

**Credibility of Online Comments in the HPV Vaccination
Discussion in Finnish Online Forums**

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<p>Tiivistelmä – Abstract</p> <p>Internet and various online channels and forums have enabled real-time online commentary for almost everyone and audiences and content consumers can be also content producers. Content can also affect on how people act. High amount of user-generated content means that credibility evaluation has become increasingly important and organizations must manage online commentary as well as be pro-active with their communications. Word of mouth reviews made by “people like me” are often seen more credible as they come from normal people not from advertisers or marketers and offer a possibility to more empathic communication compared to communication made by authorities.</p> <p>This research focuses on a topic with relevance for health and welfare: vaccines. The aim of this research is to understand credibility of online comments, use of sources and authorities and which reliability factors are recognized in online comments about HPV vaccines. As a case study, the online discussion around the HPV-vaccines in Finnish online forums in 2013–2016 was chosen. The research is implemented through social media monitoring and 752 online comments from two different online forums were coded using theory-based content analysis as a basis for interpretations.</p> <p>This research shows that objective and research-based comments with reliable sources are highly appreciated among attendants. People criticize each other's comments and seek “the truth”. Authorities are seen both in positive and negative way but the role of personal experiences remains small as well as empathic conversation with other participants. It seems that organizations weren't present and missed an opportunity to take part into debate.</p>	
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<p>Tiivistelmä – Abstract</p> <p>Internet ja lukuisat online-kanavat ja -foorumit ovat mahdollistaneet reaaliaikaisen kommentoinnin lähes jokaiselle ja näin yleisöistä ja sisällön kuluttajista on tullut sisällöntuottajia. Sisällöt voivat myös ohjailla kuluttajien käyttäytymistä. Kuluttajien tuottaman sisällön suuri määrä on johtanut siihen, että online-sisältöjen luotettavuuden arvioimisesta on tullut entistä tärkeämpää ja organisaatioiden täytyy ennakoida ja hallita heitä käsittelevää verkkokeskustelua. Tavallisten ihmisten kirjoittamat word of mouth -arviot verkossa koetaan usein luotettavammiksi kuin markkinointitekstit ja mainonta. Lisäksi yksilöiden välinen verkkokeskustelu on usein empaattisempaa kuin vastaava viranomaisviestintä.</p> <p>Tämä tutkimus keskittyy merkittävään terveyden ja hyvinvoinnin teemaan: rokotteisiin. Tutkimuksen tavoitteena on ymmärtää verkkokomenttien luotettavuutta, lähteiden käyttöä sekä auktoriteetin muodostumista ja tutkia millaisia luotettavuustekijöitä verkon HPV-rokotekeskustelun kommentteista voidaan tunnistaa. Tapaustutkimuksen aineistoksi valittiin suomalaisilla online-foorumeilla vuosina 2013–2016 käytyä HPV-rokotekeskustelua. Tutkimus toteutettiin monitoroimalla 752 kommenttia teorialähtöiseen sisällönanalyysiin pohjautuen.</p> <p>Tämä tutkimus osoittaa, että osallistujat arvostavat puolueetonta kommentointia, jossa väitteet on perusteltu tieteellisesti luotettavilla lähteillä. Osallistujat kritisoivat toistensa kommentointia ja etsivät oikeita vastauksia. Viranomaiset nähdään sekä positiivisessa että negatiivisessa valossa, mutta henkilökohtaisten kokemusten jakaminen ja empaattinen keskustelu muiden kanssa jää pieneen osaan. Näyttää siltä, että organisaatiot eivät itse olleet läsnä foorumeilla ja jättivät näin hyödyntämättä tilaisuuden ottaa osaa keskusteluun.</p>	
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CONTENTS

ABSTRACT

CONTENTS

1	INTRODUCTION.....	6
2	CREDIBILITY IN ONLINE DISCUSSIONS.....	10
2.1	Credibility.....	11
2.1.1	Trust and trustworthiness	14
2.1.2	Authenticity	15
2.1.3	Authority.....	15
2.2	Expectations	16
2.3	eWOM and sWOM.....	19
2.4	Online forums as issue arenas	21
3	CREDIBILITY FACTORS.....	23
3.1	Emotions in online communication.....	26
3.1.1	Consistency and peer pressure	27
3.1.2	Empathy and support in online discussion	27
3.2	People like me versus authorities	28
3.2.1	Experts and authorities	28
3.2.2	Content producers, peer evaluation and social relationship.....	30
3.2.3	Linguistic choices.....	31
4	THE CASE OF HPV VACCINE.....	33
5	RESEARCH METHOD	35
5.1	Theory-based content analysis	35
5.2	Collecting data	37
5.3	Coding with ATLAS.ti.....	40
5.4	Research reliability and challenges.....	43
6	FINDINGS	46
6.1	Commenters' perceptions of credibility.....	46
6.2	The use and evaluation of source material	48
6.3	Commenters' perceptions of authority	51
6.3.1	Officials.....	52
6.3.2	People like me as authorities.....	53
6.3.3	Empathy and sarcasm	54
7	DISCUSSION AND CONCLUSIONS	57
7.1	Use of sources	58

7.2	Role of empathy and people like me	59
7.3	Authorities.....	60
7.4	Opportunities for organizations.....	60
7.5	Evaluation of the study	62
7.6	Recommendations for future research.....	63
REFERENCES.....		65

1 INTRODUCTION

“People seek information for comfort, support, empowerment, the impetus and knowledge to act, or simply to learn”

- Wathen & Burkell 2002, 134.

Internet and various online channels have enabled real-time commentary for almost everyone and web 2.0 has changed people from content consumers to content producers (Chung, Nam & Stefanone 2012, 171). Thus, with the high amount of user-generated content the evaluation of credibility has become increasingly important (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 254). This has created new challenges for organizations as well as for authorities to communicate with their stakeholders, be pro-active (Tirkkonen & Luoma-aho 2010, 172–173) and to “- - ‘manage’ online comments posted in response to their messages” (Kareklas, Muehling & Weber 2015, 27). Numerous people also take advantage of internet forums while searching health-related information and significant part of the information is not authored by health professionals which offers a possibility for false information and need for credibility evaluation (Eastin 2011; Wathen & Burkell 2002).

As social media offers an organization or individual an opportunity for two-way communication, it also requires credibility (Mae Kim 2016). Organizations may use the strategic approach when creating credibility by establishing personable interaction, expertise, invitational rhetoric and trustworthiness (Mae Kim 2016). According to Jim Macnamara’s report *Creating an architecture of listening in organizations* (2015, 6) organizations actively talk about buzzwords like engagement and two-way communication but in reality organizational communication is still fo-

cused on speaking and not listening their stakeholders. Active social media monitoring can help organizations to gain intelligence and insight of issues that matter to their stakeholder groups (Macnamara 2015, 7).

It is often thought that the most reliable information comes from the authorities or from the different experts of the certain field (Shyam 2008, 84) but global Edelman Trust barometer 2016 reveals that institutions like government, business, nongovernmental organizations and media are not trusted among mass population (85 per cent of the respondents). Instead, among the remaining 25 per cent called “informed public”, trust is rising. This informed public has at least a college education. (Edelman Trust Barometer 2016.)

Often experts might be related to some specific organization or brand and the objectivity of their opinions in online environment are at stake. Then again, in some cases so called “normal individuals” writing on online forums may seem more like experts compared to actual authorities. Often online forums and their anonymity are seen as an opportunity for marketers to promote or write reviews in order to influence consumers’ judgement of the product or service and these writings can be disguised into consumer recommendations (Mayzlin 2006, 155).

People are increasingly aware and worried of the unreliable users and their motives to post online WOM (word of mouth) comments (Cheung, Luo, Chia & Cheng 2009, 11). In the online environment content is no longer edited by gatekeepers (Hargittai, Fullerton, Menchen-Trevino & Yates Thomas 2010, 469). However, eWOM (electronic word of mouth) is also seen as a trustworthy option for official brand web sites as “- - word of mouth is seen as more credible than marketer initiated communications because it is perceived as having passed through the unbiased filter of ‘people like me’ “(Kareklas et al. 2015, 398) and also as possibility to communicate empathy from user to another (Lazar & Preece 2004; Luoma-aho, Tirkkonen & Vos 2013).

Until recently, much effort in research has been put into understanding source credibility of online reviews, different web sites and trustworthiness of eWOM when buying and comparing actual products and services online. This research focuses on a topic with relevance for global health and welfare: vaccines. Vaccines can partly be processed as products, but simultaneously vaccines evoke emotional reactions as they are directly related to people’s health, children and pharmaceutical industry. Previous research has not much focused on the credibility of online

comments. In figure 1 below previous research areas and some examples of the references used in this work are presented. Some research exists on trustworthiness of eWOM (Metzger, Flanagin & Medders 2010; Pan & Chiou 2011, 68; Wu, Noorian, Vassileva & Adaji 2015) but “- - it is proposed that investigating how people evaluate on-line recommendation credibility would be a significant and interesting topic that could advance understanding of the process by which eWOM is used” (Cheung, Luo, Sia & Chen 2009, 10).

Analytical investigation of the communication on issue arenas, such as online forums, can increase the understanding of interaction and new possibilities for future research. This will furthermore enable strategic planning of communication in complex and turbulent environment. (Vos, Schoemaker & Luoma-aho 2014, 201.)

In this research, focus will be in credibility, trustworthiness and authenticity of online comments in the vaccination discussion. The aim of this research is to understand credibility of online comments, use of sources and authorities and which reliability factors are recognized in online discussions about HPV vaccines.

Previous research area	Reference
Web page credibility	Wathen & Burkell 2002 Hargittai, Fullerton, Menchen-Trevino & Yates Thomas 2010 Metzger, Flanagin & Medders 2010
Online news credibility	Chung, Nam & Stefanone 2012
eWOM credibility	Cheung, Luo, Sia & Cheng 2007, 2009
Credibility in online reviews	Jensen, Averbek, Zhang & Wright, 2013 Lim & Van Der Heide 2015 Mackiewicz 2010 Wu, Noorian, Vassileva & Adaji 2015
Source credibility	Go, Jung & Wu 2014 Kareklas, Muehling & Weber 2015 Willemsen, Neijens & Bronner 2012



Formation of credibility in online discussion

FIGURE 1 Focus related to previous research

The aim of this research is to understand credibility of online comments. As a case study, the online discussion around the HPV vaccines in Finland in 2013–2016 is chosen.

RQ1: How do people use sources in online discussions?

RQ2: Who do people use as authorities in online discussion commentary?

RQ3: Which other factors are recognized in the credibility formation of online comments about HPV?

2 CREDIBILITY IN ONLINE DISCUSSIONS

In both face-to-face and online environment we receive a large amount of information and one way to filter it is to evaluate its credibility (Wathen & Burkell 2002, 134). Trust, credibility, trustworthiness, authenticity and authority are often used in same context or included in one another. The roots of credibility research can be found in early 1950s, Hovland and Weiss' research on persuasion and source credibility (Eastin 2001). The following table 1 is defining main concepts and in the text below their similarities, differences and relationship to each other is explained.

TABLE 1 Concepts and their definitions

Main concept	Reference	Citation
credibility	Metzger 2007, 2078.	"A long history of research finds that credibility is a multifaceted concept with two primary dimensions: expertise and trustworthiness."
credibility	Tseng & Fogg 1999, 39; Wathen & Burkell 2002, 135.	Whether something is "believable".
credibility	Lim & van der Heide 2015, 68.	"Source credibility is a multidimensional concept, and expertise/competence, trustworthiness and caring/goodwill are the three most established dimensions."
credibility	Blackshaw 2008, 61.	"Credibility is the product of six core drivers, - - 1. Trust 2. Authenticity 3. Transparency 4. Listening 5. Responsiveness 6. Affirmation"
credibility	Eastin 2001.	"- - perceived expertise, bias, fairness, truthfulness, accuracy, amount of use, depth or completeness of

		message, prior knowledge and message quality”
Other concepts	Reference	Definition
trustworthiness in online discussion	Gotlieb & Sarel 1991, Hovland, Janis & Kelley 1953 in Kareklas et al. 2015, 6.	“Refers to the willingness of the source to make valid and unbiased assertions”
authenticity	McDougall 2015, 110–111.	Seen as something with “real-life” experiences, listening, acknowledging multiple viewpoints, honesty and empathy.
eWOM credibility	Fogg et al. 2002, Nabi & Hendriks 2003, Tseng & Fogg 1999 in Cheung et al. 2009, 71.	“eWOM credibility is defined as the extent to which one perceives a recommendation/review as believable, true, or factual”
trust	Rotter 1967 in Feng, Lazar & Preece 2004, 5.	“an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon”
authority	Karlsson 2011, 281.	“Authority can refer to formal power and institutions, but it also has dimensions of informal power”

2.1 Credibility

Credibility in general

A simple way to determine credibility is whether something is “believable” (Tseng & Fogg 1999, 39; Wathen & Burkell 2002, 135). Research shows that expertise and trustworthiness are the two vital elements of credibility (Metzger 2007, 2078; Tseng & Fogg 1999, 40). Trust can be understood as a property of internet user and credibility the property of information in which users base their possible trust (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255). Then again trustworthiness can be seen as the property of information giver if he or she wants to give correct information and expertise can be found if she or he is able to do so (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255).

Also Lim and Van Der Heide (2015, 68) underline the multidimensionality of the concept credibility by listing expertise/competence, trustworthiness and caring/good will as the most established dimensions. Both Lim and Van Der Heides’ (2015) and Metzger’s (2007) and Tseng & Fogg’s (1999) definitions include the idea

that trustworthiness is one part of the credibility. Often credibility is divided into different elements like 1. trust, 2. authenticity, 3. transparency, 4. listening, 5. responsiveness and 6. affirmation (Blackshaw 2008, 51) and “- - perceived expertise, bias, fairness, truthfulness, accuracy, amount of use, depth or completeness of message, prior knowledge and message quality” (Eastin 2001). When going through the previous research about credibility, trustworthiness, authenticity, authority and expertise seem to be the vital concepts related to credibility.

Credibility online

Metzger (2007, 2089) refers to many scholars (Fritch & Cromwell 2001; Metzger, Flanagin, Eyal et al. 2003) which have suggested that credibility has many different levels for internet users to evaluate. These levels might for example be the surface of the web page, presumed credibility, reputed credibility like different kinds of endorsements and earned reputation (Fogg 2003 in Metzger 2007, 2089). Also Wathen and Burkell (2002, 135) refer to Tseng and Fogg’s (1999, 41–43) four types of credibility, which are:

1. *Presumed credibility* like the perceiver’s stereotypes about the information giver and general assumptions that perceiver has about the other person. Presumed credibility requires stereotypes and assumptions about the others. That is why people often evaluate their friends as credible because they assume that they are telling the truth. (Tseng & Fogg 1999, 41–42.)
2. *Reputed credibility* consists of what the third parties have told about the information giver. The marks of reputed credibility can be for example well-known titles as doctor and professor or awards which make those people to seem more credible. In computer environment also linking a website on another site might be seen as third-party recommendation for that link. (Tseng & Fogg 1999, 42.)
3. *Surface credibility* focuses on what someone or something looks like. In virtual environment superficial characteristics of the page or comment may affect its trustworthiness. However, it has to be noted that these perceptions may differ depending on the user and culture. (Tseng & Fogg 1999, 42.)
4. *Experienced credibility* requires that the source is familiar for receiver and considered valuable. It means that someone has own experiences of some-

one or something and it often may require more than one experience to find someone worth trusting. Then the information source proves to be trustworthy regardless of whether it is human or computing device. (Tseng & Fogg 1999, 42.)

In this context Tseng & Fogg (1999) are using examples like people and computers as well as computer softwares but this study is interested in the assessment of these types of credibility when evaluating online comments.

Health literacy and credibility in health information online

Many people, especially young adults tend to look for health information online (Boiarsky, Roner & Long 2013, 883) and there are large amount of health related information available and it it's quality and consistency varies (Moorhead, Hazlett, Harrison, Carroll, Irwin & Hoving 2013). When searching online information, health literacy is an important skill to evaluate information. Health literacy can be defined as "The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions" (Berkman, Davis & McCormack 2010, 16). Norman and Skinner (2006) propose that eHealth (electronic health) literacy covers six different literacies: traditional ability to read text, information literacy to know how knowledge is organized and searched, media literacy as critical thinking about media content and setting the information to social and political context, health literacy as understanding basic terms and contexts, computer literacy to use computers in problem solving and scientific literature to understand methods, nature, limitations of creating knowledge in a systematic way. According to these various literacy skills evaluation of online health information requires multiple skills and capacity to survey the information.

Content that hasn't gone through the gatekeeping process, like personal blog, may be evaluated less credible than content with more formal process (Boiarsky et al. 2013, 883). Social media offers a variety of health information and easy access to it and it may offer peer, social and emotional support but on the other hand the credibility of information is more difficult to assess and it might be hard to apply online information to one's personal health situation (Moorhead, Hazlett, Harrison, Carroll, Irwin & Hoving 2013).

2.1.1 Trust and trustworthiness

Trust is defined as “- - an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon” (Rotter 1967 in Feng, Lazar & Preece 2004, 5) or correct (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255). Blackshaw (2008, 51) names trust the most critical part of credibility which requires confidence, dependability and faith and also plenty of previous research names trust the determining factor when building long-term relationship with organization and its stakeholders (Mae Kim 2016) .

Trust is broadly seen as something based on human interaction, either face-to-face or online and it focuses on the moral conception of the source (Tseng & Fogg 1999, 40). People often seek for clues from the environment to ensure if they are in a vulnerable position and if the others are wishing them good or bad (Friedman, Kahn & Howe 2000, 37). This takes into account that trust might be changing rapidly, must be negotiated with every individual and every brand and is constantly on the move. Trust is not an automatic feature of the organization: “Trust in institutions and their license to operate are no longer automatically granted on the basis of hierarchy or title; rather, in today’s world, trust must be earned” (Edelman 2016, Edelman Trust Barometer).

Trust is a “willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer, Davis & Schoorman 1995, 712). Both of these definitions mention an individual being vulnerable while qualifying trust. This leads to the situation where to achieve trust, one is willing to take a risk (Mayer et al. 1995, 712). In online environment interaction between individuals is not face-to-face which might make it difficult to search for cues to build trust (Feng, Lazar & Preece 2004, 4; Friedman, Kahn & Howe 2000, 40).

Trustworthiness in online discussion can be seen as it “refers to the willingness of the source to make valid and unbiased assertions” (Kareklas et al. 2015, 6) and it has a long history in credibility research (Mae Kim 2016). Unbiased is a bit complex word in this context as in online discussion opinions presumably rely on the

subjective experience. Are subjective experiences unbiased if they are told us truthfully? The major part of the trustworthiness consists of ability, benevolence and integrity and often ability is also replaced with competence (Mayer 1995, 717). Other words connected to trustworthiness are honesty, transparency and reliability (Mae Kim 2016). Benevolence refers to the willingness to do good without specific self-interest and with integrity that the advisor maintains certain principles and consistency in his or her actions (Mayer 1995, 718–719).

2.1.2 Authenticity

Authenticity is something which consists of several significant areas and considers credible, trustworthy and reliable messages (Lo 2014, 174). Authenticity is seen as something connected to “real-life” experiences, listening, acknowledging multiple viewpoints, honesty and empathy (McDougall 2015, 110–111). Authenticity is seen as an unstable concept, which often refers to “- - genuineness or realness of artifacts or events and also as a human attribute signifying being one’s true self or being true to one’s essential nature” (Steiner & Reisinger 2006, 299).

Authenticity mostly becomes an issue when it’s questioned (Peterson 2005, 1083). Discussion about authenticity is often seen as a part of product marketing campaigns and besides individuals, organizations and companies, also places and cultural characteristics are promoted as authentic (Peterson 2005, 1083–1084). Even though detailed online posts, videos and photos may increase authentic impression, people doubt the authenticity of over-detailed messages and question if they come from actual customers (Lo 2014, 180).

When talking about trustworthiness and benevolence Mayer (1995) mentions the role of matching values and the consistency of the certain principles among information seekers and advisors and Blackshaw (2008, 52) talks about the new era of marketing where consumers bring their own values into brand and authenticity evaluation.

2.1.3 Authority

Authority can mean formal power and institutions, but also informal power (Karlsson 2011, 281). Authority is not necessarily dependent upon official status

because today's online information can be created for example by students, occasional individuals, marketing professionals and the quality of information can vary across the sites and comments. It means that authority won't always come from actual institutional sources but "from below" and the understanding of the information production process to the information seekers. (Lackaff & Cheong 2008, 143–144.)

Authority is the one factor in assessing credibility but when it is impossible or difficult to determine people will seek for other clues to make their decisions about the quality of information (Lackaff & Cheong 2008; Lo 2014). Authority is the concept which is often mentioned in the same context with the concepts expertise and competence (Go, Jung & Wu 2014, 259). People want to engage with content which is competent and stakeholders evaluate if brand is an expert in one specific industry (Mae Kim 2016).

According to different definitions credibility is a concept that covers trust, trustworthiness, authenticity and authority. When evaluating someone's message and its credibility, one also must measure the writer's trustworthiness, authenticity and authority to decide whether to take into consideration the information offered in a message. That is why in this research the concept credibility is used to describe all these factors together. In this research credibility covers trust in another attendant, trustworthiness of the comment and commenter, authenticity of the comment and attendant having authority in the eyes of the reader.

2.2 Expectations

The current operating environment requires organizations to anticipate and consider stakeholders' expectations as communication is only successful when resonating with stakeholder expectations (Olkkonen & Luoma-aho 2014, 222–223, 233). Different groups have different expectations which are not necessarily similar or in line with each other (Vos, Schoemaker & Luoma-aho 2014, 201). Expectations can portray feelings from hopes and values to beliefs (Olkkonen & Luoma-aho 2014, 226–227). In table 2 below a variety of phenomena related to expectations are presented and after that introduced in further detail.

TABLE 2 Expectations

Main theme	Reference	Citation
selective filters, expectations	M.J. Metzger et al. 2010, 424.	" - - by avoiding information that is contrary to existing beliefs and ending a search when information found is in agreement with those beliefs, participants appear to employ selective filters to assist them in determining the credibility of information found online."
expectations	M.J. Metzger et al. 2010, 429.	"- - if a Web site failed to meet their expectations - - then they would judge it as <i>not</i> credible."
expectations, prior beliefs	Cheung, Luo, Sia & Chen 2007, 73; Metzger et al. 2010, 424.	"- - when reading from online consumer discussion forum, if the current online recommendations have advice that confirms the reader's existing belief, he/she will more likely to believe the information."
existing belief	Metzger et al. 2010, 423.	"Indeed, the match between some information and one's existing belief, opinion, or perspective was mentioned frequently as a good indicator of credibility."
expectation violation	Olkkonen & Luoma-aho 2015, 89.	"According to expectancy violation theory, expectations can be either confirmed or violated – positively or negatively."

Olkkonen & Luoma-aho (2015, 86–89) present four types of expectations based on earlier literature: value-based expectations, information-based expectations, experience-based expectations and personal interest-based expectations. Value-based expectations are ideal and represent the idea of what should be or what is wished for and what organization could achieve despite of what is probable. Information-based expectations are formed based on available information or alternatively missing information which can cause unrealistic expectations. (Olkkonen & Luoma-aho 2015, 86.) Experience-based expectations are based on previous experiences and make assumptions of what might happen again. Personal interest-based expectations then again base on personal gains and what is wished for individually which can cause the ignorance of official information if it doesn't fit in one's interests. (Olkkonen & Luoma-aho 2015, 86.) These four types can also be recognized in online discussion, where comments often contain personal values, information such as references or research results, personal experiences and personal interests and preferences. People rarely can land on online discussion without any expectations related to theme in discussion.

How do people evaluate the comments written on online forums and how comments affect other people in social networks? Often the process is seen to begin from expectations and previous beliefs. Usually when a person is looking for information on online forums, he or she already has some kind of hint of the product, service or organization. Reputation is often mentioned together with expectations when it is spoken as a result of past behavior creating expectations for future actions and appearance (Olkkonen & Luoma-aho 2015, 83).

In other words, people usually have expectations about the product or service when they land on the discussion forum. This is called existing belief or prior belief. (Cheung, Luo, Sia & Chen 2007; Metzger et al. 2010.) And as Herr, Kardes and Kim (1991 in Pan & Chiou 2011, 73) note, "Consumers are likely to overestimate the validity of their prior perceptions of a product or service and to retain only that information that is consistent with that perception". This raises questions about changing old perceptions and expectations with knowledge. Are people ready to change or modify their opinion about the issue, based on received information?

Additionally, there are two different kinds of errors while evaluating web information (Wathen & Burkell 2002). Information seekers who are inexperienced and not that familiar with the subject and who desperately need the information, easily have "blind faith" into source. On the contrary to that those who already are experts in that field tend to have "blind skepticism" into source. (Wathen & Burkell 2002, 138.)

Previous research has shown that people are more likely to search for information which will meet their expectations and beliefs, avoid information which could break those prior pictures of the product or organization and even end their search when matching information is found. This phenomenon is called selective filters. (Metzger et al. 2010, 424.) When a person finds the information which meets his or her beliefs, this person will more likely to believe it (Cheung, Luo, Sia & Chen 2007, 73) and the match between the information found and one's belief is often personally seen as a working indicator of credibility (Metzger et al. 2010, 423).

Expectations can also be violated either positively or negatively when the outcome will be something else as expected or they can be confirmed when the outcome will be the same as expected (Olkkonen & Luoma-aho 2015, 89). If positive expectation is positively violated, the result is even better than assimilated but if nega-

tively violated the outcome will be worse than before. Then again if negative expectation is negatively violated, the image will develop even worse or if violated positively, the negative vision will change better. (Olkkonen & Luoma-aho 2015, 89.) Online forum attendants probably have some expectations about other attendants and their behavior and style of communication as well. If another person's behavior differs heavily from expected the violation of expectations can be distracting and direct the attention away from the topic (Burgoon 1993, 35).

2.3 eWOM and sWOM

Originally the concept WOM (word of mouth) referred to face-to-face or at least voice-to-voice interaction between people (Lim & Van Der Heide 2015, 67–68) and figure 2 represents Lim & Van Der Heide's view of traditional word of mouth and electronic word of mouth (2015, 69). It is seen that WOM is a consumer-dominated channel, where the message sender is not dependent on the markets and members are not paid of their messages (Brown, Broderick & Lee 2007, 4&7). eWOM (electronic word of mouth) differs from the traditional word of mouth as it happens via electronic devices on Internet (Lim & Van Der Heide 2015). eWOM can be understood as "any positive or negative statement made by potential, actual, or previous customers about a product or company, which is made available to a multitude of people and institutions via the Internet" (Hennig-Thuray et al. 2003, 39).

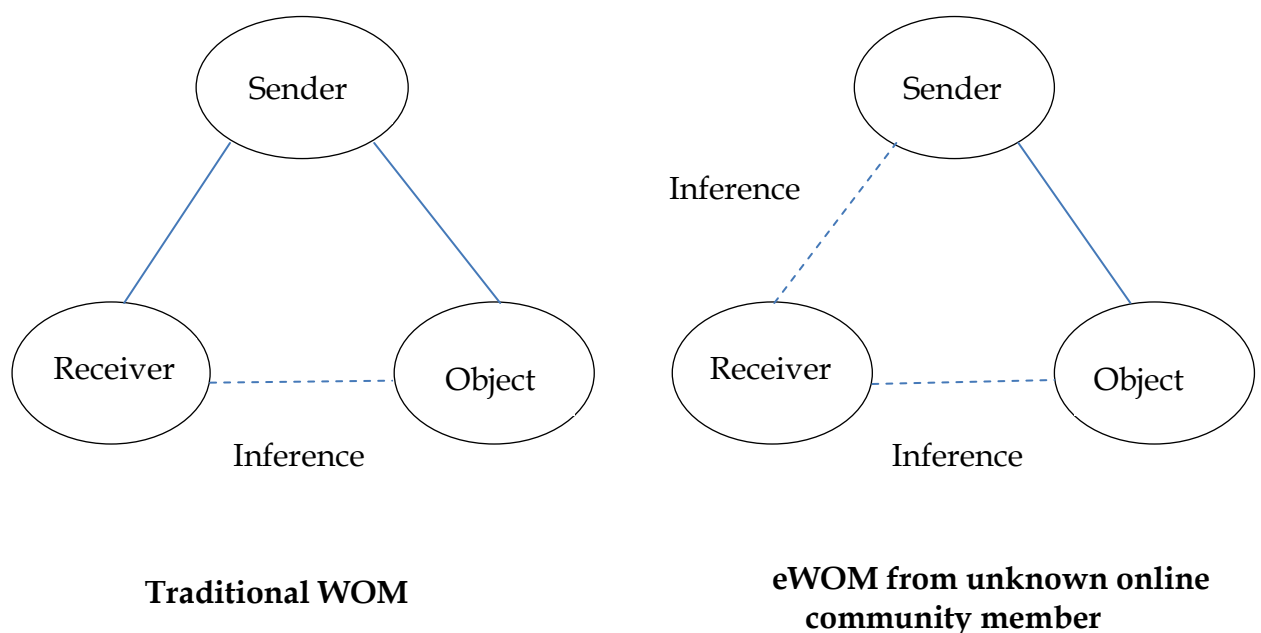


FIGURE 2 Conceptual models of traditional WOM and eWOM (Lim & Van Der Heide 2015, 69)

Online forums offer citizens an easy way to compare different products through electronic word of mouth (eWOM) and as noted by Kareklas, Muehling and Weber (2015, 1) “Online commenters who are perceived to be credible are instrumental in influencing consumers responses to pro- vs. anti-vaccination PSAs [public service announcement]”. Some of the basic features of eWOM are that people are usually strangers and they can’t look for nonverbal cues to evaluate people they communicate with (Lim & Van Der Heide 2015, 68) and thus the interpretation of credibility is mostly based on provided text (Brown, Broderick & Lee 2007, 7).

As shown in figure 2 above, that is why in eWOM people need to make inferences both the object (for example vaccine) and the unknown online community member reviewing the object (Lim & Van Der Heide 2015, 69). In traditional WOM the receiver knows the message sender and has some presumed and experienced credibility about it (Tseng & Fogg 1999, 41–42) and that’s why it is easier to evaluate the product as well. In eWOM person has to evaluate first the sender and then the product based on sender’s credibility appearance and the evaluation process is more complex.

A related concept for eWOM is sWOM (word of mouth on online social sites) which definition is quite similar adding the fact that the particular eWOM happens on individual’s social network/social sites like Facebook. It is also seen as one-to-many communication and either written or broadcast. (Eisingerich et al. 2015, 121.) In this research eWOM and sWOM are seen as similar concept. Both definitions underline the one often cited feature of eWOM, which is its ability to inform several people at once. It is noted both in communication and marketing literature that consumer generated word of mouth and announcements made by authorities can shape the public opinions (Kareklas, Muehling & Weber 2015, 23). It is vital for marketers and organizations to understand how people use the eWOM information to compare and assess products and services both online and offline and how it affects brands (Brown, Broderick & Lee 2007, 3).

As eWOM information is spreading widely and fast, consumers might have difficulties to assess the credibility of this information and its sources especially when they are diverse and not only from traditional authorities and experts. That is why people need new ways to assess reliability. (Metzger et al. 2010, 414.) “ At issue in these situations is the reader’s ability (or inability) to make informed decisions based upon the perceived credibility of the information source, coupled with their assessments of the perceived credibility of the accompanying online commentary” (Kareklas, Muehling & Weber 2015, 5). To sum up “eWOM credibility is defined as the extent to which one perceives a recommendation/review a believable, true, or factual” (Fogg et al. 2002; Nabi & Hendriks 2003; Tseng & Fogg 1999 in Cheung et al. 2009).

2.4 Online forums as issue arenas

When working as a platform for open discussion about brands, products and services, online forums can be seen as significant issue arenas for organizations and significant places for eWOM. Issue arena can be an actual place or some kind of medium for discussion but in general it refers to all places where different views and opinions on issue are changed and presented and the focus of the arena is in the certain issue not the organization (Vos, Shoemaker & Luoma-aho 2014, 201–202). As the organization-centered communication is largely over, issue arenas have become an important part of the organizations’ communication environment and active participation helps organizations to keep track on the issues and discussion as well as detect weak signals (Luoma-aho, Tirkkonen & Vos 2013, 240, 242, 248).

However, Luoma-aho, Tirkkonen & Vos (2013, 248) underline that when realizing this opportunity, organization must plan its appearance carefully and to consider who are the credible persons to communicate with people or is it better to remain at the organizational level. As these kinds of arenas are open for very different stakeholders and also individuals, many different interests may come into discussion and one certain organization can’t define the issue handled but should take part into debate (Vos, Shoemaker & Luoma-aho 2014, 201–202). Issue arenas can also be rather quiet or stable depending on the possible gap between current and the desired situation regarding the issue (Vos, Shoemaker & Luoma-aho 2014, 211).

In this research online discussion forums are working as issue arenas for public discussion on HPV vaccines and different issues related to that. The opinions about online discussion forums vary from democratic meeting places to forums for polarized decision making (Wright & Street 2007, 850). In some cases discussion forums may evolve into online communities in which people with knowledge and experiences about the same topic have non-private online discussions long enough to form a social relationship with the other participants (Brown, Broderick & Lee 2007, 3). Issue arenas need to be considered as significant place for stakeholders' expectation formation. Hence, the interaction on a specific issue can be seen in the organization's reputation. (Vos, Schoemaker & Luoma-aho 2014, 201.)

3 CREDIBILITY FACTORS

When seeking information, people usually want to reduce uncertainty, but in some cases the process can only increase it and cause dissonance due to divergent information and opinions (Wathen & Burkell 2002, 134). In the previous research a number of persuasive factors have been identified. Some of them are very humane in nature and some are more technical details, while people tend to regard both the source and the content to assess the credibility of online information (Eastin 2001). These factors are summarized in table 3 below. In online discussion forums participants are usually anonymous and take part into discussion without any user profile which would offer background knowledge to other members. When people don't really know anything about the information source, the message and its properties influence the readers' perception (Lim & Van Der Heide 2015, 71).

TABLE 3 Credibility factors

Main theme	Reference	Citation
authority	Sundar & Shyam 2008, 84.	"A common finding across the credibility literature is that one of the major criteria for assigning credibility to a site is whether the source is an official authority or not."
consistency	Cheung, Luo, Sia & Chen 2007, 73.	"If the current recommendation is consistent with the opinions of other forum users, readers are likely to rate the credibility of this recommendation more highly as people tend to follow and believe in normative opinions."
consistency	Feng, Lazar & Preece 2004, 21.	"Users are highly sensitive to mixed or contradictory messages, in which emphatic accuracy and response type are inconsistent. In such situations, trust is fragile and easily damaged."

empathy	Bickart & Schindler 2001, 33.	" - internet forums have a greater ability to generate <i>empathy</i> among readers."
empathy, support	Feng, Lazar & Preece 2004, 17 & 18.	"Communication partners who talked in an emphatic accurate and supportive way were most trusted by the participants." "In order to win other people's trust online, a person not only need to correctly infer the other's feeling, but also provide supportive response."
people like me	Kareklas et al. 2015, 398.	"The reasons for WOM's power are evident: word of mouth is seen as more credible than marketer initiated communications because it is perceived as having passed through the unbiased filter of "people like me."
people like me	Kareklas et al. 2015, 23.	" - when the both sponsor of the PSA (public service announcement) and the relevant expertise of the online commenters were identified, the impact of these comments on participants' attitudes and behavioral intentions was greater than the impact of the PSA and its associated credibility."
positive versus negative	Chiou & Cheng 2003, 52; Pan & Chiou 2011, 68.	In past research it is noted that negative online information has stronger effect compared to positive information when creating the attitude towards a brand. " - positive eWOM information can be self-serving, whereas negative eWOM information is less likely to be" (Pan & Chiou 2011, 69).
positive versus negative	Wu et al. 2015, 14.	"Advisors with almost all positive or negative reviews are perceived to be not trustworthy, while advisors who write mixed reviews are perceived to be trustworthy."
reputation, endorsement, consistency, expectation violation, persuasive intent	Metzger et al. 2010, 425.	"Data analysis revealed five heuristics commonly employed by participants when evaluating credibility: reputation, endorsement, consistency, expectancy violation and persuasive intent."
social relationship	Pan & Chiou 2011, 68.	" - the social relationship among net pals can be an important cue which an information-seeker can use to judge the trustworthiness of the comments and reviews in an internet forum."
spelling and grammar, (consistency)	Metzger et al. 2010, 424.	"Indicators such as topic mastery, writing style, spelling and grammar, and the extent of details offered were essential to evaluations of an enthusiast's expertise."

In the following sections different kinds of theory-based credibility factors, helping people to assess online information, are presented. In the figure 3 the revised 3S model (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 256) is presented. This figure has split user characteristics into three different groups: domain expertise, information skills and source expertise. This enables user to evaluate 3S information characteristics like semantic features and content, surface features and source features. Semantic features mean the accuracy, completeness and neutrality of the information and this evaluation requires a little expertise from the reader that she or he is able to compare the information to the previous knowledge about the topic (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255). Surface features mean the evaluation of the design and length of the page and number of sources and this requires knowledge of how such features as source generally s are related to credibility. Third S is source expertise where the information is not evaluated but only the source where it's coming from. (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255.)

If the information is evaluated credible it inspires trust in user and it furthermore affects user's source experience. This revised 3S model was originally made for evaluating information like web page article online and it can't be completely transferred into online comment evaluation. Most of these factors are also repeated when evaluating the credibility of online comments in discussion forums but for example the neutrality under semantic features is not necessarily appreciated among online comments if user's aim is to find answers, reduce uncertainty or make a decision. Also pictures might be in a minor role when evaluating online commentary on discussion forums.



FIGURE 3 Revised 3S-model of credibility evaluation (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 256)

3.1 Emotions in online communication

Previous research has shown a lot of interest in negativity and positivity appearing in online discussion. Also the results are at times slightly contradictory. According to most of the previous studies, negative or mixed comments are seen more credible than only positive comments and the concept two-sidedness refers to information giver's both positive and negative aspects of the service or product (Jensen, Averbeck, Zhang & Wright 2013, 299).

Some research states that people with only positive or negative reviews are perceived to be untrustworthy, while people who write mixed reviews are seen as trustworthy (Wu et al. 2015, 14), or that negative online comments often have greater effect on people's attitudes towards brand image while positive eWOM may show up self-serving (Chiou & Cheng 2003, 52; Pan & Chiou 2011, 68). This may be explain by the fact that negative information in an a largely positive comment may seem like an objective point of view and through that product or service imperfection may occur as a positive expectancy violation and review is seen as truthful (Jensen et a.l 2013, 299).

3.1.1 Consistency and peer pressure

When comparing comments, readers pay attention to consistency in positivity and negativity and also details like spelling, grammar and writing style are seen as important indicators when evaluating writer's expertise (Metzger et al. 2010, 424). Consistency among the forum users and their comments means a lot and if the recommendation is in line with other forum users, others are likely to rate it credible as people tend to put value on normative opinions (Cheung, Luo, Sia & Chen 2007, 73). If readers have to face mixed opinions with inconsistent feelings, their trust is easily broken (Feng, Lazar & Preece 2004, 21) and "When people read a review posted by a member of the community about whom they do not have interpersonal knowledge, there is uncertainty of consensus, distinctiveness, and consistency" (Lim & Van Der Heide 2015, 72).

The concept "bandwagon cue" refers to people's preference to normative opinions and willingness to rely on collective sources over individual sources (Go et al. 2014, 360). Bandwagon cue reveals the importance of peer pressure in decision making which can cause repetition and that perceptions remain the same (Go et al. 2014, 360).

3.1.2 Empathy and support in online discussion

One major factor among net pals is also the high possibility to generate empathy (Bickart & Schindler 2001, 33) when official announcements made by authorities may be suffering the lack of emotions and empathy (Luoma-aho, Tirkkonen & Vos 2013, 243). Often those who communicate in emphatic and supportive way and infer feelings are most trusted in online environment (Feng, Lazar & Preece 2004, 17–18). Nambisan (2011, 299) has investigated online health communities and perceived empathy in them and defines perceived empathy as "an individual member's (ie, patient's) perception regarding other members' feelings of compassion, warmth, sincerity, and sensitiveness towards oneself and towards the problems one has narrated or posted in the online health community". Empathy, in literature, often refers to knowing and/or feeling what the other is feeling or responding sympathetically to another person (Feng, Lazar & Preece 2004, 7; Levenson & Ruef 1992, 234; Pfeil & Zaphiris 2007, 919).

The factual knowledge about the topic is not the only thing that people attending in online forums are looking for. In demonstrating emotions, officials may remain in the shadow of anonymous individuals: “- - the media releases were timely and correct, used A(H1N1) as a label instead of “swine flu” and did not show empathy, emotion or reaction to the human side of the crises - -” (Luoma-aho, Tirkkonen & Vos 2013, 243). Often people also like to connect with those who have been in the same situation with them or have similar kinds of life experiences. This, so called homophily often gets people to acquire the information faster and thus can lead to higher perceived empathy. (Nambisan 2011, 299.)

People who easily trust other people in face-to-face interaction can be reluctant to trust other people in online environment but emphatic accuracy together with supportive responses can increase trust and this can be improved for example by providing more stories and personal information (Feng et al. 2004, 16–18).

3.2 People like me versus authorities

Sometimes comments can reveal something from their writer, writer’s status or person will disclose his or her position of one’s own volition. In definition of credibility, one important factor was expertise (Metzger 2007, 2078). Which creates the impression of expertise? The source expertise is defined as “- - perceived competence of the source providing the information” (Brown, Broderick & Lee 2007, 6). Expertise can form from authority status (Shyam 2008, Luoma-aho, Tirkkonen & Vos 2013) but then again the information coming from ordinary people might be experienced more credible as it’s filtered through so called people like me (Kareklas et al. 2015).

3.2.1 Experts and authorities

Experts taking part into online discussion can be authorities like officials, doctors, police officers, representatives of the organization or other experts in a particular field. Their position may not always be easy to identify if they do not bring it up by themselves. “A common finding across the credibility literature is that one of

the major criteria for assigning credibility to a site is whether the source is an official authority or not" (Shyam 2008, 84). Luoma-aho, Tirkkonen & Vos (2013, 248) observe that the presence of authority in online environment is often seen as positive, as many authorities choose not to attend social media. Trust in the public organizations and their officials includes a moral dimension where citizens have to feel that officials represent their interests and needs before their own agenda (Hosmer 1995 in Luoma-aho 2005, 168).

Also Lo (2014, 179) found that research participants rely on sources which seem to be comprehensive, accurate and with authority but Bekmeier-Feuerhahn and Eichenlaub (2010, in Luoma-aho, Tirkkonen & Vos 2013, 248) remind that trust towards institution or organization in online environment can be created if the messages are well targeted and the representatives of the institution are well-chosen and trustworthy. This idea draws attention to the perspective that mere presence with authority title in the online forum is not enough. Holistic authority is something to plan and build.

However, the official position is not the only sign of authority and expertise. Karreklas et al. (2015, 19) refers to Dou and colleagues (2012) who find identified sources of eWOM more trustworthy and persuasive. Still a large part of the discussion is anonymous and readers can't be sure that names and identities are actual (Mackiewicz 2010, 6). In Finland authorities are well trust but this same trust does not reach the online environment, lacks the emotional talk and dialogue and is often late (Luoma-aho & Tirkkonen 2011, 172–173) and in some cases people won't receive answers to their straight questions to the authorities (Luoma-aho, Tirkkonen & Vos 2013, 247). The other recognizable suspicion against formal authorities and organization's representatives is possible lack of objectivity. In health care section medical companies might make people doubt (Luoma-aho, Tirkkonen & Vos 2013, 246), and in some cases information seekers can identify for example paid bloggers who post unrealistic comments about the products or services (Lo 2014, 180).

People often include their comments some kind of source literature like online news or published research findings and the credibility of the comment and thus be judged by the trustworthiness of its source (Go, Jung & Wu 2014, 359; Luoma-aho, Tirkkonen & Vos 2013, 246). "- - people have a mental shortcut favoring a high expertise source that is triggered by expertise cues" (Go et al. 2014, 359). Which are these cues? Sometimes information seekers find the credible infor-

mation online but want to verify the information by checking the original source and information provided by traditional expert (Wathen & Burkell 2002, 138). While web environment offers a high amount of false information as well, one possible tool for marking and assessing others' expertise is a button to endorse certain comments or writings (Wathen & Burkell 2002, 139).

3.2.2 Content producers, peer evaluation and social relationship

Opposite to authority figure like medical professional or public servant, also the social relationship among net pals can be a significant instrument when evaluating credibility (Pan & Chiou 2011, 68) and many studies have shown that people tend to rely on their own network when searching information (Hargittai et al. 2010, 472). Social media platforms were originally designed for communications from individual to another and that is why also organizations must consider personable interaction while communicating on those arenas (Mae Kim 2016). Forming the virtual social relationship with someone else on the same online forum takes time, calls for active interaction or that persons are familiar with each other outside the social network. Thus, after a while members of a certain social media platform can become friends with each other (Lim & Van Der Heide 2015, 68) which presumably require trust and credibility.

Alongside authorities, experts and official web sites there is also another point of view on this. eWOM emphasizes the effectiveness of peer evaluation: "The reasons for WOM's power are evident: word of mouth is seen as more credible than marketer initiated communications because it is perceived as having passed through the unbiased filter of "people like me" (Kareklas et al. 2015, 398). This also refers to the research which was comparing public service announcements and the expertise of the online commenters. The impact of the comments influenced the people's behavior and attitudes more strongly than public service announcement and their assumed credibility (Kareklas et al. 2015, 23). The similar phenomenon can be observed under name "identity cue" (Go et al. 2014). It refers to online environments where people observe background information like age, gender, area or same kinds of experiences (Go et al. 2014, 360). According to these remarks, "people like me" are seen as impartial reviewers who can communicate objective information about the product or service and who are easier to identify with especially if they have similar background, age, gender or experiences. This view is mixed

with possibility that also these normal people might have connections to organizations or “people like me” can in fact be paid for their messages.

Participatory culture has paved the way for ordinary people to use and spread media technologies and content which were earlier used only by industries (van Dijck 2009, 42). Despite this van Dijck (2009, 44) also reminds that these opportunities won't turn everyone into active participant or at least participation should be split into different levels which leaves most of the users still as more passive recipients. Recently also the business value of co-creation, customer experience and power negotiation of consumer and organization have been discussed in the marketing and business discourse. It's remarkable that users also offer important information about their behavior for marketers by loading content, creating user accounts and details – are people content providers or data providers. (van Dijck 2009, 46.) What motivates ordinary people to produce content as they are not exactly professionals? van Dijck (2009, 50–51) mentions the three motivation groups which are entertainment users who are inspired by novelty of the channel, career-driven users who want to develop their knowledge in both creative and technical way and family motivated users who make content for small amount of family and friends.

3.2.3 Linguistic choices

Research has noted that also linguistic choices of information givers affect the credibility of online comments. According to Metzger et al. (2010, 424) “Indicators such as topic mastery, writing style, spelling and grammar, and the extent of details offered were essential to evaluations of an enthusiast's expertise”. Also Jensen, Averbek, Zhang & Wright (2013, 299) have identified the importance of details and “lexical complexity”, which means that the information giver uses plenty of technical terms, long words and complex sentences and on the contrary to that incorrectly used concepts and sloppy language will lower the credibility. There are more short than verbally long and rich reviews online and that is why those who are linguistically diverse will cause positive expectancy violation and through that increase credibility (Jensen, Averbek, Zhang & Wright 2013, 299).

Also exact grammar and spelling are seen very important factors in assessing the message and even small typing mistakes can get information seeker to judge the

message as untrustworthy (Wathen & Burkell 2002, 140). Also the background of information seeker may change the way they evaluate information. For example people with academic education often appreciate the information with references but people without education pay more attention to understandability of the message (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255). It's also seen that online discussion forums represent different socio-economic classes while different e-participation tools and platforms often only reach well-educated, informed and active part of the population (Klinger & Russmann 2014, 62).

4 THE CASE OF HPV VACCINE

The aim of HPV vaccine is to prevent Human Papilloma Virus, which can lead to cervical cancer but doesn't necessarily cause any disease. This vaccine became part of the Finnish national vaccination program in 2013. Vaccination target group is 11–15-year-olds girls, to whom the vaccine is free of charge and voluntary. Vaccination is intended in particular to girls between the age of 11–12 but during the first vaccination program period it was also given to the girls at the age of 13–15 (Tiitinen 2015). The vaccine used in Finland is called Cervarix and it is given all together three times. There are approximately 150 cervical cancer cases in Finland annually and 50 of them lead to death. In addition to this 34 000 have findings which demand further investigations. HPV vaccine aims to significantly reduce this disease burden. (Ministry of Social Affairs and Health 2015.)

Recently there has been a lot of discussion related to possible side effects of the vaccine and the effectiveness of the vaccine has been questioned. For example in Denmark some people have received compensation for vaccine treatment (Salomaa 2015). Big part of the debate has appeared online and “- - consumers have taken matters into their own hands, sharing opinions about medical choices, including vaccines” (Zhang, Gotsis & Jordan-Marsh 2013, 2483). In autumn 2013 big Nordic vaccination research was published and according to that there weren't major side effects identified. The study included nearly a million girls, of whom just under 300 000 girls received the HPV vaccine. (Tiitinen 2015.)

Some people are strongly against the HPV vaccine. The main reasons for the fear seem to be doubts about its testing and symptoms and diseases associated with this vaccine. Topic is easily connected to previous narcolepsy and autism cases and framed in certain way: “Framing of information through emotional pro-

cessing affects people immediately, especially parents making decisions for their children. "In the autism case the public health community failed to properly frame the vaccination recommendation before naysayers took the lead" (Zhang, Gotsis & Jordan-Marsh 2013, 2484). Searching for health information online offers a possibility for targeted information seeking on private and anytime and it can be filtered (Wathen & Burkell 2002, 138). As information sharing has become relatively quick and easy, it has also affected vaccination discussion by contributing hesitancy and refusals (Larson, Smith, Paterson, Cumming, Eckersberger, Freifeld, Ghinai, Jarett, Paushter, Brownstein & Madoff 2013, 1).

According to senior physician Kati Myllymäki, all the vaccines taken into national vaccination program are tested properly and HPV vaccine has been in use in several other countries for years and has reduced cervical cancer cases significantly (Partio 2013). The fact that doctors have publicly disagreed with the need for HPV vaccine, has baffled people.

Certain issue arenas and discussions were also monitored during the swine-flu epidemic (2009–2011) and swine-flu vaccination and the three main topics of interest identified in that discussion were symptoms of the flu, safety of the vaccine and the epidemic and risk groups and victims (Luoma-aho, Tirkkonen & Vos 2013, 244). People were also worried if the vaccine was fully tested and if it might cause side-effects (Luoma-aho, Tirkkonen & Vos 2013, 244). Critical commenters had opinions about the vaccination, the authorities and the medical companies and organizations as STM, THL, EMEA and WHO were mentioned, in particular THL which was said to be corrupt and unreliable (Luoma-aho, Tirkkonen & Vos 2013, 245–246). Positive comments were defending authorities, their professionalism and trustworthiness and scientific research (Luoma-aho, Tirkkonen & Vos 2013, 246). Then again neutral comments were asking questions and providing information to the others (Luoma-aho, Tirkkonen & Vos 2013, 244).

As previous online credibility and vaccination discussion research shows, the online credibility and vaccines have been investigated before. In the following chapters credibility research is implemented in online discussion forum environment and discussion theme is focused on HPV vaccines. This research combination offers new viewpoints to the topic and introduces a way to monitor online discussions.

5 RESEARCH METHOD

This section presents the chosen research method, how the data is collected and coded and examines the ethical dimensions of the research. This research is a qualitative case study (Hirsjärvi, Remes & Sajavaara 1997, 130) focusing on credibility of online comments on chosen online discussions related to HPV vaccines. As some frequencies are also interesting to look at, coding results and code frequencies are also presented in chapter 6. The presentation of the results is quite challenging when the research is qualitative but also the quantitative results are interesting to see considering the nature of the research. Qualitative research won't exclude quantitative observations and sometimes quantitative remarks can strengthen the feeling that results are not only based on gut feeling. To support qualitative research for example the number of codes or elements under the same theme can be calculated. (Saaranen-Kauppinen & Puusniekka 2006.) In this research that was resolved by representing some amounts and percent of used codes to help readers to perceive which factors occur often and which rarely.

In qualitative research the aim is to explore real life phenomenon as comprehensively as possible and it favors methods where the voice of investigated persons gains attention (Hirsjärvi et al. 1997, 161; 165). Qualitative research is also interested in finding regularities (Hirsjärvi et al. 1997, 166), which is an advantage when willing to compare credibility factors found in theory to factors found in data.

5.1 Theory-based content analysis

Content analysis examines usually textual data by seeking similarities and differences, summarizing the material and identifying and typifying data (Tuomi & Sarajärvi 2009) and combines both data collection method and analysis technique by

helping researcher to identify certain characteristics of chosen messages (Keyton 2006, 233). An investigation may focus on manifest content, latent content or both (Keyton 2006, 234) and in this present case the aim is to examine both manifest content like named authorities and latent content like the tone of the message.

Any written, audio- or video-material can be analyzed and material can exist as an answer to researcher's questions or naturally, like in this research (Keyton 2006, 234). The strength of the content analysis is that data often comes naturally from the communicators and the presence of researcher hasn't affected the content (Keyton 2006, 240). In content analysis the data may also come from interviews and then it doesn't exist naturally but in this research case the data comes straight from the discussion forums.

The aim is to form a picture of the phenomenon and connect the results into a broader context and previous research. In theory guided content analysis the theoretical framework guides the interpretations and previous models are tested in the new context. (Tuomi & Sarajärvi 2009, 97–98; 103.) First researcher should identify the problem and research question which the data could possibly answer and consider if all the messages or text units are worth coding (Keyton 2006, 235). In this research the limited number of messages is selected and all coded.

First it might be helpful to define content categories based on previous research to determine, what is said and how it is said (Keyton 2006, 236). Often the theoretical part defines the categories through which the data is handled (Tuomi & Sarajärvi 1998, 98) and these categories must cover all the possibilities (Keyton 2006, 236). Next task is to define the units of analysis which are often coded and then counted (Keyton 2006, 236). In this research the unit of analysis was the whole discussion forum comment and the several codes could be used in one comment. If there was only one theme recognized in one comment, then only one code was used.

Theory-based content analysis was chosen because in this research the aim is to see if the previous research about credibility also works in the online discussion environment. These factors based on literature performed in such contexts which were dealing with credibility in online reviews, online news and web pages. Relatively not much effort has put into research of online comments.

5.2 Collecting data

This master's thesis is one part of the bigger research project "Intangible expectations in online discussion on Vaccines". "Intangible expectations" is a comparative study between Finland and Spain and the research team consists of research groups from both countries.

The research is implemented through social media monitoring. Monitoring means an analytical examination and evaluation of changes (Vos & Schoemaker 2006 in Luoma-aho, Tirkkonen & Vos 2013, 241) and it can give an organization or researcher the weak signals of the ongoing issues in certain environment (Luoma-aho, Tirkkonen & Vos 2013, 242). The data is collected from 2 different, Finnish, online discussion forums dealing with HPV vaccines and the data is collected together with other researcher. Selected forums were Vauva.fi and Suomi24.fi. Vauva is a family and baby magazine with an emphasis on pregnancy and everyday life of families with children. However, the discussion forum of the magazine nowadays discovers various topics. Suomi24 is the biggest online community in Finland and it offers possibilities for discussions as well as dating services. These discussions contain all together 752 individual comments and these discussions were held between June 2013 and February 2016.

The search concepts when searching for suitable discussions in Google, Bing and Yahoo were *hpv rokote* (hpv vaccine), *hpv rokote mitä mieltä* (hpv vaccine what do you think) and *hpv rokote keskustelu* (hpv vaccine discussion) and all the discussions were in Finnish. These keywords were chosen to imitate the way in which ordinary individuals might be looking for information about HPV vaccines. Only the first page of results was considered as it is unlikely that people browse results further when looking for quick information. The only exception was the first search in table 4 because there were no discussions existing on the first page.

When searching with keywords *hpv vaccine* in Google, Bing and Yahoo, online forums were not at the top of search results. The first results were official pages made for vaccination information and campaigns, blog posts and online magazines. Online discussions exist on second page or at the bottom of the first page. When searching with *hpv vaccine what do you think* and *hpv vaccine discussion* online forums were ranked higher. Online forums are good for data collection because there is free access to it and collecting is not dependent on time or place (Im &

Chee 2006) and that's why social media can be seen as "free real time research" (Macnamara 2015, 28). Therefore the data already exists online and it's collected for research purposes.

Those 3 discussions used as data in this research were searched by comparing three different search engines Yahoo, Ping and Google and their results and the process is presented in the table 4 below.

TABLE 4 Selecting the data

Search engine	Key-word	Discussions	Ranking
Google	HPV rokote	1. http://keskustelu.suomi24.fi/t/11504443/hpv-rokote-on-aiheuttanut-vakavia-haittoja- (3.)	2. page
Google	HPV rokote keskustelu	1. http://www.vauva.fi/keskustelu/3877716/ketju/hpv-rokote (1.) 2. http://www.demi.fi/keskustelut/keho/kokemuksia-hpv-rokotteesta (2.) 3. http://keskustelu.suomi24.fi/t/11504443/hpv-rokote-on-aiheuttanut-vakavia-haittoja- (4.)	1. page
Google	HPV rokote mitä mieltä	1. http://www.demi.fi/keskustelut/omaplaneetta/auttakaaa-sanokaa-kannattaako-ottaa-se-hpv-rokote-d#.Vs72_CmR4fo (1.) 2. http://www.vauva.fi/keskustelu/4577926/ketju/hpv-rokote-mita-mielta (5.) 3. http://keskustelu.suomi24.fi/t/11504443/hpv-rokote-on-aiheuttanut-vakavia-haittoja- (6.)	1. page
Bing	HPV rokote	1. http://www.vauva.fi/keskustelu/3877716/ketju/hpv-rokote (8)	1. page
Bing	HPV rokote keskustelu	1. http://www.vauva.fi/keskustelu/3877716/ketju/hpv-rokote (1.) 2. http://keskustelu.suomi24.fi/t/11981543/hpv-rokote! (2.) 3. http://keskustelu.suomi24.fi/t/4946621/hpv-rokote (3) 4. http://www.sinikiivi.com/foorumi/konspiraatio/17827-hpv-rokote-historia-toistuu (8.) 5. http://www.meidanperhe.fi/keskustelu/2102622/ketju/hpv-rokote-miten-saan-lapseni-ottamaan-sen (9.)	1. page

Bing	HPV rokote mitä mieltä	<ol style="list-style-type: none"> 1. http://keskustelu.suomi24.fi/t/11981543/hpv-rokote/ (1.) 2. http://www.vauva.fi/keskustelu/4577926/ketju/hpv_rokote_mita_mielta (2.) 3. http://www.demi.fi/keskustelut/oma-planeetta/auttakaaa-sanokaa-kannattaako-ottaa-se-hpv-rokote-d#.Vs74zimR4fo (8.) 	1.page
Yahoo	HPV rokote	<ol style="list-style-type: none"> 1. http://www.vauva.fi/keskustelu/3877710/ketju/hpv_rokote (8) 	1.page
Yahoo	HPV rokote keskus- telu	<ol style="list-style-type: none"> 1. http://www.vauva.fi/keskustelu/3877710/ketju/hpv_rokote (1.) 2. http://keskustelu.suomi24.fi/t/11981543/hpv-rokote/ (3.) 3. http://www.sinikivi.com/foorum/konspiraatio/17827-hpv-rokote-historia-toistuu?start=10 (4.) 4. http://www.meidanperhe.fi/keskustelu/2102622/ketju/hpv_rokote_miten_saan_lapseni_ottamaan_sen (5.) 5. http://kaksplus.fi/threads/hpv-rokotus-meinaatteko-ottaa-tytoeillenne.2261630/ (7.) 6. http://keskustelu.anna.fi/threads/hpv-rokote.1941469/ (10.) 	1.page
Yahoo	HPV rokote mitä mieltä	<ol style="list-style-type: none"> 1. http://www.vauva.fi/keskustelu/4577926/ketju/hpv_rokote_mita_mielta (1.) 2. http://keskustelu.suomi24.fi/t/11981543/hpv-rokote/ (3.) 3. http://kaksplus.fi/threads/aiemmin-kuohuttanut-hpv-rokote-mitae-mieltae-nyt.2436540/ (10.) 	1.page

First discussion with red code occurred in five different searches, the second with dark blue code occurred in four different searches and discussions with turquoise and orange code occurred in three different searches. Finally we validated the search with *keyword hpv rokote kokemuksia* (hvp vaccine experiences) below and looked at the results. The search results were mainly the same discussions which also existed with the previous keywords. In this validation the discussion with turquoise code occurred one time and the discussion with orange code didn't occur at all. That is why the one with turquoise code was chosen as the third discussion with red and dark blue. The chosen discussion data was copied from discussion forums to rtf-documents.

Validation search with word *hpv rokote kokemuksia* (hvp vaccine experiences):

Google (1.page)

<http://www.demi.fi/keskustelut/keho/kokemuksia-hpv-rokotteesta>

http://www.vauva.fi/keskustelu/3877710/keiju/hpv_rokote

<http://keskustelu.suomi24.fi/t/11504443/hpv-rokote-on-aiheuttanut-vakavia-haittoja>

Yahoo (1.page)

<http://keskustelu.suomi24.fi/t/4946621/hpv-rokote>

<http://www.demi.fi/keskustelut/keho/hpv-rokote-4> new

<http://www.sinikivi.com/foorumi/konspiraatio/17827-hpv-rokote-historia-toistuu?start=10>

Bing (1.page)

<http://keskustelu.suomi24.fi/t/4946621/hpv-rokote>

<http://www.demi.fi/keskustelut/keho/kokemuksia-hpv-rokotteesta>

<http://keskustelu.suomi24.fi/t/11804678/hpv-rokote> new

<http://www.sinikivi.com/foorumi/konspiraatio/17827-hpv-rokote-historia-toistuu?start=10>

5.3 Coding with ATLAS.ti

The data consist of 752 comments. Data was analyzed based on theory part which based the big themes of the codebook and the codebook helps when summarizing the data. When analyzing qualitative data, codebook can be partially pre-defined but it is often necessary that the codes will be changed and revised during the process. Coding in qualitative research means that the researcher is connecting the certain codes with certain pieces of text according to the researcher's interpretation. Afterwards data is easier to study, search for certain fragments and categorize. When creating the codebook it is possible to start inductively by reading the data and considering which kind of codes might be rising up. The other way is to take a theory-based approach and form the codes based on it. (Eskola & Suoranta 1998.)

In this research the theory based the big picture of the codebook and the themes came from theory part. These categories were authority, references, empathy and sarcasm, credibility evaluation and opinion. The coding part was started keeping these bigger themes in mind. The sub codes were formed during the first look at the data. For example the use of source material in online commentary came from

the theory but after the first look at the data it was separated into smaller and exact codes for different kind of references. That's why the final codebook was built little by little.

Creating the codebook is a subjective process and it is likely that first step is to create a basis which will take shape little by little (Eskola & Suoranta 1998). The number of codes is not easy to define. The large amount of codes might describe the phenomenon more precisely on the other hand when the classification becomes more complicated the separation of texts under the different codes might be hard. (Eskola & Suoranta 1998.) The coding of the online comments was done with the help of ATLAS.ti -software. Coding, in this context, means the marking and naming of the data (Jolanki & Karhunen 2010, 399). ATLAS.ti is used for the researcher to help his or her thinking process but the software itself can't be seen as analyzing method (Rantala 2010, 106). As Jolanki and Karhunen (2010, 396) point out, these kind of softwares are rather made for filing and marking the chosen data before analysis than for actual analysis.

Searching for repeated words or textual characteristic could also be done manually by marking the data with different colors. This can be called as "paper and pencil paradigm" (Friese 2014, 24) remarking that working with ATLAS.ti is also based on analogy. Researcher must mark and code every piece of data one by one but it can be quicker and the software can help with grouping the pieces. First a researcher can pick up the possible codes and themes from the theory and after that check if those things can also be found from the data (Rantala 2010, 108–109).

In the first phase the following codes were chosen based on research questions, previous research and credibility factors found in it. Codebook is shown in table 5. First code examines different authorities existing in discussion forums and the way those authorities were handled. Different authority types identified in theory part and the discussion were officials, doctors, public servants and organizations representing HPV vaccine. In addition to this people used their friends and family, their own experiences and knowledge and "people like them" as authorities. The tone of the comment handling authority figures was negative, positive or neutral.

The other group of codes was references and every single reference used was coded with sub code depending on whether the reference was news, research, blog, video, social media channel or other web page. Those textual fragments where someone was criticizing other commenter's reference were also coded. Empathy,

sarcasm and potential sarcasm were marked with different codes as well as those sections where commenters were evaluating the credibility of the whole discussion forum or its single comments. Finally every comment was coded based on its attitude towards HPV vaccine. Those attitudes were positive, negative, mixed or neutral.

TABLE 5 Codebook

Theme	Subcodes	Description
Authority	auth_neg	Authority figure handled in negative way.
	auth_pos	Authority figure handled in positive way.
	auth_neut	Authority figure handled in neutral way.
	auth_offic	Authority figure is an official (doctor, public servant, organization etc.).
	auth_fri	Authority figure is a family member or friend.
	auth_me	Authority is the writer her/himself and own experiences.
	auth_plm	Justification invokes in "people like me".
References	ref_news	News is used as a reference.
	ref_research	Research is used as a reference or research is mentioned as a justification for trustworthiness.
	ref_blog	Blogpost is used as a reference.
	ref_video	Video is used as a reference.
	ref_some	Social media post is used as a reference.
	ref_web	Other web page is used as a reference.
	ref_neg	Someone is criticizing another writer's reference, noting that reference is missing or the writer is considered as untrustworthy or spreading wrong information.
Empathy and sarcasm	emo_emph	Comment has empathic tone.
	sarc_id	Comment has sarcastic tone.
	sarc_pot	Potential sarcasm in comment.
Credibility evaluation	cred_men	Credibility of other comment is mentioned or someone is confused about comment's trustworthiness.
Opinion	opi_neg	Comment includes negative opinions about the HPV vaccine.
	opi_pos	Comment includes positive opinions about the HPV vaccine.
	opi_mix	Comment includes mixed opinions about the HPV vaccine.
	opi_neut	Comment doesn't include any opinions about the HPV vaccine or it has a neutral tone.

In this research also the quantified look at the data is presented in chapter 6. The number of different persons participating was impossible to calculate because most of them were anonymous. Also the age, gender or their role was not known in most cases. Some of the participants told that they were mothers, doctors, middle aged or women. Some also told that they or their family wasn't in the target group of the vaccine.

When coding the references, every single reference used was coded individually. It means that one comment may contain multiple sources. The number of references is not equal with number of comments including reference because some of the comments included several references and some comments did not include any references.

5.4 Research reliability and challenges

Even is social media monitoring may seem easy access to already existing data it also has its own challenges. As social media environment is changing rapidly, also the methodology and techniques are changing, it is often unclear how the investments into monitoring will come financially back and the possibility of misinterpretation of metrics is possible (Zhang & Vos 2014, 12–13). Also ethical issues are on board. Private persons attending online discussion may not expect to be monitored even if the data is public and available online (Zhang & Vos 2014, 12; Tietoarkisto blogi 2016). When using the big data with anonymous participants asking for permission from every participant is impossible and one way to protect online participants is to make comments anonymous (Tietoarkisto blogi 2016). In this research the forum participants were all anonymous and data examples are translated from Finnish into English which also changes the text units.

There is also criticism against utilizing qualitative data analysis software. With the poor use of software qualitative research seems like bad imitation of quantitative research (Jolanki & Karhunen 2010, 395). Using the computer software doesn't automatically make the research more scientific (Rantala 2010, 111). Researcher must also be careful with coding and be aware of "coding trap" which can happen when researcher comes up with a code after another and as a result there might be a massive codebook without actual logic when it doesn't help creating the bigger

picture of the data (Rantala 2010, 110). This is also related to one of the threats when doing qualitative research: data often contains numerous interesting things to explore. Therefore it's important to stay in clearly defined topic and report it as closely as possible. (Tuomi & Sarajärvi 2009, 92.)

Codes need meaningful interpretations around them because as plain codes they don't have meanings (Jolanki & Karhunen 2010, 401). Then again, by proper use of software it is possible to open the research process for the researcher and audience more specifically which increases the transparency of the research. While in this research the data is collected and shared with two researchers, the codebook must be systematic so that both researchers can return to it anytime and handle the data congruently (Keyton 2006, 238–239).

In this research the data is in Finnish but it's reported in English. Some textual units and quotations are used to liven up the reporting and to provide examples. Hence, chosen online comments are carefully translated from Finnish into English to remain the original tone of the text. Nonetheless, translation of the comments might increase commenters' privacy while the examples are in different language than originally. It is important to remember that while doing content analysis, the researcher is doing some inferences about people and after a certain period of time or in a different state of mind the results might differ from the original (Keyton 2006, 234).

One thing to consider when doing content analysis is the importance of frequency: it is easy to state that elements with higher frequency have greater value than elements mentioned less often but it is not necessarily so (Keyton 2006, 234). Even if frequency tells about the popularity of certain statements, common views shouldn't be the only basis of choosing the significant parts of the data and even the single voices can raise important issues (Macnamara 2015, 49). Even if this research is considered as qualitative research some quantitative results are presented in the chapter 6 to see which codes were used a lot and which weren't.

First 30 comments were double coded by another coder through the codebook. This was done in order to see if the interpretations correspond to each other. First the two coders didn't share any other information than the codebook and first 68 % of the coding was similar. After that the researcher opened the logic and the level of details in coding process and the meanings were negotiated. After the discussion the similarity of double coding was 97 %. This shows that the textual data

analysis is largely researcher's own interpretation and the logic of two different researchers can have many differences. At least the process should be opened to another coder as another coder isn't necessarily that familiar with the topic and theory basis of the research and therefore logic is not clear in the beginning.

6 FINDINGS

The following sections outline the key findings of the study. The first subchapter focuses on how the commenters themselves have criticized or discussed the credibility of the forum or its comments. Further on, the use of different source material is analyzed based on research question one “How do people use sources in online discussions?”. Commenters’ perceptions of authority will answer the research question two “Who do people use as authorities in online discussion commentary?” and tell which authorities do individuals prefer to support their opinion or how they strengthen their own authority among other readers. In last sub chapter is handling the research question three “Which other factors are recognized in the credibility formation of online comments about HPV?” as emotions, support and sarcasm. The data examples are not consecutively comments related to each other but examples from the same theme.

On pages 10 and 11 Tseng and Fogg’s (1999, 41–43) four types of credibility separated credibility into presumed credibility, reputed credibility, surface credibility and experienced credibility. These results are also surveyed through this separation and looked at which of these occur in discussion. Researcher must also establish how the coded material will be represented when gathering the results. Coded data can be quantified for example by counted for frequency or look for categorical occurrences. (Keyton 2006, 237–238, 240.) In this research categorical occurrences are presented separately with every theme.

6.1 Commenters’ perceptions of credibility

Code	Occurred
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Credibility evaluated	47 times/752 comments
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Even if most of the discussion on chosen online discussions and their comments were about HPV vaccine, testing or lack of testing and its risks and benefits, also the credibility evaluation of the comments was discussed among commenters. In general, the data contained 47 mentions about credibility of which multiple mentions could also be in the same comment. In addition to this used references were critically evaluated 135 times. References are further investigated in chapter 7. People were generally confused and sought for “the right information”. These comments also show that participants are confused about who and what to believe:

“I wonder what the truth is in this case again?”

“I don’t know whether vaccinate or not...awful when there is such a crucial issue and one does not know what to believe.”

Many participants were frustrated about different beliefs and the uncertain tone of the debate. Hesitating tone and “guessing” the answers was not enough and many participants were searching for clear answers:

“Oh boy! Is not known yet...could have...might have...other factor would be...may determine...were more likely...not with any certainty.....not statistically...but most likely....[- -]”

Most of the credibility evaluation was negative feedback for others who provided “false” information. It seems like attendants had some prior beliefs which the new information was compared to and only few took part into discussion without any beliefs or previous information about the topic. Then again a couple of commenters gave also positive feedback to the others:

“Why do you even bother to answer when you clearly do not know even the basics about the issue?”

“133 is wonderfully clever:)!”

“I support #537’s answer.”

Code	Occurred
Positive comment	102/752 comments
Negative comment	178/752 comments
Neutral comment	404/752 comments

Mixed comment	55/752 comments
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In this data the reviewed product was HPV vaccine. 102 (14%) of the 752 comments were positive, 178 (24%) of 752 comments were negative, 55 (7%) of the 752 comments were mixed reviews and 404 (54%) of the comments were neutral or did not handle the vaccine. Many of the neutral comments were short answers or questions to someone and didn't include specific attitude or opinion about the vaccine itself. The missing one percent error is caused by a couple of comments which were not observed during the coding and another check coding or were blended in another comment and weren't recognized. In this research it was not possible to find out if mixed and negative reviews were considered more credible but writing the mixed or negative reviews was not significantly more popular than writing positive or neutral comments. A few commenters questioned whether some comments were promoting or advertising vaccines or were trolling the discussion:

“Is it allowed to advertise medicine on discussion forums in this scale? Shouldn't this be charged?”

“Over 550 vaccine ads, hmm”

“[- -] that kind of internet trolls experts are warning us.”

6.2 The use and evaluation of source material

Code	Occurred
Reference used	332 times/ 752 comments
Web pages used	147 times/ 752 comments
News content used	23 times/ 752 comments
Research used	111 times/ 752 comments
Blogs used	21 times/ 752 comments
Social Media used	9 times/ 752 comments
Videos used	20 times/752 comments
Reference evaluated	135 times/ 752 comments

The use of different source material in chosen discussions was popular. All together 332 sources or references, of which more than one could be in the same comment, were posted in 752 comments. The most popular group of sources was web pages which didn't fit into other groups (news, blogs, social media sites, research, and videos) and they were used 147 times. Those sites were for instance

vaccine and medicine web pages, other discussion forums, natural health and homeopathy pages, cancer and THL sites, Wikipedia and arguable online site Magneettimedia. Magneettimedia is an online magazine which is published by Pohjoinen Perinne ry and its articles contain hurtful incorrect information. It has also criticized vaccine campaigns. (Wikipedia 2016.)

The second most referred were researches and scientific articles or mentions about research based information which were posted all together 111 times. In most cases people linked research articles or direct quotations from them with their own comment. By using research material people tried to either prove the connection between HPV vaccine and its symptoms and diseases or prove the efficacy of the vaccine. In some cases writer didn't include any specific source or link into the comment but referred to scientific or "evidence-based" information:

"I believe in research and science, I understand that there are vaccination complications but I will get my daughter vaccinated."

"[- -] There is research-based information about HPV vaccine and according to that vaccine is effective. [- -]"

Part of the attendants also thought that information based on research is inadequate or there is no research-based information on this issue because the vaccine and its effects are such a new topic. They thought that it might take time to get some valuable research about this debate:

"[- -] Studies will take decades to obtain knowledge about all the benefits and disadvantages."

"[- -] There's no point talking about side effects as long as the benefits of the vaccine aren't scientifically proved and any evidence cannot be obtained in 50 years."

The third group of references was news content which was posted 23 times in 752 comments. News content was from Finnish newspapers or sites like Iltasanomat, Helsingin Sanomat, Turun Sanomat, Savon Sanomat, Suomen Kuvalehti and YLE or from foreign newspapers or sites like Japan Times, Tokyo Times, Newsday, Huffington Post, BBC and Telegraph. With news content people often informed the others about side effects or injuries and deaths attached to vaccine. Some

commenters thought that newspapers didn't want to publish information about the disadvantages:

"It is complained in Turun Sanomat (23.10.) that people don't want influenza vaccines anymore. Any disadvantages are still not told in the newspaper what it comes to influenza vaccine or HPV vaccine. [- -]"

"Today Helsingin Sanomat revealed that HPV vaccine can cause autoimmune diseases for those people who have propensity to get autoimmune disease. Should this be investigated a little better before we have a new, "unexpected" fiasco in our hands even if the vaccine should be perfectly safe. Why this information is withheld?"

Other used sources were videos, blogs and social media sites or posts. Blogs were linked 21 times, videos 20 times and social media sites 9 times in 752 comments. The same blogs and posts were referred several times. Videos were mainly YouTube-links, on which either doctors and vaccine researchers or those who suffer the side effects of HPV vaccine are talking. All who mentioned social media referred to Facebook-posts from either THL or Rokotusinfo or one private person.

People taking part into discussion also critically evaluated other participants' references and use of sources. References were evaluated all together 135 times in 752 comments. Participants talked about the age and relevance of sources. Some participants called the other commenter naïve or young. The majority of the commenters demanded sources to testify opinions but a few relied more on their own beliefs. One target of criticism was the lack of sources in a comment.

"Whatever, our daughter won't get vaccinated. Period. Whether my source was from Oxford University or Magneettimedia."

"[- -] The source for this claim, please. Or did you read that from Magneettimedia?"

The quality and credibility of some sources was also discussed. Often readers weren't satisfied with mere news article as a qualified reference but wanted to know in which source the news article is based on:

“[- -] And where might be the sources of this questionable article? Although some of it might be true, it’s still good to maintain some sort of criticism towards readings. Especially if reliable sources haven’t been notified.”

“[- -] Those sources were somewhat questionable, samples were small (3 persons) and the causal connection could not be verified with certainty. [- -]”

Also other’s ability to choose and evaluate sources was questioned and participants brought up the media literacy and source criticism:

“[- -] Seriously, where’s the source criticism and media literacy?”

“[- -] if the disadvantages that you told was a real risk and a very common outcome from the vaccination, there would be so many of those who suffer from the consequences that they wouldn’t have to be tracked down from questionable internet sources.[- -]”

In general, research knowledge was highly valued but some of the participants high lightened the deficiency of research or they questioned the objectivity of research. It was feared that research or their results are shaped by pharmaceutical industry:

“Pharmaceutical manufacturers pay for researchers. There are also links between pharmaceutical manufacturers and those who buy vaccines. [- -]”

“[- -] Those researches are not very high quality when you find out who has paid for them :). For some reason those research groups whose inner circle is funded by pharmaceutical manufacturers will achieve results according to which the vaccine is effective and safe.”

6.3 Commenters’ perceptions of authority

Code	Occurred
Official authority mentioned	145 times/ 752 comments
Official authority mentioned in neutral tone	9 times/ 752 comments
Official authority mentioned in negative tone	98 times/ 752 comments
Official authority mentioned in positive tone	34 times/ 752 comments
“Me” as an authority	75/752 comments
Friend as an authority	13/752 comments
People like me as an authority	6/752 comments

The importance of authority and its formation occurred in discussion on various ways. One group of authorities was officials like doctors, health professionals, researchers, organization representatives, vaccine manufacturers or single organizations but also media. In addition to that also personal experiences from individuals' or their friends' lives were shared. Some kind of authority role was recognized 239 times in 752 comments. Actual organizations or their employees didn't take part into discussion, at least they did not bring that up or weren't identifiable.

6.3.1 Officials

Officials and organizations were mentioned together 145 times in 752 comments. They were talked both in positive and negative way. Some of the comments were more neutral. Officials were mentioned 34 times with positive tone, 98 times with negative tone and 9 times with neutral tone. The general attitude against officials was therefore more negative. Negative comments criticized officials' objectivity, professionalism, and possible financial benefits and blamed them for withholding crucial information. Some names were repeated and criticized:

"[- -] It has been revealed that officials try to understate the serious side effects and consequences of the vaccine only to get people excited to have those."

"[- -] For some people vaccines are the way to make money, so that's why you shouldn't believe all the ads. Advertisements sell. Get objective research information."

Especially THL (National Institute for Health and Welfare) as an organization was under intense critique, partly because of previous swine flu -epidemic and communications actions related to that. The organization was considered dishonest and profit-making:

"Truly outrageous action from the "Health Destroying Institution". Company management is ONLY thinking about FINANCIAL BENEFIT. Our daughters will never get this poison vaccine. They should be striked back, but how?"

"THL and Co. won't tell honestly about side effects which have occurred A LOT around the world. So called benefits are exaggerated."

Then again some participants would rather put their trust on officials and professionals like doctors, cancer associations and THL than private people or discussion forum attendants. One attendant wanted to hear the information from finish officials. This can be seen as reputed credibility where well known titles and assumed professionalism increase commenter's credibility (Tseng & Fogg 1999). In some cases the attendant told to be a doctor or nurse him- or herself but in most of the cases the attendant was referring to a doctor or official.

"[- -] If vaccines had serious and common side effects, authorities who are familiar with it would tell that in public. [- -]"

"[- -] I am more than happy to get some arguments against this, from the experts though. So don't link me any blog, where some nobody hippie is telling things."

6.3.2 People like me as authorities

Always the authority was not formed based on status or wasn't necessarily a person outside the forum. Quite a few built their own authority as experts or source of experiences. "Me" as an authority was mentioned 75 times in 752 comments. Personal experiences were often without any other reference or source material. Situations in which the authority was friend or someone from the family were mentioned 13 times. Shared family member's or friend's experiences include presumed credibility (Tseng & Fogg 1999) where one expects his or her family member to be credible and so is sharing their experiences as the truth for other participant in online forum. Some people also underlined "people like me -situations" where anyone could become a victim of side effects of vaccine. A few commenters raised up their own status or professional titles.

"My older daughter got this swine flu vaccine and afterwards suffered from vein/renal infection. And after that she has had to take cortisone and other strong medication for four years. So, my younger daughter who is now pushed to take this new vaccine won't definitely get it."

"I work as a doctor in central hospital [- -]..."

Part of the participants also recommended HPV vaccine to the others, mainly based on their own experiences. Often their positive assessment focused on vaccination situation or how they felt after that:

“I’d rather take the vaccine than cancer. And it’s for free. :D”

“Oh you, I’ll have the last one of the three vaccines next week and first two didn’t hurt and I haven’t had any side effects. No fever, no ache, no fainting...simply nothing. And I haven’t died. Some of my classmates were feeling bad and had aches, but that was it. And all those “my life changed” things related to vaccine has happened only for a few people among thousands of people who didn’t get any effects.”

6.3.3 Empathy and sarcasm

Code	Occurred
Empathy recognized	3/752 comments
Sarcasm recognized	22/752 comments

One attendant told that she has been searching information from the internet but would rather hear the opinions from the other girls attending the discussion. There wasn’t still much dialogue and often responses were critical or captious. Empathy or friendly dialogue did not play a major role in the discussion and it was identified only in three comments:

“[- -] Did you medication/treatment help? All the best for you and thank you for your appropriate comment!”

“[- -] I highly recommend you getting tested, I’m feeling very concerned if you never got those tests. [- -]”

Sarcasm or potential sarcasm was identified 22 times. All in all, feelings and emotions were not shown much. From time to time the discussion had irritated or irreverent tone. Some participants reacted negatively to emotion-based argumentation and all in all science-based information and facts were highly valued compared to personal and emotional experiences:

“So, you do not seem to be able to put things into probability order but deny things only based on your emotions. [- -]”

“You do the wrong conclusions and collect only “information” which confirms your emotional knowledge. It’s a fact that you are spreading false information to young people. You guide them to make emotion-based decisions without rational arguments. [- -]”

Sarcasm was also shown to those who were against to vaccines and recommended homeopathy or natural alternatives instead. Some people liked to divide attendants into those who believed in homeopathy and natural options for vaccines and were against vaccination and for those who believed in vaccines and were more skeptical against homeopathy:

“I, by the way, have healed from cancer by eating soda and blowing soap bubbles [- -]...”

“Oh what a level of discussion! There are a few homeopathy freaks here who actively comment on every vaccine. [- -]. I believe in research and science and I understand that there are some side effects but I will get my daughter vaccinated.”

Surface credibility and experienced credibility didn’t really occur in this data. Surface credibility is perhaps a more significant factor on web pages where superficial elements like color, font or pictures create the image for the reader. Experienced credibility demands that the writers on the forum were familiar with each other and could thus rely on each other and in this study the familiarity between attendants was not exposed. Table 6 below is summarizing the different types of credibility occurring in data and critique against it.

TABLE 6 Different types of credibility and critique

Credibility factor	Support	Critique
Authorities	<ul style="list-style-type: none"> • are professionals • know the truth 	<ul style="list-style-type: none"> • don’t tell the truth • look for financial benefit • represent unreliable organization • are advertising their products
Source material	<ul style="list-style-type: none"> • research based and credible • timely correct 	<ul style="list-style-type: none"> • paid and modified by organizations • from unreliable source

	<ul style="list-style-type: none"> • from credible source 	<ul style="list-style-type: none"> • vaccine topic is too new to be researched properly and long enough
Me, friend and people like me as an authority and empathy among participants	<ul style="list-style-type: none"> • true stories • opinions from people in the same situation 	<ul style="list-style-type: none"> • rather believe expert than normal person • some comments were seen as trolls • emotion-based argument is not enough • source is missing

7 DISCUSSION AND CONCLUSIONS

Certain issue arenas and discussions about vaccination discussion were monitored also during the swine-flu epidemic (Luoma-aho, Tirkkonen & Vos 2013) as discussed in chapter 4. The main topics of interest recognized were symptoms of the flu, safety of the vaccine and the epidemic, risk groups and victims, testing, side-effects and trustworthiness of authorities, organizations and medical companies (Luoma-aho, Tirkkonen & Vos 2013, 244). In the case of HPV vaccine discussion the tone of the debate remains largely the same even if the core topic changes. Previous research of the eWOM focuses largely on product or service reviews in which consumers can dominate the channel, the message is not dependent on the markets and other people's shared information is often seen unbiased and objective compared to advertising (Brown, Broderick & Lee 2007, 4; 7).

This study focused on health industry related topic – vaccines. Online discussion about health issues might be different related to other topics or other products discussed online. Evaluation of online health information requires multiple levels of literacy (Norman and Skinner 2006). Chosen discussions were happening on open and anonymous online forums where people are probably not familiar with each other. The tone of the discussion may differ from closed or settled online communities where discussion continues for longer time and attendants are familiar with each other. The aim of this research is to understand credibility of online comments, use of sources and authorities and which reliability factors are recognized in online discussions about HPV vaccines. As a case study, the online discussion around the HPV vaccines in Finland in 2013–2016 was chosen. This research was part of the bigger project where vaccine discussion is examined from several different viewpoints.

7.1 Use of sources

First aim was to find out how people use sources and references in online discussion. This research showed that unambiguous facts and research information are highly appreciated among online commenters and the sources are required to support argumentation. Source materials were frequently used and significant observation is that different web pages and research articles were the most cited compared to news content, blogs and social media. It still must be noted that over half of the comments were missing the reference and that every one of the comment didn't include information, statement or opinion but they were for example questions, single words or plain comments without any "requirements" for reference.

Online audience also proved to be very critical and sources perceived to be unreliable were judged. This raises the idea of whether online audiences are "growing up" and appreciate objective and research information rather than emotional and personal knowledge. Go et al. (2014, 360) mentioned the concept "bandwagon cue" as crowds are prone to peer pressure and willing to choose the normative opinion which can lead to repetition. This may in part explain the frequency of demand. People like to act as the same way than others. Even if people seemed to appreciate researched and factual information, it is questionable if participants were able to evaluate the research and separate the objective research from paid research made by different brands. Some of the people discussed this and reminded others of research made by for example medical companies.

Also the background of attendants may affect the way to evaluate information and people with high education may appreciate the academic information compared to people without any education (Lucassen, Mullwijk, Noordzij & Schraagen 2013, 255). Wathen and Burkell (2002) talked about errors while evaluating online information: experienced information seekers easily have blind faith into source while those who already are experts in that particular field may have blind skepticism into source. These both existed in chosen vaccination discussion and there were also individuals who warned the others not to be too "faithful".

Also the subject of discussion may be a significant factor. People most likely want to be sure about their decisions and information related to health and medication while with other products the risk of failure in credibility evaluation is not that crucial. In online health communities, empathy is often recognized and plays an important role regarding other members' feelings of compassion towards other people's problems and personal stories (Nambisan 2011, 299).

7.2 Role of empathy and people like me

Also the role of empathy and "people like me" -filter are seen as significant credibility factors among discussion forum attendants. Discussion forum attendants' high possibility to generate empathy is seen as an important factor while building trust among writers (Bickart & Schindler 2001, 33) and supportive way of communication may increase individual attendant's credibility (Feng, Lazar & Preece 2004, 17–18). Still in HPV vaccination discussion online, only a couple of comments included empathy and people didn't seem to look for empathic approach or didn't strongly appreciate others' shared experiences.

What is the real connection between empathy and trust? The difference may be explained by experienced credibility which demands that the writers on the forum are familiar with each other and can thus rely on each other (Tseng & Fogg 1999, 42). In online forum where people spend only a limited time the same kind of trust and the feeling of similarity does not necessarily arise related to forums where people have for example similar illnesses and experiences to share in the long run.

Previously it was stated that when trying to find valuable information people look for high expertise sources by evaluating expertise cues like official authority status (Go et al. 2014, 359). On the other hand people have doubts about formal authorities' and organizations' objectivity. In health care section, which includes vaccine industry, medical companies may raise doubts (Luoma-aho, Tirkkonen & Vos 2013, 246) as well as paid bloggers or other participants which may seem unrealistic (Lo 2014, 180).

7.3 Authorities

Who do individuals use as authorities in online discussion commentary? Officials and organizations were mentioned together 145 times in 752 comments. They were talked both in positive and negative way, but still most of the comments were more negative. Negative comments criticized officials' objectivity, professionalism, and possible financial benefits and blamed them for whitewashing the information. As Hosmer (1995 in Luoma-aho 2005, 168) noted, citizens should feel that authorities represent their interests and needs leaving their own agenda in the background, which plays an important role when building trust between individuals and public organizations. In this case many people think the opposite. Then again part of the participants would rather trust officials and professionals like doctors, cancer associations and THL than discussion forum attendants. Organizations weren't present in these forums or weren't identified taking part into discussion.

Even if part of the participants trust authorities and part of them in turn personal experiences, in this specific issue research information seemed to be the strongest authority in which people referred to. Surely some people were skeptical about the credibility of research or they questioned the objectivity of research. It was feared that research or their results are shaped by pharmaceutical industry.

7.4 Opportunities for organizations

This research was made to find out which kind of comments are experienced as credible and how people use source material, mark references and how the authority is formed in online discussion about HPV vaccines. This research also offers organizations useful information about successful communication in online forums. Those individuals communicating in chosen online forums were probably private people or at least non-recognizable. It seems like there are plenty of room and opportunities for organizations related to the topic discussed to take part. As Luoma-aho, Tirkkonen and Vos (2013, 240; 242; 248) said, issue arenas can be a useful place for organizations to take part into the discussion, be aware of the top-

ics that are related to the issue and even get some signals of what is going to happen in the future. But to get that information, the appearance in the forum should be planned and on time (Luoma-aho, Tirkkonen & Vos 2013, 248).

According to this research the communication should be transparent, told by an expert of the certain field, claims scientifically proved and justified, references should be found and research should be objective, independent, not paid by an organization and on time to be perceived as credible. Continuous discussion and chance for questions would help the interaction between participants. The discussion can handle the great variety of topics and one organization can't decide what is the discussion about but can still take part into it (Vos, Shoemaker & Luoma-aho 2014, 201–202). Taking part into HPV vaccination discussion might offer some challenges as part of the participants already have strong claims against some organizations related to the topic based on the previous vaccination discussion. But it could also offer a possibility to create dialogue among organizations and individuals interested in the topic.

The early identification of issues related to organizations and their business can prevent financial and reputational losses (Zhang & Vos 2014, 2) and while monitoring vaccine discussion, organizations related to that can find the biggest concerns of the participants. Consumers and businesses can handle the discussion also through the company's channels but if consumer won't get a reply he or she may expand the discussion to other forums and this demands social media monitoring. Timely correct monitoring can enable organization to prepare early responses to issues which may expand into potential crises. (Zhang & Vos 2014, 5; 8–9.) If organizations will monitor the social media channels or even attend the discussion, it should be done in a right way. According to this research people tend to appreciate objective research information. Still many participants seemed to criticize the research made or funded by corporations. This is a challenging combination for organizations to solve. How should they offer "right", open, transparent, timely correct and research based information which wouldn't raise doubts about modified results?

However people are usually hungry for information about issues related to their life and want to be heard and take part into social debate. If organizations take people into decision-making it can strengthen the legitimacy of decision-making (Klinger & Russmann 2014, 62). As Klinger & Russmann (2014, 62) said before, only well-educated and active part of the population will take part into different

kinds of e-participation tools and platforms build necessarily for active participation. Taking this into account, discussion forums might be an effective way to reach different people and layers of the debate and not only communicate and share information in organizations' own channels. And if people would get the information early enough, maybe it would reduce the need for quick critique which often leads the discussion in online forums into absurd ways.

7.5 Evaluation of the study

This research has certain limitations. The data material consists of online comments about HPV vaccination. As there are multiple online discussions related to the theme, only some of them could be chosen. Even if the three discussions were chosen in a consistent technique, they represent only part of the whole discussion and the used data is not big enough to make generalizations about the whole HPV discussion online. As the tone of the debate in certain discussion may go to specific routes, it doesn't necessarily represent the whole atmosphere of the HPV discussion. When doing content analysis, the interpretation of the data is in this research made by one researcher and the interpretation might change after a while or under different circumstances (Keyton 2006, 234). To have this in mind, data in this research was gone through two times and then partly double coded with another researcher.

The codes were chosen based on previous research as the chosen method was theory-based content analysis. Even if the codes were modified based on data as well, the perception of the data probably focused on those points recognized in earlier findings in previous research, which might have left some new findings out of focus and the existing data might have offered also other interesting remarks. On the other hand, one single research can't cover all the possible perspectives and the perception of the data depends on the researcher. When exploring the written discussion forum comments, the evaluation of the data is missing the tone of the voice and sarcasm, irony, jokes, lies and trolling can be challenging to interpret which might also cause the misinterpretations.

Theory basis of the research brought up also some factors affecting the credibility which finally weren't in the focus of this research or were too challenging to investigate and were left out of the data research. These kind of theory-based factors

were negativity and positivity of the comment, length of the comment and grammatical choices. Finally these theory-based remarks were mentioned in a theory part to make it as comprehensive as possible but weren't further explored.

7.6 Recommendations for future research

In this research mere subjective opinions were not considered credible enough and empathy was hardly shown at all. For future research it would be interesting to find out what is the added value offered by the discussion forums if people are more interested in research information and information offered by specialists. Are the role and the character of online forums or participants changing and is scientific information more valuable compared to shared experiences or can discussion forums offer a valuable combination of shared experiences and factual information? How does this change depending on product or service? Which kind of channel would serve the sharing of health-related information? As discussed in chapter 2.1 health literacy and people's capacity to interpret and evaluate different health information online would offer interesting possibilities for future research.

Luoma-aho, Tirkkonen and Vos (2013) note that issue arenas have become an important part of the organizations' communication environment and participation helps organizations to keep track on the issues and weak signals related to them. It seems that individual citizens communicate with each other but organizations related to specific issues are not present in online discussion. Monitoring these online forums would easily give an overall picture of what people think of these organizations, what they are afraid of or what kind of questions they have. In the future it could be examined which organizations actually consider online forums as part of the strategic communication and as a way to influence people's image of the organization. As vaccine debates and their possible side effects are repeatedly at issue, also the online health discussion and its connections to successful risk communications would be an interesting topic for future research.

Organizational monitoring is linked to another important theme to focus on in future research: organizational listening. It is noted that organizations often talk about two-way communication but in the majority of cases it's mostly about organizations talking not listening (Macnamara 2015). Social media and online fo-

rum monitoring enable a way to identify influencers to help with organization's goals, to gain intelligence about issues related to the target organization and to promote their brand and messages among people who already are interested in these issues (Macnamara 2015, 7). In social media platforms the need for personable interaction with organization and individuals has been recognized to build credibility and failure to create and develop two-way dialogue easily communicates distance between the organizations and its stakeholders (Mae Kim 2016).

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