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# Knowledge sharing in two cultures: the moderating effect of national culture on perceived knowledge quality in online communities

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## ABSTRACT

Online communities have been identified as key platforms for innovation and knowledge sharing. While many studies have consistently identified that social capital and cultural factors are important for online knowledge sharing, their joint effect has to date received less attention. Addressing this gap helps us to move away from a one-size-fits-all approach of managing online communities to one which takes into account that social capital (i.e., trust, reciprocity, and a shared vision) may have differential effects on the sharing of high-quality knowledge. We therefore ask: To what extent does national culture shape the effect of social capital on perceived knowledge quality? We use survey data from two online communities from Germany and the Netherlands and demonstrate that the relationship between social capital and perceived knowledge quality differs in the two different national cultures, in particular for effects of reciprocity and shared vision. Besides practical contributions, we add to the literature by first integrating a social capital and online knowledge sharing lens and highlighting the moderating effect of national culture. Second, we provide a fine-grained understanding of the influence of national culture on knowledge sharing by delving deeper into differences between national cultures often regarded as similar.

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## 1. Introduction

Knowledge sharing is of essential value for many organisations in the knowledge-based economy (Deichmann et al., 2020; O'Mahony & Lakhani, 2011). It increasingly takes place in an online environment (Bhagat et al., 2002; Kotlarsky & Oshri, 2005; Lin & Joe, 2012; Taylor, 2004), for example, in online communities (Faraj et al., 2011, 2016; O'Mahony & Ferraro, 2007). While many studies have investigated online and offline knowledge sharing in terms of frequency (Cummings, 2004), efficiency (Hansen, 1999), amount (Hansen, 2002), behaviour (Hsu & Chang, 2014), partiality (Ford & Staples, 2010), perceived value (Ford & Staples, 2006) or sharing extent (Reinholt et al., 2011), scholars are increasingly interested in the quality of the knowledge that is being shared (Erden et al., 2008; Haas & Hansen, 2007; Yoo et al., 2011). This is because sharing high-quality knowledge online is crucial for organisational performance and success.

Exogenous factors such as knowledge management systems (Young et al., 2012) facilitate knowledge sharing. To better understand the antecedents of the quality of shared knowledge, however, it is important to take into account the social embeddedness of those who share knowledge online (Groenewegen & Moser, 2014; Moser et al., 2017). Knowledge is socially embedded (Kogut & Zander, 1992) which has been empirically studied in a substantive body of literature on the social factors

involved in knowledge sharing (see Foss et al., 2010; Phelps et al., 2012, for reviews). These social factors are united in the theory of social capital which has been found to be a decisive antecedent of knowledge sharing (Nahapiet & Ghoshal, 1998). Social capital is defined as “the interpersonal relationships of a person, as well as the resources embedded in those relationships” (McFadyen & Cannella, 2004: 735). Resources include information, influence, and solidarity (Adler & Kwon, 2002). Prior work on online communities has identified three facets of social capital which are particularly relevant for online knowledge sharing: these facets are trust, reciprocity, and a shared vision (Chiu et al., 2006; Faraj & Johnson, 2011; He & Wei, 2009; Wasko & Faraj, 2005).

Social capital and the social embeddedness of knowledge (Zander & Kogut, 1995) are intertwined with culture (cf. Giorgi et al., 2015). A large body of research on the role that national culture plays in organisations testifies to the importance of this notion (Ford & Chan, 2003; Guillaume et al., 2014; Hofstede, 2001; Hofstede et al., 1990; Nederveen Pieterse et al., 2013; Tan et al., 1998, 1998). Culture has also been found to be important for knowledge sharing (Chang et al., 2015; Jiacheng et al., 2010; Li, 2010) for two reasons. First, the increasing diversity of virtual groups, organisations, and communities influences their performance (Daniel et al., 2013). Researchers have even argued that the Internet itself may be a supranational organisation with its own,

separate culture (Ford et al., 2003). Second, integrating geographically dispersed people and teams from different cultures through online communities can stimulate the sharing of knowledge between professionals and firms (Wasko et al., 2009; Whelan, 2007).

The goal of our research is to advance earlier studies on the role of national culture in online knowledge sharing (Ardichvili et al., 2006; Pfeil et al., 2006) by applying a social capital perspective. Previous literature has treated both – social capital and national culture – as independent factors. This means that research and practice is still guided by a one-size-fits-all approach when it comes to facilitating knowledge sharing in online communities. In such an approach, different social capital facets (i.e., trust, reciprocity, and a shared vision) shape online knowledge sharing independent of the national culture within which this sharing takes place. We suggest, however, that knowledge is always socially embedded and that we therefore need a more nuanced approach to understand which social capital facets facilitate online knowledge sharing in different national cultures. By integrating insights from the literature on social capital and culture, we address the following question: To what extent does the national culture of participants of an online community influence the effect of participants' social capital on the perceived quality of the knowledge that is being shared?

To test our hypotheses, we collected data using an online survey which we distributed in two online communities from Germany and the Netherlands. Our results demonstrate that the relationship between social capital and perceived knowledge quality indeed differs in the two different national cultures. In particular, the effects of reciprocity and shared vision on perceived knowledge quality unfold differently in Germany versus the Netherlands.

Our study offers two main contributions to the literature. First, we demonstrate the effect of social capital on the perceived quality of knowledge being shared online, and illustrate to what extent this effect is moderated by national culture. Prior exploratory studies have identified national culture as a decisive factor in online knowledge sharing (Ardichvili et al., 2006; Pfeil & Zaphiris, 2009). We add to this work by testing the effect of three social capital facets (i.e., trust, reciprocity, and a shared vision) on perceived knowledge quality and show to what extent this effect is shaped by national culture dimensions. To that end, our study consolidates the existing literature and further advances our understanding of the influence of national culture on the association between social capital and high-quality online knowledge sharing. Second, our research offers a novel perspective to studying the influence of national culture. Many studies on cross-cultural management leverage the divide between Western and Asian cultures, testifying to the

differences between these cultures. Instead, we investigate two national cultures that are commonly regarded as similar, Germany and the Netherlands. Any differences that we observe in the empirical data – *despite* cultural similarities – must stem from remaining differences in national culture. Therefore, this research adds to the literature on cross-cultural management because it shows that even small and often neglected differences in national culture may have important effects on core organisational processes such as high-quality knowledge sharing.

Instead of applying a one-size-fits-all approach, our study suggests that practitioners should take a more nuanced perspective to the management of online communities and puts forward several practical recommendations. First, we recommend that managers who work with online communities should pay close attention to the cultural background of community participants, as that background might potentially influence – and thus change – the effect of social capital on knowledge sharing. Second, our findings can inform managers how they can put together teams in terms of their participants' national diversity that need to share high-quality knowledge.

## 2. Theoretical background

### 2.1. Online communities as platforms for knowledge sharing

Online communities are defined as “open collectives of dispersed individuals with members who are not necessarily known or identifiable and who share common interests, and these communities attend to both their individual and their collective welfare” (Faraj et al., 2011: 1224). The increased scholarly attention for online communities mirrors how these communities gain importance in peoples' personal and professional lives (Faraj et al., 2011; Von Krogh, 2012). Online communities are especially important in a knowledge-intensive context, because they allow people to easily and quickly share information, expertise, and experiences with each other. Many empirical accounts address open source software communities (Hertel et al., 2003; O'Mahony & Ferraro, 2007; Von Krogh et al., 2012) but there are also studies on basketball shoes (Füller et al., 2007), taxi driving (Ross, 2007), music instruments (Jeppesen & Frederiksen, 2006), and cars (Müller-Seitz & Reger, 2009) that show how online knowledge sharing is important.

In particular, the perceived quality of the knowledge that is shared is critical for online communities and their participants (Lou et al., 2013). High-quality knowledge is relevant, easy to understand, accurate, complete, reliable, and timely (Chiu et al., 2006). Participants typically feel that the wisdom of the crowd exceeds individuals' abilities, and they tend to

support and share knowledge with each other (Fang & Neufeld, 2009; Huffaker et al., 2009; Lakhani & von Hippel, 2003; Lee & Cole, 2003). While knowledge quantity has received a lot of scholarly attention (see Lou et al., 2013) and is often investigated through, for example, trace data studies (e.g., Faraj & Johnson, 2011), knowledge quantity does not reflect how online community participants value the knowledge that they share. Knowledge quality is crucial for such communities, because “the viability and success of online [...] communities depends on users to voluntarily contribute not only a large amount of knowledge, but also knowledge of high quality” (Lou et al., 2013: 356). If the quality of contributions is low or untrustworthy, then the value of an online community can be put into question and participants might even leave the community because their needs are not met (Stvilia et al., 2005).

## 2.2. Social capital in online community research

Social capital theory has often been used to better understand knowledge sharing in offline (McFadyen & Cannella, 2004) and online settings (Chiu et al., 2006; Wasko & Faraj, 2005; Wiertz & de Ruyter, 2007). Social capital is defined as the relationships between people, and in particular is concerned with the resources that are embedded in these relationships (McFadyen & Cannella, 2004). Social capital has three dimensions: structural, cognitive, and relational social capital (Nahapiet & Ghoshal, 1998). In this study, we assume the structural and cognitive dimensions of social capital as necessary conditions for knowledge sharing. This is because without social relations of any given structure (structural dimension), people have nobody with whom to share their knowledge. Likewise, without cognition (cognitive dimension), which includes shared language and narratives (Nahapiet & Ghoshal, 1998), people would be unable to understand each other in the first place. The third, relational dimension of social capital is essential for people to engage in meaningful and high-quality knowledge sharing (Faraj et al., 2016). This is because the relational dimension includes among others trust, social norms, and social obligations (Nahapiet & Ghoshal, 1998), which are essential for people to engage in meaningful and high-quality knowledge sharing (Faraj et al., 2016). These factors are echoed in prior studies on online knowledge sharing and include the influence of trust, reciprocity, and a shared vision (Chiu et al., 2006; Faraj & Johnson, 2011; He & Wei, 2009; Wasko & Faraj, 2005).

Trust is defined as an “implicit set of beliefs that the other party will refrain from opportunistic behaviour and will not take advantage of the situation” (Ridings et al., 2002: 275) and signifies a potential vulnerability

due to someone’s reliance on others’ good intentions, competence, and openness (Nahapiet & Ghoshal, 1998). In online communities, trust can act as a substituting governance mode (Hertel et al., 2003; Reid, 1999) in lieu of (often) informal set-ups and lack of hierarchy or strict rules, and also appears to be a valuable protection mechanism for community knowledge (Fauchart & von Hippel, 2008; Haefliger et al., 2008).

In addition to trust, many participants of online communities invest in their community’s future by relying on the mechanism of reciprocity (Wu & Korfiatis, 2013), defined as “benefit expectancy of a future request for knowledge being met as a result of the current contribution” (He & Wei, 2009: 828). In other words, participants believe that the amount of support, assistance, and knowledge sharing they invest now will be reciprocated by other community participants in the future (Dholakia et al., 2004; Fauchart & von Hippel, 2008; Hall & Graham, 2004; Shah, 2006).

Finally, many community participants highly value the support that people give and receive (Moser et al., 2013) and as such share a common vision of the community’s goals and how people should be supporting and helping others (Chiu et al., 2006). Shared vision is defined as an individual’s perception of whether people share the same vision, goals, and values about knowledge sharing (Chiu et al., 2006). A shared vision about how the community should support others has been found to serve as an essential bonding mechanism in online communities (Cohen & Prusak, 2001) and is crucial to enhance knowledge sharing (Kankanhalli et al., 2005).

## 2.3. National culture and online knowledge sharing

A large body of literature has addressed the role that culture plays in organisations (for a review, see Giorgi et al., 2015) and knowledge management. For example, scholars have investigated how people from different occupational communities share knowledge (Bechky, 2011); how organisational culture relates to knowledge management processes (Chang & Lin, 2015); or how organisations can best support communities of practice (Thompson, 2005). Literature that specifically uses a cross-cultural management lens has investigated conceptions of culture (Berry, 1989; Rohner, 1984), strategic and international human resource management (Lengnick-Hall et al., 2009; Pfeffer, 2010), communication (Gudykunst & Kim, 2003; Tannen, 1995), leadership (Brodbeck et al., 2000) or the effects of cultural differences on organisational behaviour (Fischer et al., 2005; Tsui & Nifadkar, 2007).

The existing literature on cross-cultural differences in a virtual environment and information systems

research (Ford et al., 2003) suggests that these differences, as observed in the physical world, should play a role in the online context, too. For example, Pfeil et al. (2006) observed cross-cultural differences on Wikipedia, which resulted in different contribution styles. Ardichvili et al. (2006) conducted a qualitative study in order to discern the influence of cultural dimensions such as collectivism on knowledge seeking and sharing patterns. They found differences in knowledge sharing patterns that were attributed to the differing national cultures. For example, Chinese respondents – in contrast to Russian and Brazilian respondents – refrained from online knowledge sharing due to fear of “losing face,” because they were modest and afraid that they could not express themselves well enough in English. While these previous studies provide important insights, it remains unclear to what extent differences in national culture might be related to perceived knowledge quality.

Large-scale investigations of culture, often operationalised as national culture, have attracted some criticism (e.g., McSweeney, 2002). However, and building on a substantive body of literature (e.g., Hofstede, 2001; Hofstede et al., 2010; Magnusson et al., 2008; Trompenaars & Hampden-Turner, 1998), we believe that the concept merits more scholarly attention. To ground our study, we draw on Hofstede’s cultural dimensions (Hofstede, 2001; Hofstede & Minkov, 2010). Other researchers have offered culture frameworks as well; most notably, the GLOBE studies (House et al., 2004) and Trompenaar’s cultural dimensions (Trompenaars & Hampden-Turner, 1998). However, IS researchers more often used the Hofstede perspective (see Ford et al., 2003 for a review) to study the influence of national culture on knowledge sharing (Ardichvili et al., 2006; Pfeil et al., 2006; Zhang et al., 2014). Here, culture is proxied by nationality. We build on evidence from these studies and further leverage the empirical differentiation from the Hofstede conceptualisation in developing our hypotheses.

Hofstede’s first studies at IBM in the 1970’s generated four cultural dimensions: power distance, individualism, uncertainty avoidance, and masculinity. Later, researchers added to these the dimension of long-term orientation. Most recently, the sixth dimension of indulgence was added. Despite criticism of such an approach towards national culture and its reduction to merely six dimensions (Ailon, 2008), the framework has been surprisingly robust in explaining variation in outcomes, throughout a multitude of studies.

## 2.4. Goal of the study

The goal of our research is to advance earlier studies on the role of national culture in online knowledge sharing (Ardichvili et al., 2006; Pfeil et al., 2006) leveraging a social capital perspective. Knowledge is always socially embedded, and by taking into account social capital we bridge the current gap in the literature by investigating, in detail, the effect of national culture on the influence of social capital facets (i.e., trust, reciprocity, and shared vision) on online knowledge sharing.

## 3. Hypotheses

In the following, we develop hypotheses about the main effects of trust, reciprocity, and shared vision on perceived knowledge quality. We also develop hypotheses for the moderating effect of national culture on each of the main effects. The proposed theoretical model is shown in Figure 1.

### 3.1. Trust

To start with, trust has been found to be especially important with regards to high-quality knowledge sharing (Chiu et al., 2006). Trust is considered as a “precondition for the effective exchange of

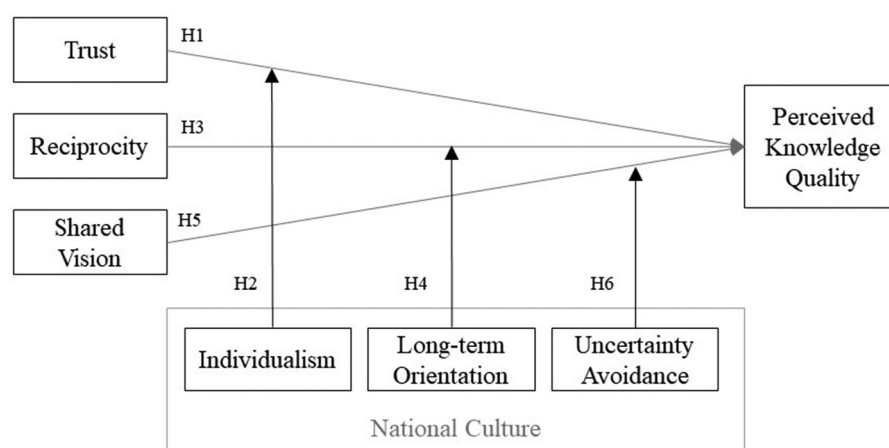


Figure 1. Theoretical model.



knowledge” (Chai et al., 2011: 317) as it facilitates cooperative behaviour (Tsai & Ghoshal, 1998). Trust is particularly crucial in an online environment, where it enables people to share and appreciate knowledge without necessarily knowing each other well (Kankanhalli et al., 2005). Consequently, trust in online communities has been positively and significantly associated with the quality of shared knowledge (Chiu et al., 2006).

*Hypothesis 1. Trust is positively associated with perceived knowledge quality.*

Not only does trust often play a role in online knowledge sharing, it has also consistently been reported as a key variable in cross-cultural research. Hofstede et al. (2010: 123) posit that “a relationship of trust should be established with another person before any business can be done.” Trust hinges on the cultural orientation of countries (Doney et al., 1998). While it is clearly a key social mechanism and therefore a precondition of all cultural dimensions, it is most notably an important part of the cultural dimension of individualism/collectivism (Hofstede et al., 2010). Therefore, we focus on this dimension to develop our hypothesis on why national culture moderates the effect of trust on perceived knowledge quality.

People in collectivist societies use trust as a means to build loyalty in cohesive groups. In more collective societies, the social group one belongs to is more important than the individual: people are life-long part of (extensive) groups, such as families, and understand themselves as part of this group. Trust is important in these collective societies: Because the group one is part of is so important in everyday life, people have to be able to trust others in that group. Therefore, trust is especially important in national cultures which score low on the individualism dimension, because the need to trust others from the group one belongs to is more pronounced in these national cultures. It follows that the positive effect of trust on perceived knowledge quality should be stronger for national cultures which put more emphasis on trust, i.e., national cultures which score low on the individualism dimension. This is because people who are accustomed to trusting others in their daily lives – as part of their national culture – should be more able to trust (possibly unknown) others in an online community.

*Hypothesis 2. The individualism dimension of national culture has a negative moderating effect on the association between trust and perceived knowledge quality.*

### 3.2. Reciprocity

Reciprocity has often been found to fuel high-quality knowledge sharing (Chiu et al., 2006; Dyer & Singh, 1998; Kankanhalli et al., 2005; Muthusamy & White, 2005) for two reasons. First, reciprocity, i.e., the future return of some action, is a fundamental driver underlying any knowledge sharing and social exchange (cf. Blau, 2017 [1964]). In an online environment, the expectation of a future return (of for example, knowledge) is generalised (Kankanhalli et al., 2005; Lakhani & von Hippel, 2003), which means that people expect reciprocity from the community, and not necessarily from individuals. Such generalised reciprocity motivates people to share their high-quality knowledge online. Second, when people receive knowledge from others, they often feel obliged to “pay back.” For example, Fauchart and von Hippel (2008) describe how professional chefs rely on reciprocity when sharing high-quality knowledge. This feeling of obligation also holds in an online environment, with the distinct difference that people expect generalised obligation and reciprocity (Wasko & Faraj, 2000).

*Hypothesis 3. Reciprocity is positively associated with perceived knowledge quality.*

Reciprocity has also been found to be an important factor in cross-cultural studies (Gächter & Herrmann, 2009). Similar to trust, reciprocity is a basic social mechanism that informs how people interact with each other. It requires a balance between inputs and outputs in social transactions which motivates people to engage in reciprocity (Blau, 2017 [1964]). In terms of cultural dimensions, reciprocity is most notably an important part of a long-term (versus short-term) orientation. Here, countries are differentiated based on whether they focus on the future or on the present and past (Hofstede & Minkov, 2010). People from national cultures that score high on the dimension of long-term orientation tend to focus on the future, whereas people from national cultures with a low score on this dimension (i.e., countries with a short-term orientation) tend to focus on the present and past. By focusing on the present and past, people embrace stability and therefore emphasise the fulfilment of social obligations and reciprocation of actions (Hofstede et al., 2010). This is to honour stable traditions and a general understanding of “paying back” others (Hofstede, 2001). Moreover, reciprocity is important to people from national cultures with a short-term orientation, because it makes them feel proud about themselves and helps them to maintain a positive self-image (Hofstede & Minkov, 2010).

To that end, the anticipated positive effect of reciprocity on perceived knowledge quality should be stronger for national cultures that value the quick

fulfilment of social obligations, i.e., national cultures which score low on the long-term orientation dimension. This is because people who are accustomed to reciprocating actions in their daily lives, as part of their national culture, should be more able and more prepared to reciprocate knowledge sharing in an online community in order to maintain stability and balance. The basic mechanism of reciprocity (Blau, 2017 [1964]) should therefore be more pronounced for people from national cultures with a short-term orientation.

*Hypothesis 4. The long-term orientation dimension of national culture has a negative moderating effect on the association between reciprocity and perceived knowledge quality.*

### 3.3. Shared vision

Finally, a shared vision about goals and values plays a crucial role in knowledge sharing because it fosters engagement between people (Cross et al., 2001). Indeed, helping each other out by actively seeking or providing help and support has previously been associated with high-quality knowledge sharing. For example, in their study of car manufacturer Toyota, Dyer and Nobeoka (2000) found that help and support in a buyer-supplier network improved high-quality knowledge sharing and organisational learning. This is because the network members could develop a common knowledge base through, for example, trainings, which enabled them to “efficiently transfer more complex quality knowledge” (Dyer & Nobeoka, 2000: 353). Similarly, online community members typically appreciate giving and receiving support (Moser et al., 2013) and share a common vision about what the identity and mission of the community should be (Chiu et al., 2006). This is essential for social bonding in online communities (Cohen & Prusak, 2001), which has been found to enhance knowledge sharing (Kankanhalli et al., 2005) and improve perceived knowledge quality (Chiu et al., 2006).

*Hypothesis 5. A shared vision is positively associated with perceived knowledge quality.*

While a shared vision should generally boost the sharing of high-quality knowledge, we posit that peoples’ national culture might moderate this relationship. A shared vision about goals and how to support others is a basic building block of many cultures. Countries differently understand a shared vision when we regard it as part of the dimension of uncertainty avoidance. Here, people attach value to control, rules, and laws embodied by institutions and norms (Hofstede, 2001). In addition, people from countries that score high on the dimension of uncertainty

avoidance tend to value expertise. Relying on expertise enables people in high uncertainty avoidance countries to plan ahead which adds to reducing ambiguity (Hofstede et al., 2010). People from countries scoring high on uncertainty avoidance share a vision about the common goal of actively supporting others, because such support contributes to maintaining social institutions (Doney et al., 1998) and thus avoids uncertainty.

Translating those insights to the context of knowledge sharing in online communities, we therefore expect that people from national cultures with a high score on uncertainty avoidance should value a shared vision more than people with a low score on that dimension. People from these high-scoring national cultures prefer to reduce ambiguity and avoid uncertainty, which is the case when they share common goals and norms about supporting each other. Therefore, the positive effect of shared vision on sharing high-knowledge quality should be enhanced for people who strongly value such shared vision as part of the national culture that they are embedded in.

*Hypothesis 6. The uncertainty avoidance dimension of national culture has a positive moderating effect on the association between shared vision and perceived knowledge quality.*

## 4. Method

### 4.1. Setting

Although many cross-cultural studies investigate very different national cultures (e.g., Ardichvili et al., 2006; Pfeil et al., 2006; Zhang et al., 2014), we purposefully investigated two national cultures that are commonly thought of as similar, Germany and the Netherlands. Prior studies indicate some differences, see Table 1 for a comparison of outcomes of Hofstede’s studies and the GLOBE studies on the relevant dimensions. Finding variation between online communities from dissimilar cultural backgrounds would not be very surprising, given the large body of literature that already testifies to the differences between, for example, Western and Asian cultures. However, the fact that the German and the Dutch show some similarities on cultural dimensions adds to the robustness of our research design. This is because any differences that we observe in the empirical data – despite cultural similarities – may be attributed to variation due to the part of the national culture that is different.

We aimed at minimising differences other than those stemming from national culture, and therefore tried to match the two communities on as many aspects as possible. Consequently, we selected two online communities on the same topic – that of cake design. Both communities were the most important ones in their field of cake design in the respective countries, in

**Table 1.** Outcomes of Hofstede's and GLOBE Studies on three cultural dimensions.

	Individualism Hofstede	Collectivism GLOBE
Netherlands	80	4.46
Germany	67	4.52/4.02*
	Long term orientation Hofstede	Future orientation GLOBE
Netherlands	67	4.61
Germany	83	3.95/4.27*
	Uncertainty avoidance Hofstede	Uncertainty avoidance GLOBE
Netherlands	53	4.70
Germany	65	5.16/5.22*

Note. Hofstede uses a 100-point scale, GLOBE uses a 7-point scale. The variables are worded slightly differently, but overlap to a large extent. For definitions of the variables in the Hofstede and GLOBE studies, see [Appendix 1](#).

\* GLOBE differentiates between East and West Germany; the scores are reported in that order.

terms of the communities with the most participants and the highest amount of activities (contributions to the forum) on their platform. We assume that most individuals concerned with this particular field are affiliated with one of the two communities, as at the time there were no viable alternative active online communities to turn to.<sup>1</sup> Although cake design is a very specific topic and not many people might be familiar with it, the existing body of literature shows that the topics that are discussed in online communities rarely affect their basic social mechanisms. Indeed, online communities researchers have regularly targeted communities that are about somewhat “quirky” topics, such as basketball shoes (Füller et al., 2007), taxi driving (Ross, 2007), or electronic music instruments (Jeppesen & Frederiksen, 2006). Existing research consistently reveals almost generic social mechanisms (Faraj et al., 2016) on which the current study builds.

The Dutch community was originally founded in 2004 and has since then experienced a rapid growth. At the time of the study, it had more than 12,000 registered participants. The German community was in most ways similar to the Dutch community, although it had fewer participants, about 4,100 at the time of the study. It came into existence in early 2006, and has experienced a comparable, albeit less explosive growth. In both communities, participants are typically female. Both communities feature an asynchronous message board: participants post messages which stay visible on the message board indefinitely. Other participants can react to messages. Registration is required to leave messages; however, most messages are visible to anybody visiting the website.<sup>2</sup> Any participant can start a topic (or thread) and leave messages at topics. The total number of messages in the Dutch community exceeded 1,500,000, whereas the German community reached circa 500,000 messages at the time of the study.

#### 4.2. Sample and procedure

An online survey was designed which consisted of 5-point rating scales measuring the concepts discussed in the theoretical section. The survey was pre-tested in collaboration with three experts: two university colleagues and one

participant from the Dutch community. All experts were trained as social scientists and willing to discuss the order and wording of the survey items. The pre-testing supported the validity of the items. The survey was translated by the first author, who is a native German speaker and has a bilingual proficiency, into Dutch and German. We asked three experts (different from the pre-test), who were either German or Dutch native speakers and well acquainted with the English language, to inspect whether the survey items were translated correctly and whether they carried indeed the same meaning in either German or Dutch. This procedure led to some minor improvements of the wording of the items. The link to the survey, including a small incentive (chance to win a 50 Euro voucher for a German or Dutch cake webshop), was posted on both websites for 21 days. Access to the Dutch website was asked and granted per mail and in person from the website owner as part of an ongoing research project. Access to the German website was requested and granted per mail from the website owner. Both owners placed a banner on the window that opened when navigating to the respective website. Participants had to click on the banner to enter the survey.

Overall response for the Dutch survey was  $N = 687$ , and for the German survey  $N = 79$ . In the following, we will describe our measures. In [Table 2](#), we provide the construct definition table, and in [Appendix 2](#) the detailed wording of our measures.

#### 4.3. Dependent variable

*Perceived knowledge quality* (six items,  $\alpha = 0.88$ ) measured the perceived quality of knowledge that is shared in online communities. The construct was adapted from Chiu et al. (2006) to fit the research context. A sample item is “The knowledge shared by community members is accurate.”

#### 4.4. Independent variables

The measure of *trust* (three items,  $\alpha = 0.87$ ) was adapted from He and Wei (2009) to fit the context of this research. We measured trust with items such as “I



**Table 2.** Construct definition table.

Construct	Definition	Number of items	Cronbach's Alpha
Perceived knowledge quality	How online community participants perceive the quality of knowledge that is shared in the online community.	6	0.88
Trust	The belief that others' intentions are good and their actions are appropriate.	3	0.87
Reciprocity	The benefit expectancy of a future request being met as a result of the current contribution.	4	0.85
Shared vision	An individual's perceptions of whether participants share the same vision, goal, and value.	3	0.87

have faith in other community members and trust them." Trust was defined as the belief that others' intentions are good and their actions are appropriate (Nahapiet & Ghoshal, 1998).

*Reciprocity* (four items,  $\alpha = 0.85$ ) was defined as the "benefit expectancy of a future request for knowledge being met as a result of the current contribution" (He & Wei, 2009: 828) and was assessed with items such as "When I share my knowledge in the community, I believe that my queries for knowledge will be answered in the future."

The construct *shared vision* (three items,  $\alpha = 0.87$ ) was also adapted from Chiu et al. (2006). The measure included items such as "Community members share the vision of helping others solve their problems around cake baking."

*National culture* is a dummy variable coded 0 for members of the Dutch community and 1 for members of the German community. We use this measure as a proxy for national culture, thus following prior studies (Pfeil et al., 2006; Zhang et al., 2014).

#### 4.5. Control variables

Following prior research (Chiu et al., 2006; He & Wei, 2009), we included a number of (demographic) control variables. We asked people to report their *age* (in years), which ranged from 15 to 64 years, with a mean of 34 years and a standard deviation of 8 years. We log-transformed this variable to correct for skewness. The *education* measure reflected the different education options of the Dutch and German education systems, with 1 being the lowest educational level (primary school) which 2% ( $N = 19$ ) of the participants selected; 2 was preparatory secondary vocational education (13%,  $N = 97$ ); 3 higher general secondary education (14%,  $N = 111$ ); 4 pre-university education such as highschool (5%,  $N = 35$ ); 5 intermediate vocational education (19%,  $N = 145$ ); 6 higher vocational education (37%,  $N = 285$ ); and 7 as the highest educational level university education (10%,  $N = 74$ ). We also included a control to measure whether people owned a *cake business* (dummy-coded 1) as expertise in this domain potentially helps people to estimate the quality of the knowledge. Furthermore, we asked participants to indicate the *frequency of community use*, because people could well visit and use the community

without actually sharing their knowledge, for example, as lurkers (Sun et al., 2014). In turn, this could affect their perceptions of the quality of the knowledge being shared on the community. We used a 5-point Likert scale ranging from "never" to "daily."

#### 4.6. Analysis

##### 4.6.1. Factor analysis

We created a correlation matrix of all items from perceived knowledge quality, trust, reciprocity, and shared vision. All items correlated at least 0.30 with at least one other item, while most items correlated above 0.60. The Kaiser-Meyer-Olkin test of 0.89 showed a good sampling adequacy. Bartlett's test of sphericity was significant ( $\chi^2(120) = 6941.28$ ,  $p = 0.000$ ), indicating strong relations among the items. Next, we inspected the anti-image correlation matrix, which returned values above 0.70, and the communalities, which were all above 0.50. Both values again indicate a good sampling adequacy and we proceeded to the factor analysis with all items.

Initial eigenvalues showed that the first four factors had eigenvalues over 1 and explained 39%, 15%, 10%, and 7% of the variance. To determine the factor structure of our model and to explain a maximum amount of variance, we performed exploratory factor analysis (EFA) with principal component analysis using PROMAX rotation and Kaiser normalisation. The EFA reveals four factors, which explained 72% of the variance. Primary factor loadings were 0.60 or higher with no cross-loadings (see Table 3). These results provide evidence for satisfactory convergent and discriminant validity of the original scales. Thus, the translation (English to Dutch or English to German) of the items had no negative impact on the reliability and validity of the previously validated scales. To confirm the results of the EFA, we additionally conducted a confirmatory factor analysis (CFA) in SEM (EQS 6.4; Bentler & Wu, 2006) to validate our measurement model stating that perceived knowledge quality, trust, reciprocity, and shared vision are empirically distinct measures. This four-factor model fits the data well ( $\chi^2(98) = 341.28$ ,  $p = 0.000$ , SRMR = 0.05, RMSEA = 0.056, NFI = 0.95, NNFI = 0.96, CFI = 0.97).

**Table 3.** Pattern matrix.

	Component			
	1	2	3	4
Perceived knowledge quality 1	0.72	0.02	-0.01	0.06
Perceived knowledge quality 2	0.86	-0.06	-0.04	-0.07
Perceived knowledge quality 3	0.87	-0.01	-0.04	0.00
Perceived knowledge quality 4	0.87	0.02	-0.01	-0.04
Perceived knowledge quality 5	0.73	0.01	0.11	0.05
Perceived knowledge quality 6	0.69	0.08	0.00	0.04
Trust 1	-0.03	0.07	0.91	-0.04
Trust 2	0.04	-0.09	0.82	0.10
Trust 3	-0.01	0.02	0.94	-0.05
Reciprocity 1	0.10	0.70	0.03	-0.07
Reciprocity 2	-0.02	0.76	0.08	0.05
Reciprocity 3	-0.05	0.91	-0.02	0.01
Reciprocity 4	0.00	0.92	-0.06	0.02
Shared vision 1	-0.06	0.05	-0.03	0.92
Shared vision 2	0.03	-0.01	-0.07	0.94
Shared vision 3	0.04	-0.04	0.11	0.81

Rotation converged in 5 iterations.

We then calculated the Cronbach alphas for the constructs, which were all above 0.85 and therefore very satisfactory (see also Table 2), demonstrating the internal consistency of the constructs. Although some measures are highly correlated, multicollinearity proved not to be problematic. Variation inflation factors (VIFs) remained well below the suggested critical value of 10 (highest mean VIF is 2.02).

#### 4.6.2. Analysis

Skewness and kurtosis statistics of the dependent variable were within the acceptable range (not greater than +1 and not lower than -1). Therefore, we performed a multiple linear regression analysis in STATA to test our hypotheses. Explanatory variables were standardised.

### 5. Results

Table 4 provides descriptive statistics and correlations. We performed linear regression analysis with perceived knowledge quality as dependent variable. The full model explained about 34% of the variance and the measurement model is shown in Figure 2. In Table 5 we report the results.<sup>3</sup>

Model 1 contains all control variables. We added national culture to Model 2. In Models 3 to 5 we separately examined the interactions between national culture and trust, reciprocity, and shared vision. Model 6 is our final and full model. Hypotheses 1, 3 and 5 are supported: trust is positively associated with perceived knowledge quality (Model 6,  $\beta = 0.17$ ,  $p = 0.000$ ); reciprocity is positively associated with perceived knowledge quality (Model 6,  $\beta = 0.07$ ,  $p = 0.000$ ) and shared vision is positively associated

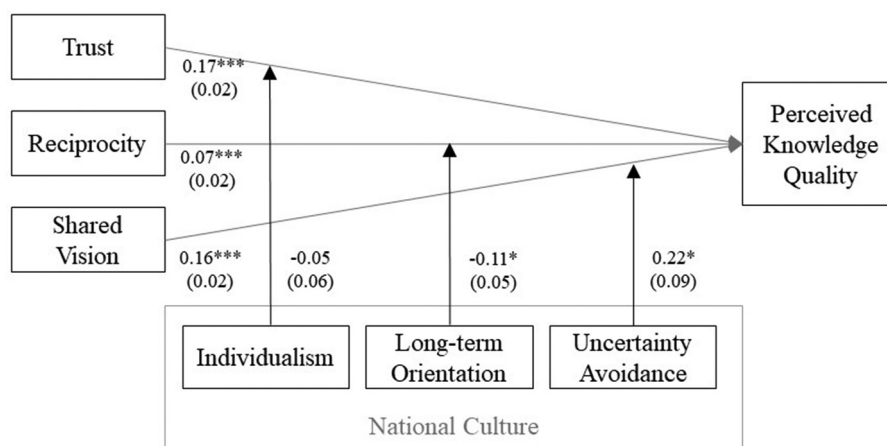
**Table 4.** Descriptive statistics and correlations matrix.

Variable	Mean	S.D.	Min.	Max.	1	2
1. Perceived knowledge quality	4.24	0.54	2.50	5		
2. Trust	3.92	0.64	1	5	0.49***	
3. Reciprocity	3.63	0.76	1	5	0.26***	0.23***
4. Shared vision	4.36	0.64	1	5	0.50***	0.52***
5. National culture	0.10	0.30	0	1	0.05	0.04
6. Age (ln)	3.51	0.30	0	4.17	-0.03	-0.02
7. Education	4.75	1.69	1	7	-0.08*	-0.11**
8. Cake business	0.10	0.30	0	1	-0.09*	-0.12***
9. Frequency of use	4.51	0.82	1	5	0.11**	0.03

Variable	3	4	5	6	7	8
4. Shared vision	0.24***					
5. National culture	0.06	0.16				
6. Age (ln)	-0.07*	-0.05	0.13***			
7. Education	-0.04	-0.15***	-0.01	-0.07*		
8. Cake business	0.02	-0.13***	0.02	0.01	-0.03	
9. Frequency of use	0.08*	0.11**	0.11**	0.00	-0.18***	0.03

Note. +  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . Two-tailed tests.

**Figure 2.** Measurement model.

**Table 5.** Results from linear regression analysis on perceived knowledge quality.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	4.44*** (0.23)	4.47*** (0.23)	4.35*** (0.20)	4.32*** (0.22)	4.23*** (0.20)	4.16*** (0.19)
Age (ln)	-0.05 (0.07)	-0.07 (0.07)	-0.03 (0.06)	-0.02 (0.06)	0.01 (0.06)	0.02 (0.05)
Education	-0.03+ (0.02)	-0.03+ (0.02)	-0.00 (0.02)	-0.03 (0.02)	0.00 (0.02)	0.01 (0.02)
Cake business	-0.17* (0.06)	-0.17* (0.06)	-0.06 (0.06)	-0.17** (0.06)	-0.04 (0.06)	-0.02 (0.05)
Frequency of use	0.06** (0.02)	0.05** (0.02)	0.05** (0.02)	0.04* (0.02)	0.03* (0.02)	0.04* (0.02)
National culture		0.09 (0.06)	0.06 (0.06)	0.07 (0.06)	-0.14* (0.07)	-0.12+ (0.07)
Trust			0.27*** (0.02)			0.17*** (0.02)
Reciprocity				0.15*** (0.02)		0.07*** (0.02)
Shared vision					0.26*** (0.02)	0.16*** (0.02)
National culture x trust			-0.06 (0.06)			-0.05 (0.06)
National culture x reciprocity				-0.11+ (0.06)		-0.11* (0.05)
National culture x shared vision					0.16* (0.08)	0.22* (0.09)
N	766	766	766	766	766	766
Adjusted $R^2$	0.02	0.02	0.25	0.09	0.25	0.34
$\Delta R^2$		0.00	0.23***	0.07***	0.23***	0.32***

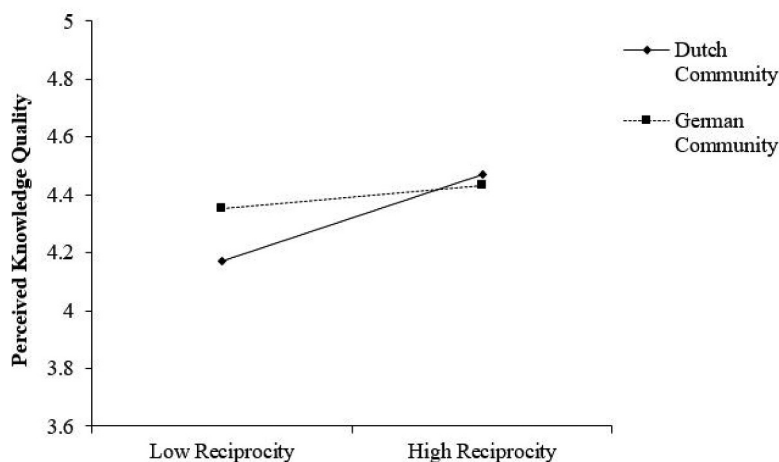
Note. Standard errors in parentheses. +  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . Two-tailed tests.

with perceived knowledge quality (Model 6,  $\beta = 0.16$ ,  $p = 0.000$ ). In our analysis, we do not find support for Hypothesis 2 which suggested that national culture moderates the effect of trust on perceived knowledge quality (Model 6,  $\beta = -0.05$ ,  $p > 0.10$ ).

The effect of national culture and reciprocity on perceived knowledge quality is significant (Model 6,  $\beta = -0.11$ ,  $p = 0.043$ ). In other words, Dutch cake designers who experienced a high degree of reciprocity reported a higher level of perceived knowledge quality, whereas the increase is less strong for German cake designers (this effect is depicted in Figure 3). This supports Hypothesis 4. An additional simple slope analysis for reciprocity shows that the slope for the Dutch community is significant and positive ( $\beta = 0.15$ ,  $p = 0.001$ ). The slope for the German community is insignificant ( $\beta = 0.04$ ,  $p > 0.10$ ), which means that

reciprocity is unrelated with higher levels of perceived knowledge quality in the German community.

Next, we examined the interaction effect between national culture and shared vision on perceived knowledge quality. This interaction is significant and positive (Model 6,  $\beta = 0.22$ ,  $p = 0.010$ ). Both Dutch and German cake designers reported perceived knowledge quality to be higher whenever they also reported higher levels of shared vision. However, the increase in perceived knowledge quality is higher for the German compared to the Dutch cake designers (this interaction is illustrated in Figure 4). The simple slope analysis for shared vision shows that the slope for both the Dutch and the German community is significant and positive ( $\beta = 0.26$ ,  $p = 0.000$  and  $\beta = 0.43$ ,  $p = 0.000$ , respectively). The slope is steeper for the German community which corresponds to the

**Figure 3.** Interaction between national culture and reciprocity on perceived knowledge quality.

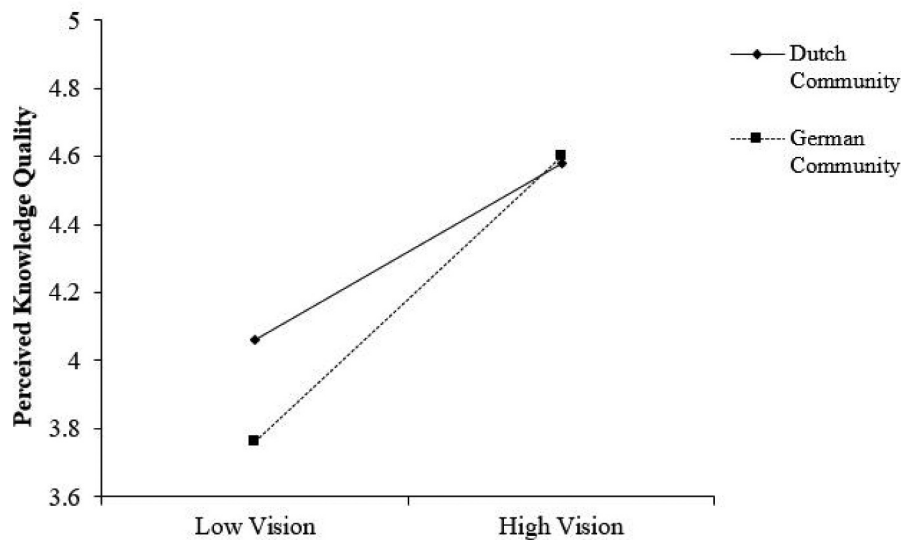


Figure 4. Interaction between national culture and shared vision on perceived knowledge quality.

theoretical underpinnings of Hypothesis 6: more shared vision is associated with higher levels of perceived knowledge quality.

## 6. Discussion

This paper reports on findings from a survey study of two online communities. First, we found positive main effects of trust, reciprocity, and shared vision on perceived knowledge quality (H1, H3, H5). These findings align with prior literature, which has found trust to be important for online, high-quality knowledge sharing (Chiu et al., 2006) because it facilitates collaborative behaviour (Tsai & Ghoshal, 1998). Reciprocity is important for high-quality knowledge sharing because it enables social exchange (Blau, 2017 [1964]) based on a feeling of generalised obligation towards the community (Wasko & Faraj, 2000). Finally, a shared vision about goals and support facilitates social bonding (Cohen & Prusak, 2001) and helping others in the community (Moser et al., 2013) to facilitate high-quality knowledge sharing. Furthermore, we found support for a moderating effect of long-term orientation on the association between reciprocity and perceived knowledge quality (H4). The negative moderating effect can be explained by Germany scoring higher, and the Netherlands scoring lower on the long-term orientation dimension. A lower score indicates a short-term orientation, where people tend to focus on the present and past. As we argued before, the basic mechanism of reciprocity seems to align better with people from national cultures with a short-term orientation – thus, Dutch community participants. For shared vision (H6), the positive moderating effect may be due to Germany scoring higher on the uncertainty avoidance dimension than the Netherlands. This means that Germans generally prefer to be in

control and abide rules and laws embodied by institutions and norms (Hofstede, 2001) which we have previously associated with a shared vision.

While we find support for two out of three moderation hypotheses, surprisingly, the effect of trust on perceived knowledge quality (H2) was not regulated by the individualism dimension of national culture. A possible explanation could be that trust in and of itself is important, as we can also see from the significant and positive main effect of trust on perceived knowledge quality (H1). However, the hypothesised influence of national culture might be less important than assumed because of the virtual environment of online communities. Trust might be decoupled from contingency factors such as national culture, because it seems to be a baseline condition for people to collaborate and communicate in online communities (Ridings et al., 2002). Because trust plays such an important role and precedes successful forms of knowledge sharing (Wasko & Faraj, 2005), it might be less affected by other factors such as national culture, as compared to an offline situation.

### 6.1. Theoretical implications

Our study confirms that social capital (Chiu et al., 2006; Faraj & Johnson, 2011; Faraj et al., 2016; He & Wei, 2009) as well as national culture matter in an online environment (Ardichvili et al., 2006; Pfeil et al., 2006; Zhang et al., 2014). However, prior research has not yet integrated these two research streams, despite the fact that social capital and culture are very much related and therefore should jointly influence knowledge sharing. With this study, we provide two distinct contributions.



First, we show the effect of social capital on online knowledge sharing, and the extent to which this effect is moderated by national culture. Extant work testifies to the strong effects of social capital on online knowledge sharing, and prior exploratory studies have identified national culture as important for online knowledge sharing (Ardichvili et al., 2006; Ford et al., 2003; Pfeil & Zaphiris, 2009). We add to this work by testing the effect of national culture and social capital on knowledge sharing. By doing so, we provide empirical evidence for the joint effect of two previously separately studied antecedents of online knowledge sharing. Our study also adds to the emerging stream of literature on the micro-foundations of knowledge sharing (Deichmann et al., 2020). Micro-foundations include actions and interactions at the individual level, which have been argued to be undertheorised yet constitutive for organisational processes (Foss et al., 2010; Gond & Moser, 2019). In our study, we investigate mechanisms at the individual level and show that peoples' knowledge sharing depends on their social capital *and* their national culture. This means that future studies on the micro-foundations of knowledge sharing should take into account participants' national culture, because it can influence the previously established effects of social capital on knowledge sharing.

Second, with our study we offer a novel perspective on studying the influence of national culture. Many cross-cultural studies have investigated very different cultures, comparing, for instance, Eastern and Western cultures (e.g., Ardichvili et al., 2006; Pfeil et al., 2006; Zhang et al., 2014) and thus leveraging and describing the differences between Western and Asian cultures. Instead, we studied two national cultures that are commonly thought of as quite similar – Germany and the Netherlands. With our study, we provide evidence that even small – and previously often neglected – differences in national culture are important in an online environment. Any differences that we observed in the empirical data, *despite* cultural similarities, must therefore stem from remaining differences in national culture. Our study contributes to a fine-grained understanding of the influence of national culture (Tsui & Nifadkar, 2007) by developing a deeper understanding of the differences between cultures that are often regarded as similar. Therefore, this research adds to the literature on cross-cultural management because it shows that even small and often neglected differences in national culture may have important effects on core organisational processes such as knowledge sharing. This means that future studies on the influence of national culture on organisational processes should pay close attention to the subtle differences between cultures, because even subtle differences can have significant effects on outcomes such as knowledge sharing.

## 6.2. Practical implications

Our research also has implications for practice. First, based on our findings we posit that the assumption of equal opportunities on the Internet and a one-size-fits-all approach in online communities might be too simplistic. As a consequence, organisations and professionals might operate under the impression that online communities provide a feasible managerial tool, whereas a more fine-grained and careful approach might be warranted to successfully create and maintain online communities and achieve cross-cultural competence (Johnson et al., 2006). Indeed, studies typically do not problematise or are agnostic about cultural backgrounds of community members, independent of whether these studies have been conducted within an online community from a single country (Ross, 2007; Wasko & Faraj, 2005; Wiertz & de Ruyter, 2007) or one with potentially international participants (Füller et al., 2007; Jeppesen & Frederiksen, 2006). Community members were typically assumed to be equal or the role of cultural background has not been mentioned. However, as we show with this research, managers who work with online communities should pay close attention to the cultural background of community participants, as that background might potentially influence – and thus change – the effect of social capital on knowledge sharing.

Second, we also show that national culture has significant effects on the extent to which social capital influences knowledge sharing. This means that organisations can leverage the cultural diversity of their employees in ways that can boost high-quality knowledge sharing. For example, we find that uncertainty avoidance enhances the positive effect of a shared vision on knowledge sharing. Leveraging this finding, managers could deploy employees from cultures that score relatively high on uncertainty avoidance to work on projects where developing a shared vision is important. Therefore, our findings can inform how managers can put together teams that need to share high-quality knowledge.

## 6.3. Limitations and future research

This study is subject to some limitations that present opportunities for future research. To start with, the studied communities were different in size and maturity, which might explain the differences in response rate. However, both samples were sufficient in size and residuals were normally distributed; therefore, we believe that the samples were nevertheless adequate for the current purpose. Furthermore, there might be other factors that influence the perceived quality of knowledge shared in online communities that were

not included in this survey. For example, we did not consider if and how individuals' motivations (Hertel et al., 2003; Wasko & Faraj, 2005) might influence perceived knowledge quality. Instead of focusing on attributes and influences on the individual level, we grounded our theoretical perspective in the social capital literature and were building on earlier research which shows that different facets of social capital are important for knowledge sharing. Future research might explore how and when the combination of individual motivation, social capital, and culture affect knowledge sharing differently. Also, the topic of cake design is not familiar to many people. The context of the study might have some influence on the findings. Although we believe that the research design and theoretical grounding testify to the soundness of the current study, we encourage researchers to continue to study other contexts in the future and to consolidate the existing body of literature.

Second, in our study we adopted a proxy measure of culture. We did not measure actual cultural factors, but used nationality to differentiate between the two online communities that we studied. We believe that the conceptual development in the front-end of the paper provides a sound basis for the empirical part of the research. However, it is possible that individualism influences not only trust, but also reciprocity: For individualistic cultures, the exchange norms are between two specific individuals, whereas in collectivist cultures, generalised reciprocity is applicable. Future research should address this issue. In addition, there could be other influential factors such as language or symbolism that are beyond the scope of the current study. Future research might address this issue and adopt different measures for national culture. Another way forward could be to investigate the Internet itself as a supranational organisation that might have developed its own culture (Ford et al., 2003).

Third, in our theorising we have included several of Hofstede's cultural dimensions, but not the masculinity/femininity dimension. This is because we were looking for strong conceptual linkages between facets of relational social capital and high-quality knowledge sharing and the influence of national culture on these relationships. We found these relationships in the conceptualisations of three cultural dimensions from Hofstede's work: individualism, long-term orientation, and uncertainty avoidance. However, the masculinity/femininity dimension might also be important because our communities were predominantly female. Observed differences might be partly due to this dominance and might be reflected in observed values for the masculinity/femininity dimension. Future research might address this issue and further tease apart any differences and similarities of cultural dimensions, and in particular the masculinity/

femininity dimension in male- or female-dominated communities and their effects on knowledge sharing and its antecedents.

Finally, another limitation of our study is that items in the survey were evaluated by the same source. However, as we were mainly interested in participants' own perception of knowledge quality and factors that are being perceived as influencing it, it would not have been helpful to validate the data using archival data or third-party evaluations. Indeed, whereas *quantity* of knowledge sharing is often measured using archival data (Wasko & Faraj, 2005), the actual perceived *quality* of knowledge sharing is typically assessed through self-report measures (Chiu et al., 2006; Hau & Kim, 2011). It is also important to note that interaction effects (our main interest in this study) are robust against common method bias (Evans, 1985). Moreover, facets of relational social capital and perceived knowledge sharing quality were measured in different sections in the survey and the relationship between these constructs is not directly obvious (Podsakoff et al., 2003). Nevertheless, we suggest that future research builds on this study and replicates it by including other data to corroborate our findings.

#### 6.4. Conclusion

In this paper, we investigated the differences between a Dutch and German online community of cake decorators regarding their perceptions of knowledge quality. We specifically hypothesised that the positive effects of trust, reciprocity, and shared vision (as salient facets of relational social capital) on perceived knowledge quality would be moderated by the national culture of online community participants (i.e., their nationality). To test our hypotheses, we collected data using a survey which we distributed in two online communities from Germany and the Netherlands. We found that the positive effects of reciprocity and vision on knowledge quality were influenced by the national culture of online community participants. The interaction effect shows that the Dutch, with typically lower scores on long-term orientation, perceive higher levels of knowledge quality when reciprocity is high. As for vision, both Dutch and German cake decorators perceived the shared knowledge to be of higher quality whenever they reported higher shared vision. However, the increase in perceived knowledge quality was higher for the German compared to the Dutch cake decorators. The interaction effect shows that German community participants, with a generally higher score on uncertainty avoidance, perceive that the shared knowledge is of higher quality when they also report high degrees of shared vision. Our findings therefore suggest that national culture is an important enabler of different relational social capital facets that shape the quality of the knowledge that is shared online.

## Notes

1. Typically, people did not join both communities. From earlier immersion in the field we knew that some participants have also been registered at the respective other community. However, they typically did not participate in the other community (mostly because of time and language restrictions).
2. Both websites feature a number of sub-forums which are only available for registered participants. We investigated only publicly visible messages.
3. In [Appendix 3](#), we provide an alternative model where we used the actual scores from both the Hofstede and the GLOBE studies, instead of the binary moderating variable “national culture.” The results are very similar to the results when we use the binary variable “national culture” as a moderator. When comparing the Hofstede with the GLOBE dimensions, we observe that they differently moderate the effect of “reciprocity.” Whereas we see a negative interaction regarding the Hofstede dimension (i.e., long term orientation) – which is in line with our earlier findings – there is a positive interaction regarding the GLOBE dimension (i.e., future orientation). This is because the Netherlands and Germany are differently evaluated in the Hofstede versus the GLOBE study.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Appendix 1. Definition of variables in Hofstede's and GLOBE studies

	Definition Hofstede <sup>a</sup>	Definition GLOBE <sup>b</sup>
Individualism/collectivism (Hofstede); In-group collectivism (GLOBE)	Collectivism represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty.	The degree to which individuals express pride, loyalty, and cohesiveness in their organisations or families.
Long-term orientation (Hofstede); Future orientation (GLOBE)	Societies who score high on this dimension [...] encourage thrift and efforts in modern education as a way to prepare for the future.	The extent to which individuals engage in future-oriented behaviours such as delaying gratification, planning, and investing in the future
Uncertainty avoidance (Hofstede and GLOBE)	The uncertainty avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen?	The extent to which a society, organisation, or group relies on social norms, rules, and procedures to alleviate unpredictability of future events

<sup>a</sup>Retrieved from <https://geert-hofstede.com/national-culture.html>

<sup>b</sup>Retrieved from <http://globeproject.com/results/countries/NLD?menu=list>

## Appendix 2. Survey instruments

Scale	Items	Based on
Perceived knowledge quality	The knowledge shared by community members is relevant to the topics. The knowledge shared by community members is easy to understand. The knowledge shared by community members is accurate. The knowledge shared by community members is complete. The knowledge shared by community members is reliable. The knowledge shared by community members is timely.	Chiu et al. (2006)
Trust	I have faith in other community members and trust them. I have belief in the good intent and concern of other community members. I have belief in other community members' reliability.	He and Wei (2009)
Reciprocity	When I share my knowledge in the community, I believe that I will get an answer for giving an answer. When I share my knowledge in the community, I expect somebody to respond when I'm in need. When I contribute knowledge to the community, I expect to get back knowledge when I need it. When I share my knowledge in the community, I believe that my queries for knowledge will be answered in the future.	He and Wei (2009)
Shared vision	Community members share the vision of helping others solve their problems around cake baking. Community members share the same goal of learning from each other. We share the same value that helping others is pleasant.	Chiu et al. (2006)

**Appendix 3. Results from linear regression analysis on perceived knowledge quality**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	4.69*** (0.42)	4.01*** (0.33)	4.84*** (0.35)	4.92*** (0.63)	5.32*** (0.91)	5.49*** (0.64)
Age (ln)	−0.03 (0.06)	−0.02 (0.06)	0.01 (0.06)	−0.03 (0.06)	−0.02 (0.06)	0.01 (0.06)
Education	−0.00 (0.02)	−0.03 (0.02)	0.00 (0.02)	−0.00 (0.02)	−0.03 (0.02)	0.00 (0.02)
Cake business	−0.06 (0.06)	−0.17** (0.06)	−0.04 (0.06)	−0.06 (0.06)	−0.17** (0.06)	−0.04 (0.06)
Frequency of use	0.05** (0.02)	0.04* (0.02)	0.03* (0.02)	0.05** (0.02)	0.04* (0.02)	0.03* (0.02)
Individualism (Hofstede)	−0.00 (0.00)					
Collectivism (GLOBE)				−0.13 (0.13)		
Longterm orientation (Hofstede)		0.00 (0.00)				
Future orientation (GLOBE)					−0.22 (0.19)	
Uncertainty avoidance (Hofstede)			−0.01* (0.01)			
Uncertainty avoidance (GLOBE)						−0.27* (0.13)
Trust	−0.09 (0.37)			−0.32 (0.61)		
Reciprocity		0.62* (0.26)			−1.37+ (0.82)	
Vision			−0.45 (0.37)			−1.20 (0.75)
Individualism (Hofstede) x Trust	0.00 (0.00)					
Collectivism (GLOBE) x Trust				0.13 (0.14)		
Long-term orientation (Hofstede) x Reciprocity		−0.01+ (0.00)				
Future orientation (GLOBE) x Reciprocity					0.33+ (0.18)	
Uncertainty avoidance (Hofstede) x Vision			0.01* (0.01)			
Uncertainty avoidance (GLOBE) x Vision						0.31+ (0.16)
N	766	766	766	766	766	766
Adjusted R <sup>2</sup>	0.26	0.09	0.26	0.26	0.09	0.26

Standard errors in parentheses. +  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . Two-tailed tests.