THE DEVELOPMENT AND VALIDATION OF A TELEVISITATION ATTITUDE SCALE (TAS)

by

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Abstract

The 12 item Televisitation Attitude Scale (TAS) was developed in this study using the method of factor analysis. The prototype Televisitation Attitude Scale (TAS) was administered to UNBC students (N=204) in an on-line format. Kaiser-Meyer-Olkin's (KMO) test was .900 and Bartlett's test was χ^2 (66) = 1198.500, $p < .001$, confirming the validity of the obtained data. The Chronbach's alpha test reliability for the final TAS was .91. It was found that the students' attitudes toward televisitation were one-dimensional (Evaluation dimension) and had a positive tendency (M = 1.29 on -3 +3 scale). Independent sample t-tests ($p \leq .05$) found significant differences in attitudes toward televisitation among subpopulations of UNBC students distinguished by gender, presence of children, and place of birth. TAS and its methodology can help researchers and televisitation investors to predict with some degree of accuracy whether a support person would televisit a patient in a hospital or a nursing home.

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Definitions of Terms

Attitude	A social psychology term meaning a hypothetical construct of cognition with some degree of attraction (emotional valence) reflecting the classification and evaluation of objects and events manifested in conscious experience, verbatim, observable behaviour, and physiological reactions (Levy, 2008).
Connotative vs. Denotative	Connotative meaning or, in other words, implicit meaning is the content (associations, overtones, and feel) of attitudes toward a concept. It also contrasts with denotative - explicit meaning. The same definition of two words can have different connotations. The semantic differential psychosemantic technique is a tool to study connotative meanings. The phenomenon of synaesthesia is a basis for semantic differential study of connotative meanings where a reflection of an attitude in one modality is manifested in another: for example, where music is perceived as a colour (Marshal, 1998).
Semantics	The study of meaning in philosophy and empirical science (also known as *semiotics*, *semology*, or *semasiology*,). The term is a derivative of the Greek verb *sēmainō* ("to mean" or "to signify"). S*ēmantikos* ("significant") is the Greek root for the noun semantics and the adjective semantic; s*ēmeiōtikos* ("pertaining to signs") is the root for semiotics (adjective and noun); *sēma* ("sign") + *logos* ("account") are the roots of semology; and *sēmasia* ("signification") + *logos* ("account") are the roots for semasiology (Levy, 2008).
Semantic Differential	A psychosemantic technique contrived by C.E. Osgood (1957) and his associates. It studies the connotative meaning of a wide range of stimuli of cultural objects by using bipolar rating scales (for example high/low, fast/slow). Evaluation, potency, and activity are the three general components repeatedly appearing after semantic differential scales are intercorrelated and factor analyzed. Semantic differential data can be compared within a particular group and between different groups. Semantic differential technique is used in different settings including market research and therapy (Marshal, 1998).

Synesthesia	A condition when perception of a stimulus in one sense creates association in another. The "coloured hearing" is an example of such association when a subject has a visual sensation when receiving an auditory stimulus (for example, a tone A is associated with the colour green). The tone-colour associations can be universal for different people. The photism (colour perception) can be triggered by taste, touch, pain, smell, or temperature (Levy, 2008).
Telecommunication	A usually private communication system transmitting information through five conventional media agents - copper wire, fibre optic cable, coaxial cable, satellite and microwave (National Aboriginal Health Organization (NAHO), 2005).
Telehealth	A transmission of healthcare related voice, data, images, and information using information and communications technologies (ICT) over long or short distances without an in-person contact involving patients, healthcare practitioners, or educators (Canadian Society of Telehealth (CST), 2008).
Televisitation	A part of telehealth that provides virtual (non-in-person) visits to a patient by significant others by means of tele/videoconferencing. In other words, televisitation is a virtual, social support delivery system, which uses information and communications technologies (ICT) (NAHO, 2005; Winnipeg Regional Health Authority (WRHA), 2008).
Videoconferencing	A communication technology delivering video and audio signals in a two-way, real-time manner between two or more recipient points (NAHO, 2005).

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Chapter 1: Introduction

Preamble

On many occasions, families and close ones are separated by distance for medical reasons – whether they have to stay in a hospital or in a nursing home. This issue is especially of concern in Canada because of its vast area (Romanow, 2002). It is important not only to have an occasional telephone call to a close one who is in a hospital, but also to have visual contact (Savenstedt, Zingmark, & Sandman, 2003b). However, visiting a person is not always possible because of distance and the cost of travelling. In this case, televisitation, which uses information and communications technology (ICT), can help to eliminate the distance problem in communications between close ones.

Televisitation is not a well-researched subject (Lavoie, 2010). A literature search on televisitation from PubMed, Science Direct, Academic Search Premier, Blackwell-Synergy, EBSCO host, and LexisNexis Academic provided a few relevant research articles, mainly discussing televisits of elders in nursing homes and children in hospitals. Furthermore, televisitation, as any system involving ICT, requires substantial financial investments (First Nations and Inuit Health Branch - Health Canada, 2001; Ho & Jarvis-Selinger, 2005; Kumar, Tay-Kearney, Chaves, Constable, & Yogesan, 2006; Lavoie, 2010; Persaud, et al., 2005). If the users of televisitation have a low acceptance of it, they are not likely to use it, and in such cases, the deployment of televisitation, despite its benefits, would be a poor investment. Hence, it is essential to have an adequate picture of users' acceptance of televisitation before its deployment.

Very often, when researchers conduct surveys about the acceptance of healthcare innovations, they ask potential users direct questions about their attitudes toward a studied

object (Aarnio, Jaatinen, Hakkari, & Halin, 2000; Cheung et al., 1998; Cornish et al., 2003; Davis, Howard, & Brockway, 2001; Linassi & Li Pi, 2005; Miller & Levesque, 2002; Saqui et al., 2007). For example, televisitation "sounds good" because it allows relatives to see and talk to family members in a hospital or a nursing home. However, answers to direct questions about the benefits of a technology do not necessary give a representation of the attitudes that determine a person's behaviour toward televisitation. In other words, a person who gives positive feedback on a technology is not necessarily going to use it. Osgood, Suci, and Tanenbaum (1957) discovered that behaviour-determining attitudes, the ones that make a person act toward a stimulus, could not be observed with direct questioning. Osgood and his colleagues developed an instrument – the semantic differential – that measures the types of attitudes that most influence our behaviour toward any objects or concepts (Osgood et al., 1957). The semantic differential gained its popularity in marketing where potential monetary losses are not acceptable (Foxall & Goldsmith, 1994). In fact, monetary losses are not acceptable in healthcare either, and that is why the semantic differential, constructed and validated for televisitation, can have a practical application. Finally, negative behaviour-determining attitudes can be changed, for example with education, and these attitude changes can also be explored with semantic differential before the implementation of televisitation in populations where it can benefit the most.

Areas Where Televisitation Will Bring the Most Benefits

As noted by many authors, televisitation as a type of social interaction provides an important social support, which is linked to improved mental and physical well-being (Bensink et al., 2006; Ezumi et al., 2003; Frasure-Smith et al., 2000; Krumholz et al., 1998; Kuulasmaa, Wahlberg, & Kuusimaki, 2004; Mickus & Luz, 2002; Robinson & Turner, 2003;

Savenstedt, Brulin, & Sandman, 2003a; Savenstedt et al., 2003b). Hence, televisitation, allowing an audio/video communication between patients and their significant others, can be an effective tool to guarantee social support to Canadian populations.

The literature reviewed for this thesis showed two groups of people who can benefit the most from televisitation – elders and children. Health concerns are amplified with age, and seniors are the fastest growing population in Canada. This population has grown by 62 percent since 1981 and continues to grow. By 2021, it is estimated that 19 percent of the Canadian population will be comprised of seniors; by 2041, this percentage is expected to be 25. More than one out of every eight Canadians is a senior now. Seniors aged 85 years and over comprise the fastest growing segment of the group characterized by many ill health conditions associated with old age (Public Health Agency of Canada (PHAC), 2008). Childhood, on the other hand, is a period of reliance on others when self-concept forms and where social support plays an important developmental role (Castiglia, 1999). Moreover, separation anxiety in hospitalized children significantly increases their stress level, decreasing immune responses that affect the healing process (Kyle, 2007). As a logical conclusion, the benefits of televisitation – the provision of social support – may affect the duration and number of hospitalizations by improving the healing process. An overall change in the lengths of hospitalization can ultimately affect healthcare cost.

It is understandable that social support provided by televisitation is important for elders and children, but any person in a hospital can feel the need for relatives, family, parents, community members, and significant others support. Thus, there is a huge gap in televisitation research, as it does not include other populations that could benefit from this ICT-mediated health care delivery system.

The distance factor is especially problematic in rural and remote populations (Ho & Jarvis-Selinger, 2005; Lavoie, 2010). For example, there was only one reference on televisitation experience in remote indigenous communities. It showed that a televisitation system, installed at the William George Extended Care Unit (ECU) located in Sioux Lookout, Ontario, has had significant success in connecting elders with their relatives and significant others in their remote community. Before the installation of televisitation equipment, family visits in the ECU were very scarce. Televisitation allowed 80% - 90% of the ECU residents to visit routinely with their family and community members who, without this opportunity "would never have had a chance to see all their family members" (Cromarty, 2008, p. 3).

Purposes of the Study

The main purpose of this study was to develop and validate, for the first time in televisitation research, the semantic differential technique specific to televisitation – the Televisitation Attitude Scale (TAS). This study can be helpful (as a framework) to researchers who want to obtain psychosemantic data on the attitudes of future users toward televisitation. It can ultimately give an opportunity to healthcare investors in televisitation to have an all-round picture of attitudes toward the virtual social support delivery system (televisitation). This is particularly important in cases when low acceptance is anticipated and additional steps, such as education, may be necessary for successful deployment of televisitation to benefit a targeted population.

The main purpose of this study was achieved by measuring the attitudes toward televisitation among University of Northern British Columbia (UNBC) students. The sample choice was determined by the method of the study which requires a large homogenous group

(not less than 200 respondents). UNBC students are a young, educated, and computer literate population, which suited the developmental purposes of the study well. Finally, the students were potential televisitation users since they could have elders, children, and other significant people in the hospital or a nursing home.

Rationale for the Study

Televisitation requires substantial financial investments (First Nations and Inuit Health Branch - Health Canada, 2001; Ho & Jarvis-Selinger, 2005; Kumar, et al., 2006; Lavoie, 2010; Persaud, et al., 2005). For example, First Nations and Inuit Health Branch (2001) approximated the average funding allocations per site at about $180,000 - 240,000 annually, with about $60,000 for equipment purchases. The annual amount includes usage charges, office supplies, training, technical support and maintenance, administration, management, and coordination. Therefore, televisitation investment pros and cons have to be considered. Prior to spending money on televisitation, it is insufficient to know only the benefits of it. It is also important to have some data on televisitation acceptance because the users have a choice between conventional face-to-face visiting and televisiting. Unlike healthcare investors, marketing profit-oriented investors have always paid special interest to the data on consumers' preferences in products, advertisements, and ideas (Eagly & Chaiken, 1993; Foxall & Goldsmith, 1994; Umiker-Sebeok, 1987; Yasevich & Perminova, 2005). However, the only investor in publicly funded Canadian healthcare is the government (Levy, 2008). Generally, government investors, before spending money, look into the benefits of the intended item and, unlike marketing investors, pay less attention to the users' acceptance. If Canadians do not use televisitation, then government spending will have been wasted. An example of such wastage is the Internet Home Televisit (IHT) service for prisoners in

Singapore (Singapore Prison Service (SPS), 2008). IHT allowed both prisoners and their loved ones to televisit each other from "the comforts of their home, without having to travel to the institutions for their visits" (SPS, 2008). Unfortunately, the IHT system was discontinued in April 2009, despite its beneficial provision of family support in the rehabilitation process (SPS, 2008). A review of the IHT system conducted in 2007/2008, considering such factors as the number of users and cost-efficiency, showed that the number of users benefiting from the system did not justify the resources required to maintain it (SPS, 2008). In fact, Avery and McDonald (2005) warned that "prior to telehealth investments, there is a clear need to determine the 'telehealth readiness' of communities [...] to reduce the risk of failure and losses in time, money, and effort" (p. 61). Finally, Vieru (2000) suggested that without acceptance, many of the presumed benefits of telehealth would be neglected because non-acceptance would create forced users.

The majority of studies on telehealth/televisitation reviewed for this thesis were focused on technological development, clinical applications or benefits of this virtual healthcare delivery system, and its financial impact on hospital budgets. However, only a few studies have assessed the impact of telehealth/televisitation on the actual or potential users of these systems, and no study has been conducted to measure attitudes towards telehealth/televisitation.

Theoretical Framework

The theoretical framework of this study has three key aspects: social supportive communication, attitudes in marketing, and semantic differential's theoretical framework.

Social supportive communication is defined by Albrecht, Burleson, and Goldsmith (1994) as "verbal and nonverbal behaviour that influences how opponents view themselves,

their situations, the other, and their relationship and is the principal process through which individuals coordinate their actions in support-seeking and support-giving encounters" (p.435). The importance of social supportive communication lays in the fact that it can improve patients' immunity, increase longevity, reduce mortality rates, increase self-esteem, and facilitate psychological adaptation to health and social functioning (Robinson & Turner, 2003).

The importance of attitudes has been widely studied in marketing (Foxall & Goldsmith, 1994). The concept of attitudes occupies a central position in social psychology and consumer behaviour studies. Due to wide implementation of clinical and technological advances in medicine, both healthcare users and providers are taking the role of consumers of new virtual healthcare (ICT) delivery systems, including telehealth/televisitation. Attitudes play an important role in explaining consumers' behaviour and are a crucial link between what consumers think about products and what behaviour they initiate toward those products (Foxall & Goldsmith, 1994).

One of the techniques in studying attitudes in contemporary research is the method of semantic differential which, in comparison to another popular technique – the Likert scale, is less fallible to acquiescence bias (Friborg, Martinussen, & Rosenvinge, 2006). This method is employed to measure connotative meanings of a wide variety of concepts (Eagly & Chaiken, 1993). Semantic differential helps to obtain delicate aspects of meanings, which respondents attach to words or concepts, and which are not normally identified by other methods (Foxall & Goldsmith, 1994).

The development of Osgood's semantic differential is rooted in research on synesthesia. Warren (1963) defined synesthesia as "a phenomenon characterizing the

experiences of certain individuals, in which certain sensations belonging to one sense or mode attach to certain sensations of another group and appear regularly whenever a stimulus of the latter type occurs" (p.342). In such a manner, certain scents and sounds evoke certain visual images. Mechanisms of synesthesia are apparent in mechanisms of connotative meanings, which represent the psychological needs of a consumer.

In summary, easy access to interpersonal communication provided through televisitation can be beneficial to a large population in Canada increasing the overall level of social support. The acceptance of televisitation can be a crucial aspect in the successful implementation of televisitation in a particular group of potential users. According to the literature review, televisitation acceptance research has not been conducted yet. However, acceptance research has been conducted in telehealth – the overall ICT health care delivery system, which includes televisitation. The literature review on telehealth acceptance showed that the implicit – connotative part of attitudes had not been studied (Aarnio et al., 2000; Bowater, 2001; Cheung et al., 1998; Cornish et al., 2003; Davis et al., 2001; H. Lamminen, Tuomi, J. Lamminen, & Uusitalo, 2000; Ho & Jarvis-Selinger, 2005; Jong & Kraishi, 2004; Kumar et al., 2006; Lavoie, 2010; Linassi & Li Pi, 2005; Miller & Levesque, 2002; Ohinmaa, Vuolio, Haukipuro, & Winblad, 2002; Persaud et al., 2005; Saqui et al., 2007). Therefore, the objective of this study was to introduce a new approach for studying attitudes (acceptance) in televisitation research.

Objective of the Study

The objective of this research was to fill a gap in the conceptual representation used in studying attitudes (acceptance) toward televisitation by developing the Televisitation Attitude Scale (TAS) and by introducing the associated methodology to a televisitation

acceptance research. UNBC students, as potential users of televisitation, were chosen to study an implicit (connotative) part of attitudes toward televisitation as a first attempt to develop and test psychosemantic methodology in televisitation acceptance research.

Research Questions

This research attempted to answer the following questions:

1. Is it possible to develop a valid Televisitation Attitude Scale (TAS)?
2. What are the semantic differential's results for students of the University of Northern British Columbia (UNBC) towards televisitation?
3. Are there any statistical differences in attitudes towards televisitation among UNBC students:
    a. distinguished by gender?
    b. distinguished by marital status?
    c. distinguished by presence of children?
    d. distinguished by age?
    e. distinguished by place of birth (born in Canada/born outside of Canada; born in BC/born outside of BC)?
    f. distinguished by ethnicity?
    g. distinguished by presence of relatives/friends receiving care in nursing home or a hospital?
    h. distinguished by educational level?

The rest of the thesis is structured as follows. In Chapter 2, the literature review focuses on the definition and benefits of televisitation, satisfaction with telehealth, the definition of attitude and techniques available to study it, some introductory notes on activity

theory as a possible psychosemantic attitude-descriptive tool, and some additional notes of the psychosemantic gap in televisitation attitude research. Chapter 3 discusses the method chosen for this thesis and research procedures. In Chapter 4, the data analysis and results are presented. Chapter 5 discusses difficulties and limitations of the research and, finally, Chapter 6 presents the conclusions, the implications of the results, and recommendations for future research.

Chapter 2: Literature Review

The first part of the literature review presents definitions of televisitation and its related terms because when attitudes of a concept are studied, the concept has to be scrupulously defined. The scarce number of scientific papers available on televisitation revealed that a current scope of its utilization is limited to televisits of elders and children being in a hospital by a significant support person. It clearly shows a gap of literature available on televisitation, which possibly can be improved with research on the benefits of televisitation done in such populations as rural and remote communities or different age/gender populations that can also benefit from social support provided through televisitation.

Televisitation is a part of a broader virtual ICT-mediated healthcare delivery system – telehealth; therefore, a discussion of the satisfaction/acceptance with telehealth is included. The next part of the literature review discusses the term of attitude, its roles, and its components; this is followed by a presentation of the techniques available to study attitudes, including the semantic differential technique. Semantic differential is applied to televisitation acceptance research for the first time in this thesis. Secondary tests studying the environment where attitudes are formed are also discussed. Finally, activity theory is emphasized at the end of the literature review as a possible tool in describing the dynamics of attitudes. It also forms the basis of the psychosemantic technique for studying attitudes - semantic universals, which is newly introduced in this research.

Televisitation and Its Related Terms

In this thesis, televisitation will be defined using the definitions provided by Winnipeg Regional Health Authority (2008) and NAHO (2005). These definitions show the main aspects of televisitation: (1) usage of information and communication technologies

(ICTs), (2) delivery of healthcare services in a form of social support provided by families and significant others, and (3) delivery over certain geographical distances. These parameters would fit under the definition of telehealth which is "the use of information and communications technologies (ICTs) to deliver health services and transmit health information over both long and short distances" (CST, 2008). Televisitation is a component of telehealth. Figure 1 shows the main components of telehealth.

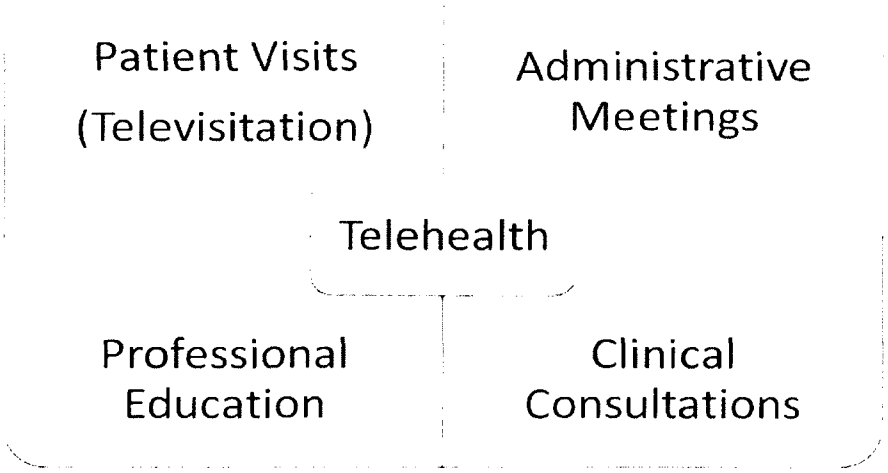


Figure 1. Components of telehealth (Figure was formalized using information from Alberta Health Services (AHS), 2009).

Mickus and Luz (2002) described televisitation as a part of teleconferencing. An important distinction exists between teleconference and videoconference. Teleconference refers to "the live exchange and mass articulation of information among persons and machines remote from one another but linked by a telecommunications system, usually over the phone line, providing one or more of the following audio, video, and/or data services by one or more means, such as telephone, telegraph, teletype, radio, and television" (Alliance for Telecommunications Industry Solutions (ATIS), 2007). Videoconference is defined as "a

set of interactive telecommunication technologies which allow two or more locations to interact via two-way video and audio transmissions simultaneously; it has also been called visual collaboration and is a type of groupware" (ATIS, 2007). However, according to Whybray, Morrison, and Mulroy (1997), teleconference has developed through the stages of audio, video, and now data conferencing (including fax, file exchange, and shared document editing). When it went through the video stage of its development, it began to be referred to as videoconference. Therefore, the terms teleconference and videoconference, when attributed to televisitation, can be used interchangeably.

According to Mitchell (2000), there are several other related definitions necessary for the comprehensive understanding of televisitation: (a) Telemedicine is a provision of medical services through telecommunication technology; (b) Health informatics is a science studying the optimization and best utilization of healthcare data; (c) Information economy is the economy dealing socially and commercially through information technology with a new type of non-material medium – information; (d) E-commerce is an electronic transaction in a business environment; (e) E-health is an electronic interaction in a healthcare environment. Figure 2 shows the relations among these terms.

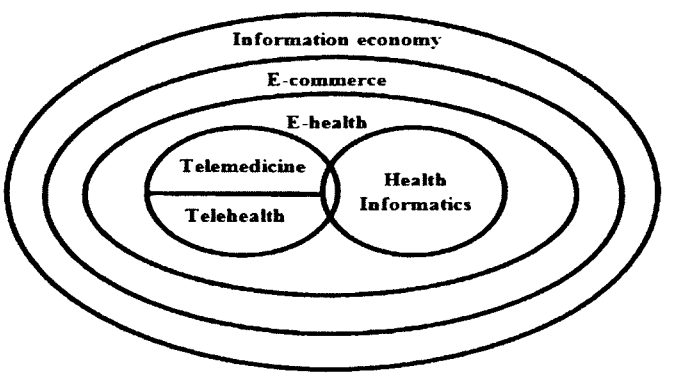


Figure 2. Relations of the terms (Mitchell, 2000).

Applications and Benefits of Televisitation in Geriatrics

Teleconferencing has rapidly gained respect in effectively delivering healthcare information, especially in home, extended health, and paediatric care. Patients and healthcare providers are the main users of teleconferencing in the area of geriatrics (Mickus & Luz, 2002). However, there has been virtually no research on the usage of teleconferencing for social support - linking patients with their families or significant others. Televisitation, as a form of teleconferencing, is based on the idea that regular telephone interactions between family members can be significantly enhanced by providing a visual contact. This, in turn, would deliver closer social support for isolated patients (Mickus & Luz, 2002). In general, Mickus and Luz's (2002) study suggested that videophone family interaction technology could be successfully used in nursing homes by selected residents to enhance social interactions and to close the distance between residents and their family members. Note that the "videophone" and the "televisitation" terms are interchangeable. A study by Mickus and Luz (2002) involved three nursing facilities in the mid-Michigan area where residents (n = 58) with no or mild cognitive impairment (according to Mini-Mental Status Examination (MMSE)) had been interacting for six months with their relatives. The purpose of their study was to test the capabilities of televisitation in the provision of social support in nursing homes. The study demonstrated that televisitation successfully enhanced the social interactions of frail residents, potentially reducing isolation in institutionalized elders, and decreasing mobility and distance barriers. Mild dementia, other common geriatric medical conditions, and physical limitations of the residents are not obstacles in using the videophones. This study also noted that residents with a certain level of vision

impairment or with a low level of tolerance towards new activities might not benefit from televisitation.

Mickus and Luz (2002) stated that video contact facilitates social interactions more than merely audio contact interactions. Essentially, participants of the study commented, "We need to find a way to keep using this equipment" and "It has really helped my mother but I didn't realize how much it would help me too" (Mickus & Luz, 2002, p. 394). The case of two elderly sisters who had been estranged by distance and visually saw each other for the first time after a long separation clearly illustrated the impact of the experience of televisitation. When they first saw each other, one sister said, "Thank you God, thank you whoever made this possible. It is so wonderful to see my sister's face. I never thought I'd see her again" (Mickus & Luz, 2002, p. 394). Taking into account that social networking decreases with age, the opportunity to keep and facilitate the remaining social contacts for the elderly may significantly increase their quality of life. Moreover, residents with speech impairments may benefit from using visual stimuli to enhance their communication. In the study, a patient with advanced multiple sclerosis (MS) was unable to speak, yet she was highly satisfied with using videophone. Likewise, her family members highly graded the interaction because they were able to see her lips move along with her body language (Mickus & Luz, 2002). In fact, non-verbal communication represents about 70% of the whole communication process and influences the success of the whole episode of communication more significantly than the spoken word (Scan Health Plan (SHP), 2008).

Savenstedt et al. (2003b) reported that videophone interactions could increase the attentiveness of elders with cognitive impairments. Cognitive impairment in the elderly can be described in terms of pathological changes in the brain and in terms of socio-cultural

habits changing patients' behaviour when compensatory psychological mechanisms cause loss of functions and loss of ways to communicate (Savenstedt et al., 2003b). On that assumption, dementia might be managed more easily with the facilitation of social interactions with family and social networking of the elderly. Interestingly, Savenstedt et al. (2003b) noted that not only family interactions but also the videophone technology itself increased episodes of lucidity in elderly patients with severe dementia. This phenomenon can be explained by the fact that videophone interactions provide a special calm atmosphere, which may create the feeling of being in a familiar place like home for patients with dementia. It was also evident that this special environment with sensory limitations made elderly patients more attentive and focused on the conversation. Fascinatingly, the familiarity also increases with the usage of video-communication devices because they become "transparent" to the user who loses awareness of the devices' existence during the interaction (Walters, 1995). Further, it was noted by Kuulasmaa et al. (2004) that listening was an important factor in family communication. Televisitation interactions forced the participants to listen because speaking at the same time interrupted audio connection and made it impossible for the users to hear each other. This technical limitation of televisitation may also help to increase the attentiveness in elderly patients during video communication sessions.

The Swedish study conducted by Savenstedt et al. (2003a) distinguished that videophone communication gave family members a new way for caring for their demented relatives. It gave them the opportunity to choose the best time for such communication, which provided non-rushed environments. In addition, videophone communication is a tool that helps family members to minimize negative feelings resulting from having to put their

relative in a nursing home. The users of video-telephone in the study in Sweden reported the importance of the ability to actually see their relative and not just talk to them (Savenstedt et al., 2003a). They also emphasized that this ability to see helped them to determine their relatives' wellbeing. One family member during an interview said, "It means a lot to me that I can see immediately if he is having a good or bad day" (Savenstedt et al., 2003a, p. 218). Being able to see each other (both family members and residents) showed a decrease in anxiety levels. One videophone user said, "I could see on the videophone when the anxiety was gone and he was feeling well again, and at the same time my own anxiety disappeared" (Savenstedt et al., 2003a, p. 218). Video contact made it possible to have more meaningful family interactions, despite the diminished communication abilities of elderly residents with dementia. Some relatives reported that a videophone interaction had better quality than a face-to-face interaction in terms of a focused and relaxed atmosphere. One of the relatives said, "I have my best moments with him on the videophone. There are moments when we can joke and laugh like in the old days and use our old private language. That never happens when I am visiting him" (Savenstedt et al., 2003a, p. 219). In fact, video communication makes the speech of the participants more articulated and clear than regular face-to-face communication (Blokland & Anderson, 1998). The Swedish study found that videophone interactions allowed families to be closely involved in the caring processes for their relatives. In videophone conversation, both verbal and non-verbal communications are present. The non-verbal communication can facilitate a compensatory mechanism in patients with dementia in interpreting visual non-verbal messages. It is interesting that visual pathways and the ability to interpret visual images showed no differences between patients with Alzheimer's disease and individuals without dementia (Rizzo, Anderson, Dawson, &

Nawrot, 2000). In the study with videophone interactions, even residents with some visual impairment effectively interpreted visual feeds and transmitted feedback to the family members that the interaction was meaningful to them (Savenstedt et al., 2003a). A study conducted in Japan on supporting elderly people at home showed that videophone communication was an effective tool for reducing the subjects' feelings of loneliness, improving the activities of daily living, and increasing the networks of social interactions and peer support relationships. This study also assumed that videophone technology, due to its cost, would require financial assistance for elderly people (Ezumi et al., 2003).

Applications and Benefits of Televisitation in Paediatrics

Use of televisitation in paediatric settings has not been widely studied either. The availability of papers on televisitation in paediatric settings was scarce. Therefore, this part of the literature review contains only some highlights on the topic. Bensink et al. (2006) studied the usage of videophones in a paediatric bone marrow transplantation (BMT) case. One videophone was installed in the patient's hospital room using the existing telephone line; another one was installed in the patient's family home. The videophone provided real-time audio and visual communication between the patient and the family. BMT usually involves two family members: one who requires bone marrow and one who donates bone marrow. After the procedure, both the donor and the receiver require long-term hospitalization and isolation causing depression and anxiety in a child who receives the BMT procedure.

Family interactions are crucial in childhood development, especially during situations that create excessive stress in a child. During critical times, a child requires increased emotional support from the family. Families who live far away from a hospital are not always able to provide adequate social support for their child. The distance aggravates the

already stressful situation for the child. Patients, family, and nursing staff reported satisfaction over the usage of the videophone communication, which facilitated intra-family social and emotional support, reducing the child's anxiety and distress resulting from paediatric BMT (Bensink et al., 2006).

The significance of parent-newborn interaction has also been recognized as an essential component of the healthy development of infants and the well-being of parents (Saint Peter's University Hospital (SPUH), 2008). Saint Peter's University (2008) in New Brunswick, New Jersey, deployed a real-time televisitation technology (Peek-a-boo N-I-C-U™), which allows mothers to see and to speak to their babies when they are placed in neonatal intensive care units (NICU). This technology helps to relieve anxiety for mothers and promotes bonding with their babies (SPUH, 2008). Similar technology (Telebaby®) has been deployed in the Netherlands at the University Medical Center Utrecht (Spanjers & Feuth, 2002). Telebaby® allows parents to see their babies over the Internet from their homes through private webcam service. The study conducted in the University Medical Center Utrecht showed that Telebaby® reduced parents' anxiety and the stress associated with NICU visitation restrictions (Spanjers & Feuth, 2002).

Satisfaction with Telehealth

Because televisitation is part of telehealth, it is imperative to show some important highlights of research done on the acceptance of telehealth. User acceptance and satisfaction are derivatives of the psychosocial category of attitudes toward stimuli. The attitudes toward telehealth have been studied in a variety of ways. A review of telehealth literature shows that there have been several studies conducted for measuring satisfaction towards telehealth (Aarnio et al., 2000; Cheung et al., 1998; Cornish et al., 2003; Davis et al., 2001; Ho &

Jarvis-Selinger, 2005; Linassi & Li Pi, 2005; Miller & Levesque, 2002; Saqui et al., 2007). Publications measuring the satisfaction associated with the benefits of reduced cost of healthcare delivery through telehealth (Jong & Kraishi, 2004; Kumar et al., 2006; Linassi & Li Pi, 2005; Ohinmaa et al., 2002; Persaud et al., 2005) and satisfaction associated with the communication benefits of telehealth have been found in the literature as well (Aarnio et al., 2000; Cheung et al., 1998; H. Lamminen et al., 2000). Some studies have documented the satisfaction of physicians and other new virtual healthcare ICT delivery system users towards telehealth (Aarnio et al., 2000; Bowater, 2001; Cornish et al., 2003; Davis et al., 2001; Jong & Kraishi, 2004).

It is important to note that users' acceptance (the level and degree of attitudes) plays a key role in the successful implementation of telehealth (Bashshur, Sanders, & Shannon, 1997). These researchers state that one of the reasons that telehealth system implementations have failed in the past was the lack of users' acceptance of the new technology, and they have determined factors which may affect willingness or reluctance to adopt a new technology. These factors are: (1) Usefulness – the perception of benefits of a new technology; (2) Compatibility – the perception of how new technology would fit into a work/life schedule; (3) Complexity – the perception of the technical level of difficulty associated with the usage of the technology; (4) Visibility – the perception of how interaction can be altered due to technical difficulties; and (5) Replacement – users' perception of being replaced by new technology.

At this point, the literature review moves from the televisitation part of the semantic differential object discussion to the attitudes part of the discussion. The subsequent sections of this chapter of the thesis define attitudes and discuss their roles and components, the

techniques available to study attitudes, and some new bases of descriptive tools in televisitation acceptance research such as activity theory.

Attitudes in Marketing: Their Definition, Role, and Components

Attitudes, in marketing, are defined as the affective or evaluative reactions of consumers toward elements of marketing strategies and products these strategies are designed to promote (Foxall & Goldsmith, 1994). In addition to the affective side of attitudes, the theory of attitudes includes both beliefs about the attributes of products and intentions to behave toward them. Developments of the products consumers want, effective promotion of these products, and evaluation of the promotional efforts depend on the measuring and understanding of consumer attitudes (Foxall & Goldsmith, 1994).

Hughes and Guerrero (1971) define attitudes as an "individual's favourable or unfavourable inclination toward an attribute of an object" (p.126). In general terminology, attitudes are complex psychosocial hypothetical constructs used by psychologists. As with any other hypothetical construct, attitudes are not directly observable but can be inferred from observable responses (Eagly & Chaiken, 1993). Brands, products, new technologies, companies, stores, or advertisements have a certain value in consumers' attitudes – their liking or disliking of these stimuli. According to Foxall and Goldsmith (1994), attitudes have three components, which are beliefs (cognitive component), affects (connotative), and intentions (conative or behavioural component). In other words, there is a cognitive, affective, and behavioural triad of attitudes. This multidimensional approach in viewing attitudes is more acceptable and has better descriptive capabilities than a simple view on attitudes (Foxall & Goldsmith, 1994).

Osgood and Snider (1969) postulated that the meanings of any object could be denotative or connotative. Denotation reflects the literal, dictionary, definition of the object. For example, the meaning of a "tall" person represents denotation of this person's height. However, the meaning of "rough" when used toward a person can have several connotative or metaphorical meanings. In fact, Williams (1969) reviewing Osgood and Snider's (1969) work emphasized that " in the area of attitude research, simple semantic differential Evaluation ratings seem to get as much the same thing as do the laboriously derived individual scales of attitude toward this, that, and the other. Perhaps in psychology, as in other sciences, the truly important conceptualizations serve to simplify rather than complicate" (p.1027). Umiker-Sebeok (1987) suggested that "a product [...] composed of the following two meanings for consumers: (a) Denotative meaning involves a product's surface meaning, which mainly implies its technological and functional meaning (practical and substantial meaning), and corresponds to the consumers' physical needs; (b) Connotative meaning involves a product's deep and hidden meaning, which tacitly and vaguely suggests a non-material and imagistic meaning (a visual, acoustic, tactile, gustatory, and olfactory meaning) and corresponds to the consumers' psychological needs" (p.45). These "psychological needs" influence human behaviour toward stimuli to a greater extent than "physical needs" (Umiker-Sebeok, 1987; Williams, 1969).

Researchers can obtain information from all three dimensions of attitudes in order to predict consumer behaviour towards products. When working with focus groups, they try to simulate situations of respondents' real experiences hoping that they can analyze motives of their behaviour toward a product. Motives are usually determined by the means of direct questions during an interview. Analyzing the resulting data, researchers assume that

responders determine their behaviour through motives that they ascribed during the interview. However, on many occasions, respondents direct their behaviour with unconscious motives, which cannot be determined through direct questions of rating scales projecting real life situations. These methods help to determine attitudes from cognitive and behavioural levels. Even if a researcher asks a respondent what he/she feels towards the object, the researcher may receive information on how the respondent constructs his/her feelings towards the objects but not the information on the person's attitudes, which is in many cases subconscious (Yasevich & Perminova, 2005). The aforementioned literature review on telehealth/televisitation suggests that the data on the liking or disliking of this virtual ICT healthcare delivery system has been obtained through direct questioning, which cannot cover the connotative or affective part of attitudes. In fact, Jenkins (1966) states that direct questioning often creates results highly influenced by "what the respondents believed were the socially desirable answers rather than what they truly believed about the subject" (p.549). Finally, it is important to understand that "the connotative or affective meanings of stimuli are often of much greater importance than their formal or denotative meanings in the determination of behaviour" (Williams, 1969, p. 1027).

Techniques Available to Study Attitudes

Testing or measuring attitudes provides an important position in consumer studies. There are a few psychosemantic methods which measure attitudes (Foxall & Goldsmith, 1994).

Likert: Summed ratings. Likert (1932) developed a scale suitable for attitude survey research. This type of scale consists of a series of statements about objects and provides a multi-item measure. A respondent shows his/her level of agreement on a scale

about objects by rating them with values: strongly agree, agree, neutral, disagree, or strongly disagree. Attitude items may be reverse worded in order to avoid a "halo" bias that could be possible if all the items were worded in one direction. Figure 3 shows examples of Likert scales.

I like Tuvo computers.	SA	A	?	D	SD
I think Tuvo computers are user friendly.	SA	A	?	D	SD
*Tuvo computers have poor design.	SA	A	?	D	SD

Indicate the extent to which you agree with each of the following statements by placing a tick under the appropriate number: 1 – "Strongly Agree", 2 – "Agree", 3 – "Don't Know", 4 – "Disagree", and 5 – "Strongly Disagree".

*Tuvo computers are a good buy	1	2	3	4	5
*Tuvo computers are popular	1	2	3	4	5
Tuvo computers are expensive	1	2	3	4	5

Note: * Indicates items are reverse scored

Figure 3. Examples of Likert scales (Foxall & Goldsmith, 1994).

Rating scales. Researchers use simple rating scales to measure consumer beliefs, feelings, or evaluations of products, brands, new technologies, stores, and services (Foxall & Goldsmith, 1994). A rating scale usually contains questions about what a respondent thinks of or feels about an item by marking a position on a scale. It provides a respondents' value of behavioural intentions and self-reports of behaviours. Figure 4 shows examples of a rating scale.

Tuvo computers are:

expensive _____ cheap

How expensive do you
think Tuvo computers are?

expensive cheap
[ ] [ ] [ ] [ ] [ ] [ ] [ ]

Figure 4. Examples of rating scales (Foxall & Goldsmith, 1994).

The semantic differential. The semantic differential is a psychosemantic technique that can be used to measure connotative meanings of a wide variety of concepts (Eagly & Chaiken, 1993). This technique elicits subtle nuances of meaning that respondents attach to objects, events, and concepts, which are not normally identified by other methods (Foxall & Goldsmith, 1994).

The semantic differential is a series of bipolar adjective scales, which are typically seven-point ratings of adjectival opposites. The attitude object is placed at the top of the page. The respondents are asked to rate this object by checking a category on each of the bipolar scales. The middle part of the scale represents a neutral position between opposing adjectives. Figure 5 shows an example of a semantic differential scale.

Tuvo computers

Beautiful	___:___:___:___:___:___:___	Ugly
Bad	___:___:___:___:___:___:___	Good
Pleasant	___:___:___:___:___:___:___	Unpleasant
Dirty	___:___:___:___:___:___:___	Clean
Wise	___:___:___:___:___:___:___	Foolish

Figure 5. Example of semantic differential scale (Foxall & Goldsmith, 1994).

The number of scales can be customized in a number of ways. For example, in Katzer's (1972) study on attitudes toward an online information retrieval system, three adjective scales were added to the scales selected from the thesaurus study because they were appropriate for the project, in the author's opinion. The original study used 19 adjective scales. Yasevich and Perminova (2005) suggested conducting about 10-20 non-formal free association interviews to obtain an opinion on the appropriateness of presented adjectives, and on what other adjectives could be added to the studied concept. In Bowles (1986) study on attitudes toward menopause, besides adjectives taken from the Osgood et al. (1957) thesaurus study, the author also selected adjectives from literature describing experiences and expectations of women over the studied concept. Bowles (1986) also included adjectives from two semantic differentials that had been already developed to measure attitudes toward menopause. The final adjective content validation for Bowles' (1986) study was conducted by experts in the area of the examined concept. Lastly, Williams (1974) identified the following steps in selecting specific scales: (1) A small group of respondents freely discuss the characteristics of a concept (this discussion is taped); (2) The adjectives are elicited from the discussions and used for the definition of a set of prototype bipolar adjectival scales; (3) Respondents evaluate a concept using the prototype scales; (4) The resultant scale responses are quantified and intercorrelated, and then factor analysis is used to determine more basic dimensions for the ease of the interpretation.

According to Osgood et al. (1957), factor analysis very often showed the three dimensions of attitudes: evaluation, potency, and activity (EPA). For example, the adjective scales of "good-bad", "beautiful-ugly" would correspond to the first dimension; "strong-

weak", "heavy-light" would correspond to the second dimension; and "fast-slow", "active-passive" would correspond to the third dimension respectively.

Methodological studies of the semantic differential (Heise, 1969; Katzer, 1968; Osgood & Snider, 1969) suggest that the simple assumption that these three dimensions will fit any study is incorrect because of a possibility of scale by concept interactions. Therefore, factor analysis has to be done in each individual study (Katzer, 1972). In fact, Katzer (1972) also suggested that "a factor analysis not only identifies the independent dimensions of attitude, but also identifies which adjectives (in each pair) go together (e.g., "good" and "beautiful"); both reflect the positive end of the evaluative dimension, but this may not hold up with all concepts" (p.123).

Yasevich and Perminova (2005) suggested that semantic differential allowed using different methods to analyze data and a choice of a particular analytical method depending on the studied objectives. The most common methods used to analyze semantic differential data are: (1) Analysis of mean values (mode, median, and arithmetic mean) allows one to reveal the averaged scale values of objects and, thus, to compare these objects; (2) Cluster analysis allows grouping alike respondents, scales, or investigated objects that were maximally remote from each other. Most frequently, the cluster analysis is applicable during a study of differences in the perception of objects by different groups of respondents. Cluster analysis is not a popular technique; (3) Factor analysis allows determining and constructing a typology of factors of the studied object. These factors include values of the scales of semantic differential which are closely correlated. Therefore, factor analysis provides for understanding what semantic differential dimensions of the studied object are most relevant to consumers. These semantic differential dimensions help to construct a semantic space,

which is a system of coordinates with axes representing the significant factors. In this semantic space, a researcher puts a studied object(s) that can be compared to the ideal object of the semantic space. Moreover, semantic spaces of different studied groups can be compared and contrasted. Figure 6 shows an example of semantic space.

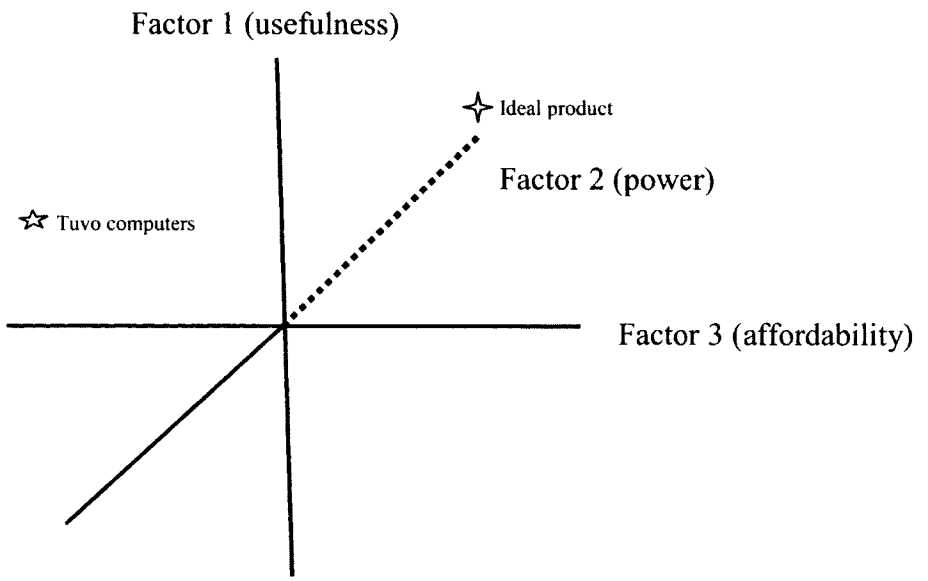


Figure 6. Example of semantic space adapted from Foxall and Goldsmith (1994), Heise (1969), and Yasevich and Perminova (2005).

In addition to the methods of semantic differential data analysis described by Yasevich and Perminova (2005), it is worthy to note one more method – the method of group semantic universals of Artemeva (Serkin, 2008). This allows distinguishing the most frequently represented scales (semantic universals) of attitudes toward a studied object in the minds of respondents. It is applicable for comparing the semantic universals between groups, and it avoids the errors of the complicated mathematical computations necessary in cluster and factor analyses. In addition, it does not require a large sample; groups of a

minimum of 15 respondents can have valid semantic universals to compare (Artemeva, 1999).

In conclusion, Williams (1969) emphasizes:

> The influence of Osgood's theory and method upon modern psychology has been remarkable, and the impact of his work has been felt all the way from the ivory towers of pure experimental psychology, to the consulting rooms of clinical psychology and the sweatshops of consumer psychology. The objectivity of the semantic differential method, and Osgood's theoretical emphasis upon the phenomenological concept of meaning, seemed to provide just the mix of rigor and significance, which many psychologists were seeking. (p.1027)

Secondary tests

To understand a studied group's psychosemantic meaning environment and its socio-cultural predispositions better, a researcher can conduct a few additional tests (Serkin, 2008). For example, the Purpose in Life Test (PIL) is a 20-item, 7-point, Likert-type scale, developed by Crumbaugh and Maholick to measure the degree to which an individual experiences purpose in daily life. The PIL is primarily composed of several parts, including both quantitative (Part A) and qualitative (Parts B and C) data. Part A is easily quantified and compared across samples. Parts B (13 incomplete sentences) and C (paragraph composition relating to future goals and past meaningful experiences) are focused on qualitative information (Schulenberg & Melton, 2010).

Rotter's I-E Scale (Internal-External Locus of Control Scale) is a 23-item, forced choice items and six filler items scale. It measures locus of control, which in social

psychology, shows the extent to which respondents believe that they can control events affecting them rather than having events controlled by outside forces or other people (Klockars & Varnum, 1975).

Lastly, projective techniques such as the Hand-Test can also be used. The Hand Test, developed by E. Wagner, is a projective technique that uses simple line drawings of hands in semi-ambiguous poses as a projective medium. It is believed that respondents will project prototypal behavioural action tendencies or lack of them onto the stimulus. The stimuli are pictured on nine cards, and a respondent is asked what a hand might be doing. Responses are recorded verbatim. For the 10th blank card, a researcher asks a respondent to imagine a hand in action (Hoover, 1978).

Some Notes on Non-classical (Cultural-Historical) Psychology Basics

This thesis introduces the simple yet highly valid technique of semantic differential data reduction – semantic universals of Artemeva (see Chapter 2 and Appendix E). The methodological background of semantic universals psychosemantic technique comes from non-classical (cultural-historical) psychology - the activity theory (Leontiev, 2010). This theory was developed in the 1920s by a key founder, Vygotsky, for whom "mental functions are given in the form of social relationships, which serve as the source of the emergence and development of these very functions in man" (Elkonin, 1989, p. 473).

There are two fundamental assumptions in this theory (Robertson, 2007):
(1) Knowledge is mediated through tools and artefacts; (2) The basic unit of analysis is "activity". The activity theory arrived in the West in the early 1970s with the help of the works of Engestrom, a psychologist. The first generation of the activity theory proposed that tools, artefacts, and symbols mediate between the subject and the object (see Figure 7). The

subject refers to who the important actor(s) is (are) in this particular activity. The object is essentially the objective of the activity.

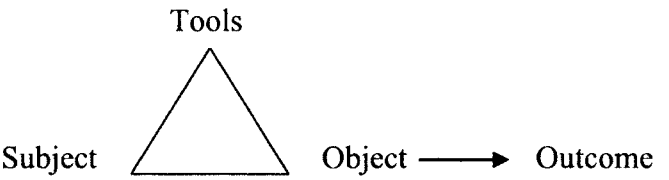


Figure 7. First generation of activity theory (Robertson, 2007).

The second generation of the activity theory (see Figure 8) built its work on the first generation, putting a base to it and adding the notion that activity is a collective activity. The second generation held the idea that when the activity is undertaken, there is a set of implicit and explicit rules dictating which activity would occur and why. In addition, in the second generation there was a community of actors involved, and there was the division of labour, which refers to who does work.

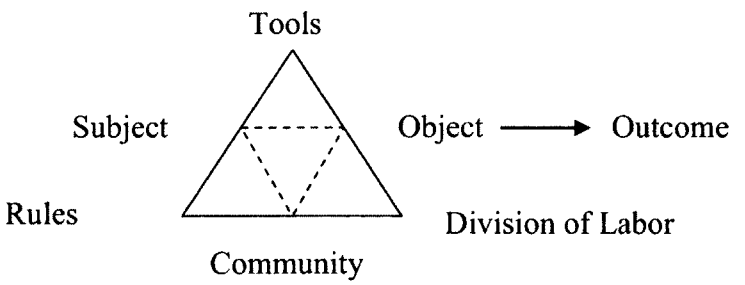


Figure 8. Second generation of activity theory (Robertson, 2007).

Mwanza and Engestrom (2003) elaborate the key concepts of the activity theory shown in the Table 1.

Table 1

Activity Theory Key Concepts Explained

Activity	What sort of activity?
Object(ive)	Why is the activity taking place?
Subjects	Who is involved?
Tools	What means are used in performing the activity?
Rules and regulations	Are there any cultural norms, rules or regulations?
Division of labour	Who are responsible for what and are those roles organized?
Community	What is the environment in which this activity is being carried out?
Outcomes	What is the desired outcome?

In the third generation of the activity theory, the subjects started to interact (see Figure 9). If two people were involved in an activity, there was an open discussion, open debate, and open reflection on practice. As a result, there was a potential for expansive learning, which helped people achieve more collectively rather than separately.

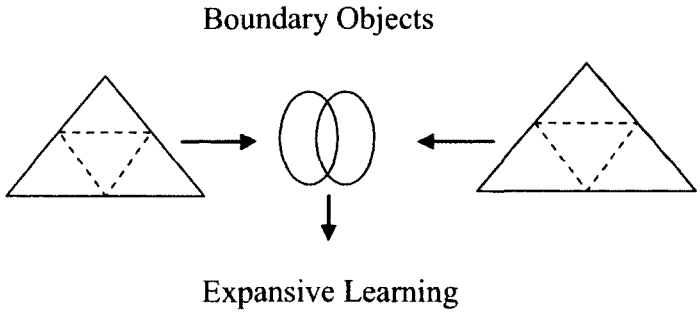


Figure 9. Third generation of activity theory (Robertson, 2007).

Activity is not a composition of behaviours that a person exhibits to adapt to the environment, but rather a complex, structured, dynamic system with its own actions, motives,

and operations (Leontiev, 1975). Cooperation and social interaction of people is a social core of the activity. Intellectual activity is also a type of activity. "Thinking," as viewed by Ilyenkov (1977), "is not the product of an action but the action itself" (p.35). Vygotsky (1981) distinguished as psychological tools not only manual actions but also mental actions. Vygotsky gave the following list of psychological tools: "language; various systems for counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps, and mechanical drawings; all sorts of conventional signs; etc." (Vygotsky, 1981, p. 137). Both signs of different semiotic systems and material instruments were included in Vygotsky's list of psychological tools. Using different systems of signs, such as speech, a person as a social entity regulated interactions with the environment and regulated his/her behaviour.

The concept "image of the world", which is used in the discussion part of this thesis, was defined by Golovin (1998) as the holistic, multilevel system of the ideas a person has about the world, about other people, about himself/herself, and his/her own activity. In the activity theory, the holistic part of the concept of the image of the world is based on the unity of the objective world and the systemic nature of human activity reflected through a person's image of the world. Activity-like qualities of the image of the world are demonstrated through the presence of not only the space-time coordinates of the physical world but also through the fifth quasi-dimension system of meanings comprised in themselves as the result of joint social practices of people. The continuous generation of the interconnected system of the cognitive hypotheses, directed towards the external stimuli, is an expression of the active nature of the image of the world. This contrasts with the traditional ideas about the

cognitive images appearing as a result of reflective processes – neural reactions that are developed in response to the external exposure.

Finally, activity theory is a powerful descriptive tool that provides a language as well as a conceptual paradigm to examine activity where mediation between a subject and an object is central (Engerstrorm, Miettinen, & Punamaki, 1999). This, in turn, can be helpful in understanding and describing the origins, dynamics, and distinctions of attitudes.

Additional Findings on the Analysis of Semantic Differential

In western psychology there are only two methods of data reduction used for semantic differential: factor analysis and cluster analysis. The latter is not very popular. The third method of data reduction of semantic differential, which was introduced to western psychology in this research for the first time, is the group semantic universals method of Artemeva. Artemeva's method is not only a very simple method requiring no special statistical programs, but also a method with greater reliability and validity than both factor and cluster analyses, often used for semantic differential data reduction (Serkin, 2008). The group semantic universals algorithm and empirical rules are described in Appendix E.

The group semantic universals method is a set of invariable ratings of semantic differential distinctive to the majority of a homogeneous group of respondents (Artemeva, 1999). The simplest analysis of semantic differential results computes the frequency of most common ratings in a group of participants. A high frequency suggests a significance of the semantic value represented in the minds of a studied group. These significant values represent group semantic universals. The algorithm of the method of group semantic universals does not require computer support, as do other semantic differential analysis methods such as factor or cluster analyses. The method of group semantic universals is more

valid than factor or cluster analyses because it is free from limitations of mathematical modeling. A minimum of 15 participants is required to obtain valid group semantic universals results with 75% level of frequency. The level of frequency can be 80% or even 90% to increase representativeness in group semantic universals. In comparison, factor analysis requires a minimum of 200 respondents for the results to be viable (Tabachnik & Fidell, 2007).

The method of group semantic universals is free from the following limitations of factor and cluster analyses: (1) Controversies over levels of measurement of semantic differential scores and applicability of factor and cluster analyses; (2) Subjectivity in naming factors and clusters; and (3) Partial loss of data in factor analyses. These limitations of factor and cluster analyses suggest some incentives for future research to compare the results of factor, cluster, and semantic universals methods. However, in accordance to the literature review for this thesis, cluster analysis is not a popular data-reduction statistic technique for semantic differential. Moreover, Osgood et al. (1957) used only factor analysis as a data reduction in the original work. The procedures of factor and cluster analyses are automated and come with statistic software (e.g. SPSS). Therefore, these procedures are not discussed in this research.

The validity of the group semantic universals method has been demonstrated in Artemeva's (1999) research by the methods of semantic reconstruction: semantic universals obtained from one group of respondents were presented to other groups of respondents with requests to name (construct) an original object or select the original object from other objects. The results of the methods of construction and selection of the object, in the research of Artemeva (1999), had high levels of degrees of confidence equal to .01.

Additional Considerations of Semantic Data Collection

To grasp a better picture of the attitudes of a studied population, it is important to recall that the main research methods in psychology are observation and interview. The standardized psychological techniques, such as semantic differential, are secondary in regards to the main psychological methods; however, without standardized results the complete psychosemantic picture of attitudes would not be evidential. According to Serkin (2008), the main psychological methods of observation and interview cannot be truly standardized, and their results can be inapplicable for statistical analysis. The interview and observation in the context of psychosemantic is troublesome. Supposedly, a researcher gives a pile consisting of questionnaire blanks, psychosemantic techniques, consent forms, and so forth to a statistically significant sample of a few hundred and usually more respondents. This would take many hours for respondents to process. Besides, it is known that an average respondent is able to concentrate on a task for no more than 1.5 - 2 hours (Serkin, 2008). The completed forms have to be properly filed. After the proper completion of the forms, a researcher has to conduct a lengthy interview with each respondent asking free content addressable questions with following lengthy answers and discussions. During interviews and following longitudinal interviews, a researcher has to conduct a variety of observations. The psychosemantic observations are concentrated on distinguishing deeper meanings of the behaviour. For example, by the observation of how a person is dressed, one can have some insights into whether that person got ready for work, for the theatre, or for fishing. Experienced observers can describe the social status or the psychological state of a respondent by his/her appearance. In many different closed social groups there are specific gestures and words, the meaning of which is only known to them. The psychological

literature has a description of one manager who was writing "authorize" on business forms. Worthy of note was that the manager's subordinates knew if "authorize" was written in green it was valid, but when the word was written in red, it meant to mark time and to create a reason for a rejection of a business deal (Serkin, 2008). Lastly, during an interview a researcher can ask respondents about goals and motives of behaviour.

Importantly, during the analysis of the results of the interview, a researcher has to take into account that motives of behaviour, as a rule, are not recognized and not verbalized by respondents, and that respondents usually explain their behaviour with rationales. These rationales toward a studied object are easily tested with Likert-type scale questionnaires. For this purpose, respondents can honestly believe that their rationales are true motives of their behaviour (Serkin, 2008; Umiker-Sebeok, 1987). During an interview an experienced observer, generally, can distinguish implicit semantic components of a verbal response (presupposition of that response), which are not expressed explicitly, but are inferred meanings of the participants' responses both verbal and nonverbal. This inferred meaning is usually obvious in the context of a specific situation and unknown without that context. For example, a person, who is not familiar with public healthcare in Canada, may consider that someone's personal concern about the cost of televisitation may be reasonable because televisitation in that person's place of residence has to be covered by users. The content of the meaning of a studied object can be formed under the influence of many factors, which a researcher has to take in account. For instance, Bondarchuk (2007), when constructing a complete semantic profile of miners' attitudes toward mining, used results of observations (diversity of living conditions, groups and styles of intercommunication, info-media, patterns of sleep, rest and wakeful state, and security), interviews (actively expressed

negative attitudes toward mining: lengthy isolation, closed group of intercommunication, severe conflicts, rugged environment, and hard work conditions but, on the other hand, rationalizing of its personal importance - "there is no way out", "need to feed family"), and biographical methods (summer - work, winter - no work). Without these findings, the results of semantic differential in Bondarchuk's (2007) study would have been quite limited or "extemporized" because the environment of the formation and development of miners' attitudes toward their labour would have been unknown. On the other hand, the availability of semantic differential's group results, or any other standardized technique's group results, makes psychosemantic research statistically evident.

The results of interviews, observations, and standardized techniques, such as semantic differential, can be compared. The results from semantic differential can also be compared with the results of Likert-type questionnaires, other techniques such as the Purpose in Life Test (PIL), Rotter's I-E scale, and projective techniques such as the Hand-Test to get a more complete picture of the content of the meaning forming attitudes toward studied stimuli.

Finally, a researcher has to decipher a deeper semantic picture of the studied attitudes subjectively. This process of subjective deciphering is important in understanding the whole picture of studied attitudes (Serkin, 2008). However, in market research, the results from semantic differential can be sufficient from a practical perspective since to get statistically significant results from a valid semantic differential technique would not take a lot of time and resources. In addition, the parts of attitudes studied with semantic differential are practical because they show the measure of inner motives toward a studied object (Serkin, 2008; Umiker-Sebeok,1987). Therefore, the statistically viable results of semantic

differential are essential for marketing research to make a decision if a studied product would be sold or/and used.

Summary

Televisitation is a part of the telehealth system, which is based on ICT. It provides social support in healthcare settings, in nursing homes, residential homes, and paediatric care units where the collocutors' physical presence is not available. It is possible that televisitation can be applicable in other areas, but the literature search on televisitation was limited to the above-mentioned areas of healthcare.

Televisitation is a new and understudied system delivering social support in healthcare through ICT. The majority of papers on satisfaction with televisitation represent conscious levels of attitudes toward this healthcare delivery system. The main topic in the papers is the reasoning of respondents about televisitation, not true motives. This usually inadequately projects respondents' reactions toward the studied object. These reactions are relatively unimportant to marketing research. The true motives, not just mere reasoning, can usually suggest if the studied product would be used or bought by consumers. Understanding these motives can help decrease financial losses in marketing, and correspondingly, in the healthcare environment.

The literature review presented in this thesis did not touch upon the subjects of factor and cluster analyses in depth because these tools are standard and well presented technical procedures. Factor and cluster analyses relate to this study circumstantially. The most readily available and useful technique to predict adequate reactions toward a studied object is semantic differential. Factor and cluster analyses are the two methods of treating semantic differential data described in western psychology; however, factor analysis is the most frequently used. The third method - group semantic universals - was shown to be a very

effective tool for treating semantic differential data as well. It comes from the realm of non-classical (cultural-historical) psychology. This psychology trend can be a descriptive instrument in explaining the dynamics of attitudes.

Chapter 3: Method

Research Method

This research is a semi-randomized study implementing the semantic differential scaling method which is a highly reliable (Osgood et al., 1957; Osgood & Snider, 1969) and a credibly valid paper-and-pencil attitude scale (Harvey, 2000; Heise, 1969; Katzer, 1968; Lemon, 1973).

Bowles (1986) stated that: "(1) Semantic differential is a greatly acceptable and frequently used measurement instrument of attitudes; (2) It is readily available for statistical techniques for validation purposes; (3) It can be completed in a timely manner; (4) Semantic differential is a versatile technique because it can be used in a variety of populations; and (5) It has been also used successfully in cross-cultural studies" (p.82). In addition, Kerlinger (as cited in Thompson, 1980) reported that the semantic differential technique had been shown "to be sufficiently reliable and valid for many research purposes..., [and is] flexible and relatively easy to adapt to varying research demands, quick, and economical to administer and to score" (p.110). Finally, this psychosemantic technique helps to elicit fine points of connotative meaning of objects, events, and concepts, which are not normally identified by other methods (Eagly & Chaiken, 1993; Foxall & Goldsmith, 1994).

The semantic differential contains one concept and one or more bipolar adjective pairs. Usually seven equal intervals separate these adjective pairs. A respondent is instructed to indicate his/her affective reaction to the concept by marking an interval between adjective pairs. These marked adjective pairs form an attitude scale. Typically, the resulting adjective scales for each respondent can be grouped independently, which represents different aspects or dimensions of the respondents' attitudes toward the concept. The scales

within one factor are related. They also measure the same dimension of attitudes. Factor analysis followed by orthogonal (i.e. independent) rotation is a standard method for reducing the number of variables (Katzer, 1972).

Research Procedures

This study used the scales from the thesaurus study, which consist of 76 core English adjectives (Osgood et al., 1957, pp. 47-66). These adjectives were validated and adjusted by experts (UNBC's telehealth team members) in the telehealth/televisitation area (n = 7). The experts were also asked to suggest additional adjectives appropriate to the subject of the study. The ends of adjective scales (positive and negative) were reversed by the flip a coin method in order to minimize response set bias (Katzer, 1972). A Kit 1 with instructions, adjectives, a consent form, and information on the research itself was available for the experts after ethical approval (see Appendix A). The result of this first step of the study was a prototype semantic differential scale containing 49 adjective pairs (see Appendix B).

The second step was a pilot study. The pilot study was a necessary step in order to obtain feedback on the clarity of instructions, the scale's relevance to the studied concept, and possible comments and suggestions about the study. A direction sheet was adapted from Osgood et al. (1957). Kit 2 (see Appendix B) with a direction sheet also included information about researcher and the research itself, a consent form, and a demographic survey. The pilot study involved 30 students randomly approached at UNBC; 14 completed were returned.

The final study involved a larger group of UNBC students (n = 204). The number of 200 or more respondents was determined by the minimum required for valid factor analysis results (Tabachnik & Fidell, 2007). The pilot study also determined a very low response rate

– 14 responses in 3 months. Thus, an on-line version of the survey using the web-based tool Surveygizmo was developed. The posters with a link to the on-line survey were available in UNBC with prior ethical committee permission (see Appendix C). In addition, some large graduate and undergraduate UNBC classes were selected for the study. The professors of these classes were contacted via email with the request to gain permission to conduct an approximately ten-fifteen minute on-line study. The professors and students were notified of the voluntary nature of the research and the freedom of participation. To stimulate participation, a money draw was announced (see Appendix C). The online survey was closed in February 2010 with 204 fully completed responses.

SPSS 17 (2008) was used to factor analyze the data from 204 responses on adjective scales using quartimax orthogonal (i.e., independent) rotation, following procedures in Bowles (1986), Katzer (1972), and Osgood et al. (1957). The initial hypothesized number of orthogonal dimensions was rotated and this way simplified. Dimensions that accounted for a large percentage of the total variance were selected for the interpretations (Katzer, 1972). As a result of the factor analysis, the Televisitation Attitude Scale (TAS) with 12 adjective pairs of one dimension was developed for measuring attitudes toward televisitation (see Appendix D).

In summary, televisitation-specific adjectives were selected and verified by telehealth/televisitation experts. Next, the prototype semantic differential scale was constructed. After the pilot study, the online version of the prototype semantic differential scale was administered to 254 (204 full responses) UNBC students, and the resultant data was statistically analyzed and interpreted for 204 full responses. As a result, the 12-item TAS was developed. Finally, the semantic space of attitudes of the students toward

televisitation was drawn, and statistically significant differences in subpopulations of UNBC students were outlined. The XLSTAT - Pro 7.5 was used to graphically represent TAS results of UNBC students and their subpopulations (XLSTAT, 2007). Table 2 illustrates the research procedures.

Ethical Considerations

The UNBC Research Ethics Board granted research ethics approval for conducting this study. All research data was de-identified and stored on a password-protected computer, and all paper data was stored in a locked office.

Table 2

Research steps outline

Research Steps	Timeline	Participants	Purpose	Research step procedure	Results and difficulties
1.Construction of the prototype TAS	May-July 2009	8 UNBC telehealth experts	The development of the prototype TAS.	Development of Kit 1 (see Appendix A). Kit 1 contained: participant information sheet, informed consent form, demographic survey form, bipolar adjective pairs selection form (76 adjective pairs) with instructions. Kit 1 was presented to 8 UNBC telehealth experts who were told to choose adjectives that, in their opinion, would describe televisitation.	Results: the 49 adjective pairs were selected from 7 fully completed kits. Difficulty: the lack of a clear framework on how to conduct a study involving semantic differential psychosemantic technique.
2. Pilot study of the prototype TAS	July-September 2009	30 UNBC students	Test clarity of instruction, definition of televisitation, and meaning of adjectives. Test scales' relevance to the concept of televisitation. Test the time taken to complete the survey. Receive comments and suggestions about the study.	Kit 2 (Appendix B) was developed including participant information sheet, informed consent form, demographic survey form, instructions and the televisitation scales, and comments form. Kit 2 was given to 30 randomly selected UNBC students.	Results: 100% of participants understood the instructions and definition of televisitation. 86% of participants understood the mining of all adjectives. The average time to complete the questionnaire was 12.5 minute. Difficulty: low response rate (14 out of 30 in almost 3 month period); therefore, a web-based survey was developed.

(table continues)

Table 2 (continued)

Research Steps	Timeline	Participants	Purpose	Research step procedure	Results and difficulties
3. Testing and Validating of the prototype TAS	November 2009 - February 2010 (data collection)	254 UNBC students	To develop TAS. To explore attitudes toward televisitation of UNBC students as a first attempt to introduce semantic differential attitudes study in televisitation acceptance research.	The on-line version of Kit 2 was developed and used through Surveygizmo. To stimulate participation a money draw was announced in recruitment poster (see Appendix C). The recruitment of UNBC students was conducted via posters and via emails. Data was statistically analyzed with SPSS 17. Semantic differential charts were drawn with XLSTAT-Pro 7.5.	Results: there were 254 logins with 204 fully completed surveys (80%). 204 fully completed responses were analyzed. As a result of factor analysis, the TAS (12 adjective pairs) was constructed (see Appendix D). The semantic space of UNBC students' attitudes toward televisitation was drawn. The semantic spaces of the attitudes of subgroups UNBC students were also drawn. Difficulty: the level of measurement of semantic differential scale data was not clear from lit review to proceed with statistic analysis.

Chapter 4: Results

This chapter reports on the findings of this study. The chapter is organized along the steps of the study. In the first step, the seventy-six adjective pairs were offered for selection to eight UNBC telehealth experts (7 - fully completed). They had to choose the adjectives that were, in their opinion, appropriate to describe televisitation. At the end of the first step, forty-nine adjective pairs were included in a prototype semantic differential. In the next pilot study step, the prototype semantic differential form was submitted to thirty randomly approached UNBC students. As a result, only fourteen fully completed prototype semantic differential forms were returned. It took almost three months to complete the pilot study showing a very low response rate (14 responses over 3 months). Therefore, the plans for the next third step of a paper based survey, where at least 200 UNBC students had to be involved, were changed. Thus, in the third step, the online survey with forty-nine adjective pair prototype semantic differential forms was launched in the fall of 2009. The number of UNBC students who logged in for the survey was 254. At the beginning of 2010, when 204 (200 is a minimum number required to acquire valid factor analysis results) fully completed surveys were submitted online, the survey was closed. The response rate had increased significantly (204 responses over 3 months). The next step included statistical treatment of the data from 204 UNBC students' responses to 49 prototype semantic differential scales. Factor analysis reduced the data to 12 adjective pairs comprising one semantic space - evaluation. These 12 adjective pairs were included in the final semantic differential specific to televisitation - Televisitation Attitude Scale (TAS). Finally, the semantic space of the attitudes toward televisitation of UNBC students was drawn showing a positive tendency. The semantic spaces of significantly different subgroups of UNBC students were also drawn.

Independent sample t-tests determined those differences. Female UNBC students, students with children, students born in Canada, and students who were born in British Columbia had more positive attitudes toward televisitation when compared to male UNBC students, students with no children, international students, and students who were born outside of British Columbia, respectively. These differences were graphically represented in semantic differential charts drawn in XLSTAT - Pro 7.5 (XLSTAT, 2007). Finally, the semantic differential descriptors of the attitudes of UNBC students toward televisitation were outlined at the end of this chapter.

First Step: Adjective Selection by Telehealth Experts

A prototype Kit 1 was developed for the first step of the study (see Appendix A). This step lasted from the beginning of May to the beginning of July 2009. Following procedures in Bowles (1986), Clevenger, Lazier, and Clark (1965), and Katzer (1972), seventy-six core English adjectives from the thesaurus study were given to eight experts (UNBC's telehealth team members) in the telehealth area for their selection. One expert did not follow the instructions, and that person's response was omitted. Out of the remaining seven experts, five (71%) were female and two (29%) were male participants. The mean participant's age was 46.8 years (SD = 9.05 years), and all experts were Caucasian Canadians. Among all participants, six were married and with children (86%), and one was single and without children (14%). Four experts participating in this step of the study held Doctor of Philosophy (PhD) degrees (57%), and three held Master of Science (MSc) degrees (43%). Finally, six experts reported that they did not have any relatives or friends receiving care in a nursing home or a hospital at the time of the research (86%) while one stated the opposite (14%).

As a result of the first step, forty-two adjective pairs (shown in Table 3) were selected as the most frequently chosen by telehealth experts. Three adjective pairs (ineffective-effective; unreliable-trustworthy; authoritative-undependable) were added as per suggestions of one telehealth team expert, and four adjective pairs (cruel-kind; unfriendly-friendly; weak-strong; small-big) were selected from the Katzer (1972) study. In fact, Clevenger et al. (1965) emphasized that "any number of bipolar scales may be included [in the study], and their composition is limited only by the purposes and imagination of the investigator" (p.80).

Table 3

Adjective Pairs (n = 42) Chosen by Telehealth Experts

Adjective pairs		
optimistic-pessimistic	negative-positive	interesting-boring
incomplete-complete	reputable-disreputable	insensitive-sensitive
heavy-light	untimely-timely	aggressive- defensive
sociable-unsociable	constricted-spacious	near-far
passive-active	serious-humorous	intangible-tangible
ungrateful-grateful	stable-changeable	extraneous-inherent
good-bad	fast-slow	competitive-cooperative
awkward-graceful	complex-simple	periodic-erratic
painful-pleasurable	rational-intuitive	naive-sophisticated
successful-unsuccessful	orthodox-heretical	public-private
high-low	healthy-sick	subjective-objective
meaningful-meaningless	old-new	free-constrained
unimportant-important	unusual-usual	sceptical-believing
progressive-regressive	mature-youthful	cold-hot

A resultant prototype semantic differential included forty-nine seven-interval adjective scales, shown in Appendix B under "Instructions and the Televisitation Scales".

This scale consisted of thirty adjective pairs from the evaluation dimension of attitude space, six from potency, four from activity, eight unassigned, and one from aggressiveness.

Second Step: Pilot Study for TAS Development

Next, a prototype Kit 2 was developed for the second step of the research (see Appendix B), and a pilot study was conducted among thirty participants of which only fourteen completed semantic differential scales with comments were returned. This step occurred from the end of July to the middle of September of 2009. Ten females (71%) and four males (29%), eleven married (79%) and three single (21%), eight with children (57%) and six without children (43%), thirteen Canadian/Caucasians (93%), and one non-Canadian/non-Caucasian (7%) participated in the second step of the study. None of the fourteen respondents (100%) had any relatives or friends receiving care in a nursing home or a hospital. Eleven participants were enrolled in Bachelor of Science (BSc) programs (79%), and three were enrolled in MSc (21%) programs. The mean age of the participants was 27.2 years (SD = 7.01 years). The study has indicated that 100% of respondents understood the instructions and the definition of televisitation given in Kit 2. Two respondents (14%) out of fourteen did not understand two adjective pairs (orthodox-heretical; extraneous-inherent), but the adjective pairs were kept since those two respondents were ESL students. The remaining twelve respondents (86%) did not have any problems with understanding the meaning of all forty-nine adjective pairs. The mean time to complete the questionnaire was 12.5 minutes (SD = 4.8 min).

The pilot study revealed a few practical aspects of data collection for the research. For example, it took more than two months to collect data from fourteen respondents out of thirty kits given. The low response rate did not change after numerous friendly reminders.

Therefore, it was necessary to find a solution that could increase the response rate. Swartz, Gabel, and Irani (2009) suggested that an online survey could be the best alternative to increase a response rate in cases with semantic differential. Also, Buchanan and Smith (1999) and Fouladi, McCarthy, and Moller (2002) noted advantages of on-line surveys over paper-and-pencil surveys. As a result, a web-based survey was developed using Surveygizmo Online Survey & Questionnaire Software (Surveygizmo, 2010) – a highly secure and easy to use tool for students and researchers.

Beyond the increased response rate, the web-based procedure had the added advantage of saving at least 2000 printed pages of a paper-based survey. The collected data from the web-based survey could also be easily transferred to SPSS, improving time management of the research.

Third Step: Survey

The web-based survey was launched in November 2009, and it was terminated in February 2010. There were 254 logins with 204 fully completed surveys (80%). Most of the uncompleted surveys were abandoned during the demographic part. Therefore, only the final 204 fully completed responses were analyzed. Age frequencies of UNBC students are shown in Figure 10. The mean age was 24 years (SD = 7.5 years). High kurtosis of 6.127 and skewness to the right of 2.354 indicated a non-normal distribution which was undesirable for the age groups comparison. The demographics of the fully completed responses are shown in Table 4.

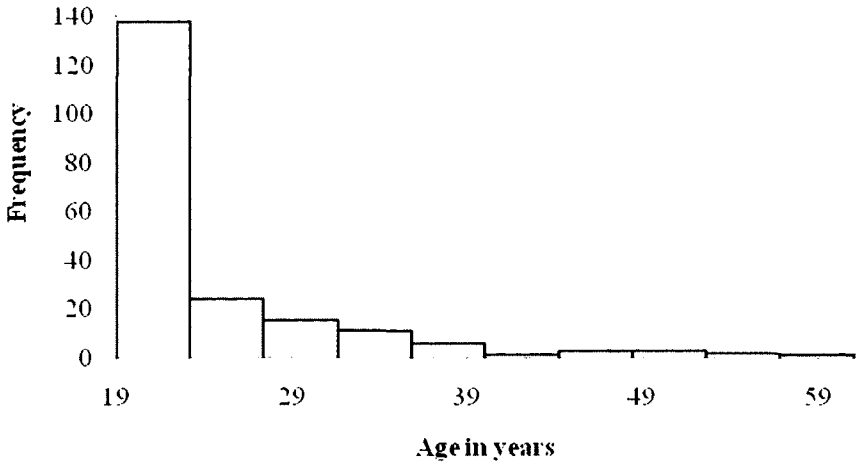


Figure 10. Age frequencies of UNBC students.

Table 4

Demographics of UNBC Students

		Frequency	Percent
Gender	Male	67	32.8
	Female	137	67.2
Marital Status	Never married	168	82.4
	Married/been married	36	17.6
Children	No children	179	87.7
	Children	25	12.3
Country of birth	Canada	179	87.7
	Abroad	25	12.3
Province of birth	British Columbia	140	68.6
	Outside of British Columbia	64	31.4
Ethnicity	Caucasian	171	83.8
	Non Caucasian	33	16.2
Relatives in a nursing home (NH)	No relatives in NH	147	72.1
	Relatives in NH	57	27.9
Education	Undergraduate	169	82.8
	Graduate	35	17.2

Factor Analysis (FA)

As pointed out by Comrey and Lee (1992), a sample size of 200 is considered fair for factor analysis. Normality (skewness and kurtosis) in FA are relatively unimportant; however, if normality significantly fails, the solutions in FA are affected but they remain plausible (Tabachnik & Fidell, 2007). The ± 2SE for skewness was .34 and .68 for kurtosis. The skewness and kurtosis absolute values of adjective pairs which were both less than their ± 2SE indicated normal distribution and were shown with ^{n} in Table 5. According to significances of skewness and kurtosis (z distribution) and the presence of samples of 200 or more the "impact of departure from zero kurtosis and skewness diminishes" (Tabachnik & Fidell, 2007, p. 80). Besides, Brown (1996) emphasised that skewed distribution could be eligible in cases when, for example, the results had to be whether bad or good as with semantic differential data showing attitudes values toward a studied object. Also, the results of the normality of distribution of the affective data, resulting from the semantic differential, are unique to a studied population, and in this way, represent a philosophical importance (Sytsma, 2005). Therefore, normality was not a concern with the data on 49 adjective pairs. Table 5 shows the descriptive statistics on 49 adjective pairs.

Table 5

Descriptive Statistics on 49 Adjective Pairs

	Mean	SD	SEM	CI_{95}	Skewness	Kurtosis
bad-good	1.85	1.12	0.08	1.69 – 2.00	-0.83	-0.04
regressive-progressive	1.77	1.23	0.09	1.61 – 1.94	-1.14	1.05
pessimistic-optimistic	1.67	1.29	0.09	1.49 – 1.85	-1.19	0.91
boring-interesting	1.67	1.09	0.08	1.52 – 1.82	-1.05	1.36
meaningless-meaningful	1.65	1.30	0.09	1.47 – 1.83	-1.08	0.84
unimportant-important	1.64	1.38	0.10	1.45 – 1.83	-1.37	2.01
unsociable-sociable	1.51	1.52	0.11	1.30 – 1.72	-1.06	0.27
ineffective-effective	1.50	1.27	0.09	1.32 – 1.68	-1.02	0.86
negative-positive	1.48	1.38	0.10	1.29 – 1.67	-1.13	0.78

(table continues)

Table 5 (continued)

	Mean	SD	SEM	CI_{95}	Skewness	Kurtosis
old-new	1.34	1.37	0.10	1.15 – 1.53	-0.86	0.50
untimely-timely [n]	1.26	1.29	0.10	1.08 – 1.44	-0.29	-0.54
unsuccessful-successful	1.24	1.16	0.08	1.08 – 1.40	-0.54	-0.04
cruel-kind	1.20	1.31	0.09	1.01 – 1.38	-0.87	0.17
unfriendly-friendly	1.16	1.50	0.11	0.92 – 1.36	-0.78	0.04
ungrateful-grateful	1.15	1.40	0.10	0.96 – 1.35	-0.72	0.25
slow-fast [n]	1.12	1.17	0.08	0.96 – 1.28	-0.31	-0.05
painful-pleasant	1.07	1.21	0.09	0.90 – 1.24	-0.45	-0.10
disrespectful-respectful [n]	1.00	1.18	0.08	0.83 – 1.16	-0.28	-0.62
sick-healthy	0.99	1.51	0.11	0.78 – 1.20	-0.56	-0.68
weak-strong [n]	0.90	1.23	0.09	0.73 – 1.07	-0.18	-0.26
low-high [n]	0.83	1.11	0.08	0.68 – 0.99	0.05	-0.55
constrained-free	0.82	1.54	0.11	0.61 – 1.03	-0.33	-0.97
unreliable-trustworthy	0.77	1.39	0.10	0.58 – 0.97	-0.26	-0.78
passive-active	0.77	1.74	0.12	0.53 – 1.01	-0.66	-0.56
naive-sophisticated	0.76	1.40	0.10	0.57 – 0.95	-0.81	0.49
mature-youthful	0.73	1.17	0.08	0.57 – 0.89	0.09	-0.81
insensitive-sensitive	0.72	1.59	0.11	0.50 – 0.94	-0.60	-0.43
sceptical-believing	0.70	1.53	0.11	0.49 – 0.91	-0.40	-0.61
small-big [n]	0.68	1.17	0.08	0.52 – 0.84	0.09	0.02
intangible-tangible	0.58	1.59	0.11	0.36 – 0.80	-0.53	-0.42
humorous-serious [n]	0.50	1.31	0.09	0.32 – 0.68	0.28	-0.57
intuitive-rational	0.47	1.37	0.10	0.28 – 0.66	-0.02	-0.82
far-near	0.46	1.63	0.11	0.23 – 0.68	0.11	-1.02
erratic-periodic [n]	0.45	1.22	0.09	0.28 – 0.62	0.06	-0.46
private-public	0.42	1.76	0.12	0.18 – 0.67	0.08	-1.31
defensive-aggressive	0.18	1.06	0.07	0.03 – 0.32	0.67	1.48
constrained-spacious [n]	0.16	1.50	0.11	-0.05 – 0.37	-0.12	-0.61
cold-hot	0.16	1.13	0.08	0.00 – 0.31	-0.06	1.20
incomplete-complete [n]	0.15	1.37	0.10	-0.04 – 0.34	-0.10	-0.57
awkward-graceful [n]	0.10	1.33	0.09	-0.08 – 0.29	-0.14	-0.44
unusual-usual [n]	0.08	1.49	0.11	-0.13 – 0.28	-0.07	-0.64
heretical-orthodox	0.07	1.02	0.07	-0.07 – 0.21	0.40	0.91
heavy-light [n]	0.05	1.20	0.08	-0.11 – 0.22	-0.02	0.26
extraneous-inherent	-0.88	0.96	0.07	-0.26 – 0.01	-0.22	1.14
complex-simple	-0.79	1.55	0.11	-0.42 – 0.00	0.23	-0.75
cooperative-competing	-0.71	1.81	0.13	-0.54 – -0.04	0.73	-0.82
changeable-stable	-0.66	1.47	0.10	-0.54 – -0.14	0.76	-0.26
subjective-objective [n]	-0.63	1.48	0.10	-0.58 – -0.17	0.12	-0.51
authoritative-undependable [n]	-0.61	1.22	0.09	-0.56 – -0.22	-0.03	0.53

[n] indicate normal distribution when absolute values for skewness and kurtosis are both less than their ± 2SE.

Next, Pearson correlation was run on 49 adjectives, which showed 10 adjective pairs with correlations below .30 – they were excluded. The first line requirements of Kaiser-Meyer-Olkin's (KMO) measure of sampling and Bartlett's test before conducting the factor analysis were met: KMO = .900 and Bartlett's test was highly significant ($p < .001$). Kaiser (1974) suggested values of KMO greater than .500 as acceptable (values lower than .500 tell a researcher to collect more data or reconsider which variables are remaining); values from .500 to .700 are mediocre; .700 to .800 are good; .800 to .900 are great and above .900 are superb. The data showed a large value of KMO, resulting in confidence about the appropriateness of the factor analysis. Bartlett's test examines the null hypothesis that a correlation matrix does not differ from an identity matrix. An identity matrix is a matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0; as a result, the null hypothesis has to be rejected. Therefore, the test has to be significant (i.e. have a significance values less than .05). If the test is significant, it indicates that the R-matrix is not an identity matrix, and that there are certain relationships between at least some of the variables. Multicollinearity in a correlation matrix was unlikely as none of the variables had high correlations of .900 and above. In addition, singularity, which is the presence of redundant variables, occurs at high correlations above .900. Despite the fact that multicollinearity and singularity can cause logical and statistical problems, they are not important in analysis of structure in cases with factor analysis and principal components analysis (Tabachnik & Fidell, 2007).

The remaining 39 adjective pairs had all three EPA (evaluation; potency; activity) dimensions. These universal attitudes dimensions were originally elicited by Osgood et al. (1957). Table 6 shows the EPA distribution of 39 adjective pairs.

Table 6

EPA Distribution of 39 Adjective Pairs

Dimensions	Adjective pairs
Evaluation (26)	ungrateful-grateful; bad-good; painful-pleasant; unimportant-important; negative-positive; cruel-kind; regressive-progressive; insensitive-sensitive; sceptical-believing; unreliable-trustworthy; unfriendly-friendly; unsuccessful-successful; pessimistic-optimistic; incomplete-complete; awkward-graceful; low-high; meaningless-meaningful; boring-interesting; unusual-usual; untimely- timely; sick-healthy; old- new; disrespectful-respectful; authoritative-undependable; ineffective-effective
Unassigned (6)	intangible-tangible; private-public; cooperative-competitive; erratic-periodic; extraneous-inherent; naive-sophisticated
Potency (4)	constrained-free; constricted-spacious; small-big; weak-strong
Activity (2)	passive-active; cold-hot
Aggressiveness (1)	defensive-aggressive

Principal axis factoring with quartimax rotation, following the procedure of Osgood et al. (1957), was run on SPSS 17 (SPSS, 2008). Quartimax in factor analysis is a type of orthogonal rotation that reduces variables by increasing the distribution of the loadings inside a set of variables across factors. In semantic differential factors are considered to be uncorrelated; that is why orthogonal rotation is appropriate. In cases of orthogonal rotation, the factor loading is a measure of correlation between a variable and a dimension (Katzer, 1972). In fact, the type of rotation and factoring affect results only slightly (Fava & Velicer, 1992; Tabachnik & Fidell, 2007; Velicer & Jackson, 1990). Further still, the other types of rotations were run on SPSS 17 and revealed their low interpretability. Because the great majority of the remaining 39 adjective pairs were from the evaluation dimension, the main

purpose of the factor analysis in this case was to verify that the data of the current study was valid and noncontroversial with fundamental principles of Osgood et al. (1957). The secondary purpose of FA was to avoid heterogeneity and to elicit adjective pairs that best represented the semantic space of UNBC students toward televisitation. Rotated factor loadings are shown in the Table 7.

Table 7

Rotated Factor Matrix on 39 Adjective Pairs

	Factors				
	1	2	4	7	8
negative-positive	.779				
unfriendly-friendly	.738				
bad-good	.729				
meaningless-meaningful	.727				
ungrateful-grateful	.722				
insensitive-sensitive	.702				
cruel-kind	.690				
sick-healthy	.688				
passive-active	.660				
unimportant-important	.660				
sceptical-believing	.658				
unsociable-sociable	.633				.577
boring-interesting	.617				
ineffective-effective	.611				
weak-strong	.599				
pessimistic-optimistic	.596				
unreliable-trustworthy	.552		.469		
naive-sophisticated	.552				
awkward-graceful	.517	.448			
unsuccessful-successful	.510			.425	
painful-pleasant	.502				

Note. Method of principal axis factoring. Rotation method – quartimax with Kaiser normalization; rotation converged in 8 iterations.

As per Tabachnick and Fidell (2007), the adjective pairs which did not have loading above .500 on at least one of the extracted factors were excluded (21 out of 39 adjective pairs remained). The rotated matrix with quartimax rotation showed that four adjective pairs

(awkward-graceful; unreliable-trustworthy; unsuccessful-successful; unsociable-sociable) were complex – loading highly (above .400) on the other extracted factors (see Table 7). Those adjective pairs were excluded (leaving seventeen adjective pairs) to maintain the purity of the variables representing the semantic space of attitudes toward televisitation among UNBC students.

The FA on the remaining seventeen adjective pairs showed that the pair, meaningful-meaningless, was complex on both the rotated and non-rotated solutions. The pair was excluded. Adjective pairs such as passive-active (activity), weak-strong (potency), naive-sophisticated (unassigned) were not from the evaluation dimension. According to Tabachnik and Fidell (2007), a single variable cannot represent a factor. As a result, the remaining thirteen adjective pairs were factor analyzed and revealed that the adjective pair, painful-pleasant, had non-rotated and rotated loadings less than .500. Therefore, the pair was excluded leaving the final twelve variables with factor loadings greater than or equal to .500. The final factor analysis with twelve adjective pairs showed that even the rotated matrix had stable loadings of more than .500 on one factor. These adjective pairs were interpretable and represented a one-dimensional semantic space of attitudes toward televisitation of the studied group of UNBC students. Table 8 shows the non-rotated and rotated factor matrices on the twelve final adjective pairs.

Chronbach's alpha reliability for the final TAS was .91. Following Katzer's (1972) assessment of the reliability of the factor structure, the 204 x 12 data matrix was randomly halved, and each half was factor analysed independently using the same criteria as for the initial set. The resultant rotated factor structures were analogous to each other and to the

total population analysis. The both halves' Chronbach's alpha was .90. Thus, the initially obtained factor structure seemed reasonably reliable.

Table 8

Non-rotated and Rotated Factor Matrices on the Final Twelve Adjective Pairs

	Non-rotated	Rotated
negative-positive	.800	.800
unfriendly-friendly	.763	.764
insensitive-sensitive	.739	.740
cruel-kind	.728	.729
ungrateful-grateful	.728	.727
bad-good	.720	.719
sick-healthy	.675	.675
sceptical-believing	.654	.654
unimportant-important	.653	.653
boring-interesting	.604	.604
pessimistic-optimistic	.577	.576
ineffective-effective	.572	.573

Note. For non-rotated: Method of principal axis factoring; interpretable factors extracted; 8 iterations required. For rotated: Method of principal axis factoring; total 1 interpretable factor extracted; rotation method is quartimax with Kaiser normalization; rotation converged in 3 iterations.

Table 9 shows descriptive statistics on the final twelve adjective pairs. The assessment of means and the corresponding standard deviation would not reflect normal distribution. The examination of skewness and kurtosis did not pose significant abnormalities.

Table 9

Descriptive Statistics on the Final Twelve Adjective Pairs

	Mean	SD	SEM	CI_{95}	Skewness	Kurtosis
bad-good	1.85	1.12	0.08	1.69 – 2.00	-0.83	-0.04
pessimistic-optimistic	1.67	1.29	0.09	1.49 – 1.85	-1.19	0.91
boring-interesting	1.67	1.09	0.08	1.52 – 1.82	-1.05	1.36
unimportant-important	1.64	1.38	0.10	1.45 – 1.83	-1.37	2.01
ineffective-effective	1.50	1.27	0.09	1.32 – 1.68	-1.02	0.86
negative-positive	1.48	1.38	0.10	1.29 – 1.67	-1.13	0.78
cruel-kind	1.20	1.31	0.09	1.01 – 1.38	-0.87	0.17
unfriendly-friendly	1.16	1.50	0.11	0.92 – 1.36	-0.78	0.04
ungrateful-grateful	1.15	1.40	0.10	0.96 – 1.35	-0.72	0.25
sick-healthy	0.99	1.51	0.11	0.78 – 1.20	-0.56	-0.68
insensitive-sensitive	0.72	1.59	0.11	0.50 – 0.94	-0.60	-0.43
sceptical-believing	0.70	1.53	0.11	0.49 – 0.91	-0.40	-0.61

The correlation matrix determinant on the last twelve adjective pairs was .002 and was bigger than .00001. Moreover, there were no correlations bigger than .900. Thus, multicollinearity and singularity did not pose any issues. Most importantly, the KMO measure of sampling adequacy was .927, which was considerably higher than Kaiser's (1974) minimal limit of .500. Therefore, the evidence suggests that the sample is adequate for producing reliable factors.

Bartlett's test examines if the correlations between questions are sufficiently large for factor analysis to be appropriate. The χ^2 (66) = 1198.500, $p < .001$ indicated that the correlations within the R-matrix were sufficiently different from zero to proceed with the factor analysis. The anti-image matrix showed low values, supporting factorability.

Communalities were reviewed to clarify if the variables were well defined by the solution. Communalities show the percent of variance in a variable that matches variance in the factors. As seen in Table 10, the communality values were above .300 indicating no heterogeneity among variables.

Table 10

Communalities on the Final Twelve Variables

	Initial	Extraction
Bad-good	.531	.639
Pessimistic-optimistic	.400	.426
Boring-interesting	.376	.365
Unimportant-important	.446	.458
Ineffective-effective	.383	.341
Negative-positive	.627	.657
Cruel-kind	.537	.577
Unfriendly-friendly	.593	.680
Ungrateful-grateful	.510	.545
Sick-healthy	.499	.462
Insensitive-sensitive	.589	.639
Sceptical-believing	.472	.445

Note. Extraction method: principal axis factoring.

Most importantly, the eigenvalue for factor one, evaluation, is considerably high = 6.144 initial and 5.682 rotated, confirming a presence of one major factor (see Table 11). The Scree plot that is shown in Figure 11 also confirms the presence of one major factor.

Table 11

Eigenvalues on the Final Twelve Adjective Pairs

	Factor 1
Eigenvalue	5.682
Total % variance	47.353
Cumulative %	47.353
Common % variance	91.164
Cumulative %	91.164

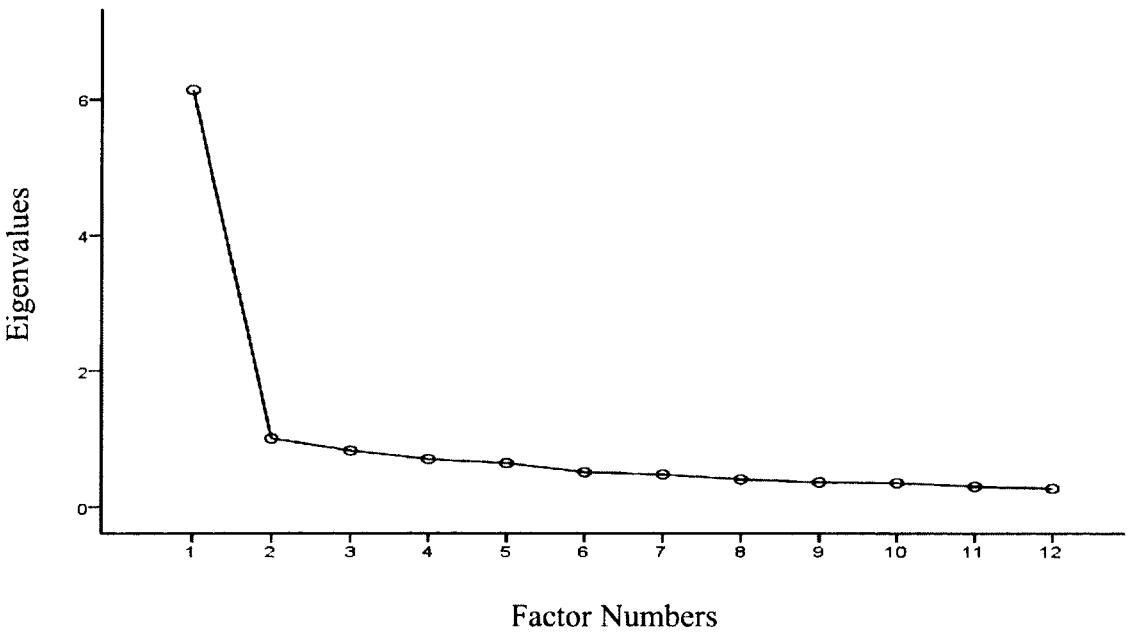
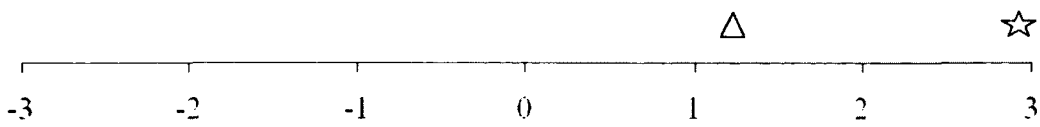


Figure 11. Scree Plot.

Semantic Spaces and Semantic Differential Charts of the Population of UNBC Students

The mean values of all adjective pairs were calculated, and the semantic space of attitudes toward televisitation of the population of UNBC students was drawn on a -3 +3 scale (where -3 is an absolutely negative end and +3 is an absolutely positive end). The attitudes toward televisitation of UNBC students show a positive tendency and are close to

the value of 1.3 as shown in Figure 12. This tendency is significant ($p < .05$) because the confidence interval's lower and upper bounds are both positive values (see Table 9).



△ Attitudes toward televisitation of UNBC students (M = 1.29)
☆ Ideal attitude toward televisitation

Figure 12. Semantic space of the UNBC students.

Next, the mean value of the attitudes toward televisitation of subgroups of UNBC students was compared using independent samples t-test (confidence interval of the difference = 95%, $\alpha \leq .05$). As a result, female students, students with children, students who were born in Canada, and students who were born in BC have more positive attitudes toward televisitation than their opposites. The significant differences in the subgroups according to the t-test are shown in Table 12.

Table 12

Subpopulations of UNBC Students with Significant Differences According to the Independent Samples T-test

Subpopulations of UNBC students		N	M	SD
Gender	Male	67	1.08	.990
p = .049	Female	137	1.39	.960
Presence of children	With children	25	1.45	.800
p = .050	Without children	179	1.27	.908
Country of birth	Canada born	179	1.30	.967
p = .050	Non-Canada born	25	1.24	1.061
Province of birth	BC born	140	1.41	.896
p = .012	Non-BC born	64	1.02	1.092

The significantly different adjective pairs were found by comparing means of the 12 final adjective pairs separately with independent sample t-tests (confidence interval of the difference = 95%, $\alpha \leq .05$). As a result, female (n = 137) UNBC students perceived televisitation as more important, optimistic, and good than male (n = 67) students. The results are depicted in Table 13.

Table 13

Adjective Pairs with Significant Differences in Female/Male Subpopulation of UNBC Students

Adjective pairs	p	M of females	SD	M of males	SD
Optimistic-pessimistic	0.003	1.86	1.220	1.28	1.357
Bad-good	0.002	2.01	1.118	1.51	1.064
Unimportant-important	0.033	1.78	1.321	1.34	1.452

For the subgroup of students with children (n = 25) and no children (n = 179), the t-tests showed one adjective pair (sick-healthy) significant to compare (p = .030). The health aspect of the attitudes toward televisitation in students with children had a significantly higher mean of 1.64 than in students with no children (M = 0.90). Similarly, the health aspect of televisitation was more significant in students who were born outside of Canada (M = 1.60) than in students who were born in Canada (M = 0.90; p = .031).

Another important difference was present after t-tests in subgroups of UNBC students who were born in BC (n = 140) and who were born elsewhere (n = 64). BC-born students showed more positive attitudes toward televisitation than those who were born elsewhere in the world in the adjective pairs shown in the Table 14.

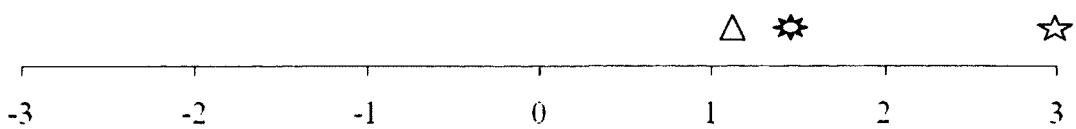
Table 14

Adjective Pairs with Significant Differences in BC Born/Non BC Born Subpopulation of UNBC Students

Adjective pair	p	M of BC born	SD	M of non BC born	SD
Pessimistic-optimistic	0.050	1.80	1.189	1.39	1.465
Ungrateful-grateful	0.048	1.30	1.227	0.83	1.696
Bad-good	0.021	1.98	1.049	1.56	1.233
Negative-positive	0.003	1.69	1.181	1.00	1.643
Cruel-kind	0.018	1.34	1.210	0.88	1.475
Boring-interesting	0.018	1.79	1.014	1.41	1.205
Unfriendly-friendly	0.044	1.30	1.443	0.84	1.596

The subpopulations of UNBC students including division by marital status, age, ethnicity, presence of relatives in a nursing home, and educational level did not show significant differences.

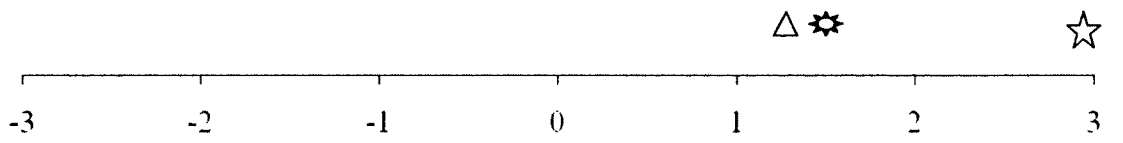
Semantic spaces of attitudes toward televisitation of the UNBC student subgroups were drawn. For instance, Figure 13 shows that the female subgroup of UNBC students showed more positive attitudes toward televisitation than the male subgroup.



☆ Ideal attitude toward televisitation
△ Attitudes toward televisitation of Males (M = 1.08)
✡ Attitudes toward televisitation of Females (M = 1.39)

Figure 13. Semantic space of the UNBC students – male/female subgroup.

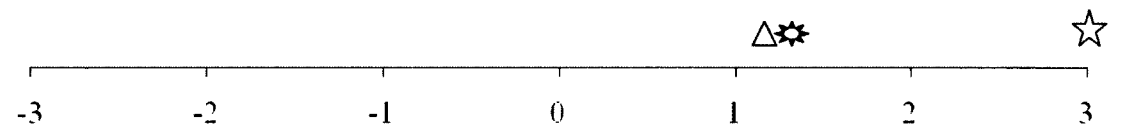
Further, the attitudes toward televisitation of the UNBC students who have children were more positive compared to students without children. Figure 14 shows the difference in attitudes among those subgroups.



☆ Ideal attitude toward televisitation
△ Attitudes toward televisitation of the students who have no children (M = 1.27)
✡ Attitudes toward televisitation of the students with children (M = 1.45)

Figure 14. Semantic space of the UNBC students – with children/without children subgroup.

In fact, the UNBC students born in Canada have more positive attitudes toward televisitation than the students who were born abroad, as shown in Figure 15.

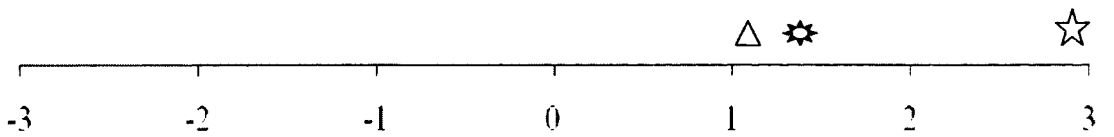


☆ Ideal attitude toward televisitation
△ Attitudes toward televisitation of the UNBC students who were born abroad (M = 1.24)
✡ Attitudes toward televisitation of the UNBC students who were born in Canada (M = 1.30)

Figure 15. Semantic space of the UNBC students – Canada born/non Canada born subgroup.

Finally, those UNBC students who were born in British Columbia (BC) have more

positive attitudes toward televisitation than those students who were born outside of BC. Figure 16 shows the difference in attitudes toward televisitation among the above-mentioned subgroups.



☆ Ideal attitude toward televisitation
△ Attitudes toward televisitation of the students who were born outside of BC (M = 1.02)
✡ Attitudes toward televisitation of the students who were born in BC (M = 1.41)

Figure 16. Semantic space of the UNBC students – BC born/non BC born subgroup.

Finally, to demonstrate the attitude composition toward televisitation of UNBC students and their subpopulations, that showed a significant difference after t-tests, semantic differential charts were generated using the XLSTAT application (as illustrated in Figures 17 to 20).

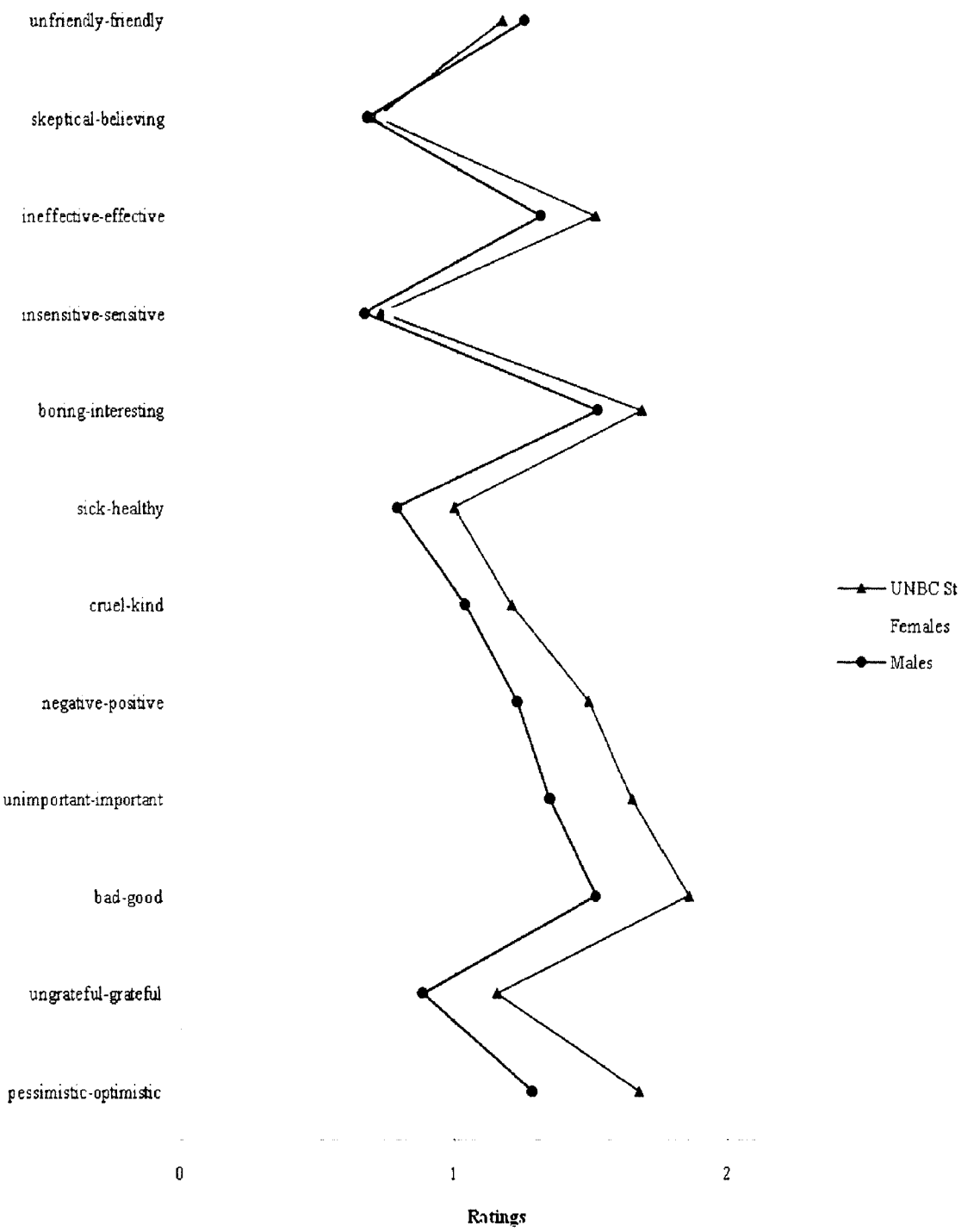


Figure 17. Semantic differential charts of all UNBC students versus female students and male students.

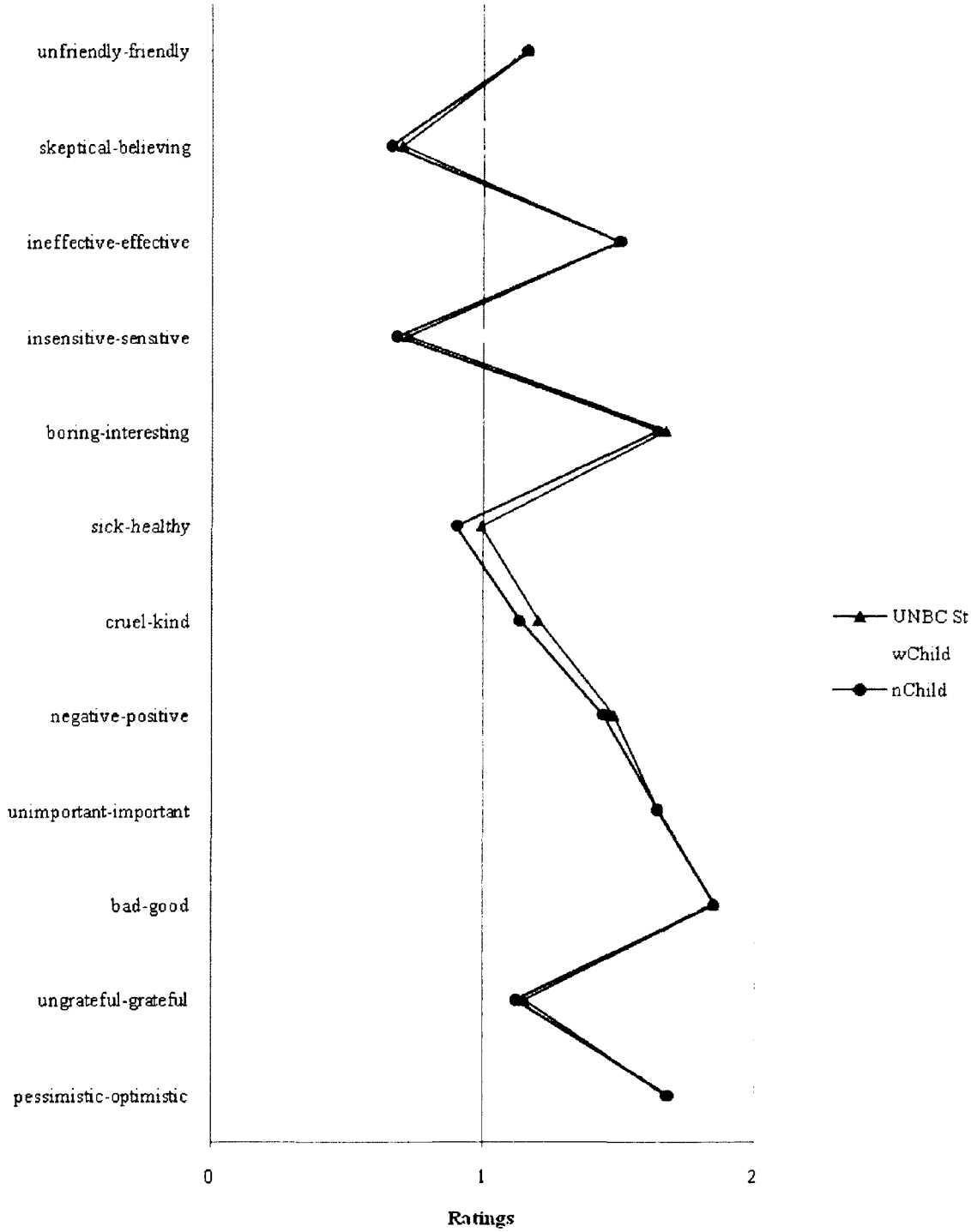


Figure 18. Semantic differential charts of all UNBC students versus students with children and students without children.

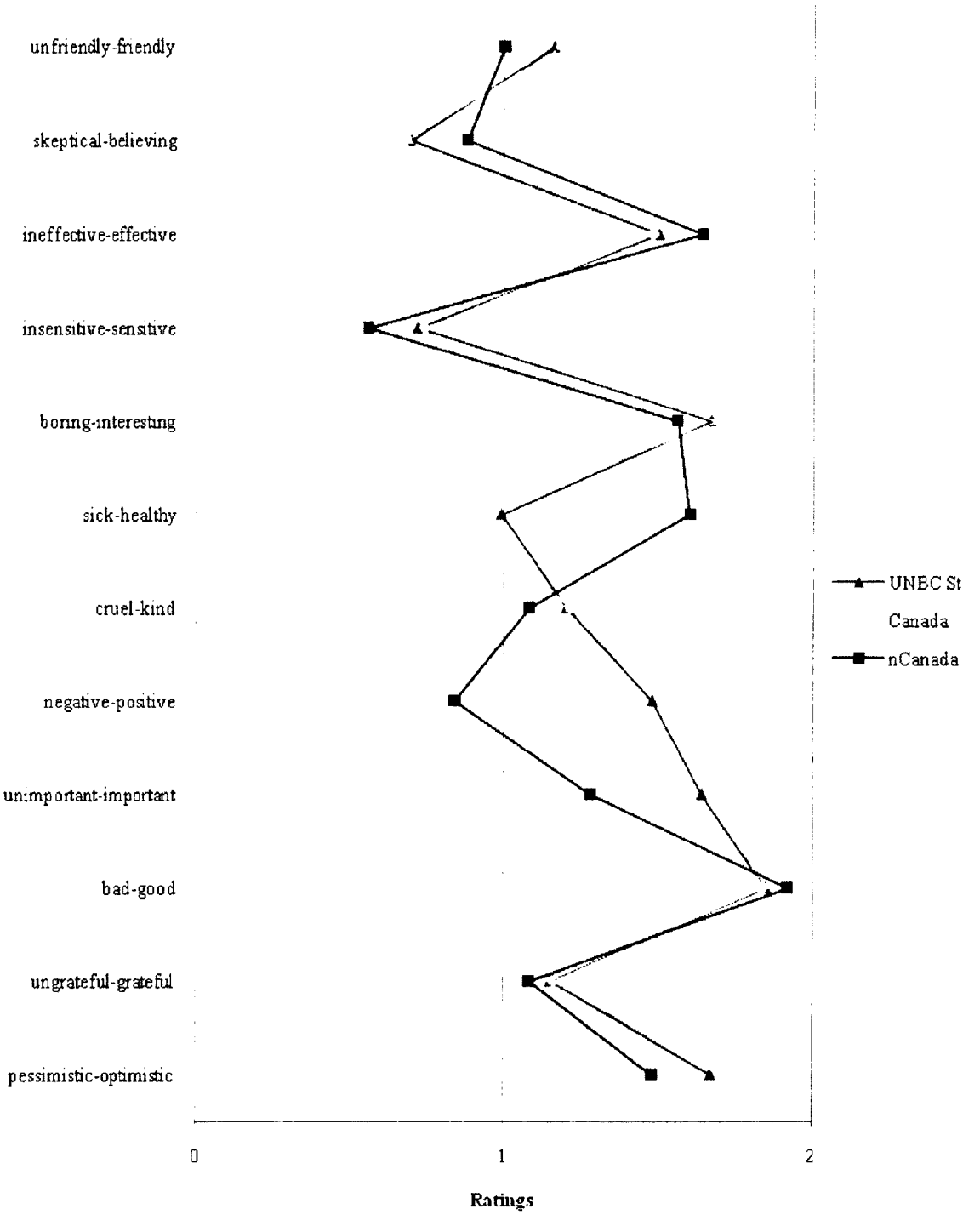


Figure 19. Semantic differential charts of all UNBC students compare to students who were born in Canada and students who were born outside of Canada.

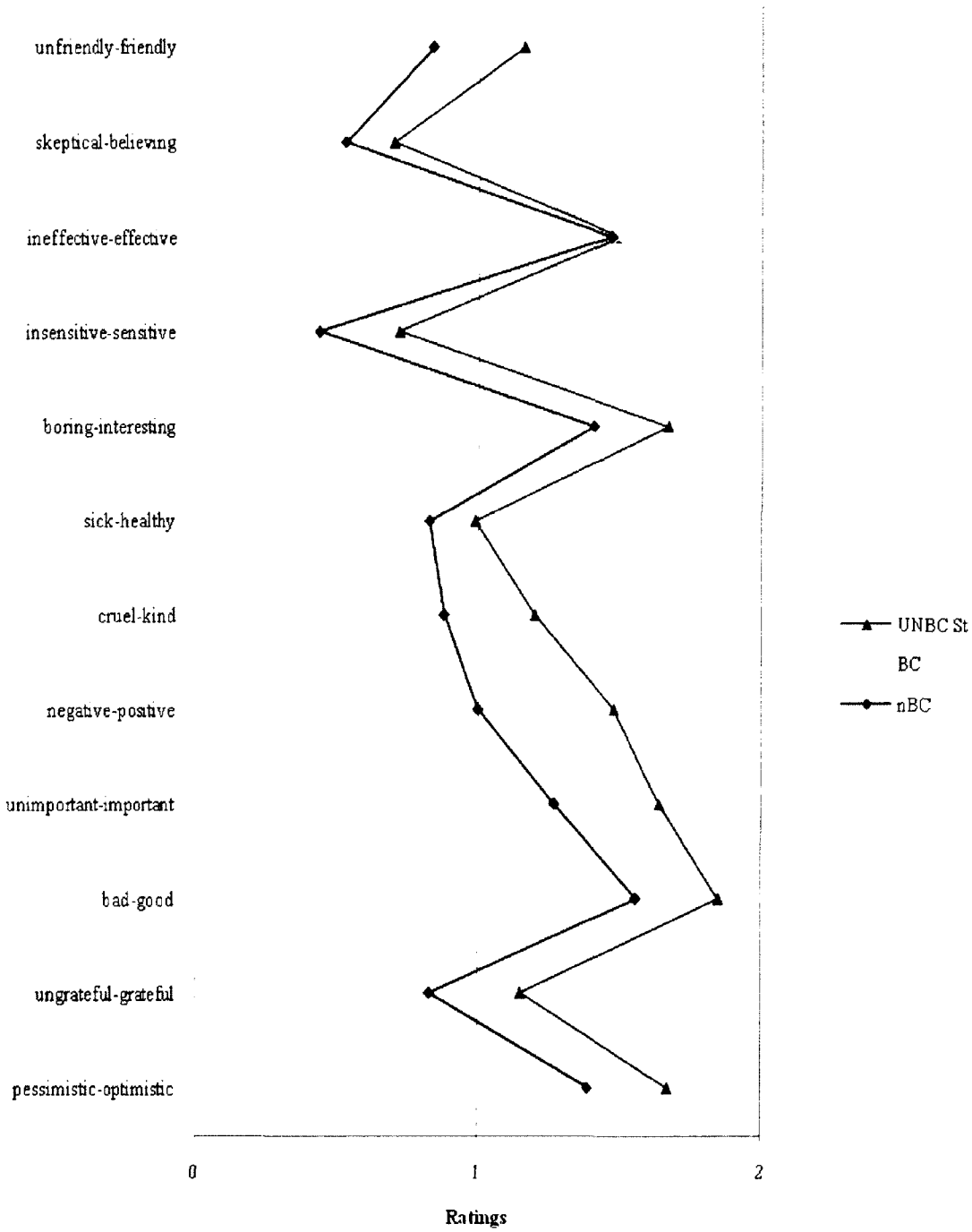


Figure 20. Semantic differential charts of all UNBC students compare to BC born students and students who were born outside of BC.

The semantic differential charts show a general positive tendency in all UNBC students' subgroups in attitudes toward televisitation. In addition, the chart of UNBC students divided by gender clearly shows that the female population has more positive attitudes toward televisitation than the male population has. UNBC students with children generally show more positive attitudes toward televisitation than UNBC students without children. The students with children show a large gap, especially on the adjective pair healthy-sick. The health aspect of televisitation is a higher priority for students with children. However, the students with children have a slight negative shift on the adjective scale for bad-good, unfriendly-friendly, and pessimistic-optimistic, which could be explained by the protective nature of a parent. The attitudes toward televisitation of UNBC students who were born in Canada are characterized by bipolar scales as more friendly, sensitive, interesting, kind, positive, grateful, and optimistic than the attitudes of the UNBC students who were born outside of Canada. However, the health aspect of the attitudes toward televisitation is more positive in the students born abroad. That may be explained by the fact that they are not covered by public healthcare, and televisitation could cost money for them in their subconscious attitudes. Finally, UNBC students who were born in British Columbia show, in the corresponding semantic differential chart, more positive attitudes toward televisitation than UNBC students who were born outside of British Columbia. The final descriptors of the attitudes toward televisitation of UNBC students and their sub-populations on the standard scale from -3 to +3 are shown in the Table 15.

Table 15

The Final Descriptors of the Attitudes toward Televisitation of UNBC Students and their Subpopulations

	UNBC students	Females	Males	With children	Without children	Born in Canada	Born outside of Canada	Born in BC	Born outside of BC
good	+1.85	+2.01	+1.51	+1.80	+1.85	+1.84	+1.92	+1.98	+1.56
optimistic	+1.67	+1.86	+1.28	+1.64	+1.68	+1.70	+1.48	+1.80	+1.39
interesting	+1.67	+1.75	+1.51	+1.92	+1.64	+1.69	+1.56	+1.79	+1.41
important	+1.64	+1.78	+1.34	+1.64	+1.64	+1.69	+1.28	+1.81	+1.27
effective	+1.50	+1.60	+1.30	+1.52	+1.50	+1.48	+1.64	+1.51	+1.47
positive	+1.48	+1.60	+1.22	+1.72	+1.44	+1.56	+0.84	+1.69	+1.00
kind	+1.20	+1.28	+1.03	+1.64	+1.13	+1.21	+1.08	+1.34	+0.88
friendly	+1.16	+1.12	+1.24	+1.12	+1.16	+1.18	+1.00	+1.30	+0.84
grateful	+1.15	+1.28	+0.88	+1.36	+1.12	+1.16	+1.08	+1.30	+0.83
healthy	+0.99	+1.09	+0.78	+1.64	+0.90	+0.91	+1.60	+1.06	+0.83
sensitive	+0.72	+0.75	+0.66	+1.00	+0.68	+0.74	+0.56	+0.85	+0.44
believing	+0.70	+0.72	+0.67	+0.96	+0.66	+0.68	+0.88	+0.78	+0.53

Supplemental Results

According to the main objective of this study, the 12 item Televisitation Attitude Scale was developed. This could be sufficient for a complete thesis work. However, in agreement with the adjunctive purpose of this thesis to introduce additional theoretical concepts in televisitation attitudes research, activity theory was discussed in the literature review. This theory is a powerful descriptive tool which can be applied to televisitation attitudes research as a conceptual framework. Activity theory can potentially give researchers an opportunity to explore attitudes in its dynamics from a wider – socio-cultural/historical view. As pointed by Wilson (2006), activity theory can provide researcher with grounds for using a battery of methods of data collection. This can be applied to a future televisitation attitudes research, and that is why additional, according to activity theory view, methodics studying socio-cultural environment of attitudes were addressed in the literature review. Moreover, the method of Artemeva, developed in the realm of activity theory, was chosen to examine an extra validity of TAS by comparing the adjective pairs, obtained from factor analysis, with semantic universals representing attitudes of UNBC students toward televisitation. However, the semantic universals of UNBC students' attitudes toward televisitation could not be computed due to the empirical rules of the method of semantic universals. Finally, in accordance to the conjunctive aim, this study made the method of semantic universals available to western researchers who can use it as a psychosemantic technique in similar studies.

Chapter 5: Discussions

General Discussion

The results of KMO and Bartlett's tests in this study confirmed the possibility of developing a valid Televisitation Attitude Scale (TAS) answering the first research question. As a result of this research, Kit 3 (see Appendix D) with the TAS was developed.

The TAS results revealed that UNBC students' attitudes toward televisitation have generally a positive tendency. The differences in attitudes of UNBC students distinguished by gender were evident with the female subpopulation being more positive than the male subpopulation. Practically, it can be inferred that in a population with prevalent females televisitation would have a better success. The differences in attitudes toward televisitation of UNBC students divided by marital status were not significant probably because of the limitation of the sample distribution with prevalent single respondents. The subpopulation of students with children showed a significant difference from the subpopulation without children, having generally a more positive attitudes toward televisitation. The differences in attitudes distinguished by age were not possible to determine due to the limitations of age variability in the population sample, with the majority of students being in somewhat the same age group. Geográphical differences in the attitudes toward televisitation were also significant. It can be inferred that a diversity of population of perspective televisitation users, distinguished by place of birth, may affect users' attitudes. Ethnicity was not a factor of significant difference in the attitudes toward televisitation because of the sample distribution limitation, with a prevalent Caucasian subpopulation. The discriminate of the presence of relatives in nursing homes did not show a significant difference nor did the discriminate of educational level. This was also due to the sample size composition with the population of

UNBC students having few relatives in nursing homes and having mostly undergraduate levels of education.

Generally, the UNBC students' attitudes toward televisitation were one-dimensional and had a positive tendency. The results of this study could suggest to a researcher that the attitudes toward televisitation of UNBC students have a rudimentary nature. This is understandable because the general concept of video telecommunication is known to the respondents considering their age, but the implications of it in a healthcare settings are new because televisitation is not yet widely available. As pointed out by Serkin (2008), an important question could arise: "What was evaluated by students?" For example, if respondents are asked to "describe a cat", one part of them would describe their own cat, the other part of respondents would describe their own apprehension of a cat, and the last part would describe the word "a cat" (Serkin, 2008). Therefore, to deploy televisitation among the studied population, at this point, would require a proper education about the studied stimuli. It is necessary to note that "the image of the world" (Artemeva, 1999; Leontiev, 1986) of televisitation or any other stimuli is not constructed during the actual process of perception, but it is adjusted in the mind of subjects. Thus, the psychological or inner pattern of any stimuli, including televisitation, is predetermined by their initial "image of the world" and only corrected during the actual process of perception (Serkin, 2008). This not only explains the facts of the affinity of a stimuli - its image or/and concept, but also makes it sufficient of the current research to determine attitudes toward televisitation even though the respondents are not familiar with the subject. Besides, knowing the current attitudes toward televisitation of a studied group helps to understand if the respondents would use this technology.

The Level of Measurement of Semantic Differential

The great majority of articles and books on semantic differential reviewed in this research lack assertive information on the level of measurement. If semantic differential is a rating scale with an ordinal level of measurement, which at first sight is obvious, then all parametric tests are unavailable for this level of measurement. However, semantic differential, in the majority of literature reviewed, is analyzed with parametric tests. The absence of conclusive information in the literature reviewed for this study about the level of measurement suggests that many semantic differential researchers are omitting that information or are not aware of the situation. Therefore, it is important to clarify the issue with the example of the level of measurement of semantic differential in this research, which can be helpful for future studies.

Drea (personal communication, June 27, 2010), who is Chair of the Department of Marketing & Finance of Western Illinois University, clarifies the situation with the level of measurement:

> Semantic differential scales (two bipolar adjectives), by definition, only have the end points of the scale anchored. When the intermediate points are unanchored, the scale would be an interval level scale. For a measure to be classified as interval the individual response categories must be able to be put in an order and the distance between each point must be known. On a semantic differential scale, both of these conditions are met (i.e., the distance between the first response category and the second response category is the same as the distance between the third and fourth response categories). If the intermediate points are anchored, it would not be a semantic differential scale and would likely be some sort of itemized rating scale.

Thus, a scale that looks like this:

Fun ___ ___ ___ ___ ___ Not Fun

where the five response categories are coded 1, 2, 3, 4, and 5 would be an interval-level measure; however, if any of the three intermediate points had been anchored with a label, it would convert the measure to ordinal level.

Limitations and Delimitations

This study has a number of limitations. First of all, as suggested by Dawis (1987), during the construction of a scale, a small pilot study could give some ideas on "how well the scale format functions, how long the scale takes to complete, and especially, how appropriate the scale items are for the target respondent population" (p. 482). A pilot study conducted in this research determined that the willingness to participate in a paper-based survey was very limited. Despite many friendly reminders, it took almost three months for UNBC students (n = 14), randomly selected for the pilot study, to complete the paper based survey, showing a low response rate. Also, the sample of UNBC students was limited to the undergraduate level of education and to an age distribution mainly concentrated around 24. Moreover, in the pilot study there were two ESL students who did not understand the meaning of two adjective pairs (orthodox – heretical, and extraneous – inherent). Nevertheless, those pairs were kept for the main on-line survey study because there was a low expectation on high numbers of ESL students. It is worthy to note for future semantic differential research that language can be a possible limitation in multicultural samples when the meaning of some English concepts is unknown to the respondents due to language barriers.

Secondly, this study was delimited by the minimum of 200 respondents required to conduct a factor analysis - the essential part of the statistical validation of the TAS

(Tabachnik & Fidell, 2007). Considering the low response rate of the paper-based survey and the large number of respondents required for the study, the online-based survey was deployed. As a result, the online-based survey dramatically increased the response rate. The study was delimited to the UNBC students because it demanded a large homogeneous sample; UNBC students could be potential televisitation users. The sample served the purpose of testing a new paradigm in televisitation acceptance research.

Next, the method of group semantic universals was not applicable for this research because the data had an exception according to the empirical rules of group semantic universals (the maximum absolute value of the means from one of the ends of the scale was less than 1.25). In this research, the maximum absolute value from the left was -0.392 and the maximum absolute value from the right was 1.848. The general positive shift of attitudes toward televisitation of UNBC students can explain the unavailability of the group semantic universals in this research.

Finally, the papers on semantic differential reviewed in this thesis lack the qualitative analysis of semantic differential data. As a possible benchmark to psychosemantic televisitation research, the potentials of qualitative analysis of the group semantic universals method results are touched upon in the literature review. The lack of qualitative analysis of semantic differential data in the papers reviewed in this thesis is understandable because attitudes in classical psychology are viewed as simple reactions to stimuli, whereas the activity theory (the paradigm of group semantic universals) views attitudes as dynamic processes. Qualitative analysis may include the qualitative analysis of semantic universals of different objects of one group or homogenous groups of respondents, semantic universals of one object from different groups of respondents, or the dynamics of semantic universals

during gaining of experiences (in educational activity, in practical activity, in joint activity, in transmission of patterns of culture activity). It carries inferences about the specifics and dynamics of representation of these objects in the consciousness of the respondents. The comparison of semantic universals allows a researcher to discuss the array of concurrent and different characteristics, inferring possible causes of these concurrences and differences (Serkin, 2008). Group semantic universals implicitly describe variables in cases when an explicit description of variables is not available, by building a hierarchy of semantic descriptors of stimulus in accordance to their weight.

Chapter 6: Conclusion

General Conclusion

The main aim of this study was to develop and validate the semantic differential technique available to help researchers to understand better the attitudes toward televisitation in a group of intended participants. Per this study's aim, the TAS consisting of 12 adjective pairs (evaluation dimension) was developed. The main aim was achieved by measuring the televisitation attitudes of UNBC students. The differences in televisitation attitudes within the UNBC student population distinguished by gender, presence of children, and place of birth were statistically significant and reflected in this study.

This research was implemented in four stages. The purpose of the first stage was to have televisitation experts choose from seventy-six core English adjectives – the ones that, in their opinion, would fit the description of televisitation. As a result, forty-nine adjective pairs remained. The second stage was a pilot study where 49-adjective-pair prototype semantic differential was administered to thirty respondents (14 fully completed). The pilot study helped to get some insights on how this technique would be conducted in a real-life environment. The third stage included the development and administration of an on-line semantic differential technique with 49 adjective pairs to 254 UNBC students (204 fully completed). This stage was not originally intended to be the on-line survey, but the pilot study showed an unavailability in a timely manner to administer the paper and pencil semantic differential technique to a large population of students. The fourth and final stage of this study involved statistical analyses of the data. This stage ran into a problem associated with the level of measurement of semantic differential scales, which was clarified and reported in this study despite the lack of sources on the issue. In addition to the two data

reduction techniques (factor and cluster analyses), a third technique (method of group semantic universals) was introduced in this study. Unfortunately, the latter was unavailable to compute due to the technique's rules (see Appendix E).

The framework of this study can help researchers in televisitation to have a better picture of the attitudes of a studied population. The findings in this research can also suggest that the composition of the intended users of televisitation can affect the overall usage. Moreover, this research touches upon some points of completing a semantic profile of a studied group and this, in turn, can be essential grounds for real-life televisitation projects.

In conclusion, the development of a semantic differential technique involves a substantial number of respondents. The possible future interest in this context can involve finding practical algorithms and following suggestions on increasing time-management of similar projects – their technical aspects. This will ultimately increase productivity and applicability of semantic differential findings, which can be an essential part of decision making in healthcare associated with televisitation.

Implications of the Results and Recommendations for Future Research

The results of this study, specifically the TAS, can be utilized by healthcare investors as an easy-to-use, time-saving tool to investigate the televisitation readiness of communities in general and the attitudes, in particular, of current and potential users of televisitation. The results, also, can be put into practice by researchers who would be interested in using TAS to measure attitude changes before, during, and after the implementation of televisitation. The televisitation attitude descriptors of UNBC students, educed in this study, can be used for comparison with other samples in similar televisitation studies. Researchers can use TAS as a new tool for televisitation research in conjunction with other methods deployed for

studying televisitation acceptance in intended communities. For example, the effects of televisitation advertisement and education on attitudes of a particular group of future televisitation users can effectively be measured with TAS. Basically, TAS can be used both as a single tool and as an additional tool in satisfaction televisitation research. The theoretical psychosemantic framework, introduced for the first time in this thesis for televisitation acceptance research, can also be tailored for televisitation. It can be done by tailoring the TAS itself and by integrating classical and non-classical psychosemantic approaches.

Overall, the possibilities of using the group semantic universals and its paradigm - activity theory in televisitation attitudes research can be explored in future research. It would be interesting to try to develop a working theoretical model of televisitation attitude dynamics, its hierarchy, and its development during the gaining of different experiences. In addition, a possible future project can expand the topic of televisitation, the fundamentals of the activity theory, which sees attitudes as dynamic, culturally and environmentally determined processes, as opposed to simple reactions to stimuli. However, that would require longitudinal semantic differential studies involving large samples.

Finally, to deploy such a virtual healthcare delivery system as televisitation in particular settings, a related party can be in need of a more complete psychosemantic picture or profile of the intended population, which can require educational sessions, interviews, observations, and standardized techniques to make suggestions as to whether such technology would be financially viable. This, in turn, could be a project for future research.

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Appendix A. Kit 1

KIT 1

Participant Information Sheet and Informed Consent Form

Demographic Survey Form

Bipolar Adjective Pairs Selection Form with Instructions

Information Sheet

Researcher's name: Katherine Wood **Supervisor's name:** Dr. Josée Lavoie
Address: Graduate Student Office, 3333 University Way, Prince George B.C. V2N 4Z9
E-mail: kwood@unbc.ca

"The Development and Validation of a Televisitation Attitude Scale (TAS)"

Purpose of the research To develop and validate a Televisitation Attitude Scale (TAS), and examine attitudes of UNBC students toward televisitation - a technology allowing hospital patients or nursing home residents and their loved ones to use both audio and video forms of social interaction over a distance.

What you will do in this research You will complete a paper and pencil task which involves rating televisitation on a bipolar (opposite) scale.

Time required Participation will take approximately 10-15 minutes to complete.

Risks There are no anticipated risks associated with participating in this study.

Benefits This study will ultimately provide grounds for deployment of televisitation technology which can help Canadians, who are separated with distance due to medical reasons, to exercise important aspects of social interactions necessary for their well-being. If interested, a copy of the final results can be attained, upon completion of the project, by contacting me directly.

Confidentiality Your participation in this study will remain confidential, and there will be no link between your responses and your identity. Only the researchers who are involved in this project will ever have access to the completed material. Your responses will be assigned a code number, and the list connecting your name with this number will be kept in a locked room and will be shredded once all the data are collected and analyzed.

Participation and withdrawal Your participation in this project is completely voluntary. Please be assured that you may withdraw from the study at any time with no consequence, and all information collected from you will be withdrawn and shredded.

Contact If you have questions about this research, please contact me at kwood@unbc.ca. Also, if you have any concerns about this study, you can contact the research supervisor Dr. Josée Lavoie at jlavoie0@unbc.ca or at (250) 960-5283. If there are any complaints about the project, please direct them to the UNBC Office of Research, (250) 960-5820 or by email: reb@unbc.ca. Please keep this copy for your reference, and you will also receive a copy of you signed consent.

Informed Consent Form

The Development and Validation of a Televisitation Attitude Scale (TAS)

Researcher: Katherine Wood Email: kwood@unbc.ca

Do you understand that you have been asked to be in research study?	Yes	No
Have you read and received a copy of the attached information sheet?	Yes	No
Do you understand the benefits and the risks involved in participating in this research study?	Yes	No
Do you understand that you are free to refuse to participate or to withdraw from this study at any time? *You do not have to give a reason.*	Yes	No
Have you been able to ask questions and to discuss this research study?	Yes	No
Do you understand who will have access to the information you provide?	Yes	No
Have the issues of anonymity and confidentiality been explained to you?	Yes	No

This study was explained to me by: _____

Print name

I agree to participate in this study:

_____ Date: _____

Signature of Research Participant

_____

Printed Name of Research Participant

_____ Date: _____

Signature of Witness

_____

Printed Name of Witness

I believe that the research participant signing this form understands what is involved in the research study and voluntarily agrees to participate.

_____ Date: _____

Signature of Researcher

Demographic Survey

Please answer the following questions:

What is your gender?

____ Female
____ Male

What is your marital status?

____ Single (never married)
____ Married/Common Law
____ Separated
____ Divorced
____ Widowed

How many children do you have? ____

What is your date of birth? Day _____ Month _____ Year _____

What is your place of birth? Country _____ Province _____City/Town _____

What are your ethnicity/cultural backgrounds? _____
(Please specify)

What is your country of origin? _____

How long have you lived in Canada? _____

Do you have relatives/friends receiving care in a nursing home or a hospital? Yes __ No ___

What is your educational level?

1st year University _____
2nd year University _____
3rd year University _____
4th year University _____
Masters _____
PhD _____

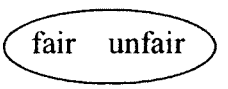
Bipolar Adjective Pairs Selection Form with Instructions

Instructions

The purpose of this study is to select bipolar (opposite) adjective pairs that would most correspond to televisitation which is a telecommunication technology allowing patients of a hospital, nursing home residents, and their significant others to have audio/video interactions over a distance. In selecting these adjective pairs, please make your judgments on the basis of what televisitation means *to you.*

Here is how you choose adjective pairs:

If you feel that the televisitation is *very closely related to* one of the bipolar adjective pairs, you should circle that pair as follows:



There are 76 bipolar adjective pairs for you to judge. Work at fairly high speed through your selection. Do not worry or puzzle over individual adjective pairs. It is your first impressions, the immediate "feelings" about the bipolar adjective pairs. On the other hand, please do not be careless because your true impressions are valued in this study.

After finishing your review of 76 bipolar adjective pairs, please feel free to suggest any additional adjectives which according to your personal judgment can describe televisitation.

Bipolar Adjective Pairs

TELEVISITATION

optimistic	pessimistic
incomplete	complete
altruistic	egoistic
sociable	unsociable
kind	cruel
passive	active
ungrateful	grateful
dissonant	harmonious
good	bad
dirty	clean
dark	light
awkward	graceful
painful	pleasurable
beautiful	ugly
successful	unsuccessful

high	low
meaningful	meaningless
unimportant	important
progressive	regressive
true	false
negative	positive
reputable	disreputable
untimely	timely
believing	skeptical
foolish	wise
hard	soft
strong	weak
severe	lenient
tenacious	yielding
constricted	spacious
asymmetrical	symmetrical
heavy	light

serious	humorous
opaque	transparent
large	small
feminine	masculine
excitable	calm
cold	hot
intentional	unintentional
fast	slow
complex	simple
drunk	sober
stable	changeable
rational	intuitive
insane	sane
rash	cautious
orthodox	heretical
angular	rounded
curved	straight

healthy	sick
blunt	sharp
old	new
unusual	usual
mature	youthful
savory	tasteless
weary	refreshed
colorless	colorful
interesting	boring
pungent	bland
insensitive	sensitive
aggressive	defensive
ornate	plain
near	far
heterogeneous	homogeneous
intangible	tangible
extraneous	inherent

dry	wet
competitive	cooperative
formed	formless
periodic	erratic
naive	sophisticated
public	private
proud	humble
subjective	objective
generous	thrifty
free	constrained

Appendix B. Kit 2

KIT 2

Participant Information Sheet and Informed Consent Form

Demographic Survey Form

Instructions and the Televisitation Scales

Comments Form

START TIME: _____

Information Sheet

Researcher's name: Katherine Wood **Supervisor's name:** Dr. Josée Lavoie
Address: Graduate Student Office, 3333 University Way, Prince George B.C. V2N 4Z9
E-mail: kwood@unbc.ca

"The Development and Validation of a Televisitation Attitude Scale (TAS)"

Purpose of the research To develop and validate a Televisitation Attitude Scale (TAS), and examine attitudes of UNBC students toward televisitation - a technology allowing hospital patients or nursing home residents and their loved ones to use both audio and video forms of social interaction over a distance.

What you will do in this research You will complete a paper and pencil task which involve rating televisitation on a bipolar (opposite) scale.

Time required Participation will take approximately 10-15 minutes to complete.

Risks There are no anticipated risks associated with participating in this study.

Benefits This study will ultimately provide grounds for deployment of televisitation technology which can help Canadians, who are separated with distance due to medical reasons, to exercise important aspects of social interactions necessary for their well-being. If interested, a copy of the final results can be attained, upon completion of the project, by contacting me directly.

Confidentiality Your participation in this study will remain confidential, and there will be no link between your responses and your identity. Only the researchers who are involved in this project will ever have access to the completed material. Your responses will be assigned a code number, and the list connecting your name with this number will be kept in a locked room and will be shredded once all the data are collected and analyzed.

Participation and withdrawal Your participation in this project is completely voluntary. Please be assured that you may withdraw from the study at any time with no consequence, and all information collected from you will be withdrawn and shredded.

Contact If you have questions about this research, please contact me at kwood@unbc.ca. Also, if you have any concerns about this study, you can contact the research supervisor Dr. Josée Lavoie at jlavoie0@unbc.ca or at (250) 960-5283. If there are any complaints about the project, please direct them to the UNBC Office of Research, (250) 960-5820 or by email: reb@unbc.ca. Please keep this copy for your reference, and you will also receive a copy of you signed consent.

Informed Consent Form

The Development and Validation of a Televisitation Attitude Scale (TAS)

Researcher: Katherine Wood Email: kwood@unbc.ca

Do you understand that you have been asked to be in research study?	Yes	No
Have you read and received a copy of the attached information sheet?	Yes	No
Do you understand the benefits and the risks involved in participating in this research study?	Yes	No
Do you understand that you are free to refuse to participate or to withdraw from this study at any time? *You do not have to give a reason.*	Yes	No
Have you been able to ask questions and to discuss this research study?	Yes	No
Do you understand who will have access to the information you provide?	Yes	No
Have the issues of anonymity and confidentiality been explained to you?	Yes	No

This study was explained to me by: _____

Print name

I agree to participate in this study:

_____ Date: _____

Signature of Research Participant

_____

Printed Name of Research Participant

_____ Date: _____

Signature of Witness

_____

Printed Name of Witness

I believe that the research participant signing this form understands what is involved in the research study and voluntarily agrees to participate.

_____ Date: _____

Signature of Researcher

Demographic Survey

Please answer the following questions:

What is your gender?

____ Female
____ Male

What is your marital status?

____ Single (never married)
____ Married/Common Law
____ Separated
____ Divorced
____ Widowed

How many children do you have? ____

What is your date of birth? Day _____ Month _____ Year _____

What is your place of birth? Country _____Province _____City/Town _____

What are your ethnicity/cultural backgrounds? _____
(Please specify)

What is your country of origin? _____

How long have you lived in Canada? _____

Do you have relatives/friends receiving care in a nursing home or a hospital? Yes ___No ___

What is your educational level?

1st year University _____
2nd year University _____
3rd year University _____
4th year University _____
Masters _____
PhD _____

Instructions and the Televisitation Scales

Instructions

TAS - Semantic differential scale on attitudes towards televisitation.

Televisitation - a telecommunication technology allowing patients of a hospital, nursing home residents, and their significant others to have audio/video interactions when they are separated by a distance.

To understand peoples' ideas and notions about such a complex concept as televisitation is difficult. This questionnaire, the TAS, is a scientific tool which helps to examine your deep *meanings* towards televisitation. In taking this test, please make your judgments on the basis of what televisitation means *to you*. In this kit you will find a concept, televisitation, to be judged and beneath it a set of scales. You are to rate the televisitation on each of these scales in order.

The scales should be used as follows:

If you feel that televisitation is *very closely related* to one end of the scale, you should place your check-mark as indicated below:

fair X :___:___:___:___:___:___unfair

OR

fair ___:___:___:___:___:___: Xunfair

If you feel that televisitation is *quite closely related* to one or the other end of the scale (but not extremely), you should place your check-mark as indicated below:

strong ___: X :___:___:___:___:___weak

OR

strong ___:___:___:___:___: X :___weak

If televisitation seems *only slightly related* to one side as opposed to the other side (but not really neutral), then you should check as indicated below:

active ____:____:__X__:____:____:____:____ passive

OR

active ____:____:____:____:__X__:____:____ passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic to televisitation.

If you consider the televisitation to be *neutral* on the scale, both sides of the scale *equally associated* with the concept, or if the scale is *completely irrelevant,* unrelated to the televisitation, then you should place your check-mark in the middle space:

safe ____:____:____:__X__:____:____:____ dangerous

IMPORTANT:

(1) Place your check-mark *in the middle of spaces,* not on the boundaries:

THIS NOT THIS

____:____:__X__:__X__:____:____

(2) Be sure you check every scale - *do not omit any.*

(3) Never put more than one check-mark on a single scale.

Work at fairly high speed through this test. Do not worry or puzzle over the concept. It is your first impression, the immediate "feelings" about televisitation that we want. On the other hand, please do not be careless because we want your true impressions.

TELEVISITATION

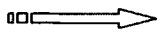
optimistic	____:____:____:____:____:____:____	pessimistic
incomplete	____:____:____:____:____:____:____	complete
heavy	____:____:____:____:____:____:____	light
sociable	____:____:____:____:____:____:____	unsociable
passive	____:____:____:____:____:____:____	active
ungrateful	____:____:____:____:____:____:____	grateful
good	____:____:____:____:____:____:____	bad
awkward	____:____:____:____:____:____:____	graceful
painful	____:____:____:____:____:____:____	pleasurable
successful	____:____:____:____:____:____:____	unsuccessful
high	____:____:____:____:____:____:____	low
meaningful	____:____:____:____:____:____:____	meaningless
unimportant	____:____:____:____:____:____:____	important
progressive	____:____:____:____:____:____:____	regressive
weak	____:____:____:____:____:____:____	strong
negative	____:____:____:____:____:____:____	positive
reputable	____:____:____:____:____:____:____	disreputable
untimely	____:____:____:____:____:____:____	timely
constricted	____:____:____:____:____:____:____	spacious
serious	____:____:____:____:____:____:____	humorous
stable	____:____:____:____:____:____:____	changeable
cruel	____:____:____:____:____:____:____	kind

fast	____:____:____:____:____:____:____	slow
complex	____:____:____:____:____:____:____	simple
rational	____:____:____:____:____:____:____	intuitive
orthodox	____:____:____:____:____:____:____	heretical
healthy	____:____:____:____:____:____:____	sick
old	____:____:____:____:____:____:____	new
unusual	____:____:____:____:____:____:____	usual
mature	____:____:____:____:____:____:____	youthful
small	____:____:____:____:____:____:____	big
interesting	____:____:____:____:____:____:____	boring
insensitive	____:____:____:____:____:____:____	sensitive
aggressive	____:____:____:____:____:____:____	defensive
near	____:____:____:____:____:____:____	far
intangible	____:____:____:____:____:____:____	tangible
extraneous	____:____:____:____:____:____:____	inherent
competitive	____:____:____:____:____:____:____	cooperative
periodic	____:____:____:____:____:____:____	erratic
naive	____:____:____:____:____:____:____	sophisticated
public	____:____:____:____:____:____:____	private
subjective	____:____:____:____:____:____:____	objective
free	____:____:____:____:____:____:____	constrained
effective	____:____:____:____:____:____:____	ineffective
skeptical	____:____:____:____:____:____:____	believing

authoritative	____:____:____:____:____:____:____	undependable
trustworthy	____:____:____:____:____:____:____	unreliable
unfriendly	____:____:____:____:____:____:____	friendly
cold	____:____:____:____:____:____:____	hot

END TIME _____

PLEASE CALCULATE THE TIME YOU SPENT TO COMPLETE THIS QUESTIONAIRE _____

PLEASE GO TO THE NEXT PAGE TO LEAVE YOUR COMMENTS 

Your Comments

Did you understand the definition of televisitation? Yes _____ No _____

If you did not understand the definition of televisitation, please specify what was unclear.

Did you understand instructions? Yes _____ No _____

If instructions were not clear, please specify which part you did not understand.

Did you find any adjectives describing televisitation incomprehensible to you?

Yes _____ No _____

If yes, please specify which one:

Additional comments and suggestions:

Appendix C. Recruitment Poster

Your Chance to Win $50

Research participants needed !

All UNBC students are welcome to participate in an on-line survey -

The Development and Validation of the Televisitation Attitude Scale (TAS).

The completion of a web-based survey will take only 10 minutes of your time.

Two lucky respondents will receive $50 each.

The draw will be conducted after first two hundred students are participated.

TELEVISITATION

If you have any questions related to the survey, please feel free to contact Katherine Wood at kwood@unbc.ca

Your Chance to Win $50
http: unbc.attitudes-towards-televisitation.sgizmo.com
Password: student

Your Chance to Win $50
http: unbc.attitudes-towards-televisitation.sgizmo.com
Password: student

Your Chance to Win $50
http: unbc.attitudes-towards-televisitation.sgizmo.com
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Your Chance to Win $50
http: unbc.attitudes-towards-televisitation.sgizmo.com
Password: student

Appendix D. Kit 3

KIT 3

Televisitation Attitude Scale (TAS) with instructions

Instructions

TAS - Semantic differential scale on attitudes towards televisitation.

Televisitation - a telecommunication technology allowing patients of a hospital, nursing home residents, and their significant others to have audio/video interactions when they are separated by a distance.

To understand peoples' ideas and notions about such a complex concept as televisitation is difficult. This questionnaire, the TAS, is a scientific tool which helps to examine your deep *meanings* towards televisitation. In taking this test, please make your judgments on the basis of what televisitation means *to you*. In this kit you will find a concept, televisitation, to be judged and beneath it a set of scales. You are to rate the televisitation on each of these scales in order.

The scales should be used as follows:

If you feel that televisitation is *very closely related* to one end of the scale, you should place your check-mark as indicated below:

fair X : ___ : ___ : ___ : ___ : ___ : ___ unfair

OR

fair ___ : ___ : ___ : ___ : ___ : ___ : X unfair

If you feel that televisitation is *quite closely related* to one or the other end of the scale (but not extremely), you should place your check-mark as indicated below:

strong ___ : X : ___ : ___ : ___ : ___ : ___ weak

OR

strong ___ : ___ : ___ : ___ : ___ : X : ___ weak

If televisitation seems *only slightly related* to one side as opposed to the other side (but not really neutral), then you should check as indicated below:

active ____:____:__X__:____:____:____:____ passive

OR

active ____:____:____:____:__X__:____:____ passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic to televisitation.

If you consider the televisitation to be *neutral* on the scale, both sides of the scale *equally associated* with the concept, or if the scale is *completely irrelevant,* unrelated to the televisitation, then you should place your check-mark in the middle space:

safe ____:____:____:__X__:____:____:____ dangerous

IMPORTANT:

(1) Place your check-mark *in the middle of spaces,* not on the boundaries:

THIS NOT THIS

____:____:__X__:__X__:____:____

(2) Be sure you check every scale - *do not omit any.*

(3) Never put more than one check-mark on a single scale.

Work at fairly high speed through this test. Do not worry or puzzle over the concept. It is your first impression, the immediate "feelings" about televisitation that we want. On the other hand, please do not be careless because we want your true impressions.

TELEVISITATION

bad	____:____:____:____:____:____:____	good
pessimistic	____:____:____:____:____:____:____	optimistic
boring	____:____:____:____:____:____:____	interesting
unimportant	____:____:____:____:____:____:____	important
ineffective	____:____:____:____:____:____:____	effective
negative	____:____:____:____:____:____:____	positive
cruel	____:____:____:____:____:____:____	kind
unfriendly	____:____:____:____:____:____:____	friendly
ungrateful	____:____:____:____:____:____:____	grateful
sick	____:____:____:____:____:____:____	healthy
insensitive	____:____:____:____:____:____:____	sensitive
skeptical	____:____:____:____:____:____:____	believing

Appendix E. The Group Semantic Universals Algorithm and Empirical Rules

Artemeva's Algorithm of Group Semantic Universals Method

Serkin (2008) gives an example of the algorithm of group semantic universals method. Table 16 shows the data and the mean and sum values from 21 scales of 16 students evaluating their apprehension of a dog.

Table 16

Semantic Differential Data of Students' Apprehension of a Dog

Respondents	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Scales																	Sum	Mean
1	0	-3	2	-3	-3	-2	-3	-3	-2	-2	-1	-3	-3	-3	-2	-2	-33	-2.06
2	0	2	2	2	3	3	3	3	3	1	1	3	3	3	-1	2	33	2.06
3	0	-3	-3	3	-2	-3	3	-3	3	2	-1	0	-3	-1	-2	-3	-13	-0.81
4	-2	2	3	2	2	2	2	3	2	1	-2	3	1	3	1	2	25	1.56
5	2	2	3	0	-1	2	-2	3	-2	0	-2	0	2	0	-2	0	5	0.31
6	0	2	2	2	3	3	-1	3	2	-3	-1	0	3	2	2	3	22	1.38
7	-1	-3	-1	-2	-3	-3	-2	-3	0	0	-1	-3	-3	-3	-2	-3	-33	-2.06
8	1	-3	-3	-2	-1	-2	-3	-2	3	3	-2	0	3	0	-2	1	-9	-0.56
9	-3	-2	-2	-3	-1	-3	0	-3	-2	-3	-1	-3	-2	-3	-2	-2	-35	**-2.19**[m]
10	3	3	-1	3	2	3	2	3	3	1	1	3	3	3	2	3	37	**2.31**[m]
11	-1	-3	-1	2	-2	-3	-2	-3	0	-3	-1	-3	-1	-3	-1	-2	-27	-1.69
12	3	3	2	2	3	3	0	3	0	3	2	0	3	3	1	3	34	2.13
13	-2	-3	-2	1	-1	-1	-2	-3	0	0	-2	-3	0	-1	0	-3	-22	-1.38
14	1	2	1	2	0	1	0	0	2	0	-1	0	2	0	1	0	11	0.6
15	0	-1	-3	-2	0	1	0	-3	-2	3	-1	0	0	-2	0	-2	-12	-0.75
16	-1	3	0	0	3	3	0	3	1	0	2	3	0	3	1	2	23	1.44
17	0	2	2	0	2	2	1	3	-2	-1	1	-3	-1	-3	-1	-1	1	0.06
18	-1	3	3	2	3	2	0	3	2	0	2	0	3	3	1	3	29	1.81
19	2	-2	-2	-2	-2	-3	-3	-3	-3	0	-2	-3	-2	-2	-3	-2	-32	-2.00
20	2	-1	-3	-2	-1	3	1	1	0	3	-1	0	1	2	3	2	10	0.63
21	-3	1	-1	0	1	1	0	0	0	3	0	3	0	2	0	1	8	0.50

[m] extrema of means.

Step 1

From the group results the mean value for each scale is computed. The range of absolute values of extrema of the means from both ends of the scales is also computed. According to the Table 16, the range of means from -2.19 to 2.31 is 4.5.

Step 2

The 10% of the length of the range of means is computed. The range of means equals 4.5; therefore, 10% = 0.45.

Step 3

Measure from each edge of the scale 10% of the length toward the middle of the scale is calculated. As a result, there are two range indentions. The left range indention is from - 2.19 to -1.74. The right range indention is from 1.86 to 2.31.

Step 4

Choose all scale descriptors from both ends that are within the right and the left range indentions. The list of these descriptors is called the group semantic universals of the studied stimuli. The group semantic universals in a 10% interval of indention of the students' apprehension of the dog are the following descriptors: charming (-2.06); strong (2.06); kind (-2.06); active (-2.19); sympathetic (2.31); energetic (2.13); honest (-2.0).

Empirical Rules for the Group Semantic Universals Method

Serkin (2008) points out some rules of the group semantic universals method. For finding the descriptors of the group semantic universals for the sample less than 20 respondents it is advisable to use only 10% interval of indention; for the sample less than 25 it is advisable to use 20% interval of indention; for the sample more than 25 respondents - 25% interval of indention. The Chi-square (χ^2) criteria show that these results are significant with significance level of 0.05. In all other cases it is advisable to use 10% interval of indention. The method of semantic universals is not applicable: (1) If the sample consists less than 15 respondents; (2) If the absolute value of the means from one of the ends of the scale less than 1.25.