Trust Antecedents in Social Networking Services

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Abstract

Objective of this thesis is to identify the antecedents of trust in social networking services (SNS) and to determine their importance. Understanding the antecedents of trust is important since trust has previously been found to influence intention to use in related technologies. There has not been a comprehensive study to explain trust formation in social networking services. Social networking services continuously evolve and the norms of usage are changing, which can affect the formation of trust.

   Trust is important in human interactions and it is needed in effective communication, learning and problem solving. Initial trust is based on perceptions and experience-based trust is based on past behavior of the trustee. Interpersonal trust and social trust are present in social networks. Social networking services can facilitate the formation of social capital, which increases trust. Based on previous studies, the antecedents were hypothesized to be propensity to trust, perceived trustworthiness, perceived critical mass, trust towards platform, structural assurances, access to right information, information overload, perceived risk, social networks, civic engagement, and life satisfaction.

   Quantitative empirical research was carried out in order to confirm the hypotheses. Data were collected with an online survey and analyzed with Partial Least Squares (PLS) method. The developed PLS model predicted 68,9 % of trust in SNS and it was found valid and reliable. The research sample contained 104 respondents, who were active SNS users.

   Research findings support that perceived critical mass, social networks, civic engagement, and life satisfaction have positive effect on trust in social networking services. Additionally, propensity to trust and access to right information could have positive effect on trust in social networking services. Perceived trustworthiness could have negative effect when it reflects the evaluation of perceived trustworthiness. The most important finding was that social capital almost solely predicts trust in social networking services. The results apply to a post-adoptive situation where experience-based trust is present. There is further the need to study trust antecedents in pre-adoptive situations and the influence of trust on usage.

Keywords social networking services, interpersonal trust, social trust, social capital

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Tiivistelmä

Tutkimuksen tavoitteena oli tunnistaa luottamuksen edeltäjät yhteisöpalveluissa ja määrittää niiden vaikutus luottamukseen. Luottamuksen edeltäjien ymmärtäminen on tärkeää, koska luottamuksen on todettu vaikuttavan käyttöaikeeseen läheisillä teknologian aloilla. Luottamuksen muodostumisesta yhteisöpalveluissa ei ole aiemmin tehty kattavaa tutkimusta. Yhteisöpalvelujen jatkuvasti kehittyessä käytön normit muuttuvat, mikä voi vaikuttaa luottamuksen syntymiseen.

Luottamusta tarvitaan kaikessa ihmisten välisessä vuorovaikutuksessa ja tehokas kommunikointi, oppiminen ja ongelmanratkaisu edellyttävät sitä. Alustava luottamus perustuu havaintoihin ja kokemus-pohjainen luottamus perustuu luotetun aiempaan käytökseen. Yhteisöpalveluissa esiintyy toimijoiden välistä ja yhteisöllistä luottamusta. Aiempien tutkimusten perusteella luottamuksen edeltäjien oletettiin olevan henkilökohtainen taipumus luottaa, koettu luotettavuus, koettu kriittinen massa, luottamus alustaan, rakenteelliset takeet, pääsy oikeaan tietoon, tietotulva, koettu riski, sosiaaliset verkostot, kansalaistoiminta, ja tyytyväisyys elämään.

Hypoteesien testaamiseksi suoritettiin kvantitatiivinen empiirinen tutkimus. Data kerättiin verkkokyselyllä ja analysoitiin Partial Least Squares (PLS) metodilla. Kehitetty PLS malli ennusti 68,9% luottamuksesta yhteisöpalveluissa ja malli todettiin päteväksi ja luotettavaksi. Tutkimuksen näyte sisälsi 104 vastaajaa, jotka olivat aktiivisia yhteisöpalveluiden käyttäjiä.

Tutkimuksen tulosten mukaan koettu kriittinen massa, sosiaaliset verkostot, kansalaistoiminta, ja tyytyväisyys elämään vaikuttavat myönteisesti luottamukseen yhteisöpalveluissa. Lisäksi henkilökohtainen taipumus luottaa, koettu kriittinen massa ja pääsy oikeaan tietoon saattavat vaikuttaa myönteisesti luottamukseen yhteisöpalveluissa. Koetulla luotettavuudella voi olla kielteinen vaikutus silloin kun se heijastaa luotettavuuden arviointikriteerejä. Merkittävin tulos oli se, että sosiaalinen pääoma melkein yksinomaan ennustaa luottamusta yhteisöpalveluissa. Tulokset pätevät käytön omaksumisen jälkeiseen tilanteeseen, missä esiintyy kokemus-pohjaista luottamusta. On edelleen tarpeen tutkia luottamuksen edeltäjiä käytön omaksumista edeltävässä tilanteessa. Lisäksi luottamuksen vaikutusta käyttöaikeeseen tulisi tutkia.

Avainsanat yhteisöpalvelut, toimijoiden välinen luottamus, yhteisöllinen luottamus, sosiaalinen pääoma

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1. INTRODUCTION

Social media has become an integral part of our daily lives over the past few years (Pew Research Center 30.8.2015). There is little to restricting the usage with smartphones and almost unlimited internet access. As social media evolves very rapidly, the norms of usage continuously change (Kane et al., 2014). Trust has an important role to play in uncertain environments (Pavlou, 2003) and it is present in all human interactions. Trust often reflects the expectation that people are benevolent and behave as expected. (Blomqvist, 1997.) It can certainly be thought that social networking services require trust in order to function properly. There are clearly several aspects of social networking services that demand some trust to be had. People often share their private information in social networking services that they necessarily do not want the whole world to see. Social media users need to assess whether to trust or not to trust the service. It is interesting to know what affects trust formation in social media. For example how does personal characteristic of the user, platform characteristics, or relationships with other users influence trust formation. There could be some factors that increase trust and others that influence negatively. Trust could also be more easily formed in certain situations.

1.1. Background of the study

The idea for this study arose from a previous research where the antecedents of technology trust and its perceived consequences were studied (Kivijärvi et al., 2013). The idea was to focus on social media and to study its trust antecedents. This was inspired by the fact that social media usage has increased so rapidly over the past few years.

Previous studies about online trust have mostly focused on online information sources and communication. In past years, several studies about trust and privacy issues with social media have been made. Most previous studies have focused on using trust to explain intention to use a certain service (Pavlou, 2003; Lorenzo-Romero et al., 2011; Russo, 2012). Pan and Chiou (2011) and Quandt (2012) studied trust towards social media information. Some studies have focused on

social capital in social networking services. Social capital involves trust and could be formed as a result of social media usage and it could also facilitate usage (Valenzuela et al., 2009; Warren et al., 2015).

Trust has been found to positively correlate with usage in many internet services (Pavlou, 2003; Lorenzo-Romero et al., 2011; Russo, 2012). Trust has shown to have high significance in uncertain environments, because it provides certain expectations of a successful transaction. It has proven to be a catalyst in consumer-marketer relationships. The main reason behind consumers not to engage in e-commerce is thought to be lack of trust. A web retailer who fails to show trustworthiness may be perceived as opportunistic and taking advantage of the internet infrastructure. (Pavlou, 2003.)

Dutton and Shepherd (2006) studied the formation of "cybertrust" explaining on a general level social determinants shaping trust in the internet. Dwyer et al. (2007) studied the relationships of internet privacy concern, trust in a social networking site, and trust in other members of a social networking site. They focused on how trust affects on building new relationships online. Beaudoin (2008) studied the relationship between interpersonal trust and internet use. Russo (2012) studied trust towards other users, the technology provider, and the information system in social location technologies. Lorenzo-Romero et al. (2011) studied factors affecting the acceptance of social networking sites with the extended TAM model, which includes trust and risk.

There is a lot of material available on the topics of trust and social media individually. Over the past ten years there have been 37 466 scientific publications on the topic of social media and the numbers have been vastly growing on last few years. Publications regarding both social media and trust have rapidly increased over the past few years, but are not anywhere close to the numbers of the other social media publications (991 publications over the past ten years). (Web of Knowledge 9.5.2015.)

There has not been a study that has tried to explain the process of how trust in social networking services is formed and what are the major contributors. The antecedents of trust in social networking services would be interesting to know since trust has been found to affect intention to use. Knowing factors that predict usage is interesting since new social networking services arise continuously (Wikipedia 30.8.2015).

1.2. Research problem and questions

There might be several things influencing social networking service users' trust towards the service. Users need to weigh privacy concerns, the platform provider's motivation and capability to protect users' information. Social threats might arise from contacts whether they are new online acquaintances or closer friends. Users cannot know everything, so they have to trust based on something. The objective of this thesis is to determine what the antecedents of trust in social networking services are. The aim is to seek an explanation for trust formation in social networking services.

Based on the objectives of the research, the main research questions are:
1. What are the antecedents of trust in social networking services?
2. How do the trust antecedents affect trust towards social networking services?

The first question seeks descriptive answers. It focuses on identifying the antecedents and the reasons behind them. The potential factors behind trust in social networking services are researched through relevant literature. The second question seeks confirmation and an explanation of the importance and effect of each antecedent. The importance of each antecedent is empirically assessed.

The results could interest companies developing new social networking services. Large organizations may also benefit from the results if they are planning to introduce internal social networking services.

1.3. Scope of the study

Since social media is a very wide topic, the main focus will be on social networking services in consumer use, as they are the most well-known and widely used social media services. Examples of these are Facebook, Instagram and LinkedIn. This thesis will not concentrate on evaluating the attributes of different social networking sites or applications, but could discuss their different properties if there is effect to trust.

The main focus will be on trust antecedents, that is the situational characteristics that affect trust formation (Das and Teng, 2004). Even though trust's influence on usage is interesting, it is not the focus of this research. Effect on usage will only be discussed through the study when it is relevant in order to understand trust in social networking services better.

The research leans on relevant literature. These mainly include previous research from the field of information systems, organizational and social behavior. Theories that will be researched for this study include social network theory, the technology acceptance model (TAM3), social capital theory, interpersonal trust, social trust, and risk. Social network theory explains the structures and formation of social networks. The technology acceptance model can be used to explain the motivation to use social networking services. Social capital is related to trust in social networks. Regarding the trust theories, the aim is to focus only to those trust theories that are relevant in social networking services. Interpersonal trust, social trust, and risk meet that requirement. Technology trust and institutional trust are also reviewed.

The empirical research part will use a quantitative method for gathering and analyzing data. The target group of the study is potential social networking service users. The aim is that the results would be generalizable to the public.

1.4. Terminology and structure of the thesis

The main concepts of this thesis are social media networks and trust towards social networking services. When referring to social media networks, the emphasis is on the actual network structure that is enabled by social media services and in this thesis in particular social networking services. Kane et al. (2014) state that social media is a very wide concept including various types. Broadly, social media covers social networking sites, blogs, microblogs, wikis, virtual worlds and video-sharing sites. It can be difficult to categorize different types of social media, especially as they evolve continuously by adding new features. Additionally, social media shares technologically many of the same characteristics as prior collaborative technologies. Often used abbreviation for social networking services is SNS.

Trust is a multifaceted concept. It has an important part to play in many human interactions. Trust is required in effective communication, learning and problem solving. In social psychology, trust is seen so that a person (trustor) puts oneself in a potentially vulnerable position with another person (trustee), at the same time having some information about the other that encourages trusting in his/her good intentions. This demands some information to be had of the trusted person. Philosophers see trust usually as good, but it can also be unconscious, unwanted or forced. (Blomqvist, 1997.) Many researchers agree that only one definition of trust cannot be constructed (Blomqvist, 1997; Das and Teng, 2004; McAllister, 1995). In this thesis, trust concepts used in organizational and information systems research will be applied.

This thesis is constructed from an introductory part, theoretical part, and practical part. First the idea behind the thesis is introduced with the main research questions. These are then studied via relevant literature. After a research framework is constructed based on the literature, a quantitative research is carried out. Finally, the results are analyzed and reflected with the theory answering the questions set for the research.

2.   THEORETICAL FOUNDATION

In this chapter, the structure of social media networks and its effects are studied. Then the concept of trust is studied in more detail and studies related to trust in SNS are reviewed. Finally, the antecedents of trust are categorized to form the basis for the empirical research.

2.1.   Social media networks

Social media networks relate to the foundations for which trust could be built. It is important to understand the dynamics of social networks and what differentiates social media networks from offline social networks. In this section, the special characteristics of social networking services and motivation to use them are presented. Formation of social capital in social networks where trust is present is also discussed.

2.1.1.   Social ties and networks

A social tie is a connection between two people. Granovetter (1973) defined the strength of interpersonal ties as follows: "*the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie.*" Each of the four elements is to a certain degree independent. Ties can be roughly categorized as strong, weak or absent. The stronger a tie is between two people, the larger the group of people is that they both have ties to, weak or strong. When the tie is absent, this overlap of friendship circles is usually small or missing. When the tie is weak, some overlap of friendship circles is predicted.

Haythornthwaite (2002) defines a social network tie as the exchange of goods, services, social support or information between communicators. Contact frequency, span, intimacy, reciprocity, and kinship are used for measuring the strength of a tie. Ties may involve only some of these measures due to the type of the tie, e.g. colleagues, relatives, neighbors. There is a constant

increase and decrease in tie strength as people get more familiar with each other or lose the reason for association.

In social network analysis (SNA) a network is thought to consist of nodes that can be anything from a person to organization. Nodes form paths between each other and thus form a network structure. The main principle of SNA is that the opportunities and restrictions a node faces can be determined of its position in the network. (Kane et al., 2014.)

Stronger ties have larger time commitments. The more similar two people are the stronger the connecting tie is. The stronger the tie between two people is, the more likely is that their friends become friends because of similarity in personality and the probability of more frequent interactions. (Granovetter, 1973.) Granovetter (1973) theorized that if a person has strong ties to two different individuals, there usually also is a tie between them. This means that a strong tie is almost never a bridge in a social network. Only weak ties form bridges between social circles.

The flow of anything in the network is directly proportional to the number and length of the paths between two people. Since weak ties usually form the shortest path, they form so called local bridges. This is the importance of weak ties since they increase the number of possible paths and shorten the length of the path between people, thus increasing the probability of information flow, for instance in the social network. (Granovetter, 1973.) Granovetter (1973) argues that individuals who have many weak ties are vital when spreading a risky innovation since a larger number of people must be exposed to it.

People who link unconnected groups and thus bridge structural holes in the network have high probability for early exposure for novel information. They can aid the information flow between groups that would be otherwise unconnected. In work environments, structural holes have been shown to give competitive advantage to people over their peers. (Wu, 2013.)

Haythornthwaite (2002) describes that motivation to communicate, amount of exchanged information, resources and communicated support increases linearly as do the tie from weak to strong. Communicators who are weakly tied use organizationally established means of communication. Pairs with strong ties use more media to communicate, and expand out of organizationally established medium. Strong ties are influenced positively by the addition of new ways to communicate, if the medium complements existing communication methods and offers additional ways and opportunities for contact. Haythornthwaite (2002) reasons that different types of ties with various strengths fill important positions in a person's daily life. A new medium may be useful as an easy way of contact with weak or absent ties or as an additional means of communication supporting strong ties.

Haythornthwaite (2002) discusses the difference of online and offline ties. The researcher states that online ties have the same characteristics as offline ties, even though they are not comparable for instance considering social support received online versus face-to-face. However, in terms of impact of exchange, online and offline ties are equally real. It was still doubted that online communication might not sustain emotional and complex exchanges. One benefit of online environment is that it offers passage to a wider range of people to whom we are weakly tied as possibilities for communication regardless of time or distance increases. Online communications support weak ties as the social risk involved when contacting strangers decreases. There is also possibility of latent ties when technically a connection is available but there has not been any social interaction yet.

Kane et al. (2014) describes several key differences between offline and online ties focusing on social media. Many social media technologies share four main features. These are network transparency, relational ties, search and privacy, and a digital profile. These features introduce opportunities and capabilities that do not exist in conventional offline or online social networks. Relational ties mean that the platform provides a way for the user to show a list of other users to whom they are connected. Network transparency means that users can see their own and others connections in the platform. Search and privacy mean that the platform offers various mechanisms which users can use to search and access content and from which they can protect

their own content. A digital profile means that the platform provides distinct user profiles, which can be built by the user, their network members and the platform.

Value in a social network can form in two ways. Flow of content (e.g. information) and the network structures ability to reach important resources (e.g. right information) both may create value. In a social media environment, users create the digital content which may offer information, influence or social support. Flow of digital content in the network differs from physical content, since it can be copied, manipulated, aggregated and searched. Structural benefits are thought to arise when there is a large number of absent ties between members in a node's personal network (structural holes). These may be the networks main source of benefits. (Kane et al., 2014.)

Characteristics of a social media site will partly shape the networks that form, since particular types of interactions thrive while others do not (Kane et al., 2014). Kane et al. (2014) suggest that a social media platform causes similarity among users in a network structure. People develop common attitudes when they occupy similar network positions. The homogenization is linked to the social media platform feature of being able to articulate a list of connections. Connections can be very different from each other. The ties to "friends" or "followers" are different since in the first both sides need to verify the tie but in the second only one needs to verify. The ability to design ties has deep effects on social network theories. Ties existing in social media networks are not only representation of social relationships but also partly define the relationships that form on the platform. The way in which relational ties are implemented affects on users' interactions and leads to different types of network structures on different platforms. (Kane et al., 2014.)

Four basic types of ties have been recognized in SNA studies. These are relations, interactions, proximities, and flows. Relations are ties that project continuous social contacts between nodes. These can be affective (dislikes, likes) or role-based relations (family, friends). Interactions are separate, momentary relational occurrences between nodes. Interactions can produce or change relations, and relations should raise the likelihood of interactions. Proximities refer to shared

spaces that offer possibilities for ties to form. Proximities can be physical or social, like short physical distance or belonging to a same group. Flows can be intangible or tangible material, like money, information or beliefs, which move from node to node when they interact. All these tie types are represented in many social media platforms. For example, Facebook contains features like friends (relationships), messages (interactions), groups and location services (proximities), and trends and shares (flows). (Kane et al., 2014.)

2.1.2. **Social media adoption and usage**

The widely studied technology acceptance model (TAM) has aimed to explain how and why people decide to adopt new technology. It has been applied in several studies involving social media and e-commerce usage (Pavlou, 2003; McKnight et al., 2011; Lorenzo-Romero et al., 2011). According to TAM *in order to be adopted technology must be useful and easy to use*. Two principal TAM constructs, perceived usefulness and perceived ease of use, have been found to consistently explain 40% of the variance in people's intention to use and the usage of technology. Perceived usefulness is defined as the belief a person has that using IT will improve his or hers job performance. Perceived ease of use is defined as person's belief that using IT will be effortless. External variables, such as design characteristics, influence indirectly these two constructs. (Venkatesh and Bala, 2008.)

The main determinants of perceived usefulness in TAM are defined as *subjective norm, image, job relevance, output quality, result demonstrability, and perceived ease of use*. Experience and voluntariness are explained as two moderators for the determinants. Subjective norm and image relate to social influence and the rest are system characteristics. Perceived ease of use, subjective norm, image, and result demonstrability has been found to significantly predict perceived usefulness. (Venkatesh and Bala, 2008.)

Perceived ease of use is argued to form based on persons' general beliefs. These are *computer self-efficacy, computer anxiety, computer playfulness,* and *perceptions of external control*. Computer self-efficacy, computer anxiety, and computer playfulness relate to individual

differences. Experience moderates computer anxiety so that the effect weakens with more experience. The determinants of perceived ease of use do not have notable effect on perceived usefulness. (Venkatesh and Bala, 2008.)

When predicting intention to use, perceived usefulness has been found to be a stronger predictor than perceived ease of use. Initially perceived ease of use has more significant role than after experience is acquired. Design characteristics are important influencers of user acceptance and system success. (Venkatesh and Bala, 2008.)

Social networking sites offer people a way of communicating. Network externalities are an important reason behind people's usage of social networking sites. (Lin and Lu 2011.) Lin and Lu (2011) combined network externalities with motivation theory to find out what makes people continue to use social networking sites. People perceive that there are two kinds of benefits from using social a networking site, usefulness and enjoyment. Lin and Lu (2011) found that enjoyment was the most important factor influencing social networking site user's behavior.

In a study of Valenzuela et al. (2009), people reported that the main reason why they joined Facebook was to keep in touch with old friends and strengthen the relationships with coworkers. Valenzuela et al. (2009) noticed two differences between Facebook users and nonusers. First, they concluded that adoption of Facebook was not random, since they found demographic differences between respondents. Younger females were more likely to be users than older males. Secondly, they concluded that Facebook attracted students who were more civically engaged.

Debatin et al. (2009) found that users' perceived benefits of online social networking are more important than the risks of revealing personal information. Users' also thought that others held a higher risk to privacy than themselves. Facebook users said that they know and use the privacy settings, but researchers found that they could have a distorted sense of what the privacy settings actually encompass.

2.1.3. **Social capital in social media networks**

Social networking services have been found to create and contain certain amount of social capital (Valenzuela et al., 2009; Warren et al., 2015). Social capital is the trustworthiness and reciprocity that arises from social network connections. (Beaudoin, 2008). Social capital has been defined in terms of social networks, trust, civic engagement, and life satisfaction (Valenzuela et al., 2009). Warren et al. (2015) defined social capital through social interaction ties, trust, shared languages and vision, and civic engagement. The components of social capital affect positively each other. The basic idea is that social capital forms from the resources available to individuals through their social interactions. Social capital is thought to increase with larger and more diverse networks of contacts. People can consciously invest in social interactions in order to accumulate social capital. Investing into social networks allows norms of trust and reciprocity to develop. These are crucial for successful participation in shared activities. Social capital enhances person's welfare by allowing access to information and opportunities that would not be otherwise possible. (Valenzuela et al., 2009.)

Social capital can be thought to contain three domains, which are intrapersonal, interpersonal, and behavioral (Valenzuela et al., 2009). Structural, relational, and cognitive dimensions have also been identified (Warren et al., 2015). The intrapersonal domain is linked to person's life satisfaction. The interpersonal domain is linked to trust between people. The behavioral domain contains person's active involvement in civic activities. (Valenzuela et al., 2009.) Beaudoin (2008) stated that interpersonal trust is a critical component of social capital.

Generally, life satisfaction means that a person is happy with his/her life at present and their future prospects (Scheufele and Shah, 2000). Social ties partly determine person's life satisfaction. High life satisfaction is shown to correlate with happiness of person's family and friends, sociable personality, and frequent interactions with people. Based on this it could be assumed that active Facebook users are probably happier than other people. The relationship between life satisfaction and participation in social network services could also be reciprocal.

Some people might want to engage in social media services to improve their life satisfaction. Norms of reciprocity and trust are clearly associated with high levels of life satisfaction. Even so, the causality is unclear and the relationship is likely reciprocal. A person with a wide network of trusted people likely receives more emotional support when needed. On the other hand, this support can increase trust towards the network contacts. (Valenzuela et al., 2009.)

Civic participation includes activities that benefit the community. Social media is a powerful tool for organizing collective action. Sites can connect activists and spread information about critical issues. (Valenzuela et al., 2009.) Warren et al. (2015) found that Facebook encourage people to participate in online civic engagement. People who are already interested in social issues are more likely to engage in civic activities. Social networking services also raise awareness in social issues, which often leads to action.

Social capital indicators and internet use have been found to have positive associations (Beaudoin, 2008). Valenzuela et al. (2009) discuss the relationship between social trust and SNS usage. Since knowledge of the counterpart is part of building trust towards them, SNS environment can decrease uncertainty as it provides detailed information of the counterpart. If people have only contacts that they trust, it can increase their social trust. This can in part facilitate the usage of SNS. However, information can also cause mistrust, even though Valenzuela et al. (2009) believe that Facebook users would not maintain friends that they distrust.

Online activities have been noticed to both increase and decrease social capital depending on the nature of the activity. In SNS, social capital is dependent on the benefits sought by the users. Different relationship types in a network can predict different types of social capital. Depending on the strength of the tie, social capital can be categorized into weak-tie social capital (bridging) and strong-tie social capital (bonding). Bridging occurs across diverse social groups as bonding occurs across uniform groups. Weak-tie social capital forms as people get access to a wider set of information and opportunities. In strong-tie networks emotional support occurring in interdependent relationships forms bonding social capital. (Valenzuela et al., 2009.)

Valenzuela et al. (2009) found that Facebook use had strong positive relationships with life satisfaction and social trust. However, the relationship was stronger with life satisfaction. Intensity of Facebook use was also positively associated with civic engagement. The causal relationship was still unclear, since it can be that trusting, happy, and civically active students just have higher probability to join Facebook.

2.2. Trust

In this section, the different dimensions of trust and the formation of trust are introduced. Interpersonal trust and social trust are important concepts relating to trust in social networking services. The trust-risk relationship is also discussed. Finally, trust in social networking services is studied more closely.

2.2.1. Trust dimensions

Trust has been defined in many ways. It has been called a substitute for control in relationships. Some scholars define it through its source, others through the traits of the trusted person that create trust. Das and Teng (2004) describe trust through three different levels. They are trust antecedents, subjective trust and behavioral trust. Subjective trust refers to an individual's psychological state. Trust antecedents are situational characteristics that lead to subjective trust. Behavioral trust is considered the outcome of subjective trust and its antecedents. Trusting is also seen as risk taking. Risk could also be seen as an antecedent of trust, the same thing as trust, or a consequence of trust.

Trust has been described consisting of different dimensions based on how it is formed. Interpersonal trust includes affect-based and cognition-based trust (McAllister, 1995). Calculative (conditional) and faith based (unconditional) trust have also been distinguished (Das and Teng, 2004).

Different levels of trust have also been recognized depending on the maturity of the relationship. First, there is *initial trust* that is based on perception before any experience with the counterpart. Once a relationship is established, trust is *knowledge-based* or *experiential* and thus originates from the predicted behavior of the trustee. Knowledge-based trust is not as fragile as initial trust and it endures more. (McKnight et al., 2011.) Different trust dimensions are linked to different maturity levels. Gefen et al. (2003) state that initial trust is mainly influenced by person's trust propensity and cognition-based trust. Knowledge based trust is influenced by familiarity, which reduces uncertainty by increasing understanding about current events. Calculative trust is based on previous knowledge. Calculative trust is evaluated on the rational assessments of the counterpart. The costs and benefits that the counterpart would gain by cheating or cooperating are carefully assessed. (Gefen et al., 2003.) Affect-based trust is based on experience, but it is related rather to emotions than just knowledge (McAllister, 1995).

A person's trust propensity is an antecedent of trust. Personality characteristics are directly linked to the propensity to trust. These can be seen as what makes a person trusting or trustworthy. Trust propensity is the general likelihood that the person will trust. The Interpersonal Trust Scale infers that people could be set in a continuum of trust from high to low. A position in the scale will affect a person's trust capability and decision-making. (Das and Teng, 2004.) A person's trust propensity is also called personality-based trust. It is particularly important before any experience on the counterpart exists. Once a relationship is formed, it loses importance because trust is then based more in the experience. (Gefen et al., 2003.)

2.2.2. Interpersonal trust

McAllister (1995) describes two principal forms of interpersonal trust, affect- and cognition-based trust. Cognition-based trust means we choose whom we trust and the choice is based on "good reasons" and "trustworthiness". Cognition-based trust is also called reliableness. Gefen et al. (2003) state that reasons used to assess trustworthiness often consists of second-hand information and stereotypes. People, who seem more similar to oneself, are usually perceived more trustworthy. McAllister (1995) points out that the need to trust disappears with total

knowledge and without any knowledge there is no basis to rationally trust. Responsibility and competence have been found to be key elements of trust in organizational setting. Interpersonal trust in close relations is also measured with reliability and responsibility. It is important to meet the reliability and responsibility expectations in order to develop and maintain trust. (McAllister, 1995.)

Affect-based trust is also called emotional trust. Emotional bonds between people generate affective foundations for trust to exist. In close trust relationships, people invest emotionally and believe their emotions are reciprocated. This can also be described as faith. Cognition-based trust is seen as one antecedent to affect-based trust since established reliability and dependability leads to a higher perception of a person's citizenship behavior. Citizenship behavior and interaction frequency are other two antecedents of affect-based trust. (McAllister, 1995.)

Comparing cognition- and affect-based trusts McAlister (1995) points out that reliableness is not seen as special as emotional trustworthiness. In his research, McAlister (1995) found that peer affiliative citizenship behavior and interaction frequency strongly correlated with managers' affect-based trust in peers. He also found cognition-based trust to be a strong predictor of affect-based trust. Even though cognition-based trust can contribute to affect-based trust, they should be considered separate forms of interpersonal trust. In established relationships the possibility of reverse causation increases. When affect-based trust exists, it is not easily re-evaluated. As time passes, the original motivations are left unquestioned, even though impairing evidence would rise. That is why a basis for cognition-based trust may not be needed when a high level of affect-based trust is formed. Supervisor's evaluation of peer performance was strongly influenced by manager's cognition-based trust for peers. In other words, other people's opinions about one's dependability may affect the evaluation of that person's trustworthiness.

2.2.3. Social trust

When interpersonal trust generalizes, it is often referred to social or generalized trust. Social trust has many good effects on societies. It contributes to economic growth, civic engagement,

reducing transaction costs and solving communal problems. (You, 2012.) Glanville and Andersson (2013) describe how the process of trust formation generalizes. A person who has had good experience with a few people in a community tends to trust the whole community as well. Multiple informal social interactions increase a person's general sense of trust in other people. People who feel they share the same rules, norms and interpretations of the world, view each other more predictable and thus more trustworthy. Generalized trust can also form in dense groups with strong ties and spread to interactions with weak ties. Greater generalized trust is thought to be preceded especially by trust in family and friends.

Siegrist et al. (2000) highlight the importance of social trust in high risk situations. They define social trust as "*the willingness to rely on those who have the responsibility for making decisions and taking actions related to the management of technology, the environment, medicine, or other realms of public health and safety*" (Siegrist et al., 2000). This means that in areas of technology, where people generally lack sufficient knowledge, social trust is important for determining trust.

Social trust has two key components; salient values and value similarity. Salient values originate from the processes and goals a person considers important. Salient values have three main characteristics. They can be described as generalizations applying in multiple situations. The saliency may change if the meaning on the situation changes. By nature, salient values are directly observed. Value similarity is based on identifying the salient values of the counterpart and comparing them with one's own. (Siegrist et al., 2000.)

Glanville and Andersson (2013) found that educational level, changes in health, and informal ties are significant predictors of trust. Those with higher education tend to be more trusting. This could be explained by other traits that are usually connected with education, such as a personal sense of control and resourcefulness. Those with poorer health tend to trust less. Socializing with others was found to increase the level of trust. There also can be a return effect since people who are more trusting probably feel at ease socializing with new people. Glanville and Andersson (2013) conclude that as informal social ties and other social arrangements increase the predictability of social interactions, they lead to increases in generalized trust.

2.2.4. Trust and risk

Risk is defined as uncertainty in outcomes, especially where the possibility of losses exists. In risky situations, the uncertainty is known and it is related to the probability of different outcomes of a decision. Trust involves expectations of the future, which are by nature uncertain and thus risky. It is often argued that trust is needed only in risky situations. Trust can also be a person's perception of the result of a risky choice. (Das and Teng, 2004.) Das and Teng (2004) describe how risk and trust are linked at the three trust levels (Figure 1). The risk based view of trust is mostly linked to calculative trust, where the probabilities of the trust outcome are weighed and to cognition-based trust where good reasons are needed for trust (Das and Teng, 2004).
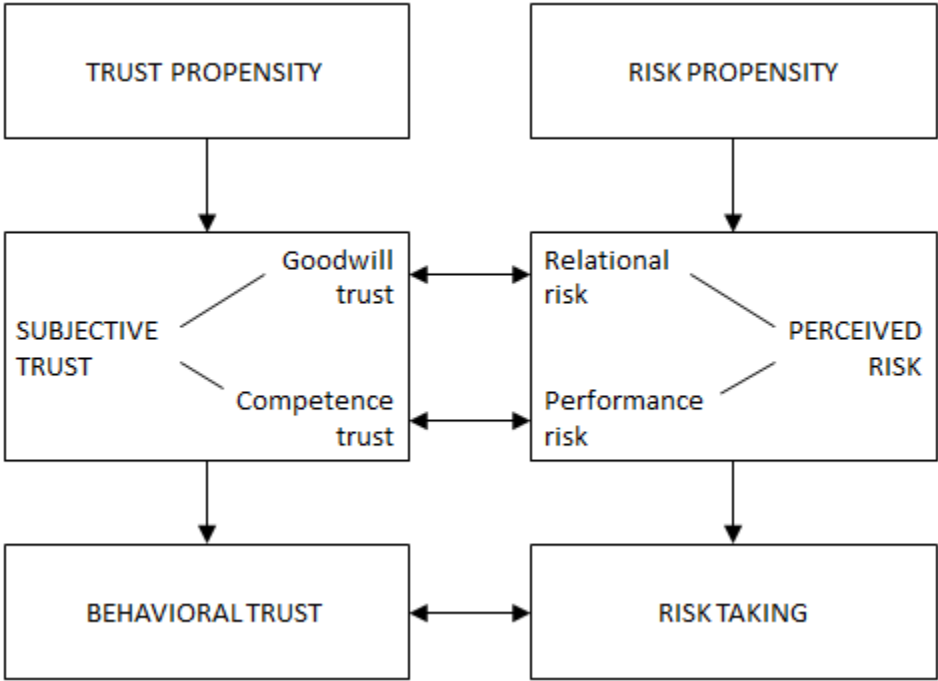
Figure 1: Trust – risk relationship (Das and Teng, 2004).

If subjective trust is looked at as the probability that the trusted person will not act deceitfully, then trusting is linked to risk taking. Perceived risk is defined as not having the wanted result. Thus perceived risk and subjective trust can be thought as reflections of each other. (Das and Teng, 2004.)

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Das and Teng (2004) consider subjective trust in terms of goodwill and competence. These correspond with McAllister's (1995) division of cognition-based interpersonal trust to responsibility and competence. Goodwill trust is created when the trustee acts dependably and has the intention to do so. Competence trust reflects the trustee's ability to act according to agreements. These two are independent dimensions, since a person can be highly competent, but ill intentioned, or well intentioned, but incompetent. In the trust-risk relationship, competence trust is linked to performance risk, since performance risk is the probability of not achieving the desired result, even though the partner has good intentions. Similarly, goodwill trust is linked to relational risk, which means that the other person is not committed to the relationship. These two risk types origin from different sources. Relational risk comes directly from the intentions of the partner and performance risk can come from the environment or from the capabilities of the partner. (Das and Teng, 2004.)

Behavioral trust is the outcome of subjective trust, which means taking action that puts oneself vulnerable. The level of vulnerability reflects the level of trust. Behavioral trust is also closely related to risk, since it is the assuming of risk. Low perceived risk leads more easily to risk taking. (Das and Teng, 2004.)

A person's risk propensity can be defined as a personal trait. Generally, some people avoid risk taking and some are more willing to take risks. Those who have higher risk propensity focus more on the possible rewards than losses, and those with lower risk propensity are more focused on the possible losses. This affects their assessment of the situation and its possible outcome. A person with high risk propensity can assess the situation to have lower risk and be more inclined to risk taking. It is notable, that high risk propensity individuals do not need to perceive as much goodwill and competency from the counterpart in order to trust them. Risk propensity and trust propensity are still essentially different and do not necessarily go hand in hand. Trust propensity reflects the person's view of uncertainty in his/her relationships. Risk propensity, on the other hand, reflects how the person addresses that uncertainty. (Das and Teng, 2004.)

2.2.5. **Trust in social media networks**

In this section, previous research relating to trust in social media networks is introduced. Comparison of the main concepts of previous research is seen in Table 1.

Table 1: Trust research related to social media networks

Study	Trust concepts	Trust object	Measures
Pavlou (2003)	Trust and risk with TAM.	E-commerce	PLS-analysis
Dwyer et al. (2007)	Internet privacy concerns, trust in social networking site, and trust in other members of social networking site.	Social networking sites	ANOVA-analysis
Beaudoin (2008)	Relationship between interpersonal trust and internet use; resource motivation for internet use, internet use, perceived information overload, and interpersonal trust.	Internet	CBSEM-analysis
Fogel and Nehmad (2008)	Risk taking, trust, and privacy concerns.	Social networking sites	ANOVA-analysis
Lorenzo-Romero et al. (2011)	Trust and risk in acceptance of social networking sites, ETAM.	Social networking sites	CBSEM-analysis
McKnight et al. (2011)	Trust in technology, interpersonal trust, TAM.	Technology	Principal Components Analysis
Pan and Chiou (2011)	Online information trust.	Social media, Internet	LVSEM-analysis
Quandt (2012)	Societal communication, network trust, institutionalized trust and personal trust.	Social networking sites	Conceptual
Russo (2012)	Objects of trust; trust towards other users, the technology provider, and the information system.	Social location technologies	CBSEM-analysis

Previously there has been some research about trust in social media networks. In addition, trust in e-commerce, internet, and towards technology and information has been studied. Trust concepts and findings relating to social media networks of the previous studies can roughly be

categorized by trust object; trust towards other users (interpersonal trust), trust towards a platform provider and technology, and trust toward information. In addition, risk and the relation of trust to usage are covered.

Risk

Trust is stated more important when there is higher perceived risk. Perceived risk increases with the absence of physical contact or lack of rules of conduct. (Lorenzo-Romero et al., 2011.) In on-line transactions, two forms of uncertainty are naturally present. These are environmental uncertainty and behavioral uncertainty, which correspond to environmental and behavioral risk. (Pavlou, 2003; Lorenzo-Romero et al., 2011.) Risk in e-commerce can be technology-driven or relational, which relate to environmental and behavioral risk. Behavioral uncertainty is formed because web-retailers can behave opportunistic and take advantage of the e-commerce system. Behavioral uncertainty creates mainly economic, personal, privacy, and seller performance related risk. The unpredictable nature of the internet creates environmental uncertainty because the web retailer or the consumer cannot fully control it. Environmental uncertainty thus creates economic and privacy risk. If a consumer thinks that a web retailer is opportunistic or has not taken care of infrastructure-related risks, he or she likely will not engage in a transaction. In e-commerce trust decreases behavioral uncertainty and related risks. Generally, trust improves consumers' views about the web retailer and thus lowers risk-beliefs towards them. (Pavlou, 2003.) Thus, perceived risk decreases perceived control and affects intention to use. The nature of the internet is argued to increase uncertainty and dangers. However, perceived ease of use can alleviate perceived risks. Complex services are seen riskier and system complexity decreases intention to use and perceived ease of use. (Lorenzo-Romero et al., 2011.)

Fogel and Nehmad (2008) found that people, who had a social networking profile, had considerably higher positive attitude toward risk taking than people who did not have a social networking profile. There were also significant differences between men and women when looking at risk taking and privacy concerns. Women tend to be more risk adverts. Women also had fewer friends but were more inclined to socialize with them in social networking services.

Dwyer et al. (2007) found that even though SNS users might be worried about privacy concerns, it did not have significant effect on sharing information about themselves.

Trust towards other users

Quandt (2012) argues that trust in social media consists of accumulated individual trust. In his view, social media users do not think that other users have some hidden agenda or work for institutions. When there is no existing tie between internet acquaintances, the relationship is assessed based on a reputation. Relationships to other users affect the reputation. People who are perceived to have strong social relationships are considered more trustworthy than those with weak social relationships. (Pan and Chiou, 2011.) Other users' actions are also valued. Users trust a site more when a perceived critical mass is achieved. (Russo, 2012.) In Russo's (2012) view users assess the trustworthiness of other users of the network service based on their own feelings and the reasoning that cheating the system would not give them any net utility. In addition, the belief that the service has sufficient safeguards against potentially harmful users can create trust. It was discovered that trust in the other users of the network is based only on the belief that there are structures and policies protecting from their ill intentions.

The concept of social resource motivation associates to media use as a mean to build and maintain social contacts and resources. Motivation is described as incentive to act and it is essentially linked to uses and gratifications. (Beaudoin, 2008.) Beaudoin (2008) links internet use to interpersonal trust with symbolization and vicarious learning. Effect of these is explained as mass media influencing people's attitudes and behavior and helping them develop bonds into others.

Dwyer et al. (2007) compared the information about two sites, Facebook and MySpace to see how site's functionality and culture affect behavior. They found that in Facebook people shared more about themselves than in MySpace. However, MySpace users developed more new relationships, even though they showed less trust in others. This indicates that online

relationships can develop even though perceived trust is low. Trust was a more important factor for Facebook users in relationship building.

Trust towards technology and platform provider

Trust in the actual technology also has an important part to play in the formation of IT-related beliefs and behavior. Trust in technology differs from trust in people since people have morals and will unlike technology, which is created by humans and has certain limited capabilities. Trust in technology is thus based on characteristics of the technology. However, the reliableness of technology can create emotions, which affect trust. Technology's functionality, helpfulness and reliability are evaluated to assess trustworthy. When evaluating functionality, features are assessed to see if they provide promised functionality. Helpfulness means that there is a help function or some other way that provides sufficient help. Even though technology has no will, it can still have flaws that affect reliability. (McKnight et al., 2011.)

Institution-based trust refers to trusting someone because the surrounding situation is believed to be trustworthy. Institutional trust is related to generalized trust. In technology trust, situational normality and structural assurances lead to institution-based trust. Situational normality means that when a situation is perceived normal, trust can be extended to new things in that situation. Structural assurances are the supporting infrastructures that make sure the use of technology will be successful. These can be physical, contractual, or legal. (McKnight et al., 2011.)

Russo (2012) presents three main causes for users to develop and maintain trust in social location technologies. These are usability, similarity to technologies the user is experienced with, and the recommendations of people who are trustworthy. Easy to learn, efficient, and error free technology can be considered as usable. If the user perceives the technology operating as expected and normally, it can be thought as comparable to another. Positive recommendations of trusted people can create trust in the technology artifact. In the same way trust can form if the user perceives that a critical mass of trustworthy people use the technology. In a study about

technology trust antecedents (Kivijärvi et al., 2013) an important finding was that, the perception of a user's skills increased the person's level of technology trust.

There is also clearly a difference between trusting a person and trusting an organization. Organizational trust is described being trust in an organization's "personality". (Blomqvist, 1997.) Pavlou (2003) determined two significant antecedents for consumer's trust towards a web retailer. These were web retailer reputation and satisfaction with previous online transaction.

Research by Dwyer et al. (2007) showed that Facebook users had more trust towards other users than users on MySpace. Fogel and Nehmad (2008) found that Facebook as a service provider also had higher trust ratings than MySpace. They theorized that Facebook enjoyed higher trust than MySpace because users might believe that their contract with Facebook had not been breached, but with MySpace it had been. One possible reason offered was that MySpace had more open policy concerning user's information and Facebook had stricter privacy policy.

Quandt (2012) points out that even though technology providers are not thought to a have hidden agenda, they can have effect on the users, for example by influencing accessibility in the network. They can filter information or push recommendations. The commercialization of social networks has also been a worry. Collaboration between social network providers and marketers raise doubt about the SNS providers' neutrality.

Trust towards information

According to Quandt (2012) some people believe social networks offer more authentic information than public media. This is because social media offers information exchange between seemingly equal parties (Quandt, 2012). One reason for using social networking services is getting access to information. People for example search for product recommendations from SNS. Contradictory information makes it hard to decide what to trust. (Pan and Chiou, 2011.) It is argued that on discussion boards or groups the numbers make sure of information authenticity since the information would in a manner self-correct itself (Quandt,

2012). However, it has been studied that usually in these groups there are only a few people contributing compared to the amount that browse the content, thus the information might be highly skewed (Pan and Chiou, 2011).

Source trustworthiness is the main reason that is used to assess information trust. When assessing web information, the reputation of the information source is used to assess source trustworthiness. (Castelfranchi, 2002.) Tie strength has large effect on information trust. Information posted in social media is perceived more credible the closer the relationship is with the information source. Even when a person does not know the person they are discussing with online, the perceived social relationship is used to judge the information the other person posts. When talking about a product, negative information is considered more credible than positive information. (Pan and Chiou, 2011.)

Information overload occurs when processing all communication and information inputs becomes too much for a person and results in ineffectiveness (Beaudoin, 2008). Beaudoin (2008) found that perceived information overload affected negatively to interpersonal trust. Limitations in cognitive processing, low quality information and irrelevant information contributes to information overload (Castelfranchi, 2002).

Effect of trust to usage

In Pavlou's (2003) view especially in an online environment, trust is a determinant of perceived usefulness in the TAM model. This is because the usefulness consumers will gain depends on the people behind the web site. Trust can also contribute to perceived ease of use as it can decrease the need for understanding and controlling the situation. Pavlou's (2003) research found that trust was positively associated with intention to transact. As TAM suggests, perceived usefulness and ease of use were significant predictors of intention to transact. Trust had significant relation to perceived ease of use, usefulness, and risk. Reputation and satisfaction in past experiences were found to be significant antecedents of trust. It was noted that the variables only influenced transaction intention and through it indirectly to actual behavior.

Lorenzo-Romero et al. (2011) studied factors affecting the acceptance of social networking sites using the ETAM model. ETAM refers to the extended technology acceptance model, where perceived risk and trust are added as dimensions. Based on their study, Lorenzo-Romero et al. (2011) found that trust and perceived risk influence acceptance of social networking sites. Trust has a positive and direct influence on the attitude towards SNS and it influences positively perceived usefulness and ease of use. This is because when users trust the site and other users, they spend less time and effort reading privacy policies and thus consider the site easier to use and more useful. Perceived risk affects negatively on the intention to use SNS, but ease of use can lower perceived risk. However, perceived risk is not a determinant of usefulness.

Russo (2012) describes that there are three objects of trust, which lead to intentions to use social location technologies. These are trust towards other users, the technology provider, and the information system. Russo (2012) found that trust in the technology and to other users had positive impact on intention to use the social location technology. Trusting the technology was only dependent on its perceived usability. Beaudoin (2008) found that internet use was positively associated with interpersonal trust. His most important finding was that the effects of social resource motivation for internet use in interpersonal trust were mediated by internet use and perceived information overload.

2.3. Antecedents of trust in social networking services

Drawing on the review of the literature the framework in Figure 2 on the next page was formed. It describes the theoretical framework from SNS trust antecedents to intention to use and perceived benefits. Combined with TAM it explains how trust may lead to usage. Trust is seen as one factor affecting perceived ease of use and usefulness. This study only concentrates on the antecedents, so the framework is not the final research model. It is presented in order to better understand the bigger picture. In this section, the situational characters that lead to trust towards social networking services are defined.

The antecedents are categorized based on their underlying source as social, technological, and information factors. Perceived risk is dealt separately, even though risk could be involved in all the factors. Social capital is an output of using SNS, but it also affects trust. Social capital is introduced as one of the antecedents.
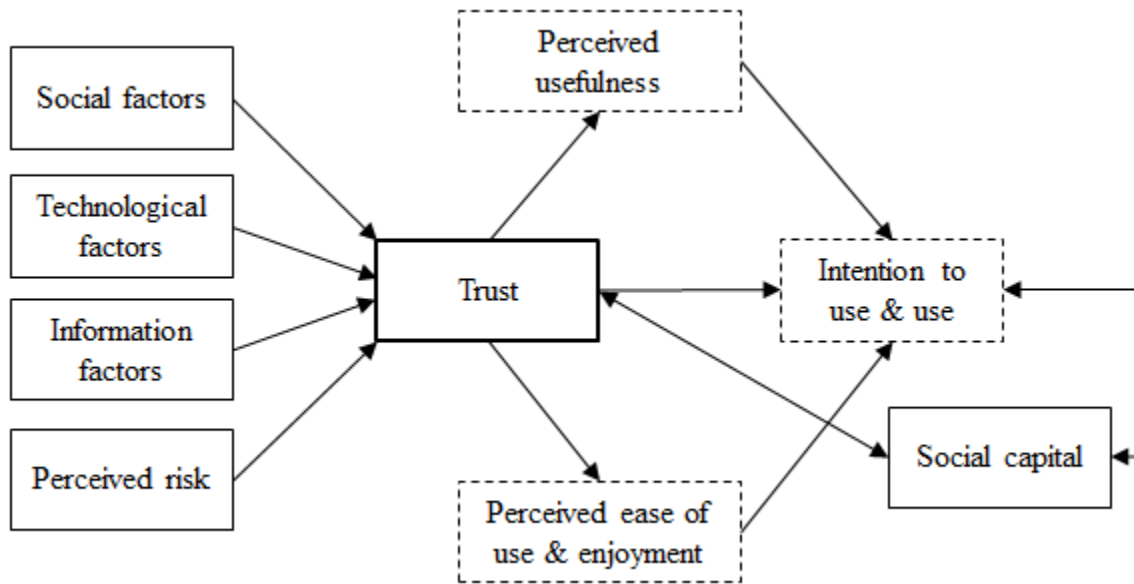
Figure 2: Theoretical framework.

Based on the previous researches it can be concluded that trust in SNS can be cognition-based and affect-based. Those who feel cognition-based trust probably believe that most SNS users are reliable and the service is capable and proficient at helping people to stay in touch. Affect-based trust in SNS could be seen so that users like using the service and would be more willing to try new SNS.

2.3.1. Social factors

Based on the literary review social factors behind trust in social networking services are *propensity to trust*, *perceived trustworthiness*, and *perceived critical mass*. Propensity to trust is an individual's personal trait. Perceived trustworthiness means the factors a person uses to assess

the trustworthiness of others. Perceived critical mass relates to the social trust generating from enough people using the service.

Das and Tang (2004) stated that personality characteristics are directly linked to propensity to trust and that people could be categorized to have high or low trust propensity. Individual's trust propensity has been defined as an antecedent of trust in general, thus it can be assumed that propensity to trust is also an antecedent of trust in social networking services. People with high propensity to trust are generally more inclined to trust than not to trust (Kivijärvi et al., 2013). They may feel they are more likely to trust new acquaintances until there is a reason not to trust (Russo, 2012).

Other users play a critical part in forming trust in social networking services. Trust towards other people in social networking services is assessed by their perceived trustworthiness. When there is no current relationship between the people, their reputation is used to assess trustworthiness (Quandt, 2012; Russo, 2012). This initial trust is weaker than knowledge-based or experiential trust, which are based on past behavior (McKnight et al., 2011). Reliability and responsibility are used to assess interpersonal trust in close relationships (McAllister, 1995). In addition, perceived good will and value similarity are important when assessing trustworthiness (Das and Tang, 2004; Siegrist et al., 2000).

Valenzuela et al. (2009) found that people who perceived higher social trust were more likely to use Facebook. Social trust is formed when a person who has had good experience with a few people of a community tends to trust the whole community as well (Andersson, 2013). Social trust increases with multiple informal social interactions. Social trust has been found important in situations, where people lack sufficient knowledge, for example related to technology. (Siegrist et al., 2000.) Russo (2012) hypothesized that perceived critical mass forms trust because other users' actions are valued. Russo (2012) also stated that recommendations of people who are trustworthy increase a person trust towards social location technology. Thus, it is reasonable to assume that close friends or trusted people using a new social networking service would most likely generate social trust towards that service. The more friends use that service, the higher the

social trust towards it would be. That is why certain perceived critical mass exists for social trust in social networking services.

2.3.2. **Technological factors**

Technological antecedents affecting trust in social networking services are *trust towards platform* and *structural assurances*. Trust towards platform relates to the perceived technical properties of the platform and to the platform providers motivation. Structural assurances relate to the need for keeping users' private information safe.

Trust in the technical aspects of the social networking platform is assessed through its features. Situational normality is an important antecedent in technology related institution-based trust. The social networking service should be easy to use and work as expected in order to be considered trustworthy. (McKnight et al., 2011; Russo, 2012.) System reliableness is also significant indicator of trustworthiness (McKnight et al., 2011.) The agenda of the platform provider may cause concerns (Quandt, 2012). Users feel they have a contract with the platform provider, which should not be breached (Dwyer et al., 2007). User's own technical skills may also increase perceived trust towards technology (Kivijärvi et al., 2013). Experienced users may have more precise expectations of the functionalities and a higher perception of their own technical skills.

Structural assurances lead to institution-based trust (McKnight et al., 2011). Russo (2012) stated that structural assurances are a significant factor behind users trust in social location technologies. In social networking services, structural assurances relate to information disclosure. Account and privacy settings are designed to keep users information safe. They are both physical and contractual (McKnight et al., 2011). The contractual side is with the platform provider, which ensures that users' information is safe even though updates or changes would be made.

2.3.3. **Information factors**

Information is one of the main perceived benefits in social networking services. Information can be searched actively or just read from a personal "feed". It can contain information for example about other users, events, or products. Thus, information factors can affect trust and could be considered antecedents of trust in social networking services. Based on the literary review the information factors affecting trust in social networking services are *access to right information* and *information overload*.

Access to right information includes information accessibility and information reliability (Quandt, 2012; Pan and Chiou, 2011). Unreliable information could affect user's perception of trust towards the service. Similarly if there is reliable information, but it is difficult to access, it could diminish user's trust towards the service. Information should be relevant to the user, correct, and easy to access in order to be accessible and reliable.

Beaudoin (2008) found that perceived information overload reduced trust associated with internet use. Large volumes of irrelevant information contribute to information overload (Castelfranchi, 2002). Since most information in social media is generated by users, it is continually updating and can be filled with errors or uninteresting posts. Users might think that there is too much information available in social networking services to recognize what is relevant to them. Information overload can also prevent access to right information.

2.3.4. **Perceived risk**

According to Das and Teng (2004) risk could be seen as an antecedent of trust. Environmental and behavioral risk has been identified in social networking services (Lorenzo-Romero et al., 2011). These correspond with relational and performance risk (Das and Teng, 2004). Relational risk in social networking services could be seen as someone trying to take advantage of the user (Lorenzo-Romero et al., 2011). Performance risk means that something can go wrong when the user for example shares information in social networking services (Russo, 2012). Since

information privacy is important, unwanted information disclosure would represent substantial threat. System complexity increases perceived risk (Lorenzo-Romero et al., 2011). This is because it may cause performance risk. Thus, perceived risk could be seen in the user's behavior to gain enough information about the capabilities of the service to protect their information. A person who perceives high risk could also be very careful of what information they share on social networking services.

A person's risk propensity is a personal trait (Das and Teng, 2004). Risk propensity could affect perceived risk, since people who have higher risk propensity focus more on the possible rewards and might not perceive the risk as high that people with lower risk propensity. Perceived risk should have negative effect to trust towards social networking services.

2.3.5. **Social capital**

Social capital has been found to have positive effect on trust in social networking services, thus its components should be considered as antecedents of trust in social networking services. Social capital is considered separate from the social factors because it is also the outcome of using social networking services. Social capital has been measured through social networks, trust, civic engagement, and life satisfaction (Valenzuela et al., 2009). Since social trust is already taken into account in perceived critical mass, it will not be discussed again. Thus, social capital related antecedents of trust in social networking services are *social networks*, *civic engagement*, and *life satisfaction*.

Large and diverse contact networks increase social capital. Interactions with the network contribute to social capital accumulation. (Valenzuela et al., 2009.) People have larger motivation to communicate with strong ties in the network (Haythornthwaite, 2002). However, large amount of weak ties may be a significant source of benefits in the network (Kane et al., 2014). Online communications also support weak ties since social risk can be perceived lower in online environment (Haythornthwaite, 2002). A person who has a large network of people in their social networking services, to whom they actively keep in touch may be seen to have a

social network that affects positively to trust in social networking services. Willingness to form many weak ties influence network size and diversity, thus it should also affect positively to trust in social networking services.

Civic engagement contributes to trust formation through shared activities (Valenzuela et al., 2009). Social networking services offer a way for civic participation and encourage it through raising awareness. Previous interest increases probability for engaging in civic activities. (Warren et al., 2015.) People who participate in activities that help the community and take interest in social issues, for example politics, have high civic engagement.

Life satisfaction connected to social capital is related to the emotional support received from a person's network. Emotional support can also lead to trust. A person's welfare is increased due to new opportunities and access to information. (Valenzuela et al., 2009.) A person who perceives high life satisfaction may feel higher trust in social networking services. People who are generally happy with their life and feel the future looks bright for them have high life satisfaction.

3. RESEARCH METHOD

The literary review aimed to explore and describe what the antecedents of trust towards social networking services are. The empirical part's purpose is to test how well these antecedents explain the trust towards social networking services. In other words, the empirical research is explanatory by nature. The resulting model could be used to predict trust towards social networking services.

3.1. Selection of research method

In this research, the positivist paradigm is applied. This means that it is assumed that the social reality is objective and separate of the people involved. Knowledge of this reality is attained by measuring the identified concepts of reality and using deductive reasoning. In the empirical part, only primary data gathered by the researcher are used. Based on the objectives of the study, a quantitative method is used. (Blaikie, 2003.)

3.1.1. Quantitative method

Since the quantitative method process numerical data, the benefit is argued to be the possibility of evaluating effects on a larger scale and more objectively testing hypothesis. On the other hand, there is always some interpretation involved in the observations that might affect the validity. Translating words into numbers must be done carefully. Usually quantitative data are thought to consist of variables, which arise from research questions or hypotheses. (Blaikie, 2003.)

First-generation quantitative methods, regression, factor and cluster analysis, are central statistical instruments. Nevertheless, they reach their limit when it comes to more complex models, where is mediating or moderating variables. In addition, not all variables can be thought as observable or be measured without error, as these methods presume. Structural Equation Modelling (SEM) was designed to overcome these limitations. (Haenlein and Kaplan, 2004.) As

a second-generation multivariate analysis technique, SEM combines the features of the first generation techniques, such as linear regression and principal component analysis (Hair et al., 2012a). With SEM, analyzing relationships between multiple dependent and independent constructs is possible. SEM also allows the construction of unobservable variables and the modelling of measurement error. (Haenlein and Kaplan, 2004.)

There are two main methods of SEM, covariance-based SEM (also referred as CBSEM) and variance-based (or components-based) SEM. Variance-based SEM is usually referred to PLS-SEM since partial least squares is the often used technique. (Haenlein and Kaplan, 2004.) Reinartz et al. (2009) compared the two SEM methods and found that when looking at parameter consistency and accuracy, CBCEM easily outperforms PLS if a threshold of 250 observations is exceeded. However, they would prefer PLS analysis if the emphasis is on theory development and prediction. This is because PLS always has larger statistical power than CBSEM, since even 100 observations can be enough with a good measurement model to get acceptable levels of statistical power. Haenlein and Kaplan (2004) also admit that generally the consistency of estimators cannot be guaranteed with PLS. The strength of PLS shows when the number of indicators per latent variable gets very high and CBSEM reaches its limit.

Of these two SEM methods, PLS supports better the research model and objectives of this study. In addition, the challenge of gathering enough respondents for CBSEM is recognized. Thus PLS modeling technique is used in this research. Next, a brief overview of this technique is presented.

3.1.2. **Overview of Partial Least Squares**

As stated in the previous section, partial least squares (PLS) analysis is a technique of variance-based SEM. As SEM is usually used to test theoretical assumptions with empirical data, it is important to understand the components of SEM. A theory may consist of concepts that are abstract and unobservable, subjectively observable, or unobservable but derived from empirical concepts. These concepts can be linked by nonobservational hypotheses, theoretical definitions, or correspondence rules. A research model that represents a theory can be constructed using

these components. When constructing a model, unobservable concepts are converted into latent variables, which are linked by hypotheses to indicators derived from empirical concepts. A path diagram can be constructed to show how the elements are linked. (Haenlein and Kaplan, 2004.)

With SEM, the independent and dependent variables are no longer differentiated, but difference between exogenous and endogenous latent variables is made. Exogenous latent variables are not explained by the hypothesized model and are thus always independent. The relationships in the model explain the endogenous latent variables. The relationships between constructs can be described with three equations. Parameters of the equations are described in Table 2. The first equation describes the relationship between the exogenous variables' indicators (x), their measurement error (δ) and latent exogenous variables (ξ). Endogenous variables' indicators (y), their measurement error (ϵ), and latent endogenous variables (η) are linked in the second equation. The third equation describes the linkage between latent exogenous (ξ) and endogenous (η) variables. Random disturbance term ζ reflects the random disturbance, meaning that the independent variables do not totally explain the endogenous variables. There are always as many equations as relationships between constructs, but with matrix algebra, the equations can be written as follows:

1. $\mathbf{x} = \mathbf{\Lambda_x}\, \mathbf{\xi} + \mathbf{\delta}$
2. $\mathbf{y} = \mathbf{\Lambda_y}\, \mathbf{\eta} + \mathbf{\epsilon}$
3. $\mathbf{\eta} = \mathbf{B}\, \mathbf{\eta} + \mathbf{\Gamma}\, \mathbf{\chi} + \mathbf{\zeta}$

(Haenlein and Kaplan, 2004.)

The first two sets of equations are called measurement equations, since they represent the correspondence rules. The third set is referred as theoretical equations, because it relates to the hypotheses and theoretical definitions. The theoretical equations are also called a *structural model* and the measurement equations referred as a *measurement model*. When these are combined, a *structural equation model* is reached. (Haenlein and Kaplan, 2004.)

Table 2: PLS Parameters and descriptions (Haenlein and Kaplan, 2004).

Parameter	Description
η	latent endogenous variable
ξ	latent exogenous variable
ζ	random disturbance term
γ	path coefficient
φ	noncausal relationship between two latent exogenous variables
y_i	indicators of endogenous variables
ε_i	measurement errors for indicators of endogenous variable
λ_{yi}	loadings of indicators of endogenous variable
x_i	indicators of endogenous variable
δ_i	measurement errors for indicators of exogenous variable
λ_{xi}	loadings of indicators of exogenous variable

Unobservable variables need to be measured using indicators. There are two types of indicators, reflective and formative indicators (Figure 3). Reflective indicators are dependent on the latent variable. They are usually highly positively correlated since they depend on the same variable. Formative indicators on the other hand cause the latent variable. They can either be positively or negatively correlated or have no correlation. This means that if one indicator changes, it will not necessarily have any effect on the other indicators of that variable. (Haenlein and Kaplan, 2004.)

Mathematically reflective indicators can be presented through their latent variable:

$$y_1 = \lambda_{y1}\, \eta + \varepsilon_1, \;\; y_2 = \lambda_{y2}\, \eta + \varepsilon_2, \text{ etc.}$$

With formative indicators, the direction of influence is opposite:

$$\eta = \gamma_{x1}\, x_1 + \gamma_{x2}\, x_2 + \gamma_{x3}\, x_3 + \zeta.$$

(Haenlein and Kaplan, 2004.)
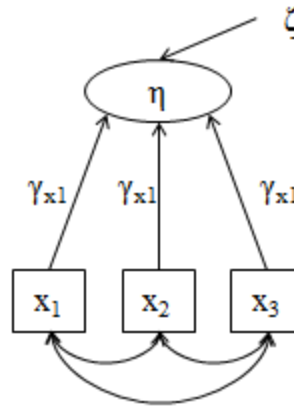
Figure 3: Reflective and formative indicators (Haenlein and Kaplan, 2004).

SEM analysis has five distinct steps (Figure 4). First, the model is conceptualized based on theory and the hypotheses are constructed. Parameters are then identified for the hypothesized constructs. The data model fit is assessed based on the collected data and modifications are potentially made. Fit is assessed again until a satisfactory model is achieved. Finally, results are achieved and the hypotheses can be validated or dismissed. (Osborne, 2008.)
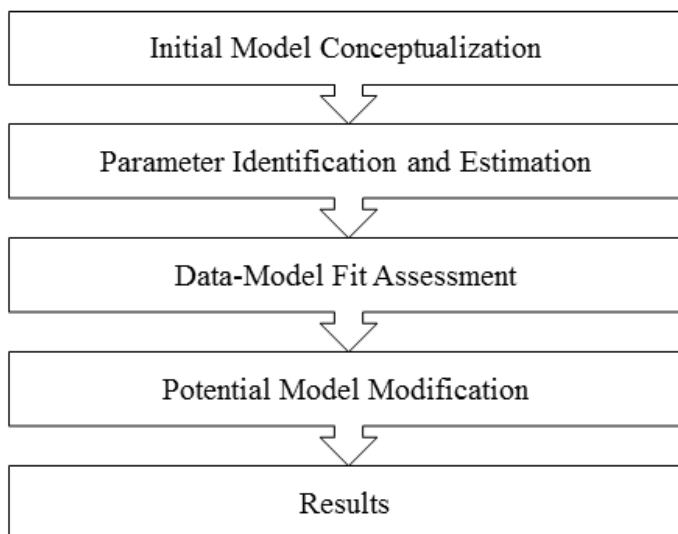
Figure 4: SEM model building steps (Osborne, 2008).

According to Haenlein and Kaplan (2004) after the research model and parameters have been constructed, PLS has three basic steps for fit assessment until getting the results. First step is to estimate the weight relations that link the indicators to their variables. Then the weight relations and the indicators' weighted average are used to calculate case values for each variable. Final parameters for the structural relations are determined by using the case values in a set of regression equations.

3.2. Research model and hypotheses
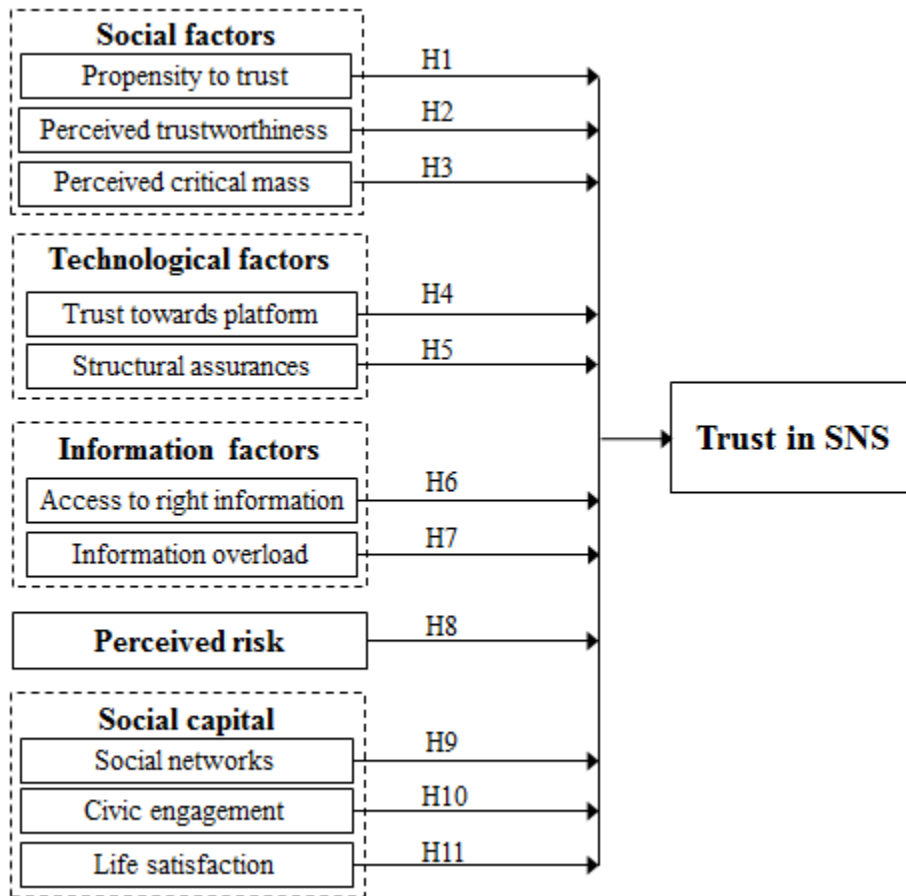
Figure 5: Research model.

Based on the antecedents introduced in Section 2.3, the research model in Figure 5 and following hypotheses were formed. Social factors consist of three constructs, propensity to trust, perceived trustworthiness and perceived critical mass. Technological factors were divided into trust towards platform and structural assurances. Access to right information and information overload constitute to information factors. Social capital is measured based on social networks, civic engagement, and life satisfaction. Perceived risk is also taken into account. Perceiver risk and information overload is hypothesized to have negative effect on trust in social networking services. The other antecedents are expected to influence positively.

Hypothesis:

H1: Propensity to trust influences positively an individual's level of trust in SNS.

H2: Perceived trustworthiness influences positively an individual's level of trust in SNS.

H3: Perceived critical mass influences positively an individual's level of trust in SNS.

H4: Trust towards platform influences positively an individual's level of trust in SNS.

H5: Structural assurances influence positively an individual's level of trust in SNS.

H6: Access to right information influences positively an individual's level of trust in SNS.

H7: Information overload influences negatively an individual's level of trust in SNS.

H8: Perceived risk influences negatively an individual's level of trust in SNS.

H9: Social networks influence positively an individual's level of trust in SNS.

H10: Civic engagement influences positively an individual's level of trust in SNS.

H11: Life satisfaction influences positively an individual's level of trust in SNS.

The statements (Appendix B) were designed based on the antecedents identified in Section 2.3 to depict the hypothesized constructs. Earlier research questions of Russo (2012) and Kivijärvi et al. (2013) were used as the basis of question design. Some of the questions were directly referred to from earlier research and others deduced based on theory. In Appendix B, "d" is used to denote those statements that were deduced by the researcher based on the source theory. Other statements are direct referrals to earlier research questions. All questions were derived from the theory relating to them at the same time trying to set them into the context of social networking services.

3.3. Data collection

The data were collected via self-administered online survey. This is a convenient way to gather data, since respondents can choose themselves the appropriate time for answering. Since the researcher will not directly affect the respondents, the reliability and validity of the study is not compromised by the data collection method. The survey tool used for this research was Webropol.

The survey questions were in the form of statements because they were designed to be answered with a Likert scale. Likert scale is a continuum of agreement ranging from "strongly disagree" to "strongly agree" with different number of levels in between. Dawes (2008) compared, five, seven and ten-point Likert scales. He found that five and seven-point scales gave the same results when scaled, but ten-point scale tends to give relatively lower values. The seven-point scale is argued to be slightly better that the five-point scale, since it gives the respondents more option, but not too many to overwhelm them. (Intelligent measurement 9.5.2015.)

The following seven-point Likert scale was selected for this research:
1. Strongly disagree
2. Disagree
3. Disagree somewhat
4. Neither agree nor disagree
5. Agree somewhat
6. Agree
7. Strongly agree

Even though the Likert categories might not be evenly spaced along the agreement continuum, in this research it is assumed that they are. Thus the measures are interval-level with discrete categories. (Blaikie, 2003.)

The survey consisted of two background questions and 40 research questions. The two background questions were meant to give the respondents a better idea of what the survey questions are about and to get a general idea of the respondents' usage of social networking services. No demographic questions were asked. The usage measures were thought to give more insight than questions for example from gender or age in this context.

The survey consisted of five pages. On the first page, there was general information about the survey and the two background questions (Appendix A). The survey questions were divided into four pages, 10 to each page to avoid too long list of questions that could be unappealing to respondents. The survey questions order was mixed to avoid survey bias. Easier questions were put first and on top of each page to keep respondents interest on until the end of the survey. A progress bar was shown at the bottom of each page also to help keep interest on.

The survey was made first in English and then also in Finnish. The Finnish copy was thought to be important to encourage Finnish respondents to answer and to help them better understand the questions. The English survey was tested on a few people and based on feedback minor changes were made. Testers were asked to time the test and answering took approximately 8,5 minutes. The estimated duration was told to respondents when they were asked to answer. After the English survey was tested, the Finnish copy was made. They were designed to be exact copies. The translations were reviewed twice and checked by a second person to make sure that the meaning of the statements was the same in both languages (Appendix B; Appendix C). After testing, both surveys were open during 23.5.2015-21.6.2015.

In total, there were 105 responses, 80 in Finnish and 25 in English. One respondent's responses were rejected because of not answering ten last questions. Generally, all questions were answered. Respondents were gathered through the researcher's social network. Around 80 % of the responses were gathered through Facebook and 20 % through email. The survey link was sent with a personal message to each respondent. The response rate is estimated to be around 70-80 %. This is estimation, since some friends were asked to share the link to their friends also, so the total number of possible respondents cannot be confirmed. Compared with other surveys, the

response rate is high. This is most likely due to the respondents' motivation to help their friend. There was no reward offered for the responses.

3.4. Data analysis

A general data check and analysis was done with QlikView software. Basic statistics were compared to make sure that the English and Finnish versions were coherent, which they were. After the comparison, the two data sets were combined for the analysis. Background questions were analyzed also with QlikView. Background question analysis included only basic statistics.

The software used for the PLS analysis is SmartPLS. The software is free to use for 30 days. It was first published in 2005 and has gained popularity since (Wong, 2013). The version used in this study is 3.2.1, released in May 6, 2015. SmartPLS has many good features from a graphical user interface to PLSc algorithm and discriminant validity assessment outcomes.

The PLS analysis was done according to the SEM steps. First, the hypothesized model was tested. Based on the results, corrections were made iteratively until a satisfactory model was achieved for hypotheses testing. The analysis process and results are described in the next chapter.

4. RESULTS AND ANALYSIS

4.1. Descriptive statistics

From the two background questions, a general view on the respondents' behavior in social networking services is obtained. It is important to get a better understanding about the usage because it relates to trust in SNS through user's experiences.
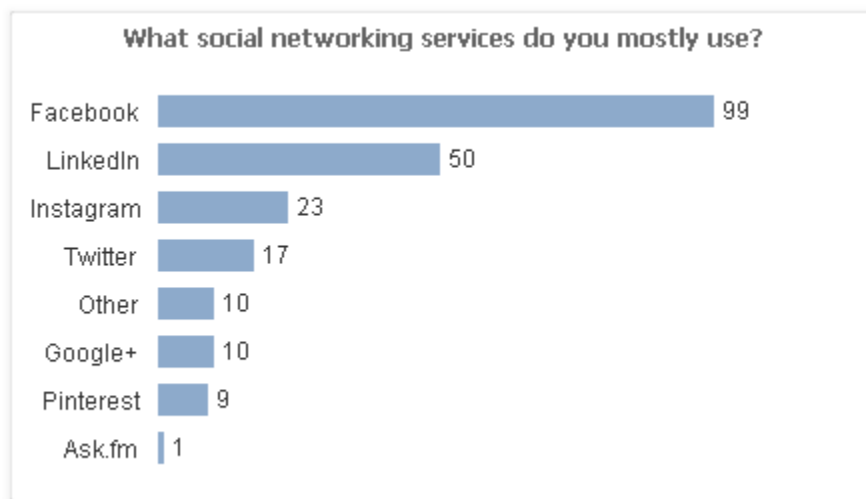
Figure 6: SNS used by respondents.

The choices for question one were selected from different top 10 lists of social media usage (Social Media Today 9.5.2015; eBizMBA 9.5.2015). Twitter usage ranked lower than in the top 10 lists (Figure 6). There were no Tumblr or MySpace users in the respondents. However, ten respondents reported using some other social networking service than in the list. Even though most responses were gathered through Facebook, there were five respondents who did not use Facebook. A significant number used LinkedIn as well. Other used services were also notable. Derived from question one, the number of used social networking services is interesting also (Figure 7). Most respondents used 1-3 social networking services listed in the questionnaire. Roughly, 1/3 of the respondents used only one social networking service and 2/3 used more than one.
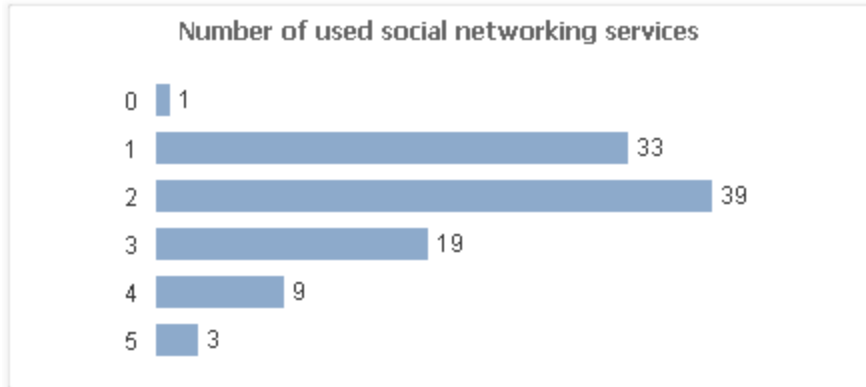
Figure 7: Number of used SNS.

Most respondents reported using social networking services several times a day or daily (Figure 8). Less than ten respondents used less often. Only one person reported never using social networking services. From the two background questions, it is seen that the respondents are active SNS users, in terms of number of services used and usage frequency. Facebook was prominently represented, which is no surprise since it was used for data collection.
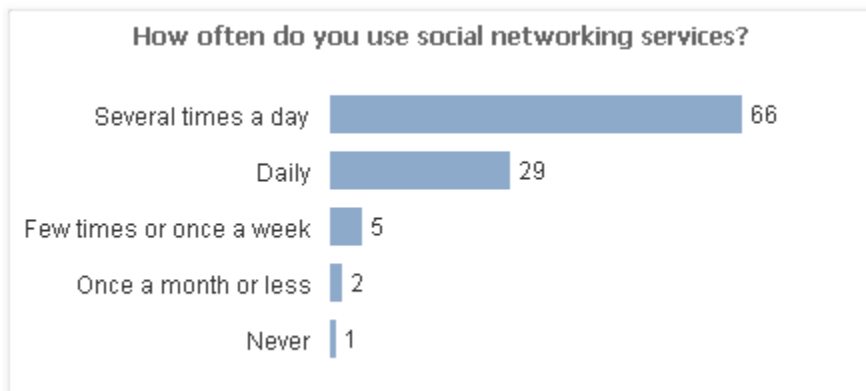
Figure 8: SNS usage frequency of respondents.

The basic statistics of the research questions are presented in Appendix D. The average, standard deviation, skewness and kurtosis were checked separately from the English and Finnish language responses and combined. Hair et al. (2012b) state that PLS-SEM is robust when a data set is highly skewed. Skewness and kurtosis should be reported from data used for PLS analysis.

4.2. PLS model development

First step in the PLS model development was to construct the hypothesized research model with SmartPLS and run the analysis. When running PLS analysis, 300 iterations should be used (Wong, 2013). The hypothesized full model included 40 reflective indicators, 11 exogenous latent variables and one endogenous latent variable (Appendix B). In the following results, the exogenous variables are denoted with "V" companied by order number and the endogenous latent variable is presented by its name as "Trust in SNS". The results of the hypothesized model looked promising, but had some discrepancies to be adjusted. The coefficient of determination R^2 was 0,747, which means that the latent variables in the full model explained 74,7% of the variance of Trust in SNS. Level of 0,75 is considered as substantial (Hair et al., 2011).

Reliability and validity are used to evaluate reflective measurement models. Composite reliability is the preferred way to test internal consistency reliability in PLS. Previously Cronbach's alpha was used, but it has been noticed to give rather conservative values in PLS analysis. (Wong, 2013.) Cronbach's alpha assumes that all indicators are equally reliable, and thus it is not suitable for PLS, which uses indicator reliability to prioritize them during model estimation. Composite reliability does not make the same assumption. In exploratory research, the values of 0,60 to 0,70 of composite reliability are acceptable, but in more advanced research values of 0,70 to 0,90 should be reached. (Hair et al., 2011.) The composite reliability for the hypothesized model showed satisfactory values over 0,70 to all but one construct, perceived risk (Table 3). Cronbach's alpha values should similarly be over 0,70. However, since several researchers (Wong, 2013; Hair et al., 2012b; Henseler et al., 2009) have advised against using Cronbach's alpha for PLS, in this research the Cronbach's alpha values will not influence model development. The values will only be reported. Four constructs (V1, V2, V5 and V6) in the hypothesized model had Cronbach's alpha values above 0,70 (Table 3). The other constructs had poorer Cronbach's alpha values, but none were below 0,50, which would be unacceptable.

Table 3: Full PLS model AVE, Composite reliability and Cronbach's Alpha.

	AVE (≥ 0,5)	Composite Reliability (≥ 0,7)	Cronbach's Alpha (≥ 0,7)
V1	0,738	0,894	0,825
V2	0,640	0,842	0,729
V3	0,544	0,779	0,593
V4	0,395	0,758	0,627
V5	0,798	0,922	0,876
V6	0,550	0,824	0,726
V7	0,680	0,809	0,536
V8	0,285	0,552	0,674
V9	0,560	0,775	0,590
V10	0,685	0,813	0,541
V11	0,703	0,826	0,578
Trust in SNS	0,430	0,789	0,667

Construct validity is measured by using convergent validity and discriminant validity. Average variance extracted (AVE) is used to measure convergent validity. An AVE value should be 0,50 or higher to indicate a satisfactory level of convergent validity. This means that more than half of indicators' variance is explained by their latent variable. (Hair et al., 2011.) In the hypothesized model three constructs (V4: trust towards platform, V8: perceived risk, and Trust in SNS) had AVE values below 0,5 (Table 3).

Discriminant validity can be assessed by two ways. The Fornell–Larcker criterion suggests that latent variables have more variance with its indicators than with other latent variables. This means that the AVE of a latent variable needs to be higher than the variables squared correlation with other latent variables. Discriminant validity can also be assessed by comparing the cross loadings of the indicators and variables. Indicators loading should be the highest in the assigned latent variable. (Hair et al., 2011.) Cross loadings for the hypothesized model looked fairly good (Table 4).

To determine where the inadequacies in latent constructs come from, the indicators need a closer look. Indicator reliability is assessed by looking at its loadings. An indicator's loading to its

latent construct should be 0,70 or higher. In exploratory research level of 0,40 is acceptable. (Hulland, 1999; Hair et al., 2011) A model can be adjusted by removing indicators that have low loadings. However, the effect on content validity should be recognized and assessed. Removal of indicators is preferred if composite reliability is increased over its threshold. (Hair et al., 2011.) The hypothesized model's indicator loadings are highlighted in Table 4 on the next page. Even though overall loadings look good, there are some loadings below 0,40 and some between 0,40 and 0,70. Indicators X27 and X28 stand out since their loadings are close to zero. This shows they do not represent the latent construct perceived risk (V8). This is not surprising since they probably represent risk related behavior more than perceived risk. These two indicators were also the reason why the composite reliability and AVE value of perceived risk were so low. The indicators were deleted from the model.

To improve the validity and reliability of the model, the indicators and their relationship with the hypothesized variables were re-evaluated. There were clearly issues with some indicators and it showed in their loadings in the hypothesized model (Table 4). These indicators were deleted from the model. Several iterations of models were made before resulting in the final model. Indicators X10, X14, X18, X20, X25, X27, X28, X30, X38 and X39 were deleted from the final adjusted model. Dropping of indicators was prepared for when designing them by ensuring there were several indicators per latent construct. In the final model, each latent construct had at least two indicators describing them.

According to Hair et al. (2011) content validity may become an issue when deleting indicators. It is justified to keep weaker indicators if their removal would affect validity. However, indicators loading under 0,40 should always be eliminated. Because of the concerns about content validity indicators X9 and Y40 were kept in the final model, even though their loadings remained below 0,70.

Table 4: Full PLS model cross loadings.

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	Trust in SNS
X1	0,897	0,689	0,242	0,290	0,305	0,287	0,212	-0,233	0,142	0,233	0,466	0,459
X2	0,895	0,618	0,232	0,211	0,154	0,245	0,200	-0,285	0,154	0,263	0,368	0,403
X3	0,780	0,562	0,203	0,246	0,264	0,145	0,234	-0,271	0,122	0,090	0,227	0,277
X4	0,526	0,845	0,473	0,476	0,416	0,467	0,376	-0,203	0,355	0,312	0,362	0,517
X5	0,684	0,804	0,349	0,324	0,241	0,230	0,231	-0,186	0,136	0,280	0,385	0,371
X6	0,581	0,749	0,427	0,418	0,273	0,245	0,293	-0,276	0,176	0,306	0,349	0,306
X7	0,158	0,375	0,777	0,427	0,203	0,316	0,263	-0,067	0,417	0,255	0,328	0,486
X8	0,338	0,533	0,804	0,529	0,415	0,447	0,365	-0,190	0,318	0,194	0,234	0,503
X9	0,012	0,171	0,618	0,356	0,296	0,326	0,201	0,078	0,239	0,073	-0,111	0,270
X10	0,213	0,323	0,336	0,512	0,644	0,354	0,418	-0,291	0,285	0,196	0,045	0,287
X11	0,251	0,460	0,539	0,712	0,405	0,346	0,257	-0,178	0,272	0,189	0,395	0,407
X12	0,160	0,215	0,236	0,667	0,153	0,268	0,217	-0,082	0,365	0,353	0,177	0,417
X13	0,180	0,387	0,466	0,762	0,361	0,319	0,357	-0,073	0,385	0,359	0,157	0,438
X14	0,059	0,196	0,382	0,425	0,134	0,168	0,136	0,068	0,044	0,160	0,145	0,088
X15	0,221	0,238	0,255	0,392	0,854	0,290	0,443	-0,368	0,182	-0,018	-0,164	0,192
X16	0,323	0,459	0,416	0,581	0,905	0,396	0,500	-0,268	0,298	0,092	0,135	0,308
X17	0,192	0,340	0,388	0,438	0,919	0,338	0,418	-0,391	0,237	0,068	-0,031	0,294
X18	0,351	0,356	0,253	0,221	0,407	0,553	0,319	-0,215	0,132	0,009	0,029	0,194
X19	0,164	0,231	0,429	0,408	0,228	0,876	0,272	-0,003	0,407	0,203	0,167	0,471
X20	0,138	0,322	0,397	0,278	0,118	0,591	0,201	0,105	0,209	0,146	0,152	0,237
X21	0,247	0,410	0,393	0,429	0,426	0,883	0,326	-0,037	0,464	0,193	0,138	0,508
X22	0,185	0,298	0,369	0,436	0,503	0,343	0,870	-0,210	0,353	0,264	0,050	0,389
X23	0,227	0,344	0,256	0,284	0,317	0,248	0,777	-0,351	0,248	0,153	0,028	0,305
X24	-0,334	-0,198	0,006	0,014	-0,212	0,002	-0,136	0,673	-0,002	0,227	-0,041	-0,140
X25	-0,253	-0,194	-0,003	-0,139	-0,340	0,103	-0,248	0,615	-0,107	-0,160	0,042	-0,112
X26	-0,199	-0,265	-0,065	-0,110	-0,197	-0,202	-0,227	0,738	-0,130	0,106	0,067	-0,139
X27	-0,152	-0,091	0,192	0,219	0,084	-0,055	0,109	-0,119	0,192	0,286	-0,031	0,123
X28	-0,175	-0,079	0,238	-0,018	-0,055	0,030	-0,078	0,190	-0,051	0,252	-0,042	-0,002
X29	0,237	0,353	0,445	0,448	0,257	0,356	0,320	-0,172	0,873	0,291	0,314	0,639
X30	0,066	-0,010	-0,056	0,140	0,274	0,194	0,260	-0,018	0,381	0,015	-0,191	0,203
X31	0,044	0,209	0,417	0,399	0,170	0,433	0,290	-0,183	0,879	0,315	0,174	0,624
X32	-0,042	0,193	0,239	0,324	0,049	0,145	0,167	0,013	0,276	0,806	0,093	0,373
X33	0,415	0,412	0,186	0,363	0,055	0,196	0,259	-0,046	0,264	0,849	0,225	0,417
X34	0,269	0,315	0,269	0,220	0,010	0,230	-0,002	0,088	0,171	0,139	0,820	0,351
X35	0,443	0,439	0,173	0,285	-0,006	0,067	0,080	-0,011	0,211	0,188	0,857	0,390
Y36	0,291	0,364	0,433	0,398	0,167	0,344	0,279	-0,174	0,577	0,317	0,502	0,748
Y37	0,293	0,195	0,242	0,360	0,179	0,233	0,246	-0,145	0,551	0,398	0,264	0,722
Y38	0,205	0,199	0,248	0,326	0,265	0,393	0,271	-0,170	0,400	0,208	0,071	0,597
Y39	0,444	0,551	0,451	0,403	0,230	0,328	0,343	-0,271	0,387	0,323	0,249	0,595
Y40	0,247	0,368	0,551	0,387	0,192	0,429	0,261	-0,020	0,377	0,301	0,281	0,598

4.3. Adjusted PLS model results and analysis

The adjusted model's coefficient of determination R^2 was 0,689, which means that the latent variables in the adjusted model explained 68,9% of the variance of trust in SNS. This is slightly lower than in the full model, but still at a very good level.

Adjusting the PLS model improved its reliability and validity. Table 5 shows that the internal consistency reliability is good since composite reliability values are above the 0,70 threshold for all constructs. The composite reliability values improved considerably for V6, V8 and V9. Average variance extracted is also above its 0,50 threshold which means that the convergent validity is at acceptable level for all constructs. The AVE values improved considerably for V4, V6, V8, V9 and Trust in SNS. The most significant increase in both composite reliability and AVE values was in perceived risk (V8) where the two low loading indicators were eliminated. Cronbach's alpha was also improved for V9, but declined for V4, V8 and for Trust in SNS. It remained the same for other constructs.

Table 5: Adjusted PLS model AVE, Composite reliability and Cronbach's Alpha.

	AVE (≥ 0,5)	Composite Reliability (≥ 0,7)	Cronbach's Alpha (≥ 0,7)
V1	0,733	0,891	0,825
V2	0,633	0,838	0,729
V3	0,543	0,779	0,593
V4	0,550	0,785	0,589
V5	0,798	0,922	0,876
V6	0,827	0,905	0,791
V7	0,677	0,807	0,536
V8	0,697	0,819	0,595
V9	0,789	0,882	0,733
V10	0,686	0,813	0,541
V11	0,703	0,826	0,578
Trust in SNS	0,549	0,783	0,583

For more detailed view of discriminant validity, the Fornell-Larcker criterion was analyzed (Table 6). The square root of AVE was the highest for each latent variable (in the diagonal at the table) than in their correlations, which means that the discriminant validity was good. Also the cross loadings support discriminant validity (Table 7).

Table 6: Fornell-Larcker criterion for the adjusted model.

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	Trust in SNS
V1	**0,856**											
V2	0,723	**0,796**										
V3	0,250	0,511	**0,737**									
V4	0,267	0,479	0,559	**0,742**								
V5	0,274	0,406	0,396	0,415	**0,893**							
V6	0,232	0,364	0,446	0,428	0,362	**0,909**						
V7	0,240	0,382	0,380	0,379	0,512	0,331	**0,823**					
V8	-0,332	-0,251	-0,007	-0,011	-0,242	-0,052	-0,187	**0,835**				
V9	0,160	0,322	0,490	0,470	0,240	0,465	0,345	-0,066	**0,889**			
V10	0,233	0,365	0,259	0,405	0,063	0,218	0,260	0,221	0,342	**0,828**		
V11	0,437	0,451	0,262	0,330	0,000	0,168	0,049	-0,003	0,275	0,192	**0,839**	
Trust in SNS	0,380	0,425	0,548	0,524	0,239	0,488	0,355	-0,086	0,687	0,453	0,484	**0,741**

The adjusted model's indicator loadings are highlighted in Table 7 on the next page. Indicator reliability in the adjusted model is also good since all, but two indicators' loadings are above the 0,70 threshold (Table 7). The two indicators, X9 and Y40, have values close to the threshold, so they have still reasonable reliability. In their constructs there were also two other indicators with loadings above 0,70, so the construct reliability remained good as well.

Table 7: Adjusted PLS model cross loadings.

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	Trust in SNS
X1	0,908	0,684	0,229	0,288	0,303	0,277	0,212	-0,303	0,140	0,221	0,465	0,396
X2	0,898	0,611	0,217	0,179	0,153	0,171	0,196	-0,281	0,161	0,249	0,368	0,339
X3	0,754	0,556	0,198	0,215	0,263	0,102	0,230	-0,279	0,102	0,081	0,226	0,185
X4	0,528	0,867	0,468	0,432	0,416	0,432	0,371	-0,161	0,363	0,312	0,363	0,444
X5	0,679	0,793	0,329	0,296	0,240	0,166	0,230	-0,220	0,146	0,272	0,384	0,289
X6	0,583	0,721	0,419	0,426	0,271	0,185	0,293	-0,273	0,206	0,297	0,348	0,212
X7	0,158	0,375	0,814	0,433	0,204	0,309	0,267	0,047	0,457	0,258	0,329	0,498
X8	0,342	0,529	0,760	0,470	0,414	0,402	0,366	-0,155	0,350	0,193	0,234	0,405
X9	0,006	0,178	0,624	0,320	0,296	0,282	0,199	0,127	0,231	0,076	-0,110	0,261
X11	0,253	0,460	0,535	0,726	0,403	0,330	0,260	-0,102	0,309	0,191	0,395	0,396
X12	0,165	0,213	0,234	0,701	0,153	0,302	0,223	0,026	0,352	0,350	0,176	0,377
X13	0,174	0,386	0,465	0,795	0,359	0,320	0,358	0,055	0,384	0,363	0,157	0,391
X15	0,218	0,244	0,245	0,250	0,855	0,265	0,442	-0,294	0,132	-0,022	-0,164	0,150
X16	0,322	0,458	0,399	0,491	0,902	0,371	0,504	-0,140	0,273	0,090	0,135	0,235
X17	0,189	0,348	0,381	0,332	0,922	0,316	0,426	-0,246	0,211	0,072	-0,031	0,235
X19	0,166	0,236	0,418	0,386	0,227	0,905	0,272	-0,016	0,400	0,205	0,168	0,434
X21	0,255	0,422	0,393	0,392	0,426	0,913	0,330	-0,077	0,445	0,192	0,138	0,453
X22	0,185	0,297	0,364	0,383	0,502	0,317	0,888	-0,065	0,321	0,261	0,050	0,337
X23	0,222	0,349	0,248	0,219	0,316	0,217	0,752	-0,286	0,238	0,152	0,027	0,235
X24	-0,334	-0,190	0,018	0,029	-0,213	0,026	-0,128	0,929	-0,015	0,234	-0,041	-0,088
X26	-0,196	-0,265	-0,051	-0,081	-0,198	-0,174	-0,222	0,729	-0,134	0,107	0,067	-0,048
X29	0,237	0,354	0,450	0,455	0,256	0,352	0,322	-0,080	0,890	0,288	0,314	0,615
X31	0,046	0,218	0,421	0,379	0,170	0,475	0,290	-0,037	0,887	0,319	0,174	0,605
X32	-0,038	0,199	0,245	0,343	0,050	0,192	0,168	0,281	0,296	0,825	0,093	0,372
X33	0,421	0,404	0,183	0,327	0,054	0,170	0,262	0,086	0,270	0,830	0,225	0,377
X34	0,275	0,324	0,278	0,258	0,009	0,204	0,001	0,067	0,218	0,140	0,822	0,387
X35	0,449	0,428	0,168	0,293	-0,009	0,084	0,077	-0,066	0,243	0,181	0,855	0,424
Y36	0,299	0,368	0,439	0,437	0,167	0,401	0,280	-0,163	0,599	0,319	0,502	0,849
Y37	0,297	0,201	0,246	0,336	0,180	0,274	0,249	-0,036	0,522	0,397	0,263	0,717
Y40	0,250	0,376	0,549	0,390	0,192	0,416	0,261	0,036	0,388	0,301	0,281	0,644

The adjusted PLS model with indicator loadings and path coefficients is shown in Figure 9 on the next page. The adjusted measurement model is good based on the PLS reliability and validity measures excluding Cronbach's alpha. The high R^2 value gives indication that the structural model is also reasonable.
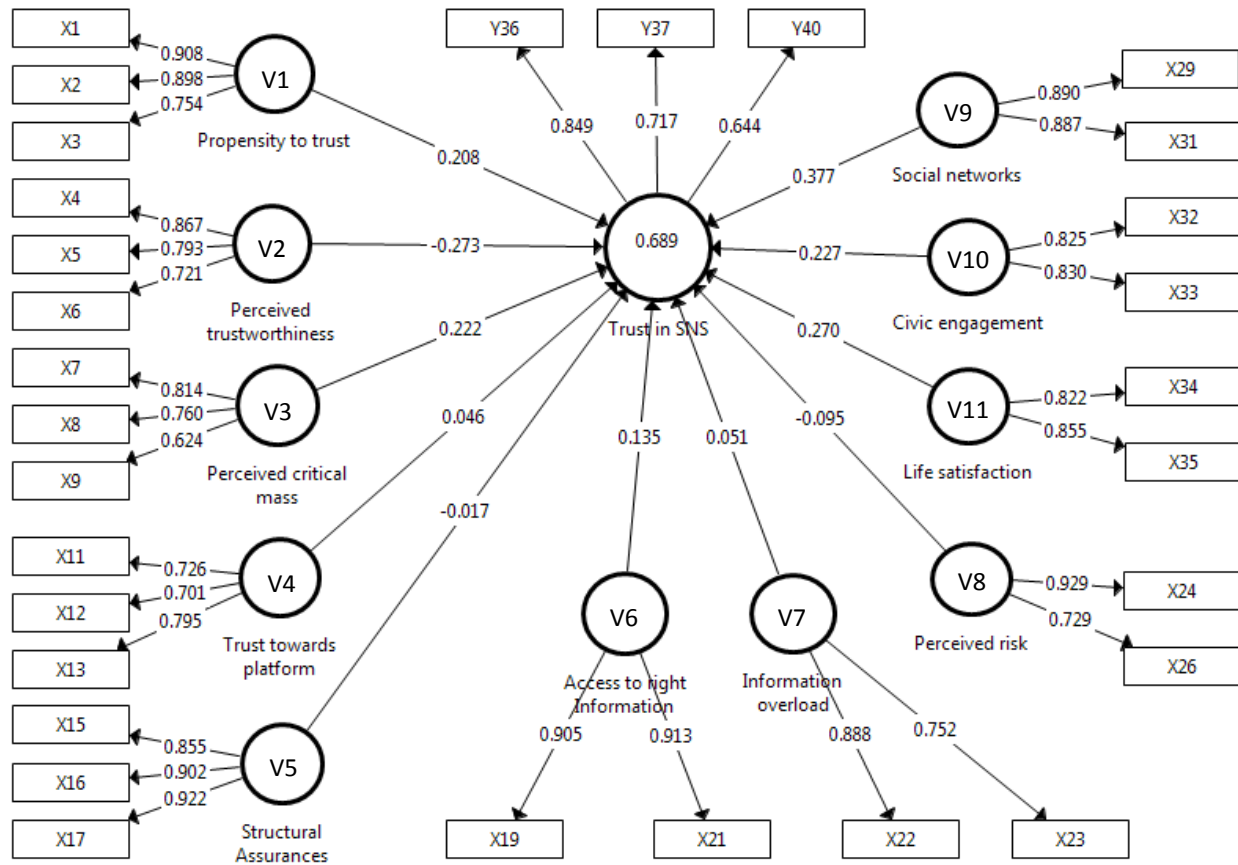
Figure 9: SmartPLS model.

According to the PLS steps since the measurement model is validated, it is time to look at the structural model. In PLS, checking structural path significance is done by generating T-statistics in bootstrapping. The aim is to assess each path coefficient's significance. Paths that are statistically significant and show the same direction as hypothesized support the hypothesis while others do not. PLS-SEM uses nonparametric bootstrapping because it assumes that data are not normally distributed. In the bootstrapping process, random cases are drawn repeatedly from the original sample while replacing it so that bootstrap samples are created. The sample distribution is assumed to be a fair representation of the population distribution in question. Cases in a bootstrap sample should always be as many as in the original sample. The number of bootstrap samples is recommended to be 5000. The bootstrap samples are used to calculate approximated path model coefficients and standard errors for them. These are then used for a Student's t-test in order to calculate the path's significance for hypothesis testing. (Hair et al., 2011.)

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The bootstrapping procedure was set to include the recommended 5000 bootstrap samples with 104 cases. The t-test was set to be a two-tailed test with 5 % significance. Significance level for this kind of t-test is 1,96 (Hair et al., 2011). This means that T-Statistics value above 1,96 shows the path is statistically significant.

Table 8: Statistics of path coefficients.

Structural Path	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (|O/STERR|)
V1 -> Trust in SNS	0,208	0,206	0,108	1,929
V2 -> Trust in SNS	-0,273	-0,248	0,142	1,927
V3 -> Trust in SNS	0,222	0,196	0,089	2,486
V4 -> Trust in SNS	0,046	0,068	0,106	0,435
V5 -> Trust in SNS	-0,017	-0,019	0,075	0,228
V6 -> Trust in SNS	0,135	0,122	0,077	1,742
V7 -> Trust in SNS	0,051	0,057	0,074	0,693
V8 -> Trust in SNS	-0,095	-0,069	0,099	0,965
V9 -> Trust in SNS	0,377	0,391	0,083	4,532
V10 -> Trust in SNS	0,227	0,216	0,077	2,949
V11 -> Trust in SNS	0,270	0,241	0,110	2,464

The results from the bootstrapping procedure are visible in Table 8. The structural paths represent the hypotheses with the first part's variable of the path having the corresponding number as the hypotheses. For validating hypotheses the significance, direction and effect should be evaluated. The T-Statistics show that hypotheses H3, H9, H10 and H11 are statistically significant. Hypotheses H1 and H2 came very close to the boundary value. H6 had also high T-Statistics value. Because the small sample size can affect the statistical significance, there is still reason to discuss the value of hypotheses H1, H2 and H6 for theory.

The significant hypotheses, H3, H9, H10 and H11, all have a positive direction, the same as hypothesized. However, hypothesis H2 (perceived trustworthiness' effect on trust in SNS) has the opposite direction. Hypotheses H1 and H6 also have a positive direction as predicted. Information overload's (V7) indicators were the opposite direction than the hypothesized

construct, thus H7 should have a positive direction in the results. The results do show positive correlation, but it is insignificant. Low significance for information overload can be partly due to inverse question phrasing, even though PLS construct validity was confirmed. Perceived risk was also hypothesized to have negative effect, which the results confirm although the significance cannot be confirmed.

Effects of 0,02 and below can be described as weak, effects of 0,15 are moderate and effects above 0,35 are strong (Hair et al., 2012b). Variable V9 is the only one that has clearly strong effect. The other significant hypotheses' variables have effects between moderate and strong on Trust in SNS. Variables V1 and V2 also have effects between moderate and strong. V6 has only moderate effect on Trust in SNS. Structural assurances (V5) is the weakest predictor in terms of effect and statistical significance.

Table 9: Hypotheses validation.

Hypothesis	Result
H1: Propensity to trust influences positively an individual's level of trust in SNS.	Not supported
H2: Perceived trustworthiness influences positively an individual's level of trust in SNS.	Not supported
H3: Perceived critical mass influences positively an individual's level of trust in SNS.	Supported
H4: Trust towards platform influences positively an individual's level of trust in SNS.	Not supported
H5: Structural assurances influences positively an individual's level of trust in SNS.	Not supported
H6: Access to right information influences positively an individual's level of trust in SNS.	Not supported
H7: Information overload influences negatively an individual's level of trust in SNS.	Not supported
H8: Perceived risk influences negatively an individual's level of trust in SNS.	Not supported
H9: Social networks influence positively an individual's level of trust in SNS.	Supported
H10: Civic engagement influences positively an individual's level of trust in SNS.	Supported
H11: Life satisfaction influences positively an individual's level of trust in SNS.	Supported

The final results are shown in Table 9. Four out of the eleven hypotheses were definitely confirmed. Three of the not supported hypotheses need more research to determine if they have any influence but for now, they are not confirmed. Hypotheses H4, H5, H7 and H8 had no significant effects.

Social networks are the most significant and strongest predictor of trust in social networking services. Other social capital constructs, civic engagement and life satisfaction also have considerable positive effect on trust in SNS. In addition, perceived critical mass, which reflects social trust, affects positively to trust in social networking services.

Propensity to trust, perceived trustworthiness, and access to right information came close to being significant and show effects above moderate. Because the sample size could affect the significance values, these constructs need to be discussed in relation theory. Perceived trustworthiness, which seems to have the opposite effect than hypothesized, especially needs a closer look.

4.4. Reliability and validity of the study

Research validity describes how well the results measure what they are claiming to measure (Wellington and Szczerbiński, 2007). Research validity assessment includes checking external and internal validity. External validity means that the results are generalizable and internal validity focuses on the content. Internal validity is evaluated with construct validity and content validity. Hair et al. (2011) reminds that in PLS convergent validity and discriminant validity only measure construct validity. There is still a need to consider content validity. The construct validity in this study is good based on the PLS convergent validity and discriminant validity values. Content validity is assessed based on if the measurement is done with the right indicators. The indicators need to be grounded in the theory and the phrasing needs to be clear and unambiguous. Because the research questions were done with two languages, there already is higher probability for respondents to understand the statements differently. Grounding the indicators in the theory was challenging because one indicator can measure several aspects of the theory. The most important construct for content validity is trust in SNS. If this would be measured wrongly, the whole study would not measure what it claims. This was noted when dropping indicators in PLS model modification and the indicators considered important were kept. The possible need to drop indicators was also anticipated by designing several indicators

per construct. Despite the challenges, good representative indicators were designed, so the content validity can be considered good.

The main concern for external validity is that how well the respondents represent the population in general. According to Kane et al. (2014), people in close networks grow similar. This goes against the generalizability of results gathered from one person's network. On the other hand, the respondents represent a very diverse group of people since they are linked from all aspects of a person's life. The background questions showed that the respondents are active social networking service users with similar usage distribution in different service as measured by market surveys. Based on this it is reasonable to assume that the respondents are a good representation of the public. However, since Facebook was the main channel for gathering respondents it might have been over represented in the results. One concern is also the statistical power with small sample size and many constructs. The minimum sample size in PLS can be determined by the maximum number of arrows pointing at a latent variable (Wong, 2013). Sample size in this study was 104 and the maximum number or arrows pointing at latent variable was 11. According to Wong (2013) this is sufficient, but at the lower boundary. According to Hair et al. (2012b) the sample size should be at least ten times the maximum number of paths. In this study that would be 110, which is a few more than in the sample. However, the sample size can be considered satisfactory.

Research reliability is a measure of how precisely the research measures what it is claiming to measure and thus how closely the result could be replicated, if the research was repeated (Wellington and Szczerbiński, 2007). Usually, reliability is high in positivist research, because the research automatically focuses on it. Based on the PLS reliability measures the reliability of this study is very good. After modification, all constructs showed composite reliability above 0,70. Indicator reliability was also fairly good, with almost all values above 0,70. Similarly as in content validity, the two languages could have had some effect on indicator reliability. There is also a need to consider that the more indicators per construct there are, the more reliable it could be considered. In this study, several constructs have only two indicators, which could be considered the minimum.

5. DISCUSSION AND CONCLUSIONS

The objective of this study was to identify the antecedents of trust in social networking services and evaluate their significance. This was done by researching earlier literature and by conducting an empirical research based on theory. In this chapter, the results are discussed in more detail and their theoretical and practical contributions are weighed. Finally, suggestions for further research are presented to conclude the research.

5.1. Main findings

In order to understand trust in social networking services, the network characteristics and motivation for usage were reviewed. Value in social networking services can be information, influence or social support. Connections to friends have been found to be very important (Valenzuela et al., 2009). Digital content can be copied, manipulated and searched (Kane et al., 2014), which emphasizes the importance of trust. Trusting could simply mean putting oneself vulnerable in a situation where is possibility for losses. Relationships between people always contain some level of trust. Without any information of the counterpart, trust cannot exist and with perfect knowledge, trust is not needed. Especially uncertain situations require trust. People often lack sufficient knowledge from complex systems, like technology, and thus technology related situations demand trust.

Based on to the literary review, social, technological and information antecedents were recognized. Perceived risk was also thought to be an antecedent to trust in SNS. Using social networking services can facilitate the formation of social capital. Social capital and trust have a tight relationship and social capital factors were seen to be antecedents for trust in SNS.

Social factors behind trust formation were hypothesized to be propensity to trust, perceived trustworthiness, and perceived critical mass. They were all thought to increase trust in SNS. Propensity to trust reflected the user's personal characteristic of more easily trusting new

acquaintances. Based on the results of the empirical research, propensity to trust could have moderate positive impact on trust in SNS. The fact that the statistical significance remained just below the boundary value is most likely due to the sample size and thus propensity to trust should be noted in future research. Similarly, perceived trustworthiness should be taken into account. Perceived trustworthiness reflected the evaluation of interpersonal trust. Opposite to hypothesized, perceived trustworthiness may have more that moderate negative impact on trust formation. People who believe they need to evaluate trustworthiness based on good will, reputation, and value similarity trust less. They might be more insecure about trusting and need reassurance in the form of trustworthiness, which is carefully evaluated. This should be taken into account in future research. Instead of asking about the evaluation criterions of perceived trustworthiness, the questions could be directed to the actual perceived trustworthiness of the subject. Then the results should show positive correlation with trust.

Perceived critical mass was validated to have slightly above moderate positive impact on trust in SNS. This was not a surprise, since several previous studies support the hypothesis. Perceived critical mass reflects the social trust experienced in SNS. A certain number of users need to exist in order to perceive social trust. Several social interactions increase social trust, thus the more friends use a social networking service, the higher the social trust is. Based on the theoretical foundations, the stronger the tie is with other users the fewer connections are needed in order to perceive social trust. A large number of weak ties also enable social trust. Perceived critical mass is important predictor of trust in SNS because the norms of usage continuously change and social trust is important when people lack sufficient knowledge of a situation.

Technological factors behind trust in SNS were identified to be trust towards platform and structural assurances. The results for trust towards platform reflect the user's perception of how easy to use the social networking services they use are, the user's own skills and the feeling that usually the SNS they use work as expected. Based on the empirical research, trust towards platform had no significant effect on trust in SNS. This is surprising since there was a lot of previous research backing up the hypothesis. Technical properties might not be perceived as important in social networking services as in other fields of technology. If users have not

experienced any technical deficiencies that would put them vulnerable to losses, then technology might not be important for trust.

Structural assurances refer to the privacy settings and policies keeping users information safe. Based on the empirical research, they had no effect on trust in SNS. This contradicts Russo's (2012) research where structural assurances were found to be a significant factor behind users trust to other users in social location technologies. It is difficult to think that social location technologies would be so different from other social networking services. Structural assurances might only affect trust in relationships at social location technologies, but not the trust in SNS. The technological factors were the most insignificant from all the constructs hypothesized to influence trust in SNS.

Information factors behind trust formation were hypothesized to be access to right information and information overload. Information factors were argued to be significant, since information is one of the values gained in social networking services and digital user generated information can easily be unreliable. Access to right information was measured as easy access to relevant information the user needs. Even though, the statistical significance remained below the boundary value, access to right information seemed to have moderate positive effect to trust in SNS. Information trustworthiness and access to right information in social networking services should be considered in future research.

Information overload was hypothesized to influence negatively to trust in SNS. Previously, it had been found to affect to trust towards internet. Because social networking services could also contain large volumes of irrelevant information, information overload could occur. However, the results did not support this view. Because the respondents were active users, they could be very good at filtering information and finding what they need and thus do not perceive such information overload that would affect trust.

Perceived risk was thought to be an important antecedent since social networking services contain several uncertainties. Perceived risk can be relational or performance based (Das and

Teng, 2004). Perceived risk was hypothesized to influence negatively to trust in SNS. Based on the results some effect could be observed, but it was not significant in trust in SNS. The findings could be explained with the results of Debatin et al. (2009). They had found that users perceive the benefits to be more important than possible risks in social networking services. Users also had a distorted view that others have higher risk than themselves. If the users had only cognition-based trust in social networking services, perceived risk would most likely be more significant antecedent for trust in SNS, because good reasons are used to evaluate it. Thus, it can be assumed that there exists fair amount of affect-based trust in SNS.

Social capital was considered influencing positively on trust formation in SNS. Thus, its components, social networks, civic engagement, and life satisfaction, were hypothesized to be antecedents of trust in SNS. Social networks construct from network size and activity with network members. Based on the empirical results, social networks have strong positive influence on trust in SNS. Even though most respondents were active SNS users, those who felt they have large networks in SNS and actively keep in touch with their network trust most in SNS. However, there is a need to consider the possible return affect that Glanville and Andersson (2013) presented. People who generally trust more, most likely are also more at ease at socializing with new people, which could generate large networks.

Civic engagement was validated to have above moderate positive influence on trust in SNS, based on the empirical results. Civic engagement facilitates trust formation through shared activities (Valenzuela et al., 2009). Civic engagement involves participation in activities that help the community and interest in social issues. People, who feel they work for a common good, trust more in the good intentions of others. Since the study measured general interest in civic engagement, not just in SNS, it could be imagined that trust in the community in general could be part of trusting social networking services. Social networking services offer opportunities for civic engagement, but probability for engaging in civic activities is increased with previous interest (Warren et al., 2015), thus there probably is not similar return affect than in social networks.

Life satisfaction was hypothesized to affect positively to trust in SNS. The empirical results validated the hypothesis and showed above moderate positive influence on trust in SNS. Person, who feels happy with their life in general and future prospects, feels higher trust in SNS. It is reasonable to expect that positive outlook in life increases probability to trust. Social networking services can also increase person's life satisfaction through emotional support, new opportunities and access to information (Valenzuela et al., 2009), thus using SNS can increase trust towards it through increased life satisfaction.

By summarizing the main findings, the two research questions can be answered. The first research question aimed to find out what the antecedents of trust in social networking services are. Based on the results perceived critical mass, social networks, civic engagement, and life satisfaction are antecedents of trust in social networking services. Additionally, propensity to trust, perceived trustworthiness, and access to right information could be antecedents of trust in social networking services. The target of the second research question was to clarify how the trust antecedents affect trust towards social networking services. Based on the results, social networks is the most important antecedent and has strong positive effect on trust towards social networking services. Perceived critical mass, civic engagement, and life satisfaction have all slightly above moderate positive effect on trust towards social networking services. Propensity to trust could also have slightly above moderate positive effect and access to right information moderate positive effect on trust towards social networking services. Perceived trustworthiness could have above moderate negative effect on trust towards social networking services when the focus is on the evaluation criterion of perceived trustworthiness.

5.2. Theoretical and practical contributions

This has been a comprehensive study to understand the antecedents of trust in social networking services. The results should be considered in future research. Theoretical contributions include the integration of social capital factors as trust antecedents in social networking services.

Since the majority of the respondents were experienced users of social networking services, they most likely evaluated the statements in relation to that experience. Thus, the results reflect a post-adoptive situation. McKnight et al. (2011) described that initial trust is based on perceptions and is more fragile than experiential trust, which is based on past behavior of the trustee. McAlister (1995) stated that cognition-based trust is one antecedent to affect-based trust. In social networking services it could mean that initial trust is more cognition-based and evaluated on good reasons. Thus, technological factors could be more important in pre-adoptive situations in social networking services. Experience facilitates the formation of affect-based trust, which is seen more special. Affect-based trust is not easily re-evaluated. (McAlister, 1995.) This could be one reason that the technological factors were found to be insignificant in the research. When starting to use, technical properties might have had more importance than post-adoption, because they could have provided good reasons for trust evaluation, i.e. for cognition-based trust. Experience has led to affect-based trust and technical properties are no longer seen as important for trust.

Value in social networking services could be information, influence or social support. Value is linked to trust since trust is needed in situations where is possibility for losses, i.e. losing value. Even though, information might bring value, it does not have great impact on trust in SNS. There was indication that access to right information has some effect on trust formation in post-adoptive situation. On the other hand, information might not be the main value. Lin and Lu (2011) had found enjoyment to be the most important factor influencing social networking site user's behavior. Enjoyment and usefulness was gained by keeping in touch with old friends and strengthening relationships (Valenzuela et al., 2009). The enjoyment and value perceived from social contacts are most likely behind the results showing that social factors and social capital are more important predictors of trust than technological or information factors.

Social capital is the major factor affecting on trust in social networking services. Especially, network size and communication activity were found to be significant predictors of trust in social networking services. However, Kane et al. (2014) stated that the characteristics of a social networking service influence the networks that form. Even though, technological factors were

found to have the least effect on trust, characteristics of a social networking service influence the networks that form, thus technological factors might have indirect effect on trust.

Social capital combined with perceived critical mass and a person's own characteristics to evaluate trust constitute the antecedents for trust formation in social networking services. Even though, social capital factors were found to be the most important antecedents, the possible return affects need to be considered.

The results may have many practical contributions. Perceived trust in SNS should be important for the platform providers since it can affect intention to use. Mcknight (2011) stated that perceived usefulness and perceived ease of use do not predict post-adoptive technology usage as well as pre-adoptive. Knowledge-based trust was thought be important in post-adoptive technology use. Social networking service providers can use the results to modify their service to be perceived more trustworthy. This can be done by marketing efforts or by modifying the platform characteristics to support trust in SNS. Platform characteristics that facilitate forming of networks indirectly influence trust formation. Characteristics that offer possibilities for civic engagement could also increase trust. Access to right information should also be considered. Features that support easy access to right information may increase trust in SNS.

The role of trust, when introducing new social networking services needs more research, but most likely introducing new SNS to a community with high social capital could contribute to adoption. As Haythornthwaite (2002) stated, a new medium can support strong ties and be useful as an easy way of contact with weak ties. Social trust is likely the most important antecedent affecting pre-adoptive trust, based on the results of this study and previous theories. Trusted parties could be used to create trust in new SNS. For example, if blogs that have many followers start using another medium for an additional way of communication, it could increase social trust towards that medium.

The main limitation of this research was that respondents are only from one person's social network and thus might not comprehensively represent the whole community. Sample size could

have influenced statistical significance and thus constituted a limitation. Nevertheless, the limitations are not seen to have substantial influence on the results.

5.3. Future research and conclusion

It was not surprising that social capital was so significant, since most respondents were active SNS users. Social capital is important indicator of post-adoptive trust in SNS. Social capital might not be as significant with pre-adoptive trust. Future research should concentrate on pre-adoptive trust antecedents in SNS. The full model showed in Figure 2 should be researched. When testing the full model, the importance of trust to usage should be evaluated and the antecedents identified in this research could be used. In addition, social capital's relationship with intention to use through increasing trust should be evaluated more carefully. This would also help determine causalities between social capital factors, trust and usage.

Since social media is such an integral part of our lives, a reverse approach to trust in SNS would be interesting to study. When there exists a trust relationship with a social networking service, what would need to happen for trust to be lost and would losing trust influence usage. The antecedents could also be extended to other aspects of social media, such as blogs, which are an important information source for many people. The importance of the antecedents could be different in other social media services.

Clearly, relationships with other users influence trust formation in SNS. Personal characteristic of the user are also very important. Platform characteristics did not seem to have effect, but they influence the relationships that form. The antecedents are used to assess whether to trust or not to trust the service. Human interactions and uncertainties in social networking services demand trust to be had. Based on the research it can be concluded that social constructs are the most important determinants of trust in social networking services. Social trust is needed in SNS because the norms of usage continuously change. Social media will keep on evolving and influencing our social life.

REFERENCES

Beaudoin, C. E. (2008) "Explaining the Relationship between Internet Use and Interpersonal Trust: Taking into Account Motivation and Information Overload", *Journal of Computer-Mediated Communication*, Vol. 13, No 3, pp. 550–568.

Blaikie, N. (Ed.) (2003) Analyzing Quantitative Data, SAGE Publications Ltd, London, England, 306 p.

Blomqvist, K. (1997) "The many faces of trust", *Scandinavian Journal of Management*, Vol. 13, No. 3, pp. 271-286.

Castelfranchi, C. (2002) "The Social Nature of Information and the Role of Trust", *International Journal of Cooperative Information Systems*, Vol. 11, Nos. 3 & 4, pp. 381-403.

Das, T. K. & Teng, B. (2004) "The risk based view of trust: A conceptual framework", *Journal of Business and Psychology*, Vol. 19, No. 1, pp. 85-116.

Dawes, J. (2008) "Do data characteristics change according to the number of scale points used", *International Journal of Market Research*, Vol. 50, Issue 1, pp. 61-77.

Debatin, B., Lovejoy, J. P., Horn, A. & Huges, B. (2009) "Facebook and Online Privacy: Attitudes, Behaviors, and Unintended Consequences", *Journal of Computer-Mediated Communication*, Vol. 15, pp. 83-108.

Dutton, W. & Shepherd, A. (2006) "Trust in the Internet as an experience technology", *Information, Communication & Society*, Vol. 9, No. 4, pp. 433-445.

Dwyer, C., Passerini, K. & Hiltz, S. R. (2007) "Trust and privacy concern within social networking sites: A comparison of Facebook and MySpace" in *Proceedings of the Thirteenth Americas Conference on Information Systems,* Keystone, Colorado, pp. 1-12.

eBizMBA (2015) "Top 15 Most Popular Social Networking Sites". Online. Available at: http://www.ebizmba.com/articles/social-networking-websites [9.5.2015].

Fogel, J. & Nehmad, E (2008) "Internet social network communities: Risk taking, trust, and privacy concerns", *Computers in Human Behavior*, Vol. 25, Issue 1, pp. 153–160.

Gefen, D., Karahanna, E. & Straub, D. W (2003) "Trust and TAM in Online Shopping: An Integrated Model", *MIS Quarterly*, Vol. 27, No. 1, pp. 51-90.

Glanville, J. L. & Andersson, M. A. (2013) "Do Social Connections Create Trust? An Examination Using New Longitudinal Data", *Social Forces*, Vol. 92, Issue 2, pp. 545-562.

Granovetter, M. S. (1973) "The Strength of Weak Ties*", American Journal of Sociology*, Vol. 78, No. 6, pp. 1360-1380.

Haenlein, M. & Kaplan, A. M. (2004) "A Beginner's Guide to Partial Least Squares Analysis", *Understanding Statistics*, Vol. 3, Issue 4, pp. 283-297.

Hair, J. F., Ringle, C. M. & Sarstedt, M. (2011) "PLS-SEM: Indeed a Silver Bullet", *Journal of Marketing Theory & Practice*, Vol. 19, Issue 2, pp. 139-152.

Hair, J. F., Ringle, C. M. & Sarstedt, M. (2012a) "Editorial - Partial Least Squares: The Better Approach to Structural Equation Modeling", *Long Range Planning*, Vol. 45, Issues 5-6, pp. 312-319.

Hair, J. F., Sarstedt, M., Ringle, C. M. & Mena, J. A. (2012b) "An assessment of the use of partial least squares structural equation modeling in marketing research", *Journal of the Academy of Marketing Science*, Vol. 40, Issue 3, pp. 414-433.

Haythornthwaite, C. (2002) "Strong, Weak, and Latent Ties and the Impact of New Media", *Information Society*, Vol. 18, Issue 5, pp. 385-401.

Henseler, J., Ringle, C. M. & Sinkovics, R. R. (2009) "The use of Partial Least Squares in Path Modelling in International Marketing", *Advances in International Marketing*, Vol. 8, Issue 20, pp. 277-319.

Hulland, J. (1999) "Use of partial least squares (PLS) in strategic management research: a review of four recent studies", *Strategic Management Journal*, Vol. 20, Issue 2, pp. 195–204.

Intelligent measurement, Likert scale & surveys – best practices (2007). Online. Available at: http://intelligentmeasurement.net/2007/11/20/likert-scale-surveys-best-practices/, [9.5.2015].

Kane, G. C., Alavi, M., Labianca, G. & Borgatti, S. P. (2014) "What's Different About Social Media Networks? A Framework and Research Agenda", *MIS Quarterly*, Vol. 38, No. 1, pp. 275-304.

Kivijärvi, H., Leppänen, A. & Hallikainen, P. (2013) "Antecedents of Information Technology Trust and the Effect of Trust on Perceived Performance Improvement", *International Journal of Social and Organizational Dynamics in IT*, Vol. 3, Issue 3, pp. 17-32.

Lin, K. & Lu, H. (2011) "Why people use social networking sites: An empirical study integrating network externalities and motivation theory", *Computers in Human Behavior*, Vol. 27, No. 3, pp. 1152-1161.

Lorenzo-Romero, C., Constantinides, E. & Alarcón-del-Amo, M. (2011) "Consumer adoption of social networking sites: implications for theory and practice", *Journal of Research in Interactive Marketing*, Vol. 5 No. 2/3 2011, pp. 170-188.

McAllister, D. (1995) "Affect- and Cognition-based Trust as Foundations for Interpersonal Cooperation in Organizations", *Academy of Management Journal,* Vol. 38, No. 1, pp. 24-59.

Mcknight, D. H., Carter, M., Thatcher, J. B., & Clay, P. F. (2011) "Trust in a specific technology: An investigation of its components and measures." *ACM Transactions on Management Information Systems,* Vol. 2, No. 2, Article 12, pp. 1-25.

Osborne, J. (Ed.). (2008) Best practices in quantitative methods, SAGE Publications, Inc. Thousand Oaks, CA, 596 p.

Pan, L. & Chiou, J. (2011) "How Much Can You Trust Online Information? Cues for Perceived Trustworthiness of Consumer-generated Online Information", *Journal of Interactive Marketing*, Vol. 25, No. 2, pp. 67-74.

Pavlou, P. A. (2003) "Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model", *International Journal of Electronic Commerce*, Vol. 7, No. 3, pp. 69–103.

Pew Research Center. "Social Media Use Over Time ". Online. Available at: http://www.pewinternet.org/data-trend/social-media/social-media-use-all-users/, [30.8.2015].

Quandt, T. (2012) "What's left of trust in a network society? An evolutionary model and critical discussion of trust and societal communication", *European Journal of Communication*, Vol. 27, No. 1, pp. 7-21.

Reinartz, W. J., Haenlein, M & Henseler, J. (2009) "An Empirical Comparison of the Efficacy of Covariance-based and Variance-based SEM" *International Journal of Research in Marketing*, Volume 26, Issue 4, pp. 332–344.

Russo, P. (2012) "The antecedents, objects, and consequents of user trust in location-based social networks", Polytechnic Institute of New York University, ProQuest, *UMI Dissertations Publishing,* 2012, 3518792.

Scheufele, D. A., & Shah, D. V. (2000) "Personality strength and social capital: The role of dispositional and informational variables in the production of civic participation", *Communication Research*, Vol. 27, pp. 107–131.

Siegrist, M., Cvetkovich, G. & Roth, C. (2000) "Salient Value Similarity, Social Trust, and Risk/Benefit Perception", *Risk Analysis: An International Journal*, Vol. 20, Issue 3, pp. 353-362.

Social Media Today (2015) "The World's 21 Most Important Social Media Sites and Apps in 2015". Online. Available at: http://www.socialmediatoday.com/social-networks/2015-04-13/worlds-21-most-important-social-media-sites-and-apps-2015 [9.5.2015].

Valenzuela, S., Park, N. & Kee, K. F. (2009) "Is There Social Capital in a Social Network Site?: Facebook Use and College Students' Life Satisfaction, Trust, and Participation", *Journal of Computer-Mediated Communication*, Vol. 14, Issue 4, pp. 875–901.

Venkatesh, V. & Bala, H. (2008) "Technology Acceptance Model 3 and a Research Agenda on Interventions", *Decision Sciences*, Vol. 39 No. 2, pp. 273-315.

Warren, A. M., Sulaiman, A. & Jaafar, N. I. (2015) "Understanding civic engagement behaviour on Facebook from a social capital theory perspective", *Behaviour & Information Technology*, Vol. 34, Issue 2, pp. 163-175.

Web of Knowledge. Online. Available at: http://apps.webofknowledge.com, [9.5.2015].

Wellington, J. J. & Szczerbiński, M. (2007) Research methods for the social sciences, Continuum International Publishing, London , 247 p.

Wikipedia. "List of social networking websites". Online. Available at: https://en.wikipedia.org/wiki/List_of_social_networking_websites, [30.8.2015].

Wong, K. K. (2013) "Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS", *Marketing Bulletin*, Vol. 24, No. 1, pp. 1-32.

Wu, L. (2013) "Social Network Effects on Productivity and Job Security: Evidence from the Adoption of a Social Networking Tool", *Information Systems Research*, Vol. 24, No. 1, pp. 30-51.

You, J. (2012) "Social Trust: Fairness Matters More Than Homogeneity", *Political Psychology*, Vol. 33, Issue 5, pp. 701-721.

APPENDICES

Appendix A: First page of questionnaire

This is a study of attitudes towards social networking services like Facebook, Twitter, LinkedIn, Instagram etc. Your answers will be highly appreciated.

1. How often do you use social networking services?
- ○ Several times a day
- ○ Daily
- ○ Few times or once a week
- ○ Once a month or less
- ○ Never

2. What social networking services do you mostly use?
Select as many as you find relevant.
- □ Facebook
- □ Twitter
- □ LinkedIn
- □ Pinterest
- □ Google+
- □ Tumblr
- □ Instagram
- □ Ask.fm
- □ MySpace
- □ Other

Appendix B: Latent variables and questions

	Latent variable		Question	Source (d=deduced)	
Social factors	Propensity to trust (V1)	X1	I believe it is generally better to trust than not to trust.	Kivijärvi et al. (2013)	
		X2	I usually trust people until they give me a reason not to trust them.	Russo (2012)	
		X3	My typical approach is to trust new acquaintances when I first meet them.	Russo (2012)	
	Perceived trustworthi-ness (V2)	X4	I think I trust those who seem to have good will towards others.	Kivijärvi et al. (2013)	
		X5	I think I trust those who have a good reputation.	Kivijärvi et al. (2013)	
		X6	I think I trust those who live by the same values as I do.	Kivijärvi et al. (2013)	
	Perceived critical mass (V3)	X7	Several of my friends use the same social networking services as I do.	Russo (2012)	
		X8	I believe a new social networking service is reliable if many of my friends use it.	Russo (2012)	
		X9	I think I should use a social networking service because most of my friends use it.	Russo (2012)	d
Technological factors	Trust towards platform (V4)	X10	I believe that generally the social networking service provider looks out for the best interests of the users.	Dwyer et al. (2007); Quandt (2012)	d
		X11	Usually the social networking services I use work as expected.	Russo (2012)	
		X12	I believe learning to use new social networking service would be easy for me.	Kivijärvi et al. (2013)	
		X13	I believe the social networking service I use is simple to use, even when using it for the first time.	Russo (2012)	
		X14	I think that a new social networking service should be very reliable for me to start using it.	Kivijärvi et al. (2013)	
	Structural assurances (V5)	X15	I believe my information will be safe even though the site privacy settings or policies would change.	Russo (2012)	d
		X16	I believe the social networking service I use is safe because there are policies in place to protect me.	Russo (2012)	
		X17	I believe the social networking service I use provides good account and privacy settings to keep my information safe.	Russo (2012)	
Information factors	Access to right Information (V6)	X18	I believe the information available in social networking services is mostly correct.	Quandt (2012)	d
		X19	I think social networking services offer me a way to get to the information I need.	Pan and Chiou (2011); Quandt (2012)	d
		X20	I think social networking services offer me a way to get information I would not otherwise be able to get.	Pan and Chiou (2011)	d
		X21	I believe it is easy to find the information that is relevant to me in social networking services.	Beaudoin (2008); Quandt (2012)	d

		X22	I believe it is easy to recognize incorrect information in social networking services.	Beaudoin (2008); Castelfranchi (2002)	d
	Information overload (V7)	X23	I don't believe there is too much information available in social networking services to recognize what is relevant to me.	Beaudoin (2008); Castelfranchi (2002)	d
Perceived risk	Perceived risk (V8)	X24	I think that it is likely that something can go wrong if I share my information on a social networking service.	Russo (2012)	
		X25	I think that it is likely that private information in social networking services will be available to everyone in the future.	Lorenzo-Romero et al. (2011); Russo (2012); Das and Teng (2004)	d
		X26	I think it is likely that someone will try to take advantage of me in a social networking service.	Lorenzo-Romero et al. (2011)	d
		X27	I like to find out as much as I can about the social networking services capabilities to protect my information.	Lorenzo-Romero et al. (2011)	d
		X28	I am always very careful of what I post or share on social networking services.	Russo (2012); Das and Teng (2004)	d
Social capital	Social networks (V9)	X29	I have a large network of people in my social networking services.	Valenzuela et al. (2009)	d
		X30	In social networking services, I like to connect with people who I have never met.	Valenzuela et al. (2009); Kane et al. (2014)	d
		X31	I actively keep in touch with people in my social networking services.	Valenzuela et al. (2009)	d
	Civic engagement (V10)	X32	I like to stay informed about today's politics	Valenzuela et al. (2009)	d
		X33	I like to participate in activities that help the community.	Valenzuela et al. (2009)	d
	Life satisfaction (V11)	X34	I believe the future looks bright for me.	Scheufele and Shah (2000); Valenzuela et al. (2009)	d
		X35	I am happy with my life in general.	Scheufele and Shah (2000); Valenzuela et al. (2009)	d
Trust in SNS	Trust in SNS	Y36	I like using social networking services.	Kivijärvi et al. (2013)	d
		Y37	I like to try new social networking services.	Kivijärvi et al. (2013)	
		Y38	I would have fun using new social networking services.	Kivijärvi et al. (2013)	
		Y39	I can rely on the majority of social networking service users.	Russo (2012)	
		Y40	I believe social networking services are capable and proficient at helping people to stay in touch.	Russo (2012)	

Appendix C: Questions in Finnish

	Kysymys
X1	Mielestäni on yleensä parempi luottaa kuin olla luottamatta.
X2	Luotan yleensä ihmisiin, kunnes he antavat syyn olla luottamatta.
X3	Tyypillinen lähestymistapani on luottaa uusin tuttavuuksiin, kun tapaan heidät ensimmäistä kertaa.
X4	Uskon luottavani ihmisiin, jotka osoittavat hyvää tahtoa toisia kohtaan.
X5	Uskon luottavani ihmisiin, joilla on hyvä maine.
X6	Uskon luottavani ihmisiin, jotka elävät samojen arvojen mukaan kuin minä.
X7	Useat ystävistäni käyttävät samoja yhteisöpalveluja kuin minä.
X8	Uskon, että uusi yhteisöpalvelu on luotettava, jos useat ystävistäni käyttävät sitä.
X9	Uskon, että minun tulisi käyttää yhteisöpalvelua, jos useimmat ystävistäni käyttävät sitä.
X10	Uskon, että yleensä yhteisöpalveluiden ylläpitäjä huolehtii käyttäjien eduista.
X11	Yleensä yhteisöpalvelut, joita käytän toimivat odotetusti.
X12	Uskon, että oppisin helposti käyttämään uutta yhteisöpalvelua.
X13	Mielestäni käyttämäni yhteisöpalvelu on helppokäyttöinen, vaikka sitä käyttäisi ensimmäistä kertaa.
X14	Mielestäni uuden yhteisöpalvelun tulee olla hyvin luotettava, jotta alkaisin käyttää sitä.
X15	Uskon, että tietoni ovat turvassa, vaikka yhteisöpalvelun tietosuoja-asetukset tai toimintaperiaatteet muuttuisivat.
X16	Uskon, että yhteisöpalvelu, jota käytän on turvallinen, koska sen toimintaperiaatteet suojaavat minua.
X17	Uskon, että käyttämäni yhteisöpalvelu tarjoaa hyvät tietosuoja-asetukset tietojeni turvaamiseksi.
X18	Uskon, että yhteisöpalveluissa oleva tieto on enimmäkseen oikeellista.
X19	Mielestäni yhteisöpalvelut tarjoavat minulle väylän tietoon mitä tarvitsen.
X20	Mielestäni yhteisöpalvelut tarjoavat minulle keinon saada tietoa, jota en muuten saisi.
X21	Mielestäni yhteisöpalveluissa on helppo löytää tietoa, jolla on merkitystä minulle.
X22	Mielestäni virheellinen tieto on helppo tunnistaa yhteisöpalveluissa.
X23	En usko, että yhteisöpalveluissa on niin paljon tietoa tarjolla, että minulle oleellisen tiedon tunnistaminen olisi vaikeaa.
X24	Uskon, että on todennäköistä, että jokin voi mennä pieleen, jos jaan tietojani yhteisöpalveluissa.
X25	Mielestäni on todennäköistä, että yhteisöpalveluiden yksityiset tiedot ovat kaikkien saatavilla tulevaisuudessa.
X26	Mielestäni on todennäköistä, että joku yrittää hyötyä minusta yhteisöpalvelussa.
X27	Haluan saada selville niin paljon kuin voin yhteisöpalveluiden valmiuksista suojata tietoni.
X28	Olen aina hyvin varovainen siitä mitä jaan yhteisöpalveluissa.
X29	Minulla on laaja verkosto ihmisiä käyttämissäni yhteisöpalveluissa.

X30	Olen mielelläni yhteisöpalveluissa yhteydessä ihmisiin, joita en ole koskaan tavannut.
X31	Pidän aktiivisesti yhteyttä ihmisiin käyttämissäni yhteisöpalveluissa.
X32	Haluan pysyä ajan tasalla nykypäivän politiikasta.
X33	Osallistun mielelläni toimintaan, joka auttaa yhteiskuntaa.
X34	Mielestäni tulevaisuus näyttää valoisalta minulle.
X35	Olen tyytyväinen elämääni yleisesti.
Y36	Käytän mielelläni sosiaalisen median yhteisöpalveluja.
Y37	Kokeilen mielelläni uusia yhteisöpalveluja.
Y38	Minulla olisi hauskaa uusia yhteisöpalveluja käyttäessä.
Y39	Voin luottaa suurimpaan osaan yhteisöpalveluiden käyttäjistä.
Y40	Mielestäni yhteisöpalvelut ovat kyvykkäitä ja päteviä auttamaan ihmisiä pysymään yhteydessä.

Appendix D: Basic statistics

	ENG				FI				Total				
	Avg	Stdev	Skew	Kurtosis	Avg	Stdev	Skew	Kurtosis	Avg	Stdev	Skew	Kurtosis	Missing
X1	4,83	1,31	-0,17	-0,58	4,94	1,44	-0,70	0,20	4,91	1,41	-0,59	0,03	1
X2	5,33	1,20	-0,88	0,99	5,29	1,48	-1,08	0,52	5,30	1,41	-1,06	0,62	1
X3	4,50	1,06	-0,47	-0,10	4,60	1,33	-0,25	-0,57	4,58	1,27	-0,26	-0,47	0
X4	5,52	0,85	-1,31	2,59	5,80	0,97	-1,78	5,03	5,74	0,95	-1,62	4,27	1
X5	4,92	1,41	-1,26	1,62	5,13	1,14	-0,62	0,35	5,08	1,20	-0,86	0,96	0
X6	5,46	1,32	-0,96	0,73	5,48	1,14	-1,24	2,03	5,47	1,17	-1,14	1,52	0
X7	5,88	1,75	-2,12	3,85	5,70	1,05	-1,06	0,89	5,74	1,24	-1,65	3,32	0
X8	4,63	1,56	-0,59	0,05	4,86	1,26	-0,72	0,01	4,81	1,33	-0,71	0,08	1
X9	4,54	1,56	-0,95	-0,28	3,71	1,42	-0,07	-0,56	3,90	1,49	-0,21	-0,81	1
X10	3,88	1,45	0,51	-0,69	3,61	1,38	0,11	-0,69	3,67	1,40	0,21	-0,65	0
X11	4,92	1,50	-1,02	0,85	5,27	0,97	-0,82	1,01	5,18	1,12	-1,10	1,80	1
X12	5,71	1,37	-1,20	1,15	5,81	1,17	-1,51	3,31	5,79	1,21	-1,41	2,48	1
X13	4,58	1,44	-0,89	0,05	4,95	1,30	-0,19	-0,77	4,86	1,34	-0,40	-0,38	1
X14	4,74	1,79	-0,35	-0,72	5,13	1,27	-0,47	-0,14	5,04	1,40	-0,53	-0,12	1
X15	3,48	1,44	0,65	0,31	3,51	1,27	-0,07	-0,36	3,50	1,30	0,13	-0,22	3
X16	3,17	1,63	0,17	-1,10	3,77	1,25	-0,36	-0,59	3,63	1,36	-0,29	-0,76	1
X17	3,83	1,58	-0,57	-0,66	3,90	1,40	-0,27	-0,90	3,88	1,44	-0,35	-0,82	0
X18	4,00	1,22	-0,16	-0,39	3,98	1,29	-0,17	-0,49	3,98	1,27	-0,17	-0,49	0
X19	4,13	1,36	-0,70	-0,12	4,13	1,30	0,01	-0,97	4,13	1,30	-0,16	-0,80	0
X20	5,08	1,35	-1,21	0,68	4,45	1,36	-0,50	-0,28	4,60	1,38	-0,60	-0,33	0
X21	3,75	1,45	-0,36	-0,74	4,25	1,44	-0,30	-0,56	4,13	1,45	-0,30	-0,58	0
X22	3,63	1,53	0,30	-1,10	3,93	1,44	0,08	-0,91	3,86	1,46	0,12	-0,98	0
X23	4,04	1,23	0,22	0,31	4,21	1,18	-0,22	-0,08	4,17	1,19	-0,11	-0,09	2
X24	4,63	1,76	-0,46	-1,37	4,51	1,27	-0,38	-0,39	4,53	1,39	-0,38	-0,72	1
X25	4,17	1,55	-0,84	-0,33	4,08	1,37	-0,05	-0,34	4,10	1,40	-0,26	-0,41	0
X26	4,17	1,37	0,00	-1,13	4,31	1,67	0,18	-1,13	4,27	1,60	0,18	-1,07	2
X27	4,96	1,81	-0,90	-0,33	4,96	1,61	-0,37	-0,86	4,96	1,65	-0,51	-0,73	0
X28	5,58	1,77	-1,88	2,80	5,30	1,49	-0,82	-0,17	5,37	1,55	-1,09	0,49	0
X29	4,50	1,98	-0,29	-1,06	4,81	1,35	-0,66	0,32	4,74	1,51	-0,59	-0,09	0
X30	2,58	1,79	1,24	0,63	2,65	1,32	0,64	-0,54	2,63	1,44	0,87	0,06	0
X31	4,38	1,86	-0,34	-0,89	4,58	1,35	-0,81	0,20	4,53	1,47	-0,67	-0,14	1
X32	5,08	1,59	-1,29	1,03	5,31	1,24	-1,20	1,55	5,26	1,32	-1,26	1,48	0
X33	5,13	1,55	-0,80	0,75	5,01	1,33	-1,13	1,09	5,04	1,37	-1,00	0,90	1
X34	5,79	1,25	-1,03	0,27	6,04	0,80	-1,73	7,18	5,98	0,92	-1,54	3,94	0
X35	5,50	1,50	-1,72	3,15	5,93	1,02	-1,48	3,90	5,83	1,15	-1,75	4,46	0
Y36	5,08	1,47	-1,32	1,68	5,68	1,23	-1,23	2,33	5,54	1,31	-1,27	2,14	0
Y37	3,17	1,81	0,50	-1,05	3,00	1,45	0,41	-0,80	3,04	1,53	0,47	-0,80	1
Y38	4,25	1,67	-0,43	-0,59	4,14	1,32	-0,46	-0,19	4,16	1,40	-0,43	-0,31	0
Y39	3,63	1,50	0,37	-0,18	4,89	1,16	-0,83	1,03	4,60	1,35	-0,61	-0,01	0
Y40	5,58	1,53	-1,68	3,18	5,29	1,29	-0,95	0,99	5,36	1,35	-1,11	1,35	0
Total	**4,57**	**1,69**	**-0,48**	**-0,73**	**4,67**	**1,52**	**-0,48**	**-0,54**	**4,65**	**1,56**	**-0,49**	**-0,57**	**21**