended version. Even though the results of the Chi-Square test were not significant ($p = .054$), it suggests that there is a relationship between the author and whether participants inform themselves more or less about the source of information. If one accepts a lower significance level than 95%, the results are evidence that opinion leaders provoke fewer sentry strategies. In comparison, if opinion seekers are faced with a peer expert, the seem to be more likely to make use of additional information and to check the source.

6.5 Study 2

In the second experiment, the focus was on investigating the influence of company affiliations. A 2 (type of source: peer expert versus opinion leader) x 3 (medical expertise: novice versus advanced versus expert) x 2 (company affiliation: COI present versus COI absent) between-subjects experiment was conducted. The experimental design builds on the findings of study 1. While study 1 investigated the perceived credibility of the source and how it affected the company, study 2 explores the influence of company affiliation on the perceived credibility of a source. Participants were primed by a disclosed conflict of interest of the source to nudge the participants toward maximizing their persuasion knowledge activation. Based on the results, effective managerial implications when cooperating with opinion leaders and peer experts can be derived for marketing purposes.

Just like in study 1, an extended abstract of a medical mock-up journal article was used. Participants were asked to read the abstract first and were then provided with one of the two author biographies (OL or PE). Participants were randomly assigned to the COI_A or COI_P condition, as well as the OL or the PE condition.

6.5.1 Participants and Samples

The eligibility criteria to participate in the study, as well as the remuneration of participants, was similar to study 1. However, in addition to medical students, practicing residents and physicians in Germany and Canada were recruited. Medical students were recruited by email from the Royal University Hospital in Saskatoon, Canada, or the University Hospital Tuebingen, Germany. Residents and physicians from various western Canadian hospitals and several German clinics and hospitals in the South of Germany were contacted by email and personal communications. Additionally, partakers were asked to forward the invitation to participate among colleagues and peers. To prevent that partakers from study 1 participated in study 2, a screening question was added to the questionnaire. Moreover, the participants were asked to not share the invitation with peers affiliated with universities from study 1.

658 students, residents and physicians followed the invitation to participate and clicked on the study link. A target number of 100 for each of the group of Canadian students as well as German students was set to limit the number of participating students. The sample counts 203 students, as three students were still in the process of filling out the questionnaire when the target number was met. Out of the 658 responding participants, 266 completed the questionnaire, 297 dropped out, eight were screened out due to ineligibility, and 95 were screened out as the target number was already met. Hence, a total of 266 participants were recruited for study 2. The numbers of participants per treatment were as follows:

Table 6.7 Overview Participants per Treatment

Medical expertise	Type of source condition	Number of participants	COI condition	Number of participants
Novice	OL	72	COI_A	35
			COI_P	37
	PE	60	COI_A	29
			COI_P	31
Advanced	OL	29	COI_A	17
			COI_P	12
	PE	44	COI_A	25

			COI_P	19
Practicing physicians	OL	27	COI_A	16
			COI_P	11
	PE	34	COI_A	22
			COI_P	12

As the German and the Canadian medical school systems are similar, medical students were again split into novice students and advanced to indicate their medical expertise. A third group, however, was added to accommodate participants who had graduated from medical school already: Practicing physicians. Hence, this group includes residents as well as medical doctors. The inclusion of this group of participants also explains why the average age of participants was higher, and the graduation year range much wider for study 2 than in study 1. The average participant was 26.2 years old, yielding a difference of +2.3 years in comparison to study 1. The participants' ages ranged from 17 to 68 years old. The participant with the most medical experience graduated in 1978, whereas the participants with the least experience expected to graduate in 2026, which results in a range of 48 years. Just like in study 1, the majority of participants were female (n = 147, 55.3%) and 109 participants identified as male (41.0%). Ten participants chose not to disclose their gender (3.8%). Of the 266 participants in total, 105 (39.5%) identified themselves as studying at a Canadian university or practicing in a Canadian hospital. The remaining 161 (60.5%) participants studied at a German University or practiced in a German healthcare facility. Although participants were recruited from two different countries, advertising skepticism and familiarity with the brand were rated similarly. Table 6.8 shows that the differences between the two countries on the previously mentioned variables is marginal and similar to the values for participants in study 1. On average, participants in study 2 finished the questionnaire in 14.8 minutes; hence were 2 minutes faster than participants from study 1.

Table 6.8 Data Sample Comparisons Between Study 1 and Study 2

	Study 1 TOTAL (n=94)	Study 2 TOTAL (n= 266)	CAN (n=105)	GER (n=161)
GENDER (F / M / D in %)	57.4 / 38.3 / 4.3	55.3 / 41.0 / 3.8		
AGE mean (age range)	23.876 (20-32 yrs)	26.213 (17-68 yrs)		

AD_SKEP mean	3.229	3.512	3.536	3.497
FAM_BRAND mean	1.700	1.680	1.390	1.87

6.5.2 Data Analysis

As in study 1, the dimensionality and reliability of the measures were tested before analyzing the data. The cutoff to determine whether measures were unidimensional or composed of multiple factors was again an eigenvalue greater than one (Courtney & Gordon, 2013). Corporate credibility and source credibility were both composed of two factors. These factors were separated into S_TRUST and S_EXPERT for source credibility as well as CORP_EXPERT and CORP_TRUST respectively for corporate credibility. In addition, Cronbach's alpha was calculated to measure the reliability of the scales. All measures were above the threshold level of .7 (Churchill & Peter, 1984) and, hence, were reliable measures:

Table 6.9 Factor Analysis and Reliability For Study 2 Measures

Variable	Construct	Items	Factor Loadings	Cronbach's α
Source credibility	Trustworthiness of the source (S_TRUST)	Dependable - undependable	.788	.924
		honest – dishonest	.882	
		Reliable - unreliable	.911	
		Sincere - insincere	.905	
		Trustworthy - untrustworthy	.896	
	Expertise of the source (S_EXPERT)	Expert – not an expert	.923	.960
		Experienced - inexperienced	.927	
		Knowledgeable - unknowledgeable	.935	
		Qualified - unqualified	.958	
		Skilled - unskilled	.901	
Attitude towards the company	(ATT_COMP)	Reaction towards company bad - good	.909	.903
		Negative - positive	.947	

		Unfavourable - favourable	.894	
Credibility of the message	(M_CRED)	Content of the abstract: accurate	.915	.898
		authentic	.904	
		believable	.918	
Recognition of Persuasion intent	(RPI)	Content of the abstract: believable	.906	.771
		truthful	.891	
		Deceptive (R)	.684	
Corporate Credibility	Corporate Expertise (CORP_EXPERT)	Olympus Inc. has a great amount of experience in the medical field	.886	.835
		Olympus Inc. is skilled in what they do.	.868	
		Olympus Inc. has great experience.	.827	
		Olympus Inc. does not have much experience in the medical field. (R)	.708	
	Corporate trustworthiness (CORP_TRUST)	I trust Olympus Inc.	.795	.818
		Olympus Inc. makes truthful claims	.867	
		Olympus Inc. is honest	.851	
		I do not believe what Olympus Inc. tells me. (R)	.727	
Ulterior Motive	(ULT_M)	Dr. Gregory Holmberg has an ulterior motive for publishing the results stated in the article.	.868	.792
		Dr. Gregory Holmberg's comments in the article are suspicious	.820	
		Dr. Gregory Holmberg is motivated to exaggerate the performance of Olympus Inc.	.833	

		We can depend on getting the truth in most advertising.	.793	
		Advertising's aim is to inform the consumer.	.808	
		I believe advertising is informative.	.739	
		Advertising is generally truthful.	.871	
Advertising Skepticism	(AD_SKEP)	Advertising is a reliable source of information about the quality and performance of products.	.906	.951
		Advertising is truth well told.	.901	
		In general, advertising presents a true picture of the product being advertised.	.884	
		I feel I've been accurately informed after viewing most advertisements.	.890	
		Most advertising provides consumers with essential information.	.825	

(R) = reverse coded

6.5.3 Empirical Findings of Study 2

Hypothesis H_1 stated that there is an interaction effect between medical expertise and source type on perceived credibility of the source. Results of the omnibus ANOVA showed that there was no significant interaction effect between source type and medical expertise on perceived *trustworthiness of the source*, $F(2,260) = 1.349$, $p = .261$. Even though differences in perceived trustworthiness of the source were identified between the three groups novice students, advanced students and practicing physicians, the results are not significant and therefore not interpretable.

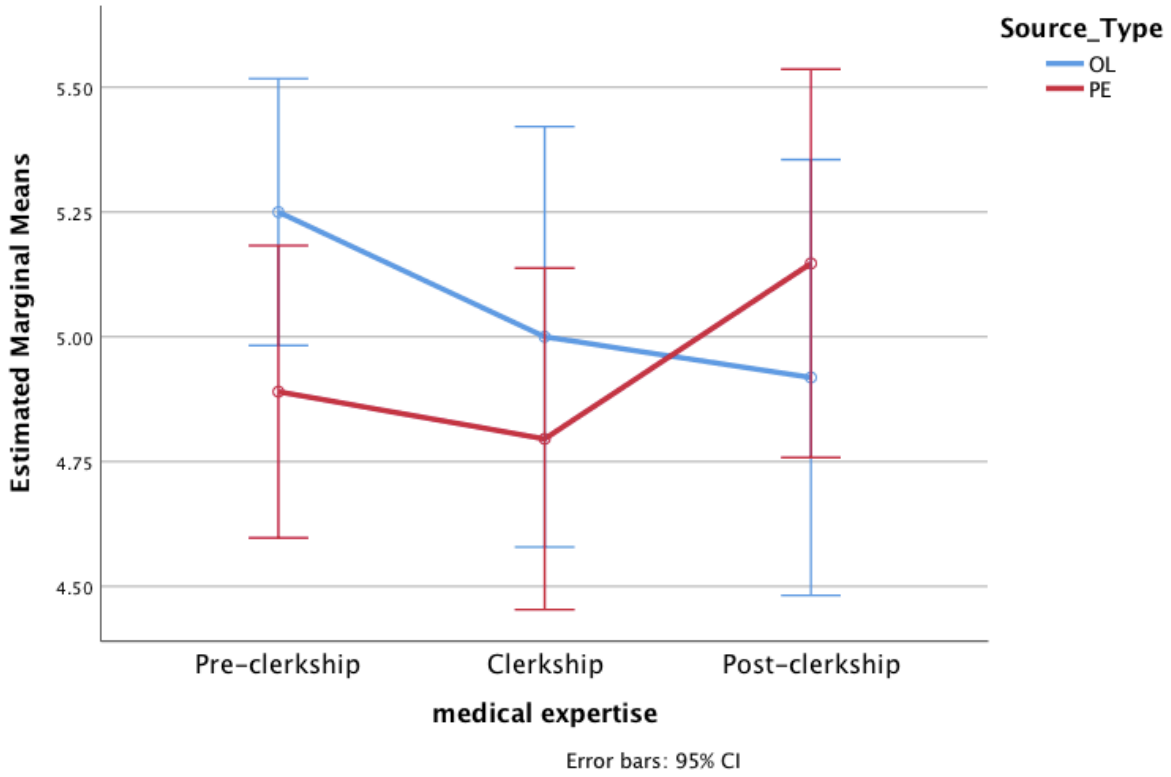

Figure 6.4 Estimated Marginal Means of Perceived Trustworthiness of the Source

Similar analyses were conducted to examine the differences between the source type and medical expertise on perceived *expertise of the source* (Table 6.12). Again, the omnibus ANOVA was not significant, $F(2,260) = 1.226$, $p = .675$. Based on these results, it can be concluded that the perception of source credibility is not moderated by medical expertise. H_1 is not statistically supported.

Table 6.10 ANOVA Table Summarizing the Differences of Source Type on Source Credibility Collapsed Over Medical Expertise

Dependent Variable	Medical expertise	OL condition	PE condition
Trustworthiness of the source (S_TRUST)	Novice	M = 5.250 ± SD = 1.054	M = 4.890 ± SD = 1.138
	Advanced	M = 5.000 ± SD = 1.229	M = 4.796 ± SD = 1.261
	Expert	M = 4.919 ± SD = 1.316	M = 5.147 ± SD = 1.019
Expertise of the source (S_EXPERT)	Novice	M = 5.942 ± SD = 1.259	M = 5.503 ± SD = 1.628
	Advanced	M = 5.779 ± SD = 1.093	M = 5.600 ± SD = 1.512

	Expert	M = 5.837 ± SD = 1.228 M = 5.856 ± SD = .987

Mediation analyses were conducted with Hayes' PROCESS model 4 to investigate whether participants' perceived trustworthiness and perceived expertise of the source was mediated by the participanpt's activation of persuasion knowledge ($H_{2a)}$. The mediation analyses were therefore conducted with variable *recognition of persuasion intent* as well as perceived *ulterior motive as mediator*. No significant mediations were found (Table 6.13). Therefore, H_{2a} is not supported. In addition to the mediation analysis, an exploratory analysis was conducted to account for the influence of company affiliations. Two moderated mediation analyses (model 7) were conducted to assess whether the presence of a conflict of interest moderated RPI or ULT_M, and, as a consequence, S_TRUST and S_EXPERT, respectively. Yet, no significant moderated mediations were found.

Table 6.11 Results of the Mediation Analysis of Perceived Credibility of the Source

Mediator	Dependent Variable	Mediation result
RPI	S_TRUST	indirect = .0001, *SE* = .011, 95% CI [-.023, .023]
	S_EXPERT	indirect = .0005, *SE* = .014, 95% CI [-.029, .032]
ULT_M	S_TRUST	indirect = .0011, *SE* = .014, 95% CI [-.029, .030]
	S_EXPERT	indirect = -.0031, *SE* = .027, 95% CI [-.063, .049]

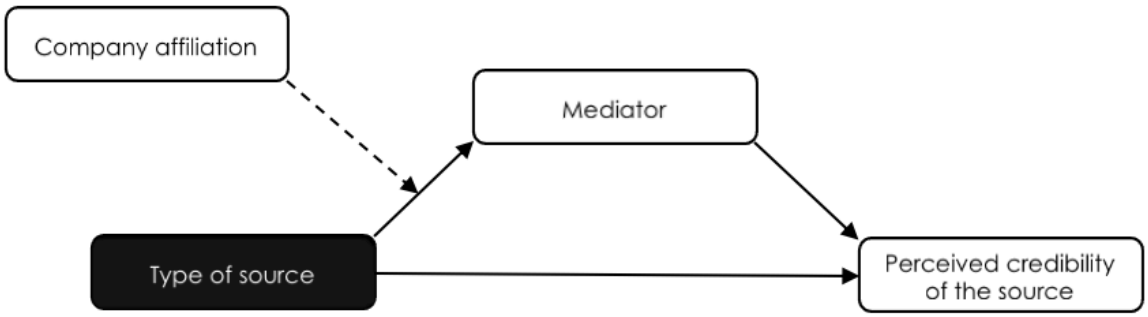

Figure 6.5 Moderated Mediation Analysis of Perceived Credibility of the Source

In H_{2b} it was hypothesized that there is an interaction between medical expertise and source type on activation of persuasion knowledge. Conducting an omnibus ANOVA analyzing the interaction effect on the variable *recognition of persuasion intent* was not significant, $F(2,260) = .458$, $p = .633$. Consequently, there was no significant difference between novices, advanced students and residents or physicians and whether they recognized

a persuasion intent when either confronted with an opinion leader or a peer expert. A second omnibus ANOVA analyzing an interaction effect between source type and medical expertise on *perceived ulterior motive* was also not significant, $F(2,260) = .058$, $p = .944$. Even though the results reveal that novice students (M = 4.051 ± SD = 1.270) are less suspicious about the source's actions than residents and physicians (M = 4.508 ± SD = 1.276) the outcomes are not statistically different. the empirical findings do not support H_{2b}.

An ANOVA was conducted to examine whether there was a difference between the source types on *credibility of the message* (H_3). Results indicated that there were no significant differences between the group means, $F(1,261) = .026$, $p = .871$. Consequently, H_3 is not supported by the data.

Hypothesis H_4 stated that opinion leader endorsements enhance attitude toward the company more than endorsements by a peer expert. An ANOVA was conducted to examine whether there was a difference between the source types on *attitude toward the company.* The outcomes revealed no significant differences, $F(1,264) = .102$, $p = .750$. Consequently, the results suggest that opinion leaders are not more effective in enhancing the attitude toward the company than peer experts. Hence, H_4 was not supported. An additional exploratory analysis was conducted to determine the influence on company affiliations on attitude toward the company. A significant main effect for company affiliation was found, $F(1,262) = 5.658$, $p = .018$. The findings demonstrate that the participants' attitude towards a company is significantly lower when a conflict of interest is present (M = 3.950 ± SD = 1.221) and higher when a conflict of interest is not disclosed (M = 4.267 ± SD = .990).

A Chi-Square test analysing the relationship between choosing to read the biography extension and the absence or presence of company affiliations was not significant, $x2$ (1, 266) = 3.575, $p = .059$. Yet, when a when a conflict of interest was absent, many participants chose actively to not read the extended biography (58.3%, n=84). Splitting the data based on the conditions COI_A and COI_P, yielded a significant relationship between reading the extended biography and the source type, but only when a conflict of interest was *absent*, $x2$ (1, N=144) = 5.095, $p = .024$. In particular, only 32.9% (n=25) of all participants in the PE condition decided to read the extended version when the conflict of interest was absent. In contrast,

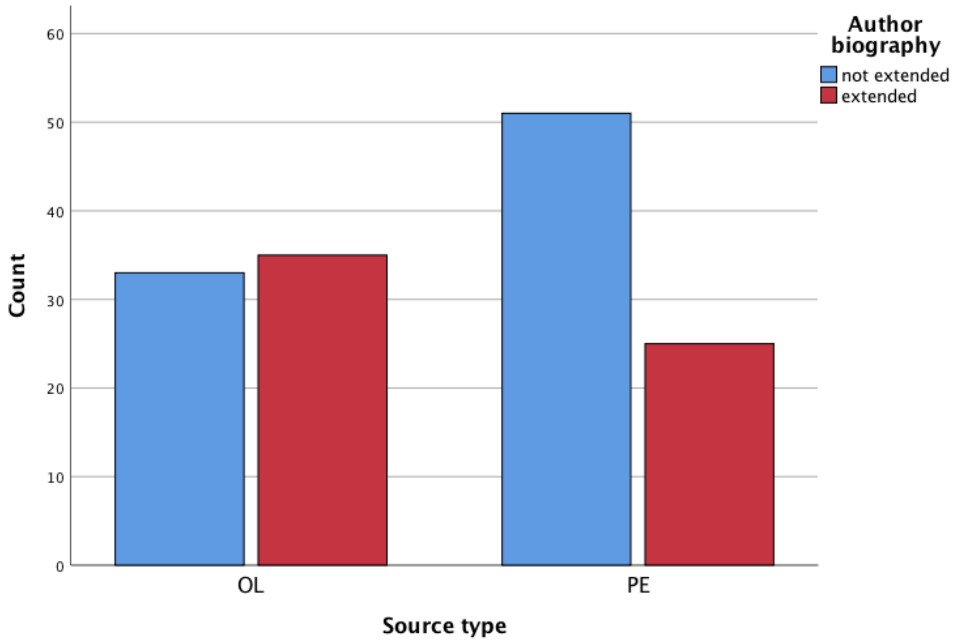

Figure 6.6 Bar Chart of Participants' Choices of Reading The Extended Author Biography When a Conflict of Interest Was Absent

under the OL condition, just over half of the participants looked at the extended biography (51.5%, n=35). There was no relationship between reading the extended version and the source type when a conflict of interest is *present*, *x2* (1, N=122) = 2.074, p = .150. These results show that when a conflict of interest is present, participants apply just as much care evaluating the source of information with a peer expert as they would with an opinion leader. However, if a conflict of interest is absent, the peer expert provokes participants to apply less care when evaluating the source. This means that participants apply fewer sentry strategies when faced with information from a peer expert. Consequently, there is significant relationship between the type of source and the application of sentry strategies. Despite the results, H_5 was not supported as it was predicted that medical professionals apply fewer sentry strategies when confronted with an opinion leader.

H_6 stated that participants would be more likely to resist a persuasion attempt when a conflict of interest is disclosed. To analyze whether the presence of a conflict of interest moderated the participants' activation of persuasion knowledge, two ANCOVAs were conducted: one with the variable RPI and one with ULT_M. After controlling for the participants' country of medical training, medical expertise and familiarity with the brand, the results indicated that there was no significant main effect of company affiliations on

recognition of persuasion intent, $F(1,263) = .462$, $p = .497$. Neither was there a significant main effect on perceived ulterior motive, $F(1,261) = 1.572$, $p = .211$. Consequently, the disclosure of a conflict of interest appears to have no effect on activation of persuasion knowledge. Thereore, H_6 is not supported.

An ANCOVA was conducted to analyze whether the presence of a conflict of interest moderated the perceived credibility of the company. When controlling for the participants' country of medical training and familiarity with the brand, the results yielded a significant main effect of company affiliations on perceived corporate expertise, $F(1,260) = 8.116$, $p = .005$.

Table 6.12 ANCOVA Summary Analyzing Whether Company Affiliations Moderate Credibility of the Company

Dependent Variable	Source type condition	COI absent	COI present	Results
Corporate expertise (CORP_ EXPERT)	OL condtion	M = 4.467 ± SD = .830	M = 4.783 ± SD = .874	$F(1,124) = 2.052$, $p = .155$
	PE condition	M = 4.477 ± SD = .827	M = 4.802 ± SD = .841	$F(1,134) = 6.533$, $p = .012$

Results of the simple main effects analyses showed a significant increase of perceived corporate expertise under the PE condition when the conflict of interest was present. Under the OL condition, the simple main effect was not significant. As a consequence, corporations benefit from a disclosed conflict of interest when cooperating with a peer expert as it increases a medical professional's perceptions of corporate expertise, and, thus, increases the credibility of the company. These empirical findings are evidence that company endorsements by a closely affiliated source have a positive effect on corporate expertise, thus corporate credibility.

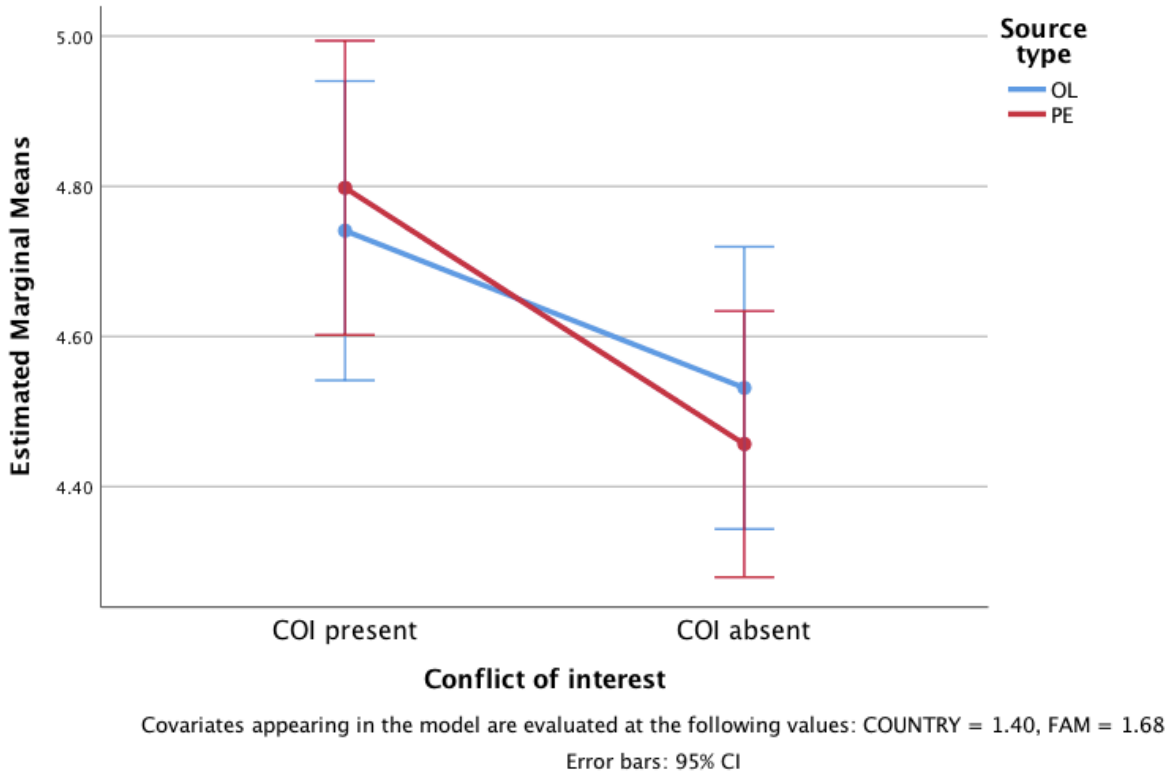

Figure 6.7 Estimated Marginal Means of Corporate Expertise Depending on Source Type and Conflict of Interest

In addition to the aforementioned calculations, an exploratory analysis was conducted to test whether there was a change of perception of expertise or trustworthiness of the source under *varying company affiliations* (Table 6.11). There was no significant main effect of company affiliations on perceived trustworthiness of the source, $F(1,264) = .036$, $p = .850$. However, perceived expertise of the source was significantly different, $F(1,264) = 4.106$, $p = .044$. The results demonstrate that perceived expertise of the source is positively influenced by company affiliations. The perceived expertise of the source increases from M = 5.596 (± SD = 1.367) under COI_A condition to M = 5.930 (± SD = 1.303) when a conflict of interest is disclosed.

6.5.4 Thematic Analysis of Open-Answered Questions of Study 2

The questionnaire of study 2 also began with an open-ended question to record the participants' general and uninfluenced thoughts after having read the extended abstract and the source biography. It was again coded for comments on the abstract content, the company, or the source of the abstract. Moreover, comments were also coded on whether they expressed a

counter-argument, a supportive argument or neutrality. As in study 1, most participants commented on the content of the extended abstract (n=169, 82.0 %) and only a few comments were coded as company related (n=24, 11.7 %) or source related (n=13, 6.3 %). Due to the limited responses, company and source-related comments were not further analysed. The chi-square analysis indicated that there was no relationship between the type of source and whether participants expressed support for the findings of the abstract or whether they expressed counter-arguments, *x2* (2, n=169) = .644, *p* = .725. Based on these results, it can be concluded that the majority of participants think about the information presented in the abstract and that the source type appears to be irrelevant when forming an opinion about the research presented in the abstract.

The answers to the second open-ended question about the participants' evaluation of the source's ulterior motive were again analyzed with a Chi-Square analysis. Responses were coded for the presence or absence of any form of skepticism or suspiciousness and how participants reasoned. Since the variable company affiliations was introduced in study 2, two chi-square analyses were conducted to account for the presence and absence of a conflict of interest in the abstract.

Table 6.13 Chi-Square Analysis Summary of the Open-Ended Question About the Source's Ulterior Motive

Open-ended question	Condition	Codes	Frequency	Justification
participants' evaluation of the source's ulterior motive	COI_P	skeptical	n = 49; 67.1%	presence of a conflict of interest (n = 35; 71.4%); study design (n = 9; 18.4%)
		Not skeptical	n = 8; 11%	biography of the source (n = 12; 50%)
		undecided	n = 16; 21.9%	
	COI_A	skeptical	n = 25; 36.2%	study design (n = 19; 76%)
		Not skeptical	n = 32; 46.4%	biography of the source (n = 21; 47.7%)
		undecided	n = 12; 17.4%	

Under the COI_P condition, the results of the chi-square analysis showed that there was no relationship between the type of source and whether participants are explicitly skeptical or not skeptical *x2* (2, n=73) = 2.603, *p* = .272. Most responses expressed some sort of skepticism,

while only a few participants explicitly mentioned not being skeptical or being undecided. The skeptics justified their opinions mostly by mentioning the presence of a conflict of interest and the study design of the research in the extended abstract. In contrast, the non-skeptics mostly pointed to the biography of the source as the reason for their opinion.

The results of the chi-square analysis under the COI_A condition confirms that there was no relationship between the type of source and whether participants are explicitly skeptical or not skeptical $x2$ (2, n=69) = 1.179, p = .555. Approximately one-third of the participants expressed skepticism, whereas 46.4% explicitly stated that they were not skeptical. 17.4% were undecided. As before, the majority of non-skeptics justified their opinion by referring to the biography of the source. The skpetics, however, mostly name the study design as the reason for their skepticism.

Based on these results, it appears that the biography of the source is an aspect that medical professionals make use of to form an opinion about the source of information. However, the outcomes suggest that if a conflict of interest is present, the biography of the source becomes less important. The following quote illustrates this process of opinion formation*:*

> "*His CV makes him credible, the payment of the company takes it possibly away again.*" (Participant ID 361, under PE and COI_P condition).

Interestingly, some participants perceived the disclosure of the conflict of interest as an act of honesty. They explicitly stated that disclosing the conflict of interest made the source more credible:

> "*Honest, since previous collaboration is disclosed.*" (Participant ID 455, under PE and COI_P condition).

These examples demonstrate how diverse opinions can be and how ambiguously the participants perceived some information.

6.5.5 Discussion Study 2

The empirical findings do not provide evidence that medical professionals differentiate between opinion leaders and peer experts depending on their own medical expertise. Although the results showed that novice students assessed the credibility of the source differently than more experienced residents and physicians, the differences were not as drastic and not

significant. Thus, medical professionals do not differentiate between opinion leaders and peer experts in terms of their credibility.

Based on the results, it should be noted that the absence or presence of a conflict of interest influences multiple variables. The empirical findings yielded a main effect of company affiliations on the participants' attitudes toward the company. In particular, the present data demonstrate that the participants' attitude toward the company significantly decreases when a conflict of interest is disclosed. Therefore, it would be in the best interest of the company when an author had no conflict of interest to disclose, as this would prevent readers to develope a negative attitude towards the company. Interestingly, the disclosure of conflicts of interest had no influence on medical professionals and their activation of persuasion knowledge regarding the presented information and its source. Regardless of the authors' company affiliations, the study participants were just as likely to recognize a persuasion intent or to perceive an ulterior motive in the author of the article. Therefore, no significant differences were found.

Yet, the results suggest that company affiliations influence the application of sentry strategies. It was found that fewer sentry strategies are applied if conflicts of interest are absent. In particular, participants informed themselves significantly less about the peer expert than about the opinion leader. It is assumed that the peer expert as author made participants in the experiment less suspicious, which, in turn, lead to the ignorance of the extended author biography. However, when company affiliations were disclosed, about every second participants chose to read the extended author biography, regardless of the type of author. This behaviour indicates that company affiliations trigger medical professionals to make use of additional information about the source. Responses to the open-ended questions reflect this behaviour.

However, the experiments also show that disclosure can be favourable for the source as well as the company. In particular, disclosure of a conflict of interest can positively affect the perceived expertise of the source as well as of the corporation. Both source types benefitted from a disclosed conflict of interest; the perceived expertise increased significantly, making the respective author of the mock-up article more credible. Additionally, when a company cooperates with a peer expert as a spokesperson, the firm can increase medica professionals' perceived corporate expertise and, in turn, appears more credible. A company cooperating with an opinion leader cannot take advantage of this effect. Perceived corporate expertise did not significantly change with the opinion leader as a spokesperson. The results reveal that a

disclosed conflict of interest is not necessarily unfavourable for companies and can even strengthen perceived corporate expertise.

7 GENERAL DISCUSSION

This research concludes that medical professionals do not differentiate between opinion leaders and peer experts in terms of the perceived credibility of these sources. The differences between academic achievements (e.g. publications, editorial work, employment at renowned medical school) and practical experience (e.g. high amount of treated patients, many years of experience as a physician) appear to have no effect on perceived expertise or perceived trustworthiness. Neither is the medical expertise of the medical practitioner influencing these results.

Yet, other findings warrant further discussion. The results of study 1 yielded evidence that opinion leaders and peer experts activate medical professionals' persuasion knowledge differently. That is, medical professionals become more suspicious about the ulterior motive of peer experts than of opinion leaders when being asked about potential ulterior motives of the source. This phenomenon could be related to the correspondence bias, which describes the fact that consumers draw conclusions from situational cues and ignore other information (Cronley et al., 1999). In the expertiment, these situational cues were provided in the form of biographies describing the sources. As one participant stated:

> "*I think Dr. Holmberg's background tells me that he is worth trusting. He also published many of his writings, and that is a good sign for me*" (Participant ID 124, under OL and COI_A condition).

Since everything was held constant, apart from the source type, the findings indicate that the academic achievements and reputation of the opinion leader play an important role when medical professionals are asked to overthink their opinion about a source's ulterior motive. As consequence, the opinion leader triggers less distrust whereas the peer expert's lack of reputation leads medical professionals to become more skeptical. In study 2, this phenomenon was not replicated, even when controlling for the medical experience of the participants or the company affiliations. An explanation for the deviating results of study 2 may be the fact that the two German student samples collected for the two studies were not homogenous enough in terms of medical training. Despite a similar nationwide curriculum for medical studies in Germany, universities can adjust courses and content. Notably, classes targeting ethical behaviour in science or seminars on how to conduct research could have affected the perception of students and how to cope with opinion leaders and other experts. Moreover, cultural differences in perception have possibly contributed to why the results from study 1 could not

be replicated, even though medical students in Germany and Canada have a similar curriculum and therefore share similar medical training. An indicator for this explanation is the significant results of the covariate measuring the country in which the participants were trained. Given these discrepancies, the interpretation of these findings remains difficult and should not be generalized beyond this study. Further research is recommended to confirm the justification of these outcomes.

Coping with persuasion attempts can lead to the application of sentry strategies by the persuasion target (Kirmani & Campbell, 2004). This research argues that conducting external research after the persuasion attempt can also be a form of a sentry strategy to guard against unwanted influences by the persuasion agent. Therefore, the experiments tested whether participants would make use of additionally provided information of the source to form an opinion about the extended abstract. The general picture emerging from the analysis is that it is not the author of the abstract that provokes medical professionals to collect more information about the source but the company affiliations. The data provide evidence that when the author explicitly reports “no conflict of interest”, the participants are less likely to read more about the source in an extended biography. Thus, they apply fewer sentry strategies and do not conduct additional external research. Conversely, when a conflict of interest is disclosed, medical professionals seem to understand the possible implications of a source’s company affiliation, namely the presentation of potentially biased information. Therefore, medical professionals guard against potential persuasion attempts. These findings are in line with the results of other scholars who have investigated disclosure related to the activation of persuasion knowledge (Boerman et al., 2017; Campbell et al., 2013; Reijmersdal et al., 2016) or processing biased information (Cain, Loewenstein, & Moore, 2005, 2010).Presumably, marketing activities such as workshops in cooperation with companies without the explicit disclosure of conflicts of interest may yield better chances to persuade future customers. However, while the participants of study 1 applied fewer sentry strategies when the opinion leader was the author of the abstract, the participants of study 2 applied fewer sentry strategies under the peer expert condition. These discrepancies can again be attributed to the different samples in the two experiments. Further research is necessary to determine which source type affects the application of sentry strategies more.

Apart from affecting the application of sentry strategies, the presence of a conflict of interest influenced the participants in various ways. Particularly noteworthy are the results

regarding the perceived expertise of the source and corporate expertise. The data suggests that there is a link between the disclosure of conflicts of interest and perceived expertise. The opinion leader's expertise was perceived as significantly higher when a conflict of interest was disclosed. Likewise, the peer expert's level of expertise increased, albeit not significantly. Consequently, the disclosure of a conflict of interest is the driving factor to let participants differentiate between the expertise of a peer expert and an opinion leader. This notion is supported by the comments that participants provided. As one participant mentions:

> "*Dr. Holmberg's association with Olympus impacted my opinion. While he may have medical experience and expertise, his research endeavours may be influenced by his affiliation with Olympus*" (Participant ID 342, under PE and COI_P condition).

Subsequently, the disclosure of conflicts of interest has a positive effect on the perception of a source's credibility. These results might seem counterintuitive, but appear to be valid if one assumes that medical companies only cooperate with highly experienced physicians which, in turn, could boost their perceived expertise in the eyes of the consumers. Cain et al. (2005) speculated about such positive effects of disclosure and Mercer (2005) demonstrated that disclosure can indeed positively affect credibility. This research confirms the positive effects of disclosure of conflicts on medical professionals and explains the phenomenon. That is, the act of disclosing a conflict of interest outweighs the conflict itself:

> "*Dr. Holmberg was quick to disclose conflicts of interest as well as forthcoming in his explanations and disclosures. I don't have enough reasons to accuse him of dishonesty or suspicious motives*" (Participant ID 340, under PE and COI_P condition).

Based on these results, it can be concluded that disclosure can also have positive repercussions in regards to source credibility, in particular to perceived expertise. Further, these findings contribute to a better understanding of the link between source credibility and disclosure literature. Only one other study had previously tested that link, but did not include source expertise in their examination (Hwang & Jeong, 2016). It has to be noted, that disclosure of conflicts of interest is a current issue in the field of medicine, which is extensively discussed by medical or pharmaceutical scholars. Yet, their focus revolves around the act of disclosing conflicts of interest and academic integrity (Sah & Fugh-Berman, 2013; Steinbrook, Kassirer, & Angell, 2015),the medical consequences of industry-sponsored studies (Flaherty, 2013), and the fine line of universities attracting funds from external parties to advance research without

becoming economically dependent on such support (Korn, 2000). Consequently, this research provides a new perspective on the issue and emphasizes the information processing by readers of such literature. The empirical findings also provide evidence that the disclosure of a conflict of interest has a positive effect on corporate expertise. The company's expertise was rated significantly higher when the peer expert was presented as the author of the abstract, and a conflict of interest was disclosed. When the opinion leader was presented as the author of the abstract, it neither had a positive nor a negative effect on the company's credibility. Results obtained by Cronley et al. (1999) are consistent with the findings of this research. They state that a source's company affiliation does *not negatively* affect corporate credibility. With the results of this research, one can even go a step further and tentatively claim that company affiliations can have *positive effects* on corporate expertise. A possible interpretation of these outcomes is that the participants appreciated the practical experience of the peer expert and transferred those characteristics onto the manufacturer of the endorsed products. In contrast, the academic achievements of the opinion leader were not as relevant and transferrable. This behaviour is in line with findings from other scholars who have found that positive personality traits are transferred under high fit with the brand while negative traits are transferred in low fit situations (Batra & Homer, 2004; Campbell & Warren, 2012). Yet, given the fact that this research did not focus on the ability to transfer expertise from spokespersons to corporations, this explanation should not be over-interpreted. In sum, it can be said with confidence that company affiliations in the form of disclosed conflicts of interest can have positive effects on the credibility of a source as well as on the endorsed company. This study, therefore, contributes to the limited literature of disclosure and emphasizes its beneficial aspects for corporations and individuals.

Besides the positive effects of disclosed conflicts of interest, there are also negative consequences for the company and the source. The outcomes demonstrate that the participants' attitude toward the company significantly decreases when a conflict of interest is disclosed. These findings are no surprise and confirm the results of previous studies (Boerman et al., 2017; Campbell et al., 2013; Reijmersdal et al., 2016). The disclosure helps consumers to identify the given piece of information as a persuasion attempt and to reassess the situation. Campbell et al. (2013) have demonstrated that the reassessment leads consumers to correct their opinions, thus, lowering their attitude toward the company. The correction process is also described by participants and confirm the explanation provided by Campbell et al.,

"*When I read that Olympus Inc. sponsored the study, I became suspicious. This painted the article, the work, the author and the company in a bad light!*" (Participant ID 281, under OL and COI_P condition).

To conclude the findings, it can be said that the type of source can activate medical professionals' persuasion knowledge and that opinion leaders are, just like other spokespersons, not immune to consumers' skepticism. Even though participants mention company affiliations as influencing factor to determine the credibility of the source, empirical analyses demonstrate that there is no statistical effect which would let the source of an article appear as an agent of persuasion with ulterior motives.

Table 7.1 Summary of Research Questions Answered in the Analysis

No.	Research question	Result/ Specific finding
RQ_1	Can an opinion leader be perceived as an agent of persuasion?	There was a statistical difference between peer experts and opinion leaders on perceived ulterior motive. That is, peer experts are more likely to be seen as source with an ulterior motive. There was no statistical difference between novice students and practicing physicians regarding the activation of persuasion knowledge.
RQ_2	Under which conditions are experts without public recognition as influential as opinion leaders?	There was no statistical difference between peer experts and opinion leaders regarding their influence on the medical professional's attitude toward the company or message credibility.
RQ_3	How do company endorsements by a closely affiliated source influence corporate credibility?	Peer experts can evoke a higher corporate expertise when a conflict of interest is present.

Additionally, the analyses revealed that peer experts are just as influential as opinion leaders in regards to message credibility or attitude towards the company. Consequently, peer experts without public recognition can evoke the same effects and there is no need to cooperate with a known opinion leader to manipulate the perceived message credibility or the attitude towards the company. The decision to cooperate with a peer expert instead of an opinion leader can be even more beneficial for a company, if boosting corporate expertise is sought to be achieved. Peer experts can increase perceived corporate expertise while opinion leaders have no significant effect in this regard. As a consequence, peer experts can be just as influential as

opinion leaders or even have a bigger influence on medical professionals, depending on the company's goals.

7.1 Managerial Implications

For marketers of pharmaceutical manufacturers or medical device companies, the findings of this research have significant implications. Since the influence of the source may change drastically depending on external factors such as whether conflicts of interest have to be disclosed, practitioners are well-advised to plan marketing campaigns carefully to align the effects with the marketing goals.

First, medical professionals appear to be just as suspicious about potential ulterior motives of an opinion leader than of a peer peer expert. The medical expertise of the target audience does not influence the activation of persuasion knowledge. Yet, marketers should focus on medical students as research has demonstrated that practices developed during training endure and are not changed later as a medical doctor (Mccormick, Tomlinson, & Detsky, 2001). Moreover, it is known that the exposure to small promotional items of medical manufacturers or pharmaceutical firms already have a favourable effect on medical professionals and their implicit attitude toward a brand (Grande, Frosch, Perkins, & Kahn, 2009). By cooperating with physicians that advocate a specific brand or a product, this brand exposure of potentially future decision-makers can be increased.

Second, when there are no conflicts of interest disclosed, medical professionals apply fewer sentry strategies in the form of additional external research. This means that many medical students and physicians are not concerned about the information source and are therefore less likely to guard against unwanted persuasion. However, if conflicts of interest are disclosed, medical professionals become more suspicious and pay more attention to the source of information. Hence, they are more likely to apply sentry strategies as the disclosure of company affiliations is perceived as an indicator of a possible persuasion attempt. As a consequence, the attitude towards the company decreases. To avoid negative endorser effects, it is recommended to keep company affiliations of a cooperating physician to the absolute minimum. Nevertheless, there is one exception: when working together with peer experts as peer expert endorsers, marketers can take advantage of the fact that peer experts can boost the company's expertise, hence the credibility.

Third, to influence the message credibility or to increase the attitude towards the company, both opinion leaders and peer experts, appear to be equally effective. From a marketer standpoint, this enables saving potential as both source types can achieve the same results. For these reasons, the choice, whether a peer expert or an opinion leader is selected for cooperation purposes, should be based on economic factors such as compensation and travel expenses, or the specific marketing goals and the appropriate endorser type.

7.2 Regulatory Implications

The empirical findings of this research show how different individuals cope with the disclosure of conflicts of interest. On the one hand, there seems to be a minority of medical personnel, students and physicians, who appreciate the source's honesty of disclosing company affiliations. In the eyes of these individuals, the act of disclosing conflicts of interest remedies the conflict itself. As a consequence, they perceive the source as (more) credible. The company benefits likewise and can increase their perceived corporate expertise. On the other hand, many medical professionals consider a conflict of interest a clear indication to mistrust the source. They use this clear evidence of conflicts of interest to cautiously process or even discount the presented information. Subsequently, disclosure of conflicts of interest can also be beneficial from a consumer protection perspective to enable proper evaluation of data as well as the circumstances under which it was collected. Despite these evident benefits of disclosure from a consumer perspective, it is also known that disclosure can lead to information receivers failing to correct for biased advice (Cain et al., 2005). A further complication of the phenomenon is that disclosure can also result in exaggerated statements and biased advice by advisors (Cain et al., 2010). Hence, in a worst-case scenario, the disclosure of a conflict of interest in a journal article could lead to distorted information presentation by the author, such as the CEE or PEE. Simultaneously, it could lead to distorted information processing by the message recipient, failing to adequately correct for biases. Given the potential for information distortion and incorrect discounting for biases, regulators should focus instead on the avoidance of conflicts of interest in the upstream processes of research.

Research centers are often dependent on grants from industry partners but also benefit from cooperations with firms to accelerate scientific progress. Yet, it seems that the core of the problem is the influence that pharmaceutical companies and medical manufacturers can exert through funding when study results are published in medical journals. In particular, biases, reciprocities and quid pro quo behaviour between scholars and industry partners arise because

firms are able to fund specific researchers or particular research projects. If a research committee or the university clinic could act as an intermediary to allocate funds from industry partners, external influence on scientific studies would be limited. Additionally, researchers would be less exposed to pressure from companies to generate favourable results. Therefore, this research suggests to limit external funding of project-specific research and exclusive research grants designated for specific researchers.

8 CONCLUSION AND LIMITATIONS

This research sought to scrutinize the effects of opinion leaders in medical science on practicing physicians as well as medical students. In particular, this research focused on the persuasion coping behaviour of persuasion targets and whether a so-called peer expert without any reputation can be as influential as a renowned opinion leader. The results showed that there are no differences regarding their influence on message credibility or attitude toward the company between the peer expert and the opinion leader. Moreover, it was found that disclosing company affiliations lead to the correction of attitudes toward the company. Besides the adverse effects, however, disclosing conflicts of interest can also be beneficial as it boosts the credibility of the source and helps to increase the perceived credibility of the corporation. Marketers can take advantage of this research and select the most effective source type depending on their marketing goals. Regulators, on the other hand, are provided with insights under which conditions medical professionals are indirectly influenced through scientific literature and how disclosure of conflicts of interest is processed. These insights can guide regulators to determine whether mandatory disclosures of conflicts of interest in publications represent an appropriate measure if research is conducted in cooperation with an industry partner.

As with any research, the empirical findings of the present experiments are not without limitations. Three limitations are highlighted. First, participants of study 1 and study 2 were not homogeneous enough. Even though participants were exposed to similar treatments in both studies, it was not possible to replicate findings of study 1 in study 2. Due to limited access to medical professionals and medical students, it was necessary to recruit participants not only from two different countries but also from various colleges. As a consequence, their medical knowledge, their coping behaviour in regards to research ethics, and their general attitude towards healthcare marketing differed. These differences may have had a bigger impact on the experiments than anticipated and explain the deviations between the first and second experiment. Second, omitting a control group limited the validity of the experiments. Due to the limited sample size, it was decided to omit the control group to simplify the experimental design and to increase empirical power per treatment. However, without a control group, it is not possible to scrutinize the magnitude of the effects that were measured. Instead, the results only allow drawing conclusions about the differences between the two source types under investigation. Third, there was little control over how long participants took to read the mock-up article and to fill out the questionnaire. Since the experiments were conducted online, it

cannot be controlled how committed participants were while reading the fictitious biography or whether they spent enough time to make their answers meaningful. Therefore, it remains unclear how influenced the participants were by the experimental manipulations in their responses.

The aforementioned limitations provide opportunities for future research to examine the influence of opinion leaders further and to compare with other source types such as peer experts. Besides these aspects, further studies will have to investigate the role of disclosure of conflicts of interest. Notably, under which conditions is disclosure beneficial for industry partners and the source is a question that should be examined. But future research should also shed light on the tradeoffs of disclosure. Moreover, more investigation is needed regarding the influence of different source or endorser types, their perceived credibility, and how this is linked to consumers' persuasion knowledge. The latter determines whether and how consumers apply seeker or sentry strategies and are, therefore, candidates for discussion.

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Appendix A. Research Ethics Approval

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB) 28/Oct/2019

Certificate of Approval

Application ID: 1480

Principal Investigator: Marjorie Delbaere

Department: Department of Management and Marketing

Locations Where Research Activities are Conducted: Online, Germany
Online, Canada

Student(s): Alexander Mueller

Funder(s):

Sponsor:

Title: Opinion Leader Endorsements in the Medical Industry the Tipping Point of Perceiving Leaders as Agents of Persuasion

Approved On: 28/Oct/2019

Expiry Date: 27/Oct/2020

Approval Of:

1. Implied consent information (Student version; Non-student version)
2. Short portraits (Opinion leader; Peer expert)
3. Extended portraits
4. Mock-up article (With company affiliations; Without company affiliations)
5. Experiment one questionnaire
6. Experiment one debriefing sheet (Student version; Non-student version)
7. Experiment two questionnaire
8. Experiment two debriefing sheet (Student version; Non-student version)
9. Participants recruitment script (in-person announcement, only for students)
10. Participants recruitment script (e-mailing list, only for students)
11. Participants recruitment script (personal e-mailing list, Student version; Non-student version)

Acknowledgment Of:

Review Type: Delegated Review

CERTIFICATION

The University of Saskatchewan Behavioural Research Ethics Board (Beh-REB) is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2 2014). The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this project, and for ensuring that the authorized project is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS

In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month prior to the current expiry date each year the project remains open, and upon project completion. Please refer to the following website for further instructions: https://vpresearch.usask.ca/researchers/forms.php.

Digitally Approved by Diane Martz, Chair
Behavioural Research Ethics Board
University of Saskatchewan

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Appendix B. Participant Consent Forms

Participant Implied Consent Form
Edwards School of Business
University of Saskatchewan

Project Title:
Opinions of scientific journal articles by medical professionals and medical students

Principal Investigator and Supervisor:
Dr. Marjorie Delbaere, Associate Professor, Department of Marketing & Management, Edward School of Business. E-mail: delbaere@edwards.usask.ca Phone: 306-996-5916

Student Researcher:
Alexander Mueller, Graduate Student, MSc. Marketing program, Edwards School of Business. E-mail: alexander.mueller@usask.ca

Purpose(s) and Objective(s) of the Research:
The objective of this research project is to examine how scientific journal articles are read and processed.

Procedures:
We will show you one extended abstract of a scientific journal article.
You will be asked to read the article first and then give your opinion about the article based on your opinion. There is no right or wrong answer. We simply wish to know your opinions. This will take approximately 15- 20 minutes of your time.

Compensation
The participation in this study will be remunerated.

[CANADIAN STUDENT][The participant receives a remuneration in form of a $10 Starbucks Print at Home Gift Card. The Starbucks Print at Home Gift Card will be send to your email account within 15 working days after participation.]

OR

[CANADIAN RESIDENT/PHYSICIAN][The participant receives a remuneration in form of a $20 Starbucks Print at Home Gift Card. The Starbucks Print at Home Gift Card will be send to your email account within 15 working days after participation.]

OR

[GERMAN STUDENT][The participant receives a remuneration in form of a 7€ Amazon Print at Home Gift Card. The Amazon Print at Home Gift Card will be send to your email account within 15 working days after participation.]

OR

[GERMAN RESIDENT/PHYSICIAN][The participant receives a remuneration in form of a 15€ Amazon Print at Home Gift Card. The Amazon Print at Home Gift Card will be send to your email account within 15 working days after participation.

If wished, the participant can withdraw from the remuneration for his/her participation by not providing an email address.

Funded by:
We have not received any external funding for this project.

Potential Risks:
The risk of participating in this study is minimal. Participants should not have any risk of psychological or emotional harm or discomfort to answer the questionnaire.

Confidentiality
The data, provided by the participant, is anonymous.
Only the student researcher and project supervisor have rights to access the original data.
For remuneration purposes, the researchers will collect an email address on a separate site, after the participant has completed the questionnaire. Providing the email address is optional but required if the participants choose to be remunerated. No other identifying data will be asked as part of this study.
The electronic data will be shared by the Social Science Research Labs (SSRL) through a secure internet connection and the analysis will be conducted by the researchers on secure computers maintained by the University of Saskatchewan.
For additional information regarding the privacy policies for personal data of Amazon as well as Voxco, please follow the respective links:

Voxco: Privacy Policy
Amazon: Privacy Policy
Starbucks: Privacy Policy

Right to Withdraw:
Your participation is voluntary and you can answer only those questions that you are comfortable with. You may withdraw from the research project for any reason, at any time by not submitting the questionnaire without explanation or penalty of any sort. Withdrawal has no effects on grades for student participants. Withdrawal from professionals has no effects on their public standing.
If you do not want to answer a specific question in the questionnaire, you can check "I don't know" or ignore the question.
Once the survey is submitted it cannot be withdrawn as no identifiers are attached to the survey.

Follow up:
To obtain results from the study, please contact the researcher via email to indicate your interest. Summarized results will be provided once they became available.

Questions or Concerns:
If you have any questions or concerns about the research, please contact researcher using the information at the top of the page.
This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board on October 28th. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca (306) 966-2975. Out of town participants may call toll free (888) 966-2975.

IMPLIED CONSENT FOR SURVEYS

By clicking the “I Agree” button and completing and submitting the questionnaire, YOUR FREE AND INFORMED CONSENT IS IMPLIED and indicates that you understand the above conditions of participation in this study.

As you complete the survey, please do not put your name or any other identifiable information on the form. Please refrain from revealing your personal identity when you provide “additional comments” at the end of the survey.

To obtain a copy of this consent form for future references, please safe this content on your personal computer.

Thank you.

Appendix C. Debriefing sheets

Debriefing Experiment [ONE] or [TWO]

Edwards School of Business
University of Saskatchewan

In order to assess the influence of journal authors on perceived credibility of the presented content without any preconception, we preferred not to communicate the focus of this. Below you can see full description of the study.

Project Title:

Opinion leader endorsements in the medical industry –the tipping point of perceiving opinion leaders as agents of persuasion

Purpose(s) and Objective(s) of the Research:

The objective of this research project is to examine which type of source (the author of the article) has an influence on the reader, the perceived credibility towards the source as well as the message (the content of the article). Even though all participants saw the same journal article, the author description, which followed, were different. We investigated whether opinion leaders (well-known experts in their field) have a bigger influence on readers than peer-experts (unknown but very experienced experts). This form of deception was necessary to investigate influences reliably without other factors affecting the participant.

Potential Benefits:

The study will provide valuable information for government agencies responsible for regulating promotional efforts in the healthcare industry including cooperation between physicians and marketers. Further, results of this study will also help marketers to improve market targeting when cooperating with medical experts. Further,

Content of the mock-up journal article:

The medical journal article that was shown in the study contained fictitious elements. The article was not published in this form and does not represent a valid and reliable scientific source. Please see the following articles for related research:

- Petruzziello, L., Campanale, M., Spada, C., Ricci, R., Hassan, C., Gullo, G., & Costamagna, G. (2018). Endoscopic submucosal dissection of gastric superficial neoplastic lesions: A single Western center experience. *United European Gastroenterology Journal, 6*(2), 203-212.
- Kakushima, Ono, Tanaka, Takizawa, Yamaguchi, & Matsubayashi. (2011). Endoscopic submucosal dissection using the insulated-tip knife. *Techniques in Gastrointestinal Endoscopy, 13*(1), 63-69.

Right to Withdraw:

Your participation is voluntary, and you may still withdraw from the research project for any reason by not submitting the questionnaire without explanation or penalty of any sort.

Once the survey is submitted it cannot be withdrawn as no identifiers are attached to the survey.

IMPLIED CONSENT FOR SURVEYS

By clicking the "**I Agree"** button at the bottom of this page **YOUR FREE AND INFORMED CONSENT IS IMPLIED** and indicates that you understand the above conditions of participation in this study. Additionally, it automatically submits the questionnaire and completes your participation in the study.

To obtain a copy of this consent form for future references, please safe this content on your personal computer.

Thank you.

Appendix D. Mock-up Article

Endoscopic submucosal dissection for the management of gastric neoplastic lesions using an insulated-tip knife

Extended Abstract

Background: Endoscopic submucosal dissection (ESD) is an evolving technique for the treatment of early gastric cancer and superficial gastric lesions. The technique allows for "en bloc" resections and was originally developed in Japan The insulated-tip (IT) knife has been a powerful device in the past but was improved to specifically perform en bloc resections.

Objective: The aim of this study is to report the en bloc resection rate, procedure outcomes and complications for patients with gastric neoplastic lesions treated with ESD using the IT knife-2 after a follow-up period of 36 months. Furthermore, the ingenuity of ESD using the IT knife-2 in particular will be discussed.

Methods: From September 2014 to June 2015 patients diagnosed with gastric superficial lesions who underwent ESD using the IT knife-2 (KD-611L, Olympus, Tokyo, Japan) were enrolled. The analysis included demographic, clinical, endoscopic, and histological data including: (1) ''en bloc'' resection rate; (2) histological confirmation of R0 rate; (3) complication rate; (4) neoplastic recurrence during follow up; and (5) performance and handling of the new IT knife-2 compared with the previous device (KD-610L, Olympus).
In the first phase the lesion was observed using narrow-band imaging before defining the edges with chromoendoscopy and indigo carmine. In the second phase border marking was performed at 2–5mm from the side margins of the lesions using the IT knife-2 and an electrosurgical generator (ESG-300, Olympus, Tokyo, Japan). Submucosal injection of saline with a moderate amount of added indigo carmine describes phase three. A precut of 1-2mm was performed at the distal margin of the lesion before conducting the circumferential incision to access the submucosa. Finally, ESD was performed dissecting the submucosa at the proximal side. The ulcer bed was examined after the resection of the specimen and residual blood vessels coagulated using monopolar forceps (Olympus).

Results: 70 patients underwent 70 ESD procedures. In 68 (97%) procedures ''en bloc'' resection was successful. 48 (70.6%) patients had a R0 resection, while 19 (27.9%) patients had a R1 resection. Two patients (2.9%) experienced a major complication (perforation), which has been treated locally. Overall, 7 patients (10%) required surgery: in two cases because of local recurrence, in one case for an intraprocedural complication not amenable to endoscopic treatment, and in four cases due to a R1 in vertical margins. The follow-up of patients with neoplastic lesions was on average after 36.6 ± 13.1 months. The handling and performance of the IT knife-2 (KD-611L, Olympus) has been improved compared to the previous model. The cutting performance of the device in a lateral direction while the endoscope is looking downward was enhanced.

Conclusion: ESD for early gastric cancer is a safe and effective technique when performed by experienced endoscopists. The advantage of ESD is the ability to perform ''en bloc'' resections without any dimensional limitation. This advantage leads to an adequate histopathological evaluation of R0 resections and reduces the risk of local recurrence. Larger studies are needed to clearly define the role and the outcomes of ESD in regions at low incidence for gastric

neoplasia. The IT knife-2 enables better cutting performances during ESDs than the original IT knife.

Declaration of conflicting interests:
[None declared.]
OR
[Dr Holmberg reported being an employee of Olympus Inc. in the past and being a paid consultant receiving lecture fees from Olympus Inc. He received research
support from the Albert Johnson Foundation and Olympus Inc. for services unrelated to the current research.]

Ethics approval: The study was approved by the Ethical Committee of the Hospital (Prot n 0166325/ 07).

Funding/ Support:
[This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.]
OR
[This research received funding from the Olympus Corporation, Tokyo, Japan.]

Role of the Funder/ Sponsors:
[None reported.]
OR
[Olympus Inc. was involved in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.]

Informed consent: All patients were informed about the endoscopic technique, including advantages and disadvantages, and possible complications. All patients signed an informed consent.

Appendix E. Biography Opinion Leader

Short Version:

Gregory Holmberg (MD) is an Associate Professor of Internal Medicine and Gastroenterology at a renowned University School of Medicine in the US. His areas of clinical expertise include therapeutic endoscopy in the management of early gastrointestinal cancers.

Dr. Holmberg has published numerous books and articles at the national as well as the international level. He is a member of the leading Associations in North America (FASGE) and Japan (JSGE) and director of the Therapeutic Endoscopy Clinical Trials Unit at John Hopkins University. Dr. Holmberg is also a member of the editorial boards of three scientific journals in the United States and Canada and received numerous awards for his scientific contributions. His publications are repeatedly cited from scholars all over the world.

Extended Version

Dr. Gregory Holmberg is an Associate Professor of Medicine, Division of Gastroenterology at the renowned Johns Hopkins University School of Medicine in Baltimore, MD. His areas of clinical expertise encompass therapeutic endoscopy and the management of early gastrointestinal cancers, including EUS, EMR and ESD.

At the David Geffen School of Medicine (University of California) in San Diego, CA, Dr. Holmberg started his studies in medicine. In 1993 he began his formal training in internal medicine and finished his training in gastroenterology and advanced therapeutic endoscopy fellowship at the Johns Hopkins Hospital in 1999. Early in his career, he developed his interest in treatments of early gastrointestinal cancers.

Dr. Holmberg has been recognized internationally as a renowned expert in advanced therapeutic endoscopy. He belongs to the very few scholars who have gained an international reputation within the leading Associations in North America (FASGE) and Japan (JSGE). Dr. Holmberg has also published numerous book chapters and is a member of the editorial boards of 3 scientific journals in the United States and Canada. His scientific contributions include over 80 peer-reviewed papers.

Dr. Holmberg is currently director of the Therapeutic Endoscopy Clinical Trials Unit at John Hopkins University and serves also as the President of the American Society for Gastrointestinal Endoscopy.

List of selected publications:

Barter, J., Rinser, I., **Holmberg, G**, Suyo, M. (2019). Endoscopic resection of advanced ampullary adenomas in retrospect: A single-center 7-year cohort study. *Surgical Endoscopy: Surgical and Interventional Techniques,* Surgical Endoscopy: surgical and interventional techniques, 2019.

Baker, S., Campbell, L., **Holmberg, G**., Merwe, S. van der (2018). Colorectal endoscopic full-thickness resection: A prospective study with a novel clip. *Endoscopy, 49*(11), 1092-1097.

Holmberg, G. (2016). Endoscopic Submucosal Dissection of Early Gastric Cancer: Procedure Times as Influencing Factors. *Journal of Gastroenterology, 22*(2), 45-46.

Holmberg, G. (2016). Quality programs in endoscopy: A patient-oriented approach. *Endoscopy, 47*(3), 190-191.

Barter, J., **Holmberg, G.**, Rinser, I., Kains, M., Smith, B (2014). Quality evaluation through self-assessment: A novel method to gain insight into ERCP performance. *Journal of Gastroenterology, 5*(1), 10-16.

Appendix F. Biography Peer Expert

Short Version:

Gregory Holmberg is an MD of internal medicine and a staff member at the gastroenterology department at a city hospital in Northern Sweden. His areas of clinical expertise include therapeutic endoscopy in the management of early gastrointestinal cancers.

Dr. Holmberg has extensive expertise in gastroenterology and has gathered over 19 years of experience in interventional endoscopy. Starting in 2012 with only a few submucosal dissections, he has completed over 400 ESD procedures over the years. Beyond his focus on ESD, he is a clinician-teacher pursuing his interests in therapeutic endoscopy, including EMR, EUS and polypectomies.

Extended Version

Dr. Gregory Holmberg is an MD of internal medicine and a staff member of the gastroenterology department at the city hospital in Lund, Sweden. His areas of clinical expertise encompass therapeutic endoscopy and the management of early gastrointestinal cancers, including EUS, EMR and ESD.

At the Lund University, Dr. Holmberg started his studies in medicine. In 1993 he began his formal training in internal medicine and finished his training in gastroenterology and advanced therapeutic endoscopy fellowship at the Lund Hospital in 1999. Early in his career, he developed his interest in treatments of early gastrointestinal cancers.

Dr. Holmberg has extensive expertise in gastroenterology and has gathered over 19 years of experience in advanced therapeutic endoscopy. Throughout his training and practice, he has completed over 400 ESD procedures. Beyond his focus on ESD, Dr. Holmberg is a clinician-teacher pursuing his interests in therapeutic endoscopy, including EMR, EUS and polypectomies. He also serves as the advanced therapeutics endoscopy program director and is involved in the "endoscopic therapy and interventional treatments" program for residents at the Lund University Hospital.

In 2017, the Lund University established the "Centre for Gastrointestinal Health" (CGH). Dr. Holmberg's commitment to the operating room contributed enormously to the success of the CGH and made the center well-known outside of southern Sweden.

Memberships

- Association of Swedish Internists
- Swedish Association for Digestive and Metabolic Diseases
- Swedish Association for Endocrinology
- Quality circle of Internal Medicine Southern Sweden

Appendix G. Questionnaire Study One & Two

1) Please indicate your current status:
   ☐ Medical student
   ☐ Resident
   ☐ Physician
   ☐ other

2) In which country are you currently practicing/ studying medicine?
   ☐ Germany
   ☐ Canada

3) In which year did you/ will you graduate?
   _____

4) Please indicate your (expected) degree-granting institution for medicine:
   ☐ University of Saskatchewan
   ☐ University of British Columbia
   ☐ University of Calgary
   ☐ University of Alberta
   ☐ other, please specify:
   _____

5) [CONSENT FORM]

6) [MOCK-UP ABSTRACT]

7) [AUTHOR BIOGRAPHY]

8) [EXTENDED BIOGRAPHY]

9) Please provide any thoughts that crossed your mind after having read the extended abstract: How did you form your opinion on the article? Why is this your opinion? (open-ended)
   _____
   ☐ Do not know

10) How would you evaluate Dr. Holmberg, the author of the abstract that you have just read?

	1	2	3	4	5	6	7	
Dependable	☐	☐	☐	☐	☐	☐	☐	Undependable
Honest	☐	☐	☐	☐	☐	☐	☐	Dishonest
Reliable	☐	☐	☐	☐	☐	☐	☐	Unreliable
Sincere	☐	☐	☐	☐	☐	☐	☐	Insincere
Trustworthy	☐	☐	☐	☐	☐	☐	☐	Untrustworthy
Expert	☐	☐	☐	☐	☐	☐	☐	Not an expert
Experienced	☐	☐	☐	☐	☐	☐	☐	Inexperienced

Knowledgeable	☐	☐	☐	☐	☐	☐	☐	Unknowledgeable
Qualified	☐	☐	☐	☐	☐	☐	☐	Unqualified
Skilled	☐	☐	☐	☐	☐	☐	☐	unskilled

11) What was your reaction towards the brand Olympus?

	1	2	3	4	5	6	7	
Bad	☐	☐	☐	☐	☐	☐	☐	good
negative	☐	☐	☐	☐	☐	☐	☐	positive
unfavourable	☐	☐	☐	☐	☐	☐	☐	favourable

12) How well do the following adjectives describe the content of the abstact that you have just read?

Describes very poorly	1	2	3	4	5	6	7	Describes very well
accurate	☐	☐	☐	☐	☐	☐	☐	
authentic	☐	☐	☐	☐	☐	☐	☐	
believable	☐	☐	☐	☐	☐	☐	☐	
truthful	☐	☐	☐	☐	☐	☐	☐	
deceptive	☐	☐	☐	☐	☐	☐	☐	

13) How would you rate the following statements?

	Strongly agree	agree	More or less agree	undecided	More or less disagree	disagree	Strongly disagree
Olympus Inc. has a great amount of experience in the medical field.	☐	☐	☐	☐	☐	☐	☐
Olympus Inc. is skilled in what they do.	☐	☐	☐	☐	☐	☐	☐
Olympus Inc. has great experience.	☐	☐	☐	☐	☐	☐	☐
Olympus Inc. does not have much experience in the medical field.	☐	☐	☐	☐	☐	☐	☐
I trust Olympus Inc.	☐	☐	☐	☐	☐	☐	☐
Olympus Inc. makes truthful claims.	☐	☐	☐	☐	☐	☐	☐
Olympus Inc. is honest.	☐	☐	☐	☐	☐	☐	☐
I do not believe what Olympus Inc. tells me.	☐	☐	☐	☐	☐	☐	☐

14) How would you evaluate the following statements?

Strongly agree	1	2	3	4	5	6	7	Strongly disagree
Dr. Holmberg has an ulterior motive for publishing the results stated in the article.	☐	☐	☐	☐	☐	☐	☐	
Dr. Holmberg's comments in the article are suspicious	☐	☐	☐	☐	☐	☐	☐	
Dr. Holmberg is motivated to exaggerate the performance of Olympus Inc.	☐	☐	☐	☐	☐	☐	☐	

15) Please provide any thoughts on your responses to the question above. How did you form your opinion on Dr. Holmberg? Why is this your opinion. Please state any thoughts. (open-ended)

_____

☐ Do not know

16) How would you rate the following statements?

Strongly agree	1	2	3	4	5	Strongly disagree
We can depend on getting the truth in most advertising.	☐	☐	☐	☐	☐	
Advertising's aim is to inform the consumer	☐	☐	☐	☐	☐	
I believe advertising is informative.	☐	☐	☐	☐	☐	
Advertising is generally truthful.	☐	☐	☐	☐	☐	
Advertising is a reliable source of information about the quality and performance of products.	☐	☐	☐	☐	☐	
Advertising is truth well told	☐	☐	☐	☐	☐	
In general, advertising presents a true picture of the product being advertised.	☐	☐	☐	☐	☐	
I feel I've been accurately informed after viewing most advertisements.	☐	☐	☐	☐	☐	
Most advertising provides consumers with essential information	☐	☐	☐	☐	☐	

17) How familiar are you with the medical products of the company Olympus Inc.?

	1	2	3	4	5	6	7	
Not at all familiar	☐	☐	☐	☐	☐	☐	☐	Very familiar

18) Please indicate the purpose of this study from your point of view (open-ended)

_____

☐ Do not know

19) How many years of medical training do you have (including medical school years + residency)?

_____

20) What is your field of expertise?
- ☐ Family Medicine
- ☐ Psychiatry
- ☐ Internal Medicine
- ☐ Gynacolegy
- ☐ Anasthesia
- ☐ Other
- ☐ None

21) Please indicate your age

_____

☐ prefer not to say

22) Please indicate your gender
- ☐ Female
- ☐ Male
- ☐ other
- ☐ prefer not to say

23) Please state your current institution or hospitals (if you have retired, please state your last institution)
- ☐ Private practice
- ☐ University of Saskatchewan
- ☐ University of British Columbia
- ☐ University of Calgary
- ☐ University of Alberta
- ☐ other, please specify:

_____

24) [DEBRIEFING]