EFFECTS OF SUBLIMINAL AFFECTIVE STIMULI ON EVALUATIVE JUDGEMENTS: A VIDEO STUDY ON HOSPITALS

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DENİZ VİDİNLİ

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EFFECTS OF SUBLIMINAL AFFECTIVE STIMULI ON EVALUATIVE JUDGEMENTS: A VIDEO STUDY ON HOSPITALS

Submitted by **Deniz Vidinli** in partial fulfillment of the requirements for the degree of **Master of Science in the Department of Medical Informatics**, **Middle East Technical University by**,

Prof. Dr. Nazife Baykal _____
Director, Informatics Institute

Assoc. Prof. Dr. Yeşim Aydın Son _____
Head of Department, Medical Informatics

Assist. Prof. Dr. Didem Gökçay _____
Supervisor, Medical Informatics, METU

Examining Committee Members

Assoc. Prof. Dr. Yeşim Aydın Son _____
MIN, METU

Assist. Prof. Dr. Didem Gökçay _____
MIN, METU

Assist. Prof. Dr. Aybar Can Acar _____
MIN, METU

Münire Tuğba Erdem _____
STAT, METU

Assoc. Prof. Dr. Alptekin Temizel _____
MODSIM, METU

Date: 18.05.2015

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Deniz Vidinli

Signature :

ABSTRACT

EFFECTS OF SUBLIMINAL AFFECTIVE STIMULI ON EVALUATIVE JUDGEMENTS: A VIDEO STUDY ON HOSPITALS

Vidinli, Deniz
M.Sc., Department of Medical Informatics
Supervisor: Assist. Prof. Dr. Didem Gökçay

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Private hospitals are business managements with medical customers (patients). One of the crucial factors that effects the acceptance of technology in hospital management systems is patient evaluations. The evaluative judgements of patients can be manipulated by subliminally induced affect. The major aim of this study is to investigate whether the evaluative judgements over the hospitals change after exposure to positive or negative affective visual stimuli, when the presentation duration is below conscious perception levels. A study with three phases is conducted for this purpose. Two private hospital videos are shot and edited to contain frames with happy and angry faces masked by the neutral counterparts, so that exposure is below the threshold for conscious perception. In the first phase, a baseline study without affective visuals is conducted. Hospital ratings indicated that participants had no preference for one hospital over the other. In the second phase, a different participant group watched the two hospital videos that contained affective stimuli. We found that the participants preferred hospitals with happy subliminal facial expressions significantly more than those with angry. In the third phase, a prime perceptibility test is administered. Sequences with affective pictures are shown and emotion recognition performance is tested. The participants performed at the chance level

in identifying the facial expressions, proving that the affect perception of the participants does not occur consciously. As a result, the most important finding of the study is that sub-consciously manipulated visuals within the hospital environment may lead to changes in customer satisfaction and decisions. To the best of our knowledge, this is the first study conducted in a hospital environment which exhibited the manipulative effects of subliminal displays in evaluative judgements. Our findings draw attention to future use of displays in medical technology abiding by ethical constraints.

Keywords: Private hospitals, Subliminal Affective Priming, Evaluative judgements , Unconscious Emotion

ÖZ

EŞİK ALTI DUYGUSAL UYARANLARIN DEĞERLENDİRİCİ YARGILARA ETKİSİ: HASTANELER ÜZERİNE BİR VİDEO ÇALIŞMASI

Vidinli, Deniz
Yüksek Lisans, Tıp Bilişimi Bölümü
Tez Yöneticisi: Assist. Prof. Dr. Didem Gökçay

Mayıs 2015, 104 sayfa

Özel hastaneler medikal müşterileri (hastaları) olan işletmelerdir. Hastane yönetim sistemlerinde teknoloji kullanımının kabulünü etkileyen en önemli faktörlerden biri hasta değerlendirmeleridir. Eşik altı uyaranlardan kaynaklanan duygulanım, hastaların değerlendirme süreçlerini geliştirebilir ya da manipule edebilir. Bu tez çalışmasının başlıca amacı, pozitif ya da negatif duygulanıma sebep olan görsellere, özellikle bilinçli algı eşiğinin altında maruz kalınma sonrasında, hastanelerle ilgili değerlendirici yargıların değişip değişmediğinin araştırılmasıdır. Bu amaçla üç aşamalı bir çalışma yürütülmüştür. İki özel hastane videosu çekilerek, mutlu ve öfkeli yüz resimleri, aynı kişiye ait nötr ifadeli yüzler tarafından maskelenmek suretiyle bilinçli algı eşiğinin altında kalacak şekilde kurguda videoalara eklenmiştir. İlk aşamada, herhangi bir duygu ifadesi içermeyen videolarla temel değerlendirme çalışması yapılmıştır. Hastane değerlendirme sonuçları, katılımcıların hastanelerden herhangi birine yönelik tercih eğilimi göstermediklerini ortaya koymuştur. İkinci aşamada, başka bir denek grubu, duygusal uyaranların bulunduğu videoları izlemiştir. Değerlendirme analizleri, mutlu görsellerin bulunduğu hastanelerin öfkelilere göre anlamlı derecede daha çok tercih edildiğini göstermiştir. Son olarak da, ikinci aşamada yer alan katılımcılar,

videolarda duygu ifadelerinin bulunduğu sekanslar gösterilerek, ifadelerin farkında olup olmadıklarına dair bir algı testine tabi tutulmuştur. Farkındalık sonuçları, duygu ifadelerinin bilinçli algılanmadığını ispatlamıştır. Çalışmanın ürettiği en önemli sonuç; hastane ilişkili ortamlarda yer alabilecek bilinçaltı algılanan görsellerin müşteri memnuniyet ve kararlarına etki ettiğini göstermesidir. Bilindiği kadarıyla bu çalışma, eşik altı görsel duygusal uyaranların manipulatif etkilerini hastane ilişkili ortamlarda ele alan ilk çalışmadır. Bulgular, medikal teknolojilerde kullanılan arayüz görüntülerinin kullanımına ve oluşabilecek etik sorunlara dikkat çekmektedir.

Anahtar Kelimeler: Özel Hastane, Eşik Altı Duygusal Uyaran,
Değerlendirici Yargı, Bilinçdışı Duygu

To my mother...

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CHAPTER 1

INTRODUCTION

Private hospitals are business managements having medical customers, namely patients. Patients are in a need state which interferes emotionally with a lot of executive decisions. In the progressing medical informatics environment, the use of technology is an inevitable issue, where most of the procedures such as requesting an appointment, getting the laboratory results, are done by the patients themselves through digital screens on computers, kiosks, queuing machines or mobile devices. In this environment, below threshold emotional cues have a tremendous effect, but such effects are rarely addressed in the information processing frame.

It is known that some of the main critical factors that affect the acceptance of technology in hospital management systems are patient choices and evaluations and the satisfaction of patients (Peker, 2010). It is also known that patient satisfaction plays an expansive role in online health information seeking (Tustin N, 2010). Besides, Kuder, Isen and De Lia (as cited in Isen, 2001) claim that the more patients are involved in medical decision processes the more they are likely to get satisfied, which means positive affect plays a substantial role in medical decision making (Isen, 2001). Positive affect enhances patient satisfaction not only during decision making but also in patient - doctor interaction according to many studies conducted by Isen and colleagues (as reviewed in Isen, 2001). The role of emotions on evaluative judgements is first proposed in 1978 by Isen, Shalker, Clark and Karp. The positive affect, especially the positive-valued affect in one's mood leads to more positive evaluative judgements through information retrieval from memory. Since then, various paradigms were introduced regarding the role of emotions on cognitive processes in both self-regulation and daily life.

The properties of emotions that aid or manipulate the thought processes are important to consider. Schwarz & Clore (1983) and Wyer & Carlston (1979) suggest that the apparent present feeling of an individual is a response to a target which ends up acting like an informative function because it may be used as a source of information in evaluating the target. Their proposal is based on the case of a phenomenal view of emotion where the emotion and its affective value is accessible, namely, conscious. However, studies indicate that cognitive processes are influenced by affect even when the experience aspect of the emotional process is missing.

Besides emotions' service as an informative function; a second property of how emotions are aiding thought processes is that the influence of the affective value of a valenced stimulus may occur without the awareness of it all (eg. Zajonc, 1980; Damasio, 1994; LeDoux, 1987). Moreover, it is proposed that the affective value of a valenced stimulus could arise before its conscious awareness and may not even be consciously perceived at all (eg. Zajonc, 1980; Bargh, 1997).

The main paradigm in explaining this theory is "affective priming" paradigm which is used for the first time by Murphy and Zajonc in 1993; where they discuss the findings of an experiment on liking ratings for neutral stimuli. In the study it is found out that the Chinese ideographs shown to participants for duration of 2 sec are liked more when they were "primed" by smiling face images for 4 msec than when they were "primed" by frowning faces. The "affective priming" is named for the first time in this study; after the cognitive priming paradigm theory which explains the effects of mood on judgement (Isen, Shalker & Karp, 1978; Bower, Monteiro & Gilligan, 1978).

The studies used this paradigm lead to certain interpretations; one of which is the third important property of the emotion's role for the current study. Not only the study given as an example but also many others have revealed that the "unconscious affect" can be attached to any stimulus, even an irrelevant one; as in the case with Chinese ideographs. This is important since being exposed to emotional stimuli could happen all the time, especially in our daily lives surrounded by signboards, commercials, digital screens of billboards, kiosks, computers and mobile devices. Considering the situation in a medical frame; online health information

seeking is done through web sites and applications on computer screens, tablets and mobile devices. Booking and getting results could be done using websites of the hospitals. What is more, there are queuing machines, many screens and signboards for informative purposes inside the hospitals. Most important of all, clinical health care could be provided at any site today through telemedicine technologies. These platforms that contain many visuals might induce unconscious affect which can easily be attached to an evaluation or decision subject related to health. Therefore, it is important to address the possible influence of the visuals used, for informative, guiding or motivating purposes.

The fourth important aspect regarding the exposure below the awareness threshold, namely subliminal priming to affective stimuli, is that the nonexistence of a detected source is especially persuasive because it is internally generated. Since the reliability of the source is an important factor on persuasion (Petty & Cacioppo, 1986), it is claimed that information from affect is most especially convincing when perceived internally (Clore & Colcombe, 2003).

A fifth important property is related to the subject's motivation for the goal. Strahan, Spencer and Zanna (2002), found out that affective priming enhanced both drinking behaviour and persuasiveness of the advertisements when subjects were motivated to drink. Bermeitinger, Goelz, Johr, Neumann, Ecker and Doerr (2009), claim that when the goal of a subject at the time of exposure to subliminal logos matches with the prime induced behaviour, priming is effective. Winkielman, Berridge and Wilbarger (2005) obtained similar results with a novel drink; not only on rating of it but also willingness to pay for and consume it when the subjects were thirsty. Thus, there is substantial evidence that the influence of subliminal affective stimuli is enhanced when the goal of the individual is relevant.

The findings in literature, which formed the ground for this current study are as follows:(1)the retrieved affect from a source could act as an informative function which in turn affects the evaluative judgements, (2)the retrieved affect need not necessarily be conscious, (3)this unconscious affect can attach to any, even an irrelevant target in evaluation or judgement scope, (4) when the source of an affective stimuli is

nonexistent to the individual due to being under the awareness threshold, it is especially persuasive and (5)when the individual's need state or current goal matches with the target to be evaluated; the effect of affective prime is enhanced.

An intriguing issue is that these paradigms are studied mostly in abstract conditions and/or they are unlikely to appear in daily life conditions. With the current study, we aimed to combine these theoretical findings with practical implications.

In order to investigate the subliminal affective priming's effect on evaluative judgments for private hospitals, the role of emotions in human cognitive behaviour should be studied. The major goal of this research was to test if subliminal affective stimuli have an effect on evaluative judgments within the private hospital setting. Therefore, an experiment is designed with two private hospitals in Ankara, Turkey. Recordings were done on a normal day within working hours, which is important for setting the stimulus to be as realistic as possible.

In the following chapter literature review is provided. In chapter 3 of this thesis, the details of the construction of stimulus set and administration of the experiment is explained in detail. In chapter 4, the analysis of the collected data and statistical methods are explained and discussed in detail. Finally in chapter 5, a discussion of the findings is presented in line with the previous studies in the literature given in chapter 2. Chapter 6 gives a brief conclusion on the findings of this thesis.

CHAPTER 2

LITERATURE REVIEW

2.1 Medical Consumers and Health Technologies

With the developing technologies in medical informatics field, health is no longer considered within the walls of a hospital building, nor does it rely solely on the face-to-face patient-doctor interaction. In today's world, most part of the health management is carried out through electronic systems; from appointment booking to queuing machines, getting results, seeking online information and even getting caretaking and clinical help through telehealth and telemedicine technologies.

Healthcare institutions today are able to provide onsite communications with the patient and provide clinical help through wireless tools, video conferences and many applications. These include patient consultations, transmission of X-rays and other still images; call center or video conferences for nursing, health education through patient portals. The practices cover the remote clinical care through telemedicine and electronic health record through health information technology (HIT) which both use various interfaces that are composed of various images and words as candidates for a potential affective stimulus.

A recent study (Gale and Sultan, 2013) conducted on patients with chronic obstructive pulmonary disorder (COPD) has shown that; a new telehealth service brought 'peace of mind' to the patients. According to the study, this happened through two mechanisms; patients gained confidence in the

management of their condition because of the legitimate contact with medical professionals and more importantly, emotional and bodily experiences could be modified with telehealth when patients' home become the main health space. This study is important both for explaining that telehealth could touch patient's emotional world and emphasizing that emotions play not only a role in a patient's decision making process (as a medical consumer) but also in healing process.

In another study by Andersson (2012) guided internet-delivered treatments with traditional face-to-face treatments in anxiety disordered patients has been compared. The findings indicate that for panic disorder and anxiety disorder, face-to-face treatments and guided internet treatments can be equally effective. The study encourages for the wider use of guided internet treatments which makes the interfaces and applications used, especially important in the context of the current study. There are many forms of internet-based treatments; for instance for cognitive behavioural therapy (CBT), there are self guided programs, open access programs and guided programs that has therapist contact (Barak, Klein and Proudfoot, 2009, as cited in Andersson, 2012). The video contact of the therapist is also important in terms of the affect generation in the patient. A study supporting this idea showed the presence of positive and negative emotions, as well as mixed emotions in the form of visual nonverbal information using facial action coding system between a nurse providing a telehospice videophone consultation and family caregiver. These affects generated in turn enhance empathy between the nurse and the caregiver (Schmidt, Gentry, Monin and Courtney, 2011).

These studies are important evidences to consider the role of emotions in many phases of a patient's life. Affect is generated in every phase through different stimuli, from which a patient is searching for a hospital online, going to hospital and looking at the informative screens, queuing machines and facing visuals in each of those interfaces to getting treatment face-to-face and interacting with doctors, nurses and other specialists or even from getting results, to having at home treatment via telehealth technologies.

Private hospitals are business managements having customers which are medical consumers, namely patients. It is known that affect plays an important role on evaluative judgements and decision making (Isen, 2001)

and positive affect enhances a preference. This feature of affect is therefore used in advertising most of the time to generate affect through ads in order to create a warm attitude toward a brand. These effects could be direct, such as the transfer of the affect as in the studies of Brown, Homer and Inman in 1998 (cited in Isen, 2001) or can be indirect such as the influence of affect on later cognitive processes.

The situation of affect generation from the visual interfaces exists for both patients and employees (doctors, nurses, caregivers etc.) and it enhances and manipulates both of their attitudes. It is known that positive affect can enhance helpfulness and generosity (Isen, 2001). A positively affected health employee would be more helpful to its patients and it is believed that patient- doctor interaction has a great role in patient satisfaction. Tustin (2010), inferred that dissatisfied patients are more likely to seek online health information and found that "the empathy shown by the health care provider and the quality of time spent with the patient" is significantly related to patients' consulting to internet as a source of health information. The health information on web is not audited unless it is a portal of a hospital and/or an official source and therefore, the reliance of the information in different sources is questionable. Patients' counting on such information also in turn makes a negative impact on doctor-patient relation.

For the reasons counted above, it is crucial to address the outcomes of affect generation. To understand the potential role of positive or negative affect; it is helpful to go over the literature for emotions and affective sciences.

2.2 The History of Emotion Research

The pioneers such as Charles Darwin, William James and Sigmund Freud published ground-breaking work on emotions towards the end of the nineteenth century. However, until recently, these were neglected except in psychiatry and pharmacological domains. The reason behind that was perhaps because "emotions" were subjective, lacking objective quantification for one's decision-making process. The opposition between reason and emotion, which was built sharply, caused emotions not to be

worth studying in cognitive science area, contrary to other fields such as attention, memory, learning, vision and many more.

However, for the last couple of decades, scientific studies on emotion have recorded an extensive amount of growth in both cognitive science and neuroscience fields with the accessibility of technologies such as functional neuroimaging techniques together with physiological recordings, surgical studies and behavioural measures. In fact, emotion is a part of various disciplines such as social psychology, biology, computer science, philosophy, economics, marketing and advertising.

In 1995, Davidson and Sutton suggested affective neuroscience as an emerging field, claiming that studies on emotional processes need a similar approach to cognitive processes such as segmenting them into basic elementary mental operations. One of the biggest controversies is on the relation between affective and cognitive processes. The question is whether they are independent, naturally different or they have a sequacious relationship. In fact, today, affective studies use nearly all of the approaches of cognitive neuroscience such as biological, psychological and computational approaches. In 1986, Minsky put forward the significance of emotion in computational models saying; "the question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without any emotions." which was actually a quite strong foresight of the affective computing field.

2.3 How to define "Emotion"?

It has always been difficult to define emotion explicitly as it is vague and the experience of it is subjective. Emotion definitions vary in many aspects regarding the point of view from different disciplines, different theories within those disciplines, historical backgrounds and cultures. Perhaps one of the first definitions of emotion is made by Aristotle, which derives from the Greek term pathos, i.e. "passion". His definition of pathe was, "The emotions are all those affections which cause men to change their opinion in regard to their judgements, and are accompanied by pleasure and pain; such are anger, pity, fear, and all similar emotions and their contraries." (Rhetoric, 1378a). This definition is so impressive as it

actually involves a connection between emotions and judgements , thereby suggests a positive and negative dimension linked to it, which is regarded as a sine qua non component of emotion today (see Colombetti, 2005).

"Passion" was considered as a harmful phenomenon to reason (Zajonc, 2000; Frijda, 1999) and it was usually alluded with loss of mental control and function disturbances. Kant, for example, regarded affects and passions as "illnesses of mind", (Anthropology 7:251). However, this view conflicts with the current accounts of emotion having adaptive functions (Damasio, 1994). Although it is hard to give an exact definition of emotion, some of its functions and roots are agreed on in any discipline, such as its evolutionary purpose. This is quite clear considering the relation of emotions with approach and avoidance mechanisms, reflexes and action tendency. McNaughton (1989) suggests that emotions are a group of reactions evolved to satisfy teleonomy, which is the goal-directed functions of living things in order to serve the continual adaptation for survival, reproduction and hence evolution as a terminology in computational aspect of purpose (Pittendrigh, 1958).

2.4 Relation of Emotion and Cognition

A groundbreaking work of Damasio (1994, 1996), actually explains clearly how emotions are adaptive functions and they serve for and beyond evolutionary purpose. In his findings, patients with a neurological damage on specific areas of their brains, namely, ventral and medial sectors of prefrontal regions, lose their ability to process emotion normally as well as the ability to make rational decisions involving risk and conflict. His "somatic marker hypothesis" suggests that "the delicate mechanism of reasoning is no longer affected, unconsciously and on occasion even consciously, by signals hailing from the neural machinery that underlies emotion."(1994). According to the hypothesis, when faced with a complex and risk involving decision making situation, somatic markers, probably placed in the ventromedial prefrontal cortex, create associations between the physiological affective states. These are triggered by amygdala to ease the decision making process via evaluating the incentive value of the choices, using emotional processes to help the cognitive processes which

might be overloaded. His theory is just the opposite of the traditional views of emotions being harmful to cognitive decisions. In addition, according to the somatic marker hypothesis, emotion has an important informational role in decision making.

Another theory which is important to explain the role of emotions as information is "Carver and Scheier's Self-Regulation Theory". According to this theory, emotions serve as a feedback mechanism (Carver & Scheier, 1990, 1998) and as a control mechanism in self-served goal-directed behaviour. Different than Damasio's Somatic Marker Hypothesis, aforementioned emotions, in this case, are conscious emotions where the "valence" component of emotion is at work. In a case of self-focused goal-directed behaviour, such as "doing workout 3 times a week" or "losing weight" in a broader sense, positively and negatively valenced affect serves as an informational input to determine "whether the behaviour is going well or poorly" (Carver, 2001) for the aimed goal.

The effect of emotion on information retrieval from memory for evaluative judgements and decisions are first suggested by Isen and colleagues in 1978, that the evaluative judgements are more positive under positive moods than negative moods (Schwarz & Clore, 2006). Further studies provided evidence of positive affect's influence on the consolidation of long-term episodic memories, working memory, and creative problem solving. (Ashby, Isen and Turken, 1999). Moreover, besides easing cognitive processes internally, evidence also suggests that in most of the cases, positive affect enhances social life, business life and healthcare through cognitive processes as problem-solving and decision-making. As a result, affects generated by ads, products and service encounters lead to customer and patient satisfaction (Isen, 2001).

For the purpose of the current study, we focus only on one-way relation of emotion and cognition as given in the previous theories, which is the influence of emotion on cognitive processes. Many other studies in literature also address the reverse direction relation between emotional and cognitional processes; however, it is not in the scope of the current study (see Clore, Schwarz, &Conway, 1994).

As Schwarz and colleagues and Wyer and Carlston (1979) indicates; "According to the view that feelings may serve informative functions, individuals may use their apparent affective response to a target as a source of information in evaluating the target." (Schwarz & Clore, 2006) The best case for this scenario seems to be of course when the judgement refers directly to the stimulus for which we have feelings (For instance, the question of liking ice cream, may be answered based on the pleasure we get from its tastes rather than a cognitive review of the usefulness of it.). A second case is the use of emotional information to simplify the cognitive task when the question of judgement is rather complex, as Damasio states in his Somatic Marker Hypothesis.

In such a situation where a complex judgemental process needs to occur, the subject likely refers to his/her feelings based on their past experience. One account here is that retrieval of the past affective value attached to the stimuli in question and the other, as Schwarz and Clore (2006) bring out; is based on the mood of the person at the time of the judgement, which could easily cause a misattribution such as distinguishing pre-existing feelings. It is argued that "in such situations, the impact of feelings on evaluative judgements should depend on their perceived informational value." (Schwarz & Clore, 2006). It could also be argued that, based on how the pre-existing feelings are formed; the number of interactions with the stimuli in the past and the mood and circumstance at the time of the interaction, those feelings might also be distant from a cognitive judgement. Still, it could be thought that affective cues and moods are always at work shaping our ideas as an information source.

In the aforementioned studies, the emotion and its affective value is accessible, explicit, in other words, conscious. Another case where the cognitive processes either aid or get manipulated by affect is when the experimental aspect of the emotional process is missing and this may occur even when the evaluative judgement is not a complex one.

Before addressing such studies, it is beneficial to distinguish the experience of emotion from the emotion itself. In the above studies, a phenomenal view of emotion is addressed. However, it is suggested that, emotions do serve as information, not only when they are felt subjectively.

2.5 Feeling, Emotion, Affect and Mood

Many differentiations have been proposed regarding feelings, emotion, affect and mood; therefore, it is important to clarify the usage of these terms. According to Damasio (2000, pg.14), the respectable amount of the difficulties in this line of research is related to the vagueness of emotion and feeling. It is imperative to make a distinction between these two terms for a proper comprehension.

Feeling is rather the experience, which is phenomenal; therefore, constitutes one's own state of understanding, ignorance or confusion of the emotion. We name the perception of emotion as feeling. As Damasio suggests, "feeling" will be used in place of "feeling an emotion". Also in the literature, feeling presents mostly the cognitive part of the emotion rather than its affective part (Schwarz & Clore, 2006).

Affect, on the other hand, is agreed as a compulsory component of emotion (eg. Whiting, 2006; Schwarz & Clore, 2006; Frijda, 1999). Affect is usually used interchangeably with emotion and it refers to the value of the emotion -hedonic experience- the experience of pleasure or pain (Frijda,1999) or "valence" -the positive and negative aspect of the emotion (in Schwarz & Clore, 2006). All emotions have affect, but not all affective things are emotions, especially felt ones. Categorization according to the positive or negative affective valence is applied on words (eg. Shaver, Wu and Schwartz, 1992), visual stimuli (eg. Lang 1995) and facial expressions (eg. Russell and Bullock 1985; Sánchez and Vázquez, 2013). Affect can be defined as the value attributed to emotion and this attribution need not necessarily be made by the individual consciously as a perception of feeling, that is to say, a self- report based on a phenomenal experience is not needed. When one faces with a valenced stimulus, its affective value could arise before, if any, its conscious awareness (eg. Zajonc, 1980; Bargh, 1997) and its influences on judgement may occur without the awareness of it all (eg. Zajonc, 1980; Damasio, 1994; LeDoux, 1987).

According to Zajonc (1980, 2000), affect and cognition systems are partially independent and separate, while affect is preliminary. This view is consistent with the evolutionary and adaptive account of affect which is connected to approach-avoidance based behaviour. This is most probably, one of the biggest debates in affective sciences along with the earlier James and Cannon debate (see Dror, 2014; Laird & Lacasse, 2014). On the other side of the debate, Lazarus claims that "Affect can be considered a primary and separate response system only if cognition is defined as excluding early attentional and interpretational processes that are inevitably involved in stimulus identification behavior any response is possible (Lazarus, 1984)." (Forgas, 2000, p.5.).

Zajonc (2000) explains the distinction of cognition and affect as follows: (1) cognition but not emotion can be evaluated as being correct or not (Eiffel Tower is taller than Pisa Tower is a correct statement however Eiffel Tower is more beautiful cannot be correct or wrong; it is subjective), (2) cognitions but not emotions always have a referring object (which are actually moods, will be further explained), (3) emotional expressions are universal whereas cognitions are not –due to being bounded to language. This distinction he proposes does not refer to a total independence as further interpreted in Winkielman's study (2010). His view considers affect rather as a preliminary process which is based on the assumption that "emotions are often unconscious that they are often the first reactions of the organism to an instigating stimulus, and that if we can devise an experimental paradigm in which behavioral effects that are brought about by such early and nonconscious affective instigations can be observed, questions about the independence of affect from cognition could be answered at least in part" (Zajonc, 2000, p.32).

Evidence in a study conducted by Murphy and Zajonc (1993) supports this very idea that affective reactions can be elicited without awareness. In their study where they showed Chinese ideographs to subjects for a duration of 2 sec, which were primed by smiling or frowning faces for either 4 msec or 1 sec, they found out that subjects' affective reaction changed without their awareness and phenomenal experience. In all cases, subjects were asked about how much they liked the ideographs or what their guess were about the ideograph representation as something bad or something good. The results indicated that under subliminal

exposure, affective primes raised the liking ratings in the case of smiling faces and decreased in the case of frowning faces significantly, where no such distinction can be claimed for the supraliminal condition. Figure 1 shows the liking ratings for both cases.

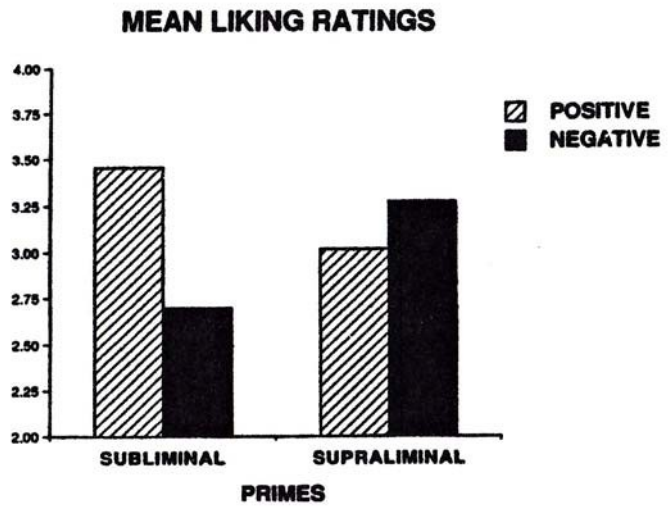


Figure 1 Liking ratings after subliminal and supraliminal positive and negative primes (from Murphy & Zajonc 1993)

The findings in this study are later approved with the same conclusion by Murphy, Monahan & Zajonc (1995). This paradigm of "affective priming" was a revolutionary methodology which is then used in many studies after the term is proposed by Murphy et al. (1995) for the first time in this study. In fact, the paradigm of "affective priming" is named by them after the cognitive priming theory which explains the effects of mood on judgement (Isen et al., 1978; Bower et al., 1978).

Mood has been argued to be more different in a number of ways than emotion. Probably, the most distinctive difference of mood from emotion is that it lacks a referent (Averill, 1980) and it is based on internal resources (Morris, 1989), whereas emotions are about something and has an eliciting object through external occurrences. This is also reflected on language, as uttered by many people: we are in a relaxed mood but we are afraid "of" or happy "about" something. This is also a substantial base for the argument that emotion requires cognitive precursors but mood does

not (Clore, Orthony, Dienes & Fujita, 1994). Another basic distinction about mood and emotion is about the time space they occur and refer to. Mood is a continuous state and can reflect the state of emotions occurring frequently (Damasio, 2000) and are about future predictions; whereas, emotions have a fast occurrence time and are about the present (Batson, Shaw & Olson, 1992). Affect, on the other hand, is a core element in feeling, emotion and mood.

Based on this core feature of affect and other parallelism of affective concepts and feelings, Clore and Colcombe (2003) suggest a unifying theory of induced mood and subliminal affective priming. Their theory is based on the unconstrained nature of both subliminal priming and mood induction. Zajonc claimed that "Nonconscious affect can become attached to any stimulus, even an irrelevant one." (2000, p.55) and moods do not also have a salient object or source to the knowledge, similar to the subliminal affective priming case. Owing to this parallel manner they propose that both "affective feelings of mood" and "unconsciously primed affective meaning" have a wide spectrum effect, as both of their sources are unknown to the awareness of the subject. They use the term "affective meaning" for the subliminally primed effect because their theory also claims that subliminal priming actually involves cognitive processes and this is consistent with affect within information theory. The second hypothesis they propose is that (Clore & Colcombe, 2003) the important similarities of affective mood and affective priming are phenomenological because of the nonexistence of a detected source. This makes them especially persuasive because they are perceived as internally generated. This persuasiveness is based on the importance of the source, which is, in this case, the person himself. Since the reliability of the source is an important factor on persuasion (Petty & Cacicoppo, 1986), they claim that information from affect is especially convincing when perceived internally.

2.6 Mere Exposure Effect

An important part of Zajonc's (1968) findings constitutes the "Mere-Exposure-Effect", which is the effect related to the familiarity of the stimulus. He suggested that, in case of many repeated exposures of a stimuli, even when the exposures are subliminal, affective dispositions of the subject towards the stimuli changes in a positive direction, eg. it is

preferred, liked, highly rated in evaluation more. Instances were found in studies involving exposure to a photograph of one's loved ones and themselves, novel objects, polygons, Chinese ideographs and many more.

Mere exposure effect can be powerful and seen in various conditions. For instance; people tend to prefer the reversed; as seen in the mirror pictures of themselves, whereas they prefer non-reversed pictures of their loved ones (Mita, Dermer, and Knight, 1977). That is because they prefer the one that they more frequently see, as they see themselves in the mirror and their loved ones en face more often.

Mere exposure effect is shown to be at work also when the exposed object is not consciously perceived and subjectively felt. In their study, Kunst-Wilson and Zajonc (1980); used polygons and repeatedly showed them three times for 1 msec in a random order and then showed two pairs of polygons one of which was shown earlier for 2seconds. Subjects preferred the one they saw previously over the entirely new one significantly whereas, the recognition of the polygon they see before was not significant. Earlier; similar results were produced where shown objects (Matlin, 1970) and auditory stimuli (Wilson, 1979) were preferred when presented more often over the ones that are unfamiliar in the absence of subjective familiarity; it was the objective history of exposures that mattered.

2.7 Subliminal Perception & Subliminal Priming Studies

The method of priming is based on subliminal perception both in cognitive and affective priming studies. A definition of subliminal perception would be, to perceive stimuli without the awareness of perceiving when the stimuli are presented below the threshold for awareness. However, as studies show, while being unaware, stimuli is found to effect evaluative judgements, even actions and consumption behaviour.

A substantial ground on priming studies might be the instances of natural occurrence of subliminal perception without a controlled laboratory study. An example of this case is the syndrome called "blindsight", where patients with a specific neurological damage in their primary visual cortex could not be aware that they see the objects and

could not describe them explicitly; however, they are able to refrain from the obstacle objects when put in front of them (Gelder et al., 2008). Like in the studies of unconscious; this finding was suspected when first published (Koch, 2004). On the contrary, it is now clear that this situation implies that the conscious and unconscious perceptions are processed through different pathways.

Actually, experiments are conducted and succeeded even before introduction of the so called cognitive and affective priming paradigms. In 1978, Silverman, Ross, Adler and Lustig had an experiment with a group of male university students, where they subliminally primed the subjects before a dart game with long sentences. In one part of the study, one of the groups is primed with a visually shown "Beating dad is OK" verbal message written with black ink on white card and a congruous image accompanying it showing a father and a son with lips turned up and another group with a "Beating dad is wrong" message and an accompanying image of an unhappy father and son with their lips turned down. They showed the pictures first for 4 msec and then a 3 sec of blank field. Afterwards, the verbal message for 4 msec and 3 sec of blank field was shown, which was repeated for three times. The results showed that, the group who received an "OK" message scored more in dart-throws than the group who received a "wrong" message (Silverman et al., 1978). Although the experiment is related to oedipal studies and needs an understanding of the related area, part of the success of subliminal priming is substantial for the current study.

In 1987, Robles, Smith, Carver, and Wellens embedded humorous, threatening and neutral subliminal images in three different videos and assessed two different self-rated anxiety measures. Their findings suggested that the subject group who received videos with threatening images had higher anxiety levels than those who watched the ones with neutral images. The anxiety level was lowest in the group who received humorous image embedded videos. A similar finding is suggested by Kemp-Wheeler and Hill, the same year, where they used emotional words for priming and taken psycho physiological measures along with psychological variables. A significant difference is found in ratings of sweating, anxiety, muscular tension in emotionally primed group compared to the other group who received neutral words. In contrast,

measures of palpitation and respiration rate increased in both groups (Kemp-Wheeler and Hill, 1987).

Later in the last decade, Strahan and colleagues (2002) conducted studies in which: (1) they primed the subjects with the words "thirst" and "dry" to measure consequent drinking behaviour and convincingness of a sports drink advertisement, (2) they primed the subjects with sad facial pictures to measure the convincingness of the mood-restoring features of a rock band in an advertisement -in motivated and non-motivated groups of subjects. Their findings were that primings enhanced both drinking behaviour and persuasiveness of the ads, when subjects are motivated and suggested that the behaviour is affected when the current goal of the subject is relevant and the subject is motivated for the goal. In 2006, substantive findings of Karreman, Stroebe and Claus proposed that priming of the name of a drink enhanced participants' both evaluative judgement amongst others and willingness to drink, in the condition of participants being thirsty, supporting both Strahan and colleagues' findings and Zajonc's mere-exposure effect.

A similar finding is represented in Bermeitinger and colleagues' (2009) experiment, where they embedded the logo of an energy pill into a computer game and found out that the tired participants consumed more from the pill. Their findings suggested that when the conditions of Strahan and colleagues'(2002) met, in other words, when the subjects' goal at the time of exposure to subliminal logos match with the prime induced behaviour, priming is effective.

2.8 Unconscious Emotion

It would be helpful to have an informative definition of "unconscious emotion". Unfortunately, more than the emotion itself, being unconscious is far vaguer. There are various views regarding the unconscious emotions' degree of unconsciousness, as to whether it involves any awareness and feelings. Dominant view was that the unconscious emotion has the feature of unfelt feeling which sounds rather odd and criticised a lot. However, it could be said that the common property of the theories of unconscious emotions is that, it accompanies a kind of unawareness which refers to not

being able to directly speak up about it without making an inference from the following behaviour. Theories regarding to which degree it involves the awareness of feelings is grouped as following in a review of literature by Michael Lacewing (2007): unconscious emotions involve conscious feelings, unconscious emotions involve no feelings at all, and unconscious emotions involve unconscious feelings.

To demonstrate such unconscious affect, Winkielman and colleagues (2005) conducted two studies where the subjects rated their "momentary feelings of subjective emotional experience" right after being exposed to pictures including subliminal happy and angry facial expressions. In another study, they also provided evidence that this unconscious emotion may lead to a change in a consequent hedonic behaviour; namely, drinking a novel drink and willingness to pay for and willingness to drink it. The remarkable part of their study was that these changes were only seen in thirsty participants. Unthirsty participants did not show a significant change in their willingness rates and drinking behaviour. Another notable finding was about unthirsty participants reporting a slight change in their subjective feelings. This shows that based on the need state of the participants similar to Strahan and colleagues' (2002) and other following studies, the consequent behaviour is goal-directed. Furthermore Winkielman et al. (2005) showed with this study that a hedonic behaviour arises from approach-avoidance mechanisms.

2.9 Current Study

Previous research has shown that subliminal affective stimuli may lead to a change in subsequent liking, motivational and goal-oriented behaviour, oedipal behaviour, anxiety levels and persuasion. Having the aim of demonstrating the effect of subliminally triggered affect on evaluative judgements; it is crucial to point out two things about the affect that is studied in this research.

First, affect, which represents states of present moment not future and not a continuous state as in mood is examined. Second, the kind of affect dealt with is a low-level state and different than the intense emotions, such as love and envy.

Our hypotheses have the assumptions based on previous studies of which the affect we are dealing with is subliminally triggered and unconscious, therefore diffuse. Not having a salient object, we expect the unconscious affect to enhance subsequent evaluative ratings.

In the study, two different hospital videos are shown to participants with either angry or happy facial expression pictures embedded in the videos, masked by neutral counterparts. Subsequently, evaluation surveys on hospitals based on the videos are given to subjects, after being informed prior to viewing.

Our hypotheses are as follows: (1) the hospital choice over one another would be in favour of the video with a happy subliminal expression, (2) both the general score rating assessed to the hospitals and the detailed ratings would be in favour of the video with a happy subliminal expression rather than the one with an angry subliminal expression.

The main purpose that makes this study innovative in a way is because (1) in the literature of subliminal priming, the findings are mainly bounded by the condition of one's need state and/or goal at the moment of exposure, (2) the object and/or subject of posterior rating in previous studies, were either neutral such as Chinese ideographs (Zajonc, 1980), polygons, or related to one's mood such as an ad showing a rock band with mood enhancing features or addressing one's needs, such as a drink (Winkielman et al., 2005).

In the current study, it is proposed that subliminal stimuli could affect an evaluative judgement even when the rated stimuli itself has a valence. Hospitals are places where someone would go only in a need of treatment or consultation for either themselves or an acquaintance, which, therefore, is the direct opposite of a motivational case. Even with the presence of a conscious emotional context, we believe positively and negatively valenced primes would still have an effect on subsequent evaluations.

CHAPTER 3

EXPERIMENTS

3.1 Construction of Stimulus Set

Two different hospital videos are shot especially to use as the explicit stimuli in the experiments. Priming stimuli used in videos are chosen from KDEF database (Lundqvist, Flykt & Öhman, 1998). In this section, preparation of the videos is explained in detail.

3.1.1 Video production

Two different private hospital videos are prepared for the evaluation of subjects. For the purpose of the study, the hospitals' shooting and editing processes are handled not only in a detailed way but also carefully in order not to create any possible visual aesthetic differences due to lighting and scenery conditions.

3.1.2 Shooting

Shooting is done with Canon DSLR cameras; Canon 60D and Canon 5D Mark II at 1920*1080p resolution, 25fps, and manual white balance is

used for each of the hospitals. During shooting; Canon EF 24-105mm f/4L IS USM and Canon 50mm f/1.4 USM lenses, monopod, tripod and dolly are used. To minimize any supraliminal effects of the hospitals, shooting is done carefully in the same hospital departments in each hospital and the same angles tried to be used while shooting for a specific section.

3.1.3 Editing

The first part of the editing process is done using Edius ver.5.50, with the settings; Hardware : Generic OHCI, Video; Frame size : 1920 x 1080, Frame rate : 25.00(25/1), Pixel aspect : 1.0000, Field order : Progressive, Setup; Render format : Canopus HQ Standard, Over Scan Size : 3 %, Panning mode : Standard, Color space conversion : Standard.

Captured sequences are cut and organized in order to make them identical for both hospitals in terms of duration and angle for different parts of the hospital. Then they are merged for each hospital, adapted for the same storyboard for each one. Any visible signboards including the name of the hospital, labels, logos are blurred using the "Region" effect in order to avoid prejudice and bias. "White Balance" and "Color Balance" effects are used to make sure that the lighting and colour conditions are even and homogenous between the sequences of both videos. Videos are rendered and exported to be further edited to add the subliminal pictures with Adobe tools.

3.1.4 Selection of Pictures

The Karolinska Directed Emotional Faces (KDEF) database consist of 4900 pictures of 70 different amateur actors; 35 female and 35 male with 7 different facial emotional expressions, photographed from 5 different angles twice. The actors are aged between 20 and 30 years old. All subjects wear gray T-shirts, with no beards, moustaches, earrings or eyeglasses, and no visible make-up.

The material was developed to be used in medical and psychological research by Daniel Lundqvist, Anders Flykt and Professor Arne Öhman at

Karolinska Institutet, Department of Clinical Neuroscience, Section of Psychology, Stockholm, Sweden in 1998.

2 female and 1 male models are chosen from the KDEF to be embedded as the subliminal visuals into the videos. Pictures are selected based on the ratings listed in validation studies on the database. A validation study conducted by Goeleven, Raedt, Leyman and Verschuere (2008) evaluates 490 of the pictures, which are shot from straight angle, according to their emotional content. In the study, pictures are rated on an intensity and arousal scale and according to the study results; database is valid for using as affective facial stimuli. From the 20 most intense and highest arousal valued pictures list provided in the study, we chose the ones with the highest values and compared them with different study results. Another study conducted on the KDEF by Sánchez and Vázquez (2013), where they used the strategy of presenting emotional faces paired by its neutral expression of the same actor for the rating process, provides an intensity and prototypicality list of the faces. In their study, they name the method of rating as "anchor-point method" and the raters judge 198 of the straight pictures for sad, angry and happy emotions based on their related neutral pair.

During the process of choosing the models to be used as subliminal stimuli, because we wanted to avoid any possible effect of a non-target emotional expression, we first eliminated the models who were photographed with an open mouth for the angry emotional expression shots, so that the angry and happy emotional expressions would be distinct enough since the happy shots were all smiling with an open mouth. According to the lists in the validation studies, we chose 2 female and 1 male actors, coded as AF20, AF21, AM05 in KDEF (Lundqvist, Flykt, and Öhman, 1998). In the table below; the intensity, arousal and prototypicality value results for the chosen models taken from both studies are listed.

Table 1 Intensity, arousal and prototypicality values of chosen pictures

Study:		Goeleven et al.					Sanchez et al.				
			Intensity		Arousal			Intensity		Prototypicality	
Expression	Model	N	Mean	SD	Mean	SD	N	Mean	SD	Mean	SD
Happy	AF20	64	5.81	1.74	3.84	2.19	55	5.18	1.57	6.25	1.43
	AF21	64	7.33	1.57	4.14	1.98	55	5.84	1.53	6.11	1.74
	AM05	64	6.94	1.49	4.22	2.06	62	7	1.48	6.82	2.04
Angry	AF20	63	6.7	1.68	3.4	1.8	52	7.13	1.74	7	1.73
	AF21	64	6.36	1.77	3.48	1.77	52	5.85	2.34	6.37	2.26
	AM05	64	6.31	1.87	3.83	2.19	59	5.4	1.81	4.85	2.12

In the study of Goeleven at al. (2008), the rating scores are on a 9-point scale. Based on the percentage highest-rated emotion and mean intensity score, ranks of the pictures for happy and angry expressions of AF20, AF21, AM05 amongst the same gender (N=35) are consequently (7,2,8; 4,6,2).

In the study of Sanchez et al. (2013), the scores are on a 0-10 Likert scale, and mean rankings of prototypicality of the pictures for happy and angry expressions of AF20, AF21, AM05 amongst the same gender(N=35) are consequently; (11,12,1; 1,3,11) and the mean rankings of intensity of the pictures for happy and angry expressions of AF20, AF21, AM05 amongst the same gender (N=35) are consequently; (21,16,2; 2,10,12). One can point that the chosen models are not on the top 5 list. This is because of the need for the same model to have a high rating in both angry and happy expressions. The selection of the models are made based on the three criteria; first, on having an angry expression with a closed mouth; second, on the highest hit rate based on Goeleven et al.'s (2008) study and third, on the mean intensity and mean prototypicality scores listed on both Goeleven et al. (2008) and Sanchez et al.'s (2013) studies.

3.1.5 Digital Pre-Processing Procedures on Pictures

To be able to use the affective facial stimuli subliminally in the videos, a series of pre-processing needed to be applied on the pictures. Adobe Photoshop 5.5 is used during the processing of the images.

The stimuli are to be used as if they are framed pictures on the walls of the hospitals. To avoid any possible extreme show up in a specific scene, the pictures are turned into black & white. To convert the pictures into grayscale; green and blue channels are deleted from the Adobe RGB channels and only Red channel is used as it is the best matching grayscale for human skin and a widely used method in portrait photography. Then pictures are saved in grayscale mode in 8bits/channel. Since the picture that subjects will be exposed to, supraliminally, is the neutral model and the angry or happy expression are to be masked by the neutral picture, to keep clear of any occurrence of jumping, the pictures for the emotional expressions and the neutral ones are aligned for a particular model. Proposed jumping effect was due to the vertical and horizontal alignment of the head; more specifically hair. Models were usually posed with an inclined head, beetle-browed and a look from bottom up when angry and upright when neutral and happy. That was causing a jumping effect, occurring at the onset of switching the pictures in the frame. Alignment is done without touching to the face and no change in the facial expression is done. Alignment process is done using Layers in Photoshop, simply by opening the two picture on top of each other, aligned by the eyes and the mouth of the model, increasing the transparency level of the top picture, and deleting the hair and replacing the hair with the below picture by merging the two layers. In the last step of the processing, pictures are put into frames which are exactly fitting to the dimensions of the original picture, again using Layers property in Photoshop. The figure below shows the pre-processing of the pictures step by step.

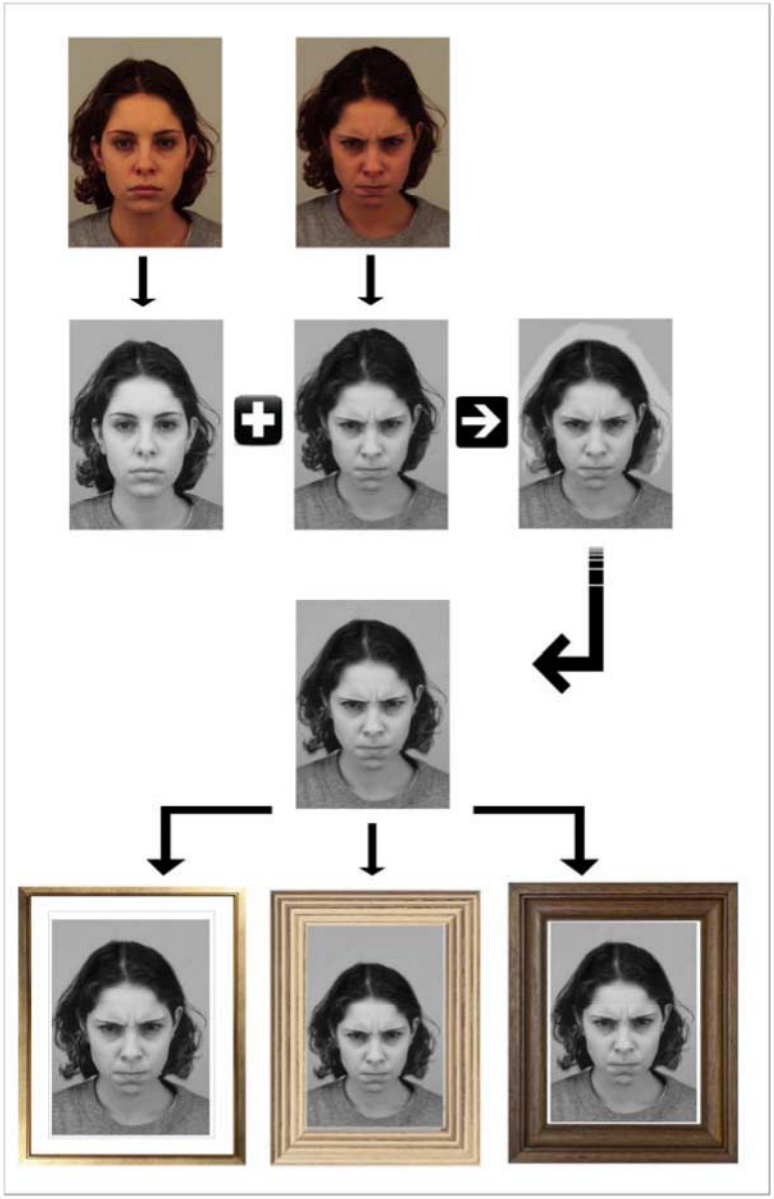


Figure 2 Pre-processing of pictures to be embedded in the video

3.1.6 Post Processing of Videos

After editing both of the hospital videos similar to each other, further post processing is carried out to embed the facial stimuli as framed portrait pictures inside the videos. For this process Adobe Premiere Pro 5.5 and

Adobe After Effects 5.5 are used. In each video, three different scenes around 2 seconds from the videos similar to each other is chosen. Inside each of the scene, one of the three models' framed photographs is placed, blended in the scene as if it is a picture on the wall. During this 1200msecs of scene, the neutral photograph is shown first and then the primed photograph is placed for a frame which is 40msecs in our video. This is done for two times in equal intervals for the male and one of the female models and for one time for the second female model because the duration of the total scene is relatively shorter in her case. In order to have the effect as naturally blended in the scene with the angle, perspective and the motion of the shot, corner- pin effect, track motion effect and warp stabilization special effects are used in Adobe tools.

For each hospital, two types of video are exported for angry and happy primes. In each of the 4 videos, there are 5 flashes of primes, 2 for male and first female model and 1 for the second female model. The total duration of the videos is 2 minutes.

3.2 Experiment Method

From now on the term 'prime' is used to depict subliminal facial expressions disguised as portraits on the walls of the hospital videos. These expressions appear with a frame rate of 40 msec, which are then masked with the neutral facial picture.

A total of three experiments are conducted in the study. In the first place , a baseline study is done under neutral conditions, where participants rated the two hospital videos that will be used in the primed experiment without any subliminal image embedded in the videos. Participants responded to the same questions on the same forms, which will be used in the main (primed) study, as well as an open ended question about the reason why they gave a higher score for the hospital . Secondly, a different group of participants took part in the main study, where they watch the hospital videos consequently with one of them having an angry portrait prime and the other with happy portrait prime in counterbalanced order. Thirdly, the participants who took part in the main study, took a prime perceptibility test right after it, where they were exposed to the exact same

primed sequence. Then, they tried to guess the emotion they saw at the instant of the blink of prime from a two emotional picture shown as a forced- choice.

3.2.1 Participants

In the baseline study, a total of 12 subjects participated, where 6 of them watched the hospital-1 first and 6 of them the hospital-2. The detailed demographics of the participants are given in Table 2, where H1H2 is the sequence in which hospital-1(H1) videos are shown first, and hospital-2(H2) videos are shown later and H2H1 is the sequence in which H2 videos are shown first, and H1 videos are shown later.

Table 2 Demographics information of the subjects in baseline study

Demographics of Subjects in Baseline Study			
	Group-1	**Group-2**	**Total**
	H1H2	*H2H1*	
N	6.00	6.00	12.00
Age			
Mean	25.00	27.67	26.33
Range	18-37	21-33	18-37
Std. Dev.	8.44	4.08	6.47
Sex			
F	5.00	3.00	8.00
M	1.00	3.00	4.00
Education *(student or alumni)*			
Undergraduate	3.00	4.00	7.00
Graduate	3.00	2.00	5.00

A total of 51 participants took part in the main study, where 7 of the participant's data are not included in the study due to either their true guess of the hospital name which may result in a confounding effect or their Positive and Negative Affect Schedule (PANAS) results which were in the extremes either on a positive or a negative scale. 3 of these participants guessed one of the hospitals correctly, 2 of the participants had an extreme positive scale result in PANAS analysis ,which are likely to be false positives, 1 of them had an extreme negative scale result,

which may indicate a major depression existence and 1 of the participants reported to be under a psychiatric and hormonal medical treatment.

Table 3 Number of participants in primed experiment study

	Total Participants	Valid	Hospital Familiarity	Invalid PANAS		Psyc. Stability
N	51	44	3	3		1
				Positive outlier	Negative outlier	
N				2	1	

Among the 44 participants counted in the study; 21 were female and 23 were male adults aged between 23-55 whose mean age is 30.09 (SD=5.11) years. All participants have an education level of at least undergraduate degree, with 25 of them having a higher degree of graduate or doctorate. All of the participants have lived in big cities. None of the participants has a traumatic memory with a hospital with a few of them having minor successful operations.

In Table 4; H1A-H2H represents the sequence in which hospital-1 (H1) video with angry primes embedded inside is watched first and hospital-2 (H2) video with happy primes embedded inside is watched afterwards. In all other groups; H2A-H1H, H1H-H2A, H2H-H1A represents the sequences similarly; where H1 stands for hospital-1 and H2 stands for hospital-2, A stands for angry primes and H stands for happy primes.

Table 4 Demographics information of the subjects in main study

Demographics of Subjects in Main and Prime Perceptibility Experiment					
	Group-1	**Group-2**	**Group-3**	**Group-4**	**Total**
	H1A-H2H	*H2A-H1H*	*H1H-H2A*	*H2H-H1A*	
N	11.00	11.00	11.00	11.00	44.00
Age					
Mean	30.09	28.64	31.45	30.18	30.09
Range	23-35	23-35	25-55	25-36	23-55
Std. Dev.	3.59	3.83	8.19	3.71	5.12
Sex					
F	4.00	6.00	4.00	7.00	21.00
M	7.00	5.00	7.00	4.00	23.00
Education *(student or alumni)*					
Undergraduate	4.00	6.00	1.00	8.00	19.00
Graduate	7.00	4.00	8.00	1.00	20.00
Doctorate		1.00	2.00	2.00	5.00

3.2.2 Apparatus – Materials

Videos used in the study were full HD resolution and in mp4 format, as it is explained in detail in the post processing of videos part. The screen used during the experiments was a 15.6 inches Samsung R580 laptop screen, with 1366*768 resolution display. Videos were played with GOM player version 2.2.57.5189.

3.2.3 Procedure

Experiments were run individually or in groups of 2 to 3 in a silent atmosphere. All participants signed a consent form; presented in Appendix A.1, and then filled a questionnaire for demographic information; presented in Appendix A.2. In order to have an idea of the subjects' general mood states before watching videos, they received a Positive and Negative Affect Schedule (PANAS) scale; provided in Appendix A.4. It is a 20-item self-report measure to assess affect which is developed by Watson, Clark and Tellegen (1988) and validity and reliability for Turkish society is studied by Gençöz (2000). The PANAS is a valid and reliable

measure and is widely used as one of the best measures of current mood (Watson, Clark and Tellegen, 1988).

After these questionnaires, participants watched the first hospital video with either positive or negative subliminal facial affective stimuli embedded inside. Right after watching the video, they received a short questionnaire to rate the hospital based on what they watch and by further using their imagination based on what they see about the hospital in the video. This questionnaire is presented in Appendix A.4. After evaluating the first hospital, they watched the second hospital's video with counter affective subliminal stimuli embedded inside and filled the evaluation form identical to the first one, for the second hospital. Consequently, participants received a form asking to make a choice between the two hospitals as if they had to be treated in one of them. After assessing the hospitals and the final question, participants took part in a prime perceptibility test, where they watched 6 video sequences simultaneously to verify the subliminal presentation of the facial affective stimuli. Each of the 6 videos included a forced-choice recognition task, where participants were asked to identify which expression they saw in the first part of the video. In each video, a part of the hospital video was taken where one of the 3 model's photograph were used on the wall. On each of the videos, the participant was first exposed to a black matte for 1 second, then to a scene from the original hospital video with a neutral face which masks an angry or happy facial stimulus which flashed for 40msec twice with equal intervals during a 2-seconds of show up. Afterwards, the participant was asked to determine which face they had seen in the flash, the one on the right or the one on the left as the video presented two faces side by side for 2 seconds, one of which had been the subliminal expression. A black matte of 1 second ended the first trial and the participant watched the second one, and continued the process until the 6 of them were all finished. For this perceptibility task, surprised, disgusted, afraid and sad expressions of the same people from the Karolinska Database are coupled with angry and happy expressions.

The experiment was grouped in 4 kinds of trials in which the order of the hospitals and the subliminal expression were counterbalanced to avoid any confounding effect of the order. To be more clear; if the first group of participants watched the hospital-1 video first with angry primes and

hospital-2 video second with happy primes, a second group of participants watched the hospital-1 video first with happy primes and hospital-2 with angry primes. A third group watched the hospital-2 video first with angry primes and hospital-1 second with happy primes and a fourth group watched the hospitals in the same order with the third but with happy and angry primes consequently. In each trial, the prime perceptibility task part was also different in terms of the order; the models used for a specific expression, the hospitals from which the scene was taken and the side of the correct answer (in terms of the subliminal that had been flashed appearing in left or right) were different between the groups. Each of the prime perceptibility task parts of the 4 trials included 3 happy and 3 angry subliminals, tested on these counterbalanced conditions. Figures below show the sequence of events in the experiment trials clearly.

Figure 3 Sequence of events in main (primed) study

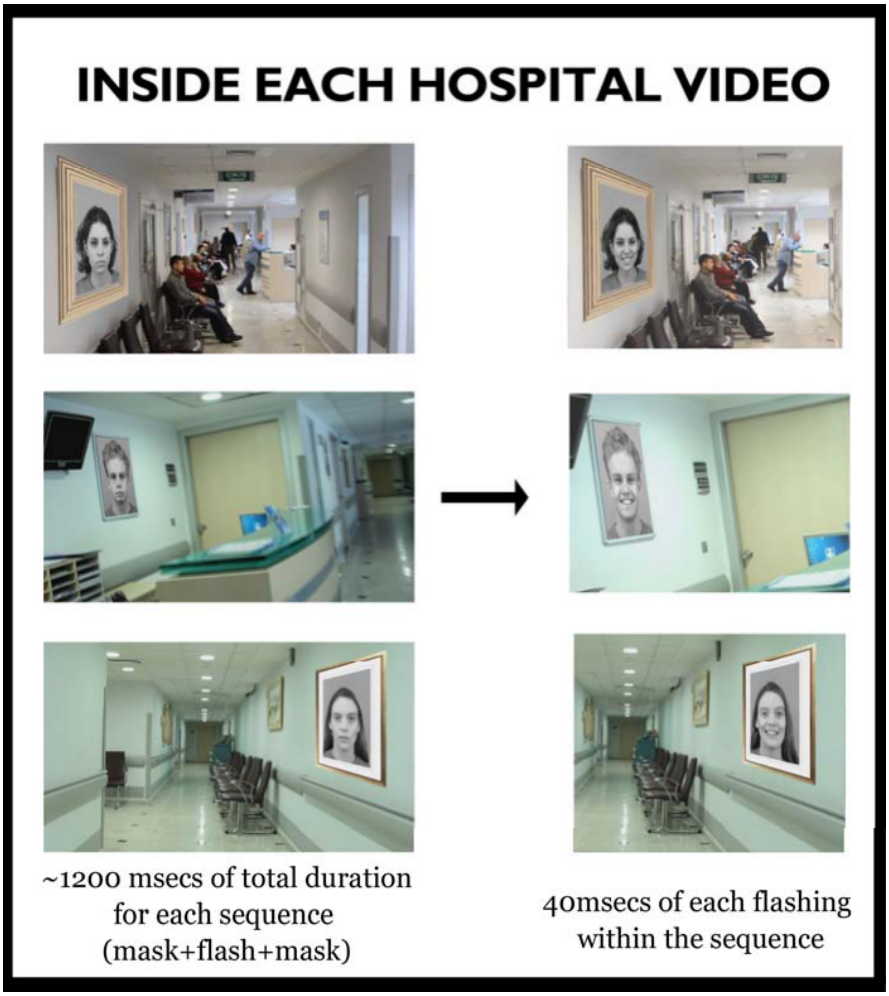


Figure 4 Scenes from video sequence with pictures

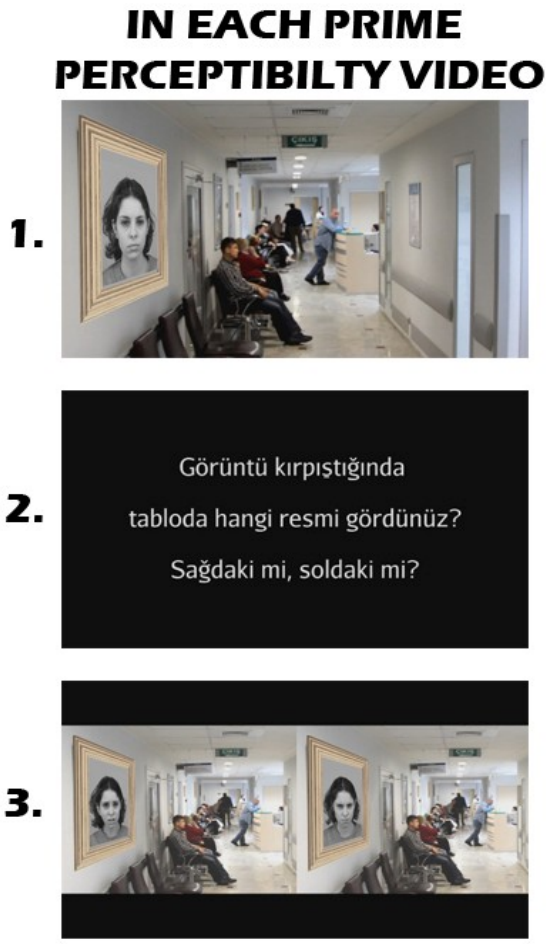


Figure 5 Scenes from prime perceptibility video sequence
1. exact sequence as appeared in the video, 2. for 3sec., 3. for 2 sec.

CHAPTER 4

RESULTS and DISCUSSION

4.1 Mood Ratings

Both in the baseline study and main study; general mood condition based on the PANAS evaluation before the experiments are measured, right after filling the demographics form and before rating the hospital videos.
In the baseline study, none of the participants' PANAS scores, the difference of positive affect and negative affect were extreme and all participants are counted in the study, with a mean score of 12.67 (SD =8.83).

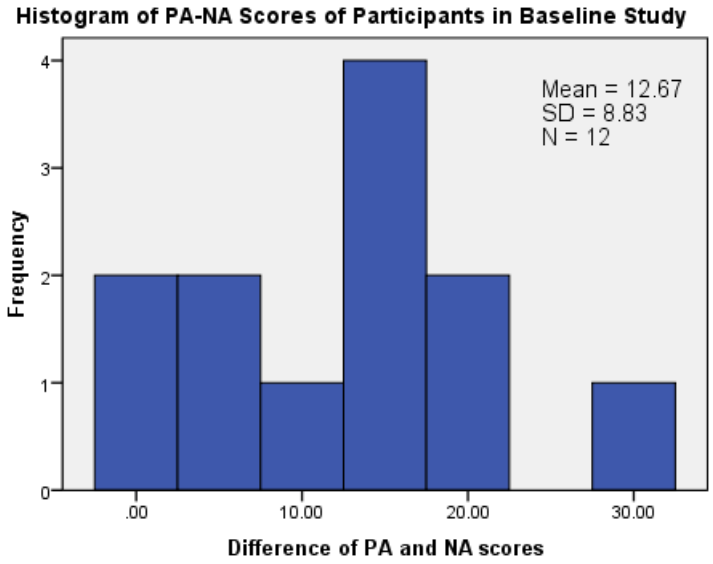


Figure 6 Histogram of differences of PA and NA scores in baseline study

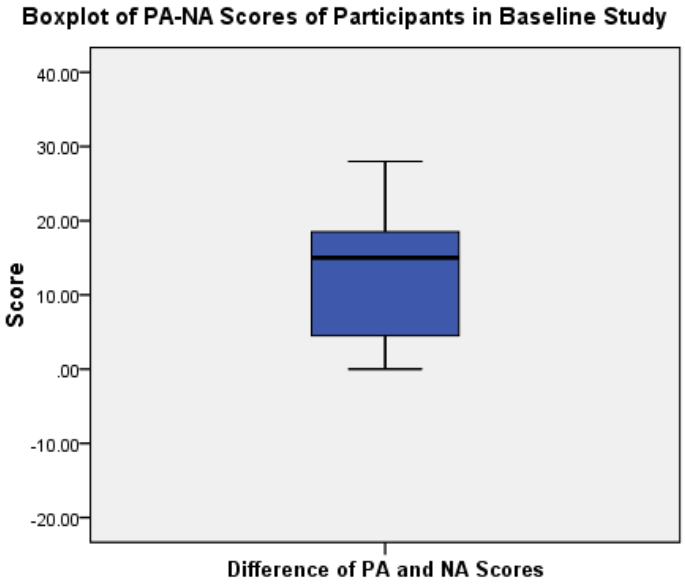


Figure 7 Boxplot of differences of PA and NA scores in baseline study

In the main study, 3 of the participants are determined by outlier labelling method to have extreme scores for the difference of positive and negative affects scales. In order to have a stable model, to refrain from a possible distortion effect on estimates of regression coefficients and, because it is important to conduct the experiment on psychologically healthy subjects, these three participants are excluded from the analysis.

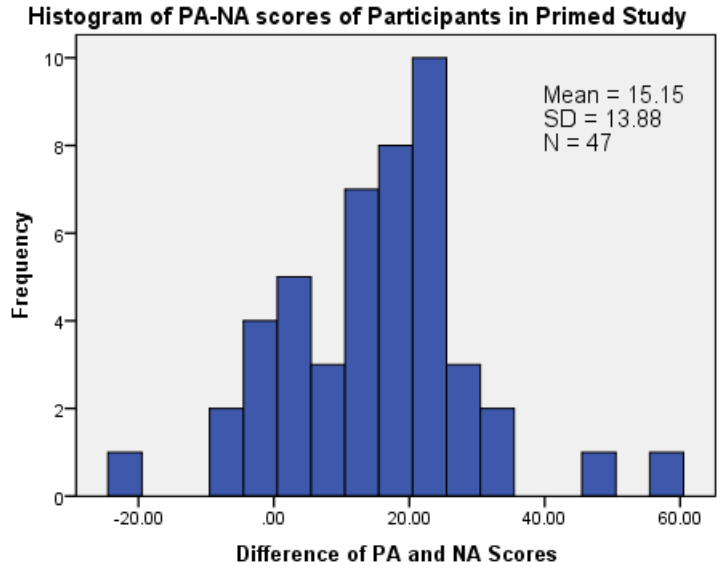


Figure 8 Histogram of differences of PA and NA scores in main study

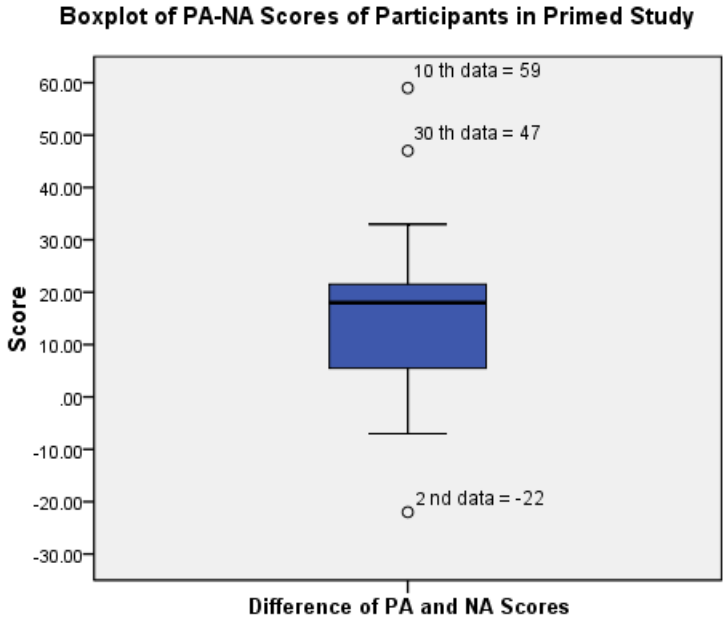


Figure 9 Boxplot of differences of PA and NA scores in main study

Tables below show the descriptive statistics of the PANAS evaluations in detail:

Table 5 Descriptive information of PANAS evaluation in baseline study (experiment 1)

Descriptive Values of PANAS Scores in Baseline Study																				
	PA (Positive Affect)										NA (Negative Affect)										PA-NA (Difference)	
	SUMS					AVERAGE					SUMS					AVERAGE					SUMS	AVERAGE
N	12					12					12					12					12	12
Valid N	12					12					12					12					12	12
Minimum	36					3,6					21					2,1					0	0
Maximum	56					5,6					41					4,1					28	2,8
Mean	45,417					4,542					32,750					3,275					12,667	1,267
Std. Deviation	6,868					0,687					5,479					0,548					8,825	0,883
Questions	q1	q3	q5	q9	q10	q12	q14	q16	q17	q19	q2	q4	q6	q7	q8	q11	q13	q15	q18	q20		
Valid N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
Minimum	4,0	3,0	3,0	3,0	2,0	1,0	2,0	3,0	2,0	3,0	2,0	2,0	1,0	1,0	1,0	2,0	1,0	2,0	1,0	2,0		
Maximum	6,0	7,0	6,0	7,0	7,0	6,0	6,0	6,0	6,0	7,0	6,0	5,0	4,0	5,0	5,0	6,0	5,0	6,0	5,0	4,0		
Median	4,5	5,0	4,0	5,0	4,0	4,5	4,0	4,0	5,0	5,0	5,0	4,0	3,0	2,0	2,0	4,0	3,0	4,0	3,5	3,0		
Std. Deviation	0,94	1,27	0,79	1,38	1,75	1,60	1,08	0,97	1,08	1,03	1,24	0,89	1,11	1,31	1,24	1,19	1,08	1,03	1,14	0,83		

Table 6 Descriptive information of PANAS evaluation in main study (experiment 2)

Descriptive Values of PANAS Scores in Primed Study																				
	PA (Positive Affect)										NA (Negative Affect)										PA-NA (Difference)	
	SUMS					AVERAGE					SUMS					AVERAGE					SUMS	AVERAGE
N	44					44					44					44					44	44
Valid N	44					44					44					44					44	44
Minimum	28					2,8					18					1,8					-7	-0,7
Maximum	56					5,6					43					4,3					33	3,3
Mean	44,932					4,493					30,659					3,066					14,273	1,427
Std. Deviation	7,199					0,720					6,445					0,644					10,244	10,244
Questions	q1	q3	q5	q9	q10	q12	q14	q16	q17	q19	q2	q4	q6	q7	q8	q11	q13	q15	q18	q20		
Valid N	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44		
Minimum	2,0	2,0	2,0	3,0	2,0	1,0	2,0	3,0	1,0	2,0	2,0	2,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0		
Maximum	6,0	7,0	6,0	7,0	7,0	6,0	6,0	7,0	7,0	7,0	6,0	5,0	5,0	4,0	5,0	6,0	6,0	6,0	5,0	6,0		
Median	5,0	4,0	4,0	5,0	4,0	4,0	4,0	5,0	5,0	5,0	4,0	4,0	2,5	2,0	2,0	3,0	3,0	3,5	3,0	2,0		
Std. Deviation	0,99	1,30	1,04	1,18	1,37	1,52	1,10	1,06	1,37	1,24	1,12	1,04	1,21	1,11	1,12	1,24	1,18	1,15	1,08	1,02		

More detailed statistics; question based frequency of scores can be found in Appendix-B.3 and B.5.

4.2 Prime Perceptibility Results

The forced-choice prime perceptibility task evaluated participants' awareness of emotional expressions during the test sequences.

A Nonparametric Binomial Test is applied on the data of guesses. Performance on correct guessing the emotional expressions was 46% , which was not significantly different from chance t (264)=1, p=0.24.

Table 7 Binomial test for prime perceptibility

Binomial Test for Prime Perceptibiliy Task								
		Category	N	Mean	Std. Deviation	Observed Proportion	Test Proportion	Asymp. Sig. (2-tailed)
Guess	Group 1	incorrect	142			,54	,50	.242[a]
	Group 2	correct	122			,46		
	Total		264	0,46	0,50	1,00		

a. Based on Z Approximation.

To test whether guessing the emotional prime correct or not is independent of the prime itself or not; Pearson's chi-square test is applied on the data. The chi-square test for independence was appropriate because the data collected passes the two assumptions that are needed to do this test. First, the data is on nominal level and second; it consists of two categorical groups; guess (correct or incorrect) and prime type (happy or angry).

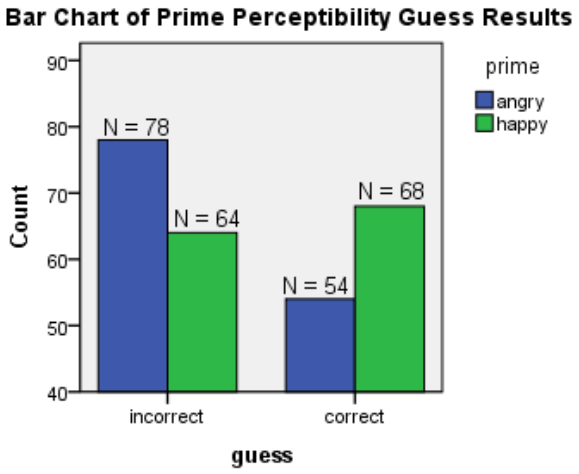


Figure 10 Bar chart of prime perceptibility results. (See appendix B.8 for crosstabs.)

Chi-square test on whether correct or incorrect guessing is related to facing an angry or happy prime, does not show any significance, $\chi(1) = 2.99$ $p = 0.084$.

Table 8 Chi-Square Test of Independence of Guessing and Prime Type

Chi-Square Test for Independence of Guessing and Prime Type					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.987[a]	1	.084		
Continuity Correction[b]	2.575	1	.109		
Likelihood Ratio	2.993	1	.084		
Fisher's Exact Test				.108	.054
N of Valid Cases	264				

a. 0 cells (.0%) have expected count less than 5.The minimum expected count is 61.00.

b. Computed only for a 2x2 table

So there is no statistically significant association between primes and guessing wrong; that is, both happy and angry primes are equally guessed wrong.

4.3 Hospital Evaluations

After demographics and PANAS evaluations, in both the baseline and main primed studies; participants watched the two hospital videos consequently and rated the hospitals with a general score and on a detailed survey.

4.3.1 Baseline Study Hospital Ratings

12 participants, grouped in 2, watched the two hospital videos without any emotional face pictures embedded inside on a counterbalanced order. The general scores given to the hospitals were analysed using Wilcoxon Signed Ranks Test considering the data is ordinal on a likert scale, independent variable consists of two categorical related groups as the same subjects rated both of the hospitals and the distribution of differences between the scores of hospital-1 and hospital-2 are symmetrical in shape, which are the assumptions that should be met in order to be able to do the test. The symmetrical shape of the differences' distribution can be seen in boxplot.

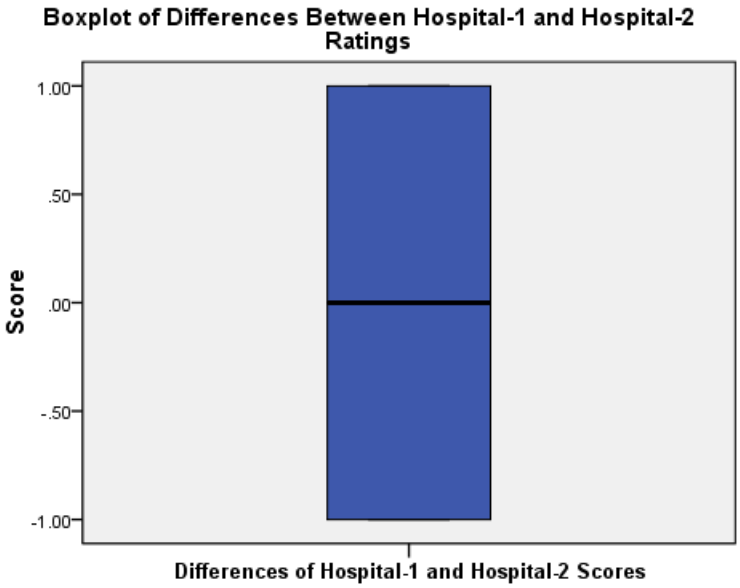


Figure 11 Boxplot of differences between Hospital-1 and Hospital-2 scores

Wilcoxon signed-rank test showed that there is no statistically significant difference between the ratings given to two hospitals (Z = -0.333, p = 0.739).

Table 9 Wilcoxon Signed-Rank Test for baseline study

Wilcoxon Signed Ranks Test Statistics of Baseline Study Hospital Ratings	
	H2-Score - H1-Score
Z	-.333[b]
Asymp. Sig. (2-tailed)	,739

b. Based on positive ranks.

An open ended question was also asked to participants on this baseline study, about on what aspect they based their rating for the hospitals. The answers were in line with the sub scaling method applied to the survey questions using statistical methods which are explained later in section 4.3.4. The answers to these questions can be found in Appendix B.14.

4.3.2 Effect of Primes on Hospital Ratings

Two different hospitals are rated based on the videos with two different subliminal affective primes as explained.

Mann-Whitney U test is applied to the data to test if there is a significant difference between the two distributions of hospital ratings for angry and happy primed videos. A nonparametric measure; Mann-Whitney U test is considered because the data is in ordinal scale, the independent variable consists of two categorical, independent groups (prime type: angry and happy), the observations are independent such that there is no relationship between the observations in each group or between the groups themselves. There are different participants in each group with no participant being in more than one group; if a participant rated the hospital- 1 with angry prime; then they rated the hospital-2 with happy prime and another participant rated the hospital-1 with happy prime and hospital-2 with angry prime. Finally, we used Mann- Whitney U test because our data is not normally distributed. Normality test details can be found in Appendix-B.10.2.

Mann-Whitney U test revealed a Z = -2.918, p = 0.004 for hospital-1 and Z = -2.201, p = 0.028 for hospital-2 which supports our hypothesis that the ratings for a given hospital is not the same under angry and happy subliminal primed conditions, where the ratings under happy subliminal picture exposure is statistically significantly higher for both of the hospitals as can be seen from the mean ranks values.

Table 10 Mann Whitney-U test for main study

Mann-Whitney U Test Statistics[a] on Hospital Ratings in Main(Primed) Study		
	Hospital 1	**Hospital 2**
Mann-Whitney U	127,500	157,500
Wilcoxon W	380,500	410,500
Z	-2,918	-2,201
Asymp. Sig. (2-tailed)	,004	,028

a. Grouping Variable: PrimeType

Table 11 Ranks for Mann-Whitney U test in main study

Ranks of Hospital Scores for H-1 and H-2				
	Prime Type	N	Mean Rank	Sum of Ranks
Hospital-1	Happy	22	27,70	609,50
	Angry	22	17,30	380,50
	Total	44		
Hospital-2	Happy	22	26,34	579,50
	Angry	22	18,66	410,50
	Total	44		

Analysis for the two hospitals' distributions is conducted to see if it is applicable to combine the data for the two hospitals. To do this Mann-Whitney U test and 2 Sample Kolmogorov Smirnov tests are used; as the distributions are not normal and the data is in ordinal scale. The Mann-Whitney U test focuses on central tendency, but also a test for both location and shape as it can detect differences in shape and spread as well as just differences in medians (Hart, 2001); whereas, the Kolmogorov Smirnov test is multipurpose and is sensitive to any kind of difference; such as central tendency, variability, skewness and kurtosis in the distributions from which the two samples were drawn (Siegel, 1956, p.126).

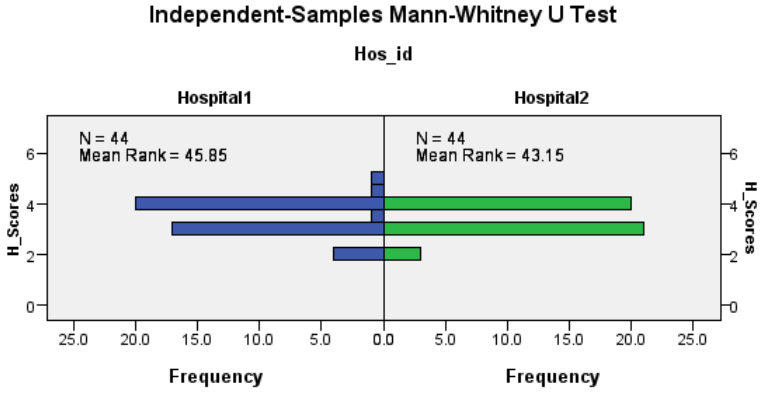
Both Mann-Whitney U tests and 2 sample Kolmogorv Smirnov (K-S) tests revealed that there is insufficient evidence to say that the two distributions are different, with p=0.585 for Mann-Whitney U and p=1.00 for K-S tests.
Since the K-S test leads to a rejection of null hypothesis at any point, it finds a significant difference in the cumulative frequencies of the two samples, where the p-value is very high when compared to Mann-Whitney U test as expected.

Table 12 Hypothesis test summary for Mann-Whitney U test and 2 sample K-S test

Hypothesis Test Summary

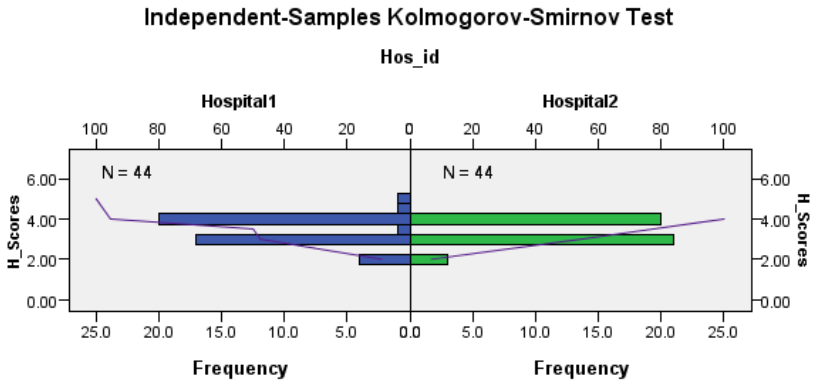
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of H_Scores is the same across categories of Hos_id.	Independent-Samples Mann-Whitney U Test	.585	Retain the null hypothesis.
2	The distribution of H_Scores is the same across categories of Hos_id.	Independent-Samples Kolmogorov-Smirnov Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.



Total N	88
Mann-Whitney U	908.500
Wilcoxon W	1,898.500
Test Statistic	908.500
Standard Error	108.850
Standardized Test Statistic	-.547
Asymptotic Sig. (2-sided test)	.585

Figure 12 Mann Whitney U test for differences in distributions



Total N		88
Most Extreme Differences	Absolute	.068
	Positive	.023
	Negative	-.068
Test Statistic		.320
Asymptotic Sig. (2-sided test)		1.000

Figure 13 2 sample K-S test for differences in distributions

Combining the two hospitals, the hospital ratings are analyzed to see whether there is a significant difference for the embedded happy or angry expressions. According to the results of Mann-Whitney U test, it is found that there is a significant difference between the two distributions of angry and happy primed video ratings with a p-value of 0.00, where the mean ranks of happy primed video scoring is 53.75 and angry primed video scoring is 35.25. It is concluded that the scores given under subliminal happy face picture exposure is statistically much higher than the scores under angry picture exposure.

Table 13 Mann-Whitney U test for main study when hospitals are combined

Mann-Whitney U Test Statistics[a] on Hospital Ratings in Main (Primed) Study (Hospital effect discarded)	
	Hospital Scores
Mann-Whitney U	561,000
Wilcoxon W	1551,000
Z	-3,739
Asymp. Sig. (2-tailed)	,000

a. Grouping Variable: Prime Type

Table 14 Ranks for Mann-Whitney U test in main study when hospitals are combined

Ranks of Hospital Scores				
Prime		N	Mean Rank	Sum of Ranks
Hospital Scores	Happy	44	53,75	2365,00
	Angry	44	35,25	1551,00
	Total	88		

4.3.3 A detailed analysis with Generalized Linear Model with Logistic Link Function

The main hypothesis proposed in this study, that is, the ratings scored for a given hospital would be different under positive and negative affective subliminal stimulus in favor of the positive, is supported. It is useful to see what effects are correlated with this scoring. In order to analyse this, a regression model is tried. Regression model is chosen according to the nature of the data, where dependent variable; hospital rating scores are categorical in a likert scale of 5, of independent variables age is continuous, gender, education, prime type and hospital id are categorical. A general linear model could not be used on the present sample as the dependent variable is not normal and not continuous, so a generalized linear model with a logistic link function is chosen.

Owing to the nature of the model to be fitted; in order not to create empty cells with missing variables (i.e. dependent variable levels by

subpopulations); necessary variables are transformed within each category having an instance. The recoded scores are labelled as good for 4 and 5 and bad for 2 and 3. Education is categorized as undergraduate, graduate and doctorate degrees in 3 groups, since all participants were at least an undergraduate student.

Due to the nature of the transformed dependent variable, both binary logistic and multinomial logistic regressions as link with the linear model give the same results. The reason that the same person has two votes for hospital; as per prime type and hospital id counterbalanced; their age, gender and education information was counted in the model twice. Thus, in order to eliminate this, a person id variable is defined as the subject in the model for a proper nested design.

The model predicted the good scores of 76.2% and bad scores of 80.4% accurately with an overall 78.4% correct prediction.

Model Summary

Target: Score_Grp

Target		Score_Grp
Probability Distribution		Binomial
Link Function		Logit
Information Criterion	**Akaike Corrected**	101.242
	Bayesian	117.184

Information criteria are based on the -2 log likelihood (85.842) and are used to compare models. Models with smaller information criterion values fit better.

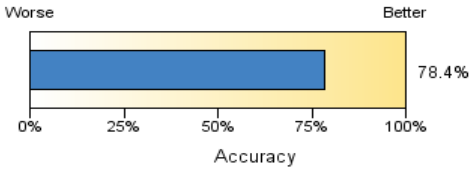


Figure 14 Predicted GLIM model summary

Table 15 Prediction success percentage for scores

Classification

Target:Score_Grp

Overall Percent Correct =78.4%

Observed	Predicted	
	Good	Bad
Good	76.2%	23.8%
Bad	19.6%	80.4%

Row Percent
100.00
80.00
60.00
40.00
20.00
0.00

According to the GLIM model; prime is found to have a significant effect on the hospital ratings with p=0.001 (F = 12.691), while age also has a significant effect (F = 11.468, p = 0.001). On the other hand, hospital id (F = 0.489, p = 0.487) gender (F = 0.209, p = 0.649) and education (F = 2.085, p = 0.132) do not have a statistically significant effect.

Table 16 Significancy of effects in GLIM model

Fixed Effects

Target:Score_Grp
Reference Category:Bad

Source	F	df1	df2	Sig.
Corrected Model ▼	3.423	6	71	.005
Prime	12.691	1	71	.001
Hos_id	0.489	1	71	.487
Gender	0.209	1	71	.649
Education	2.085	2	71	.132
Age	11.468	1	71	.001

Probability distribution:Binomial
Link function:Logit

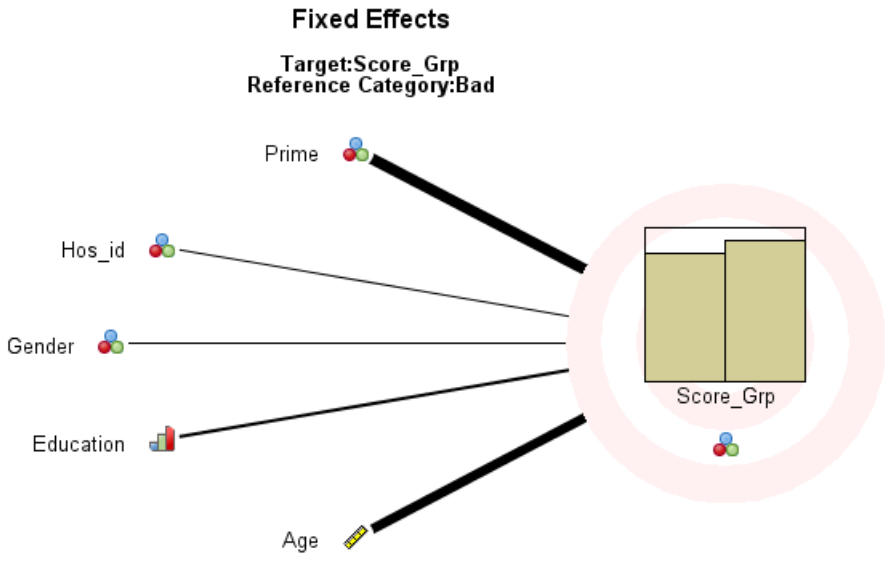
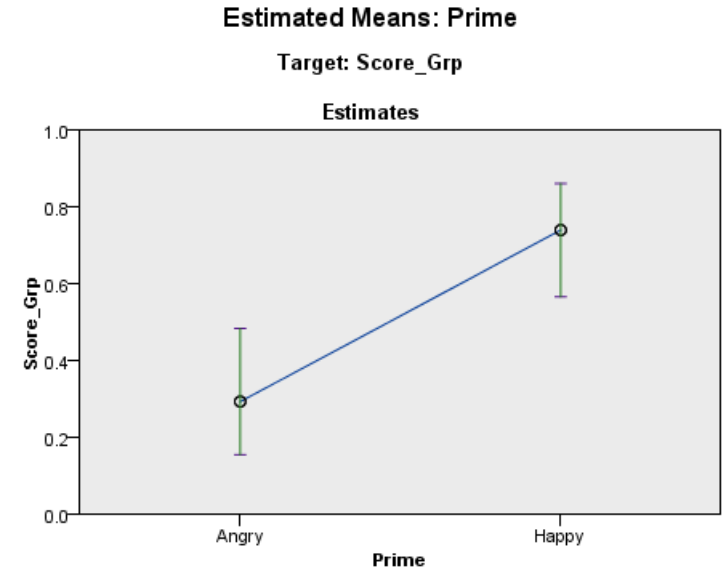
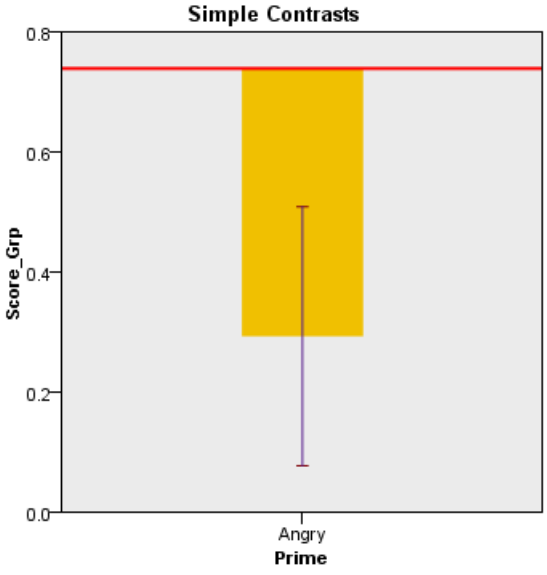


Figure 15 Chart for significance of effects in GLIM model

Estimated means for prime values can be graphed as below. Age is fixed at the mean value, because it is continuous in this estimation.



Continuous predictors are fixed at the following values: Age=30.09.



The horizontal line is the Score_Grp estimated mean at Prime=Happy. The vertical bars are the simple contrasts (Score_Grp at each level of Prime minus Score_Grp at Prime=Happy).

Significant contrasts are shaded gold. The least significant difference adjusted significance level is .05.

Figure 16 Estimated means for prime effect in GLIM model

The effect of age could not be graphed as the predictor of prime variable, because of the continuous scale of the variable.

Assesing the estimated betas of the model, how the independent variables effect the outcome is found using the odds ratio. The relation of prime variable with hospital scores is therefore explained by its odds ratio = exp(1.922) = 6.84; which means the odds of evaluating the hospital as "good" is 6.84 times greater in those who are exposed to happy subliminal affective stimuli than it is in those exposed to angry subliminal stimuli. The relation of age and hospital score is not that powerful as it is in the prime score, since the odds ratio is exp (0.3) = 1.35 in that case.

Table 17 Significance of coefficients in GLIM model

Fixed Coefficients

Target:Score_Grp
Reference Category:Bad

Model Term	Coefficient ▼	Std.Error	t	Sig.	95% Confidence Interval	
					Lower	Upper
Intercept	-10,259	2,922	-3,510	,001	-16,085	-4,432
Hos_id=1	0,365	0,512	0,712	,479	-0,657	1,386
Hos_id=2	0,000[a]					
Gender=f	0,243	0,571	0,426	,672	-0,895	1,381
Gender=m	0,000[a]					
Education=1	-0,527	1,007	-0,523	,602	-2,534	1,480
Education=2	0,643	0,952	0,675	,502	-1,256	2,542
Education=3	0,000[a]					
Prime=1	1,922	0,539	3,564	,001	0,847	2,998
Prime=2	0,000[a]					
Age	0,300	0,091	3,284	,002	0,118	0,483

Probability distribution:Binomial
Link function:Logit

[a]This coefficient is set to zero because it is redundant.

4.3.4 A detailed analysis based on subgrouping the hospital ratings

The 14 questions to test the hospital ratings in detail are provided in Appendix A.4. We have conducted tests to see if these questions can be arranged into subgroups. According to the cronbach alpha tests, we grouped our questions in measuring the three different aspects of the hospitals as follows:
Group 1: physical appearance and condition of the hospitals
Group 2: service quality and patient satisfaction
Group 3: the diagnosis-treatment, technology opportunities and facilities.

Our cronbach alpha tests revealed a 0.739 correlation value for 3 questions in subgroup-1, 0.746 correlation value for the 6 questions in subgroup-2 and 0.656 correlation value for the 5 questions in subgroup-3 for the first hospital. According to these results we have decided to omit question number14 from the analysis which lowers the subgroup-3 results. After removing question 14 from subgroup-3, we had a 0.712 correlation value. For the second hospital, the correlation values for the 3 questions of subgroup-1, 6 questions of subgroup-2 and 4 questions of subgroup-3 are consequently, 0.794, 0.804 and 0.819. Detailed tables on cronbach alpha statistics can be found in Appendix- B.11.

Ratings for subgroups are analysed using Mann-Whitney U test since the assumptions are met, as was explained earlier. Results show that there is a significant difference for all of the subgroups in hospital-1 between the angry and happy primed video exposure ratings, where the happy has a significantly higher score as we expected in our hypothesis (p=0.003 for physical condition, p=0.001 for service quality & patient satisfaction and p=0.017 for diagnosis- treatment and technology oppurtunities and facilities). In the second hospital analysis rather close scoring is observed, where we failed to reject the null hypothesis that the angry and happy primed score distributions are the same with 99.5% confidence interval (p=0.064 for physical condition, 0.224 for service quality and p=0.050 for diagnosis, treatment and technology). On the other hand, we can say that physical appearance & condition's and diagnosis, treatment and technology opportunities' ratings have rather low p-values, indicating a

marginally significant difference in the ratings for different affective prime exposures.

Table 18 Mann-Whitney U test for subscales in main study

Mann-Whitney U Test Statistics[a] of Main(Primed) Hospital Study Subgroup Ratings						
	H1 Group 1	H1 Group 2	H1 Group 3	H2 Group 1	H2 Group 2	H2 Group 3
Mann-Whitney U	117,000	100,500	142,500	164,500	190,500	159,500
Wilcoxon W	370,000	353,500	395,500	417,500	443,500	412,500
Z	-2,981	-3,345	-2,385	-1,849	-1,215	-1,960
Asymp. Sig. (2-tailed)	,003	,001	,017	,064	,224	,050

a. Grouping Variable: PrimeType

According to the subgrouping which is supported by cronbach alpha values, the scores of baseline studies are also analyzed to see if there are any differences between the two hospitals' scoring in terms of physical conditions, service qualities and patient satisfaction guesses or diagnosis, treatment and technology evaluations. Wilcoxon Signed Ranks test is applied again as per the data sets' fitting into assumptions explained before. None of the subgroup scores showed a statistically significant difference between the two hospitals; which means the scoring on the two hospitals are significantly equal under neutral conditions, also in terms of physical condition ($Z = -1.403$, $p = 0.161$), service quality and patient satisfaction ($Z = -0.393$, $p = 0.694$) and diagnosis, treatment and technology opportunities ($Z = -0.630$, $p = 0.529$) guesses based on the videos.

Table 19 Wilcoxon Signed Ranks Test for subscales in baseline study

Wilcoxon Signed Ranks Test Statistics of Baseline Study Hospital Subgroup Ratings			
	H2 Group1 - H1 Group1	H2 Group2 - H1 Group2	H2 Group3 - H1 Group3
Z	-1.403[b]	-.393[c]	-.630[c]
Asymp. Sig. (2-tailed)	,161	,694	,529

b. Based on negative ranks.

c. Based on positive ranks.

CHAPTER 5

GENERAL DISCUSSION

With the developing technology and the studies showing that the usage of technology in health care can be as effective as a face-to-face treatment in some cases (eg. Andersson, 2012), it is inevitable to use human created interfaces to reach out to patients and their clinical information. If we think about the private hospitals as business managements, it is possible that these human created interfaces to include content with commercial purposes. Today, in health area, the signboards and websites of the doctors and clinics are audited in order to refrain from commercial and marketing elements. However there is no audit mechanism for the affective content of the technology used in telehealth and telemedicine.

This study investigated the effects of subliminal positive/negative affective pictures on evaluative judgements of private hospitals. Angry and happy emotional expressions were embedded into two different hospital videos. The hospitals were later assessed by the participants based on these videos. This study showed that in 44 Turkish adults, subliminal happy and angry primes had an effect on hospital evaluations. The participants exhibited preference for the hospitals that are seen in the videos with happy facial expressions over the ones with angry expressions. The findings are discussed below in comparison to previous studies in the literature.

5.1 Effects of Subliminal Affective Stimuli on Hospital Ratings

Data was collected from 4 groups of subjects who watched the two hospital videos which contained angry and happy facial stimuli in a counterbalanced order. Results revealed that for both hospital videos, the rating scores were significantly higher in the condition of happy primes than in angry primes (hospital-1 $p= 0.004$, hospital-2 $p= 0.028$). Further data analysis showed that the distribution of the two distinct hospital rating scores could be merged as there is insufficient evidence to say that the two distributions are different ($p= 0.585$). Combining the data, results revealed that there is a significant difference between the hospital evaluations for the hospitals with subliminal happy priming and angry priming, in favour of our hypothesis.

Previous studies showed that, in a need-state or when the stimuli to be rated matches with the subject's goal at the moment, subliminal priming has an enhancing effect on evaluations (eg. Murphy & Zajonc, 1993, Murphy, Monahan & Zajonc, 1995), liking ratings (eg. Strahan et. al., 2003, Winkielman et al. 2005) subsequent behaviour (eg. Silverman et al., 1978) and consumption behaviour (Winkielman et al., 2005, Bermeitinger et al. 2009).

Based on the results of the current study, it can be discussed that these changes in cognitive processes, such as evaluative and behavioural changes, (1) could be due to very low-level affective change in states, which might be elicited with a small number of exposures, (2) could be explained by the free-floating nature of subliminally primed affect, (3) could be attached to a subsequent stimuli because of the free floating nature of the affect elicited.

One might question the number of exposures to subliminally primed pictures, which is five and rather a small number in this study compared to literature. One reason why we wanted to use such a small number is because the duration of our subliminal exposures were 40ms and rather long compared to previous studies (eg. 16ms in Winkielman et al. 2005, 4msec in Murphy & Zajonc 1987, 4 msec in Silverman et al., 1978). One might also question that this duration could have been not under

the threshold for one's conscious awareness; however, prime perceptibility test results show the evidence that the emotional expressions masked by the neutral pictures were not consciously perceived, as the explicit information given by the subjects on test results were not different from chance level with a p=0.24. One of the reasons for this might be that, in the previous studies, subjects were directly exposed to the stimuli, such as a sentence flashing in a task (Silverman et al.1978), or doing a gender classification task on the neutral masks (Winkielman et al., 2005). In the current study, the stimuli was blended in the videos, which the participants believed to be the actual stimuli and is therefore, smaller than the supraliminal stimuli (hospital scene covers the whole screen, whereas, the subliminal primes cover small part of it as being in a frame on the wall in the scenery) and inside a moving image which is more disruptive than a still image when compared.

The other reason for the use of low number of primes is rooted in the automatic effect of familiarity. Since the videos with subliminal angry expression and subliminal happy expressions are watched consequently, even though there was an interruption with the evaluations to avoid any possible mere- exposure-effect (Zajonc, 1968), it is not preferred to use the priming pictures for many times. As further explained in chapter 2, studies have shown that, whether subliminally used or not, subjects develop a preference towards things that are exposed many times because of the familiarity effect. The faces used in each hospital video belong to the same three people chosen from KDEF. Videos are watched back to back. Although there was an interruption for the evaluation, familiarity is wanted to be minimized. Also, it was possible that a subliminal emotional expression to affect the next subliminal emotional expression's affective value. When the happily primed video is watched first, the effect should have worn out until the next video with the angry primes, in order to avoid interference. These are based on the previous studies of Zajonc revealing the additive property of unconscious affect (2000, pg.55). Also counterbalanced order of the videos in different subject groups gave the opportunity to eliminate the confounding effect of familiarity in the data.

Another crucial thing to point out is that, the reason why angry and happy faces are used in the study is based on suggestions made by the previous studies pointing out elicitation of affect through low-level mechanisms such as familiarity (Morris et al., 1999). A second factor why facial stimuli are considered is because of the humane nature of the evaluated stimuli. Visual affective stimuli such as violent or heart-warming scenes would be a rather unrelated set with the object of the free-floating affect aimed to be elicited.

Previous studies suggested that the diffuse nature of unconscious affect could attach to anything. In addition to the direct effect to cognitive processes, according to the study of Kemp-Wheeler and colleagues (1987), the evidence suggests that unconscious affect contributes to a change also in anxiety levels, which is a free-floating emotion itself. Zajonc proposed that; "If the person is unable to specify either the origin or the target of affect he or she is experiencing, then this affect can attach itself to anything that is present at the moment. Stimuli that have no connection with its origin can thus become targets of nonconscious affect." (2000, p.48). Our findings are consistent with this view since the positive and negative affects' influence is significant over the evaluative judgement on hospitals which was the object of subject's attention at that moment. Besides the difference being induced subliminally in the current study, the enhancing effect of positive affect is found and suggested many times before, in medical context (see Isen 2001 for a review of the previous studies).

One of the important differences of the current study is the stimulus used for evaluation. The baseline for the study which is the hospital video itself is likely to have a negatively valenced value, both because the videos having scenes such as blood-drawing, syringes and because of the fact that hospitals are places people go when either themselves or their acquaintances have a problem, and therefore, to search for a cure. To eliminate any excessive effect, such as history of a traumatic event related to hospitals, a question regarding previous illnesses/surgeries is added to the demographic questions form. Consistent with Kemp-Wheeler and colleagues' findings, Zajonc's proposal is important to explain our findings here; "Nonconscious affect can become attached to

any stimulus, even an irrelevant one, and it can combine additively with affect from other sources" (2000, pg.55). In the current study, it is believed that, a possible negative value of the hospital and the subliminal primes are processed additively, therefore, a hospital video with a happy subliminal expression was preferable to the one with an angry facial expression. The baseline experiment under neutral conditions conducted in this study showed that the hospital ratings alone are not that negative, compared to the ones under happily primed conditions in main (primed) study. However, the mean and median values for rating scores are dropped substantially in the angrily primed condition (see tables B9.1 and B.10.1 in appendix-B).

Similarly, the ratings for the 4 subscales which include: 1)physical appearance and condition, 2)service quality and patient satisfaction, 3)diagnosis-treatment and technology opportunities and facilities of the hospitals were not statistically significantly different between the hospitals in the baseline study. Therefore, based on this finding, the scoring data within each hospital is analysed according to the priming factor in the main primed study which revealed a real close result to being significantly different for the physical condition ($p= 0.064$) and diagnosis-treatment and technology opportunities ($p = 0.05$). This is also in-line with the hypothesis proposed. In contrast, for the service quality and patient satisfaction, a significant difference is not found based on the data ($p= 0.224$). The reason underlying for this result might be because the scoring was made based on the video, there wasn't a clearly appealing information presented for the service quality and patient satisfaction. Hence, the scorings had to be done on "guesses" based on the videos, which caused participants to think and engage in more complex cognitive executions, which are not conformed to subliminally elicited affect in the literature.

For the reasons mentioned above; whether or not, the subliminally elicited affect caused an unconscious emotion as in the account of Winkielman et al. (2005) or acted as the affect-as-information account of Scwarz and Clore (1983), it is believed that current study is helpful to give a thought on the following three main issues about subliminally elicited affect. Firstly, the affect could be elicited within a small number and

low-level of exposures. Secondly, as being undedicated at the time of elicitation, subliminally induced affect could be attached to an unrelated stimulus without a need state. Thirdly, induced affect could be diffused into an affective stimulus and in that case subliminally induced affect would have an additive affect on the stimulus' baseline affective value.

It is known from previous studies that, when the individual's need state or current goal matches with the target to be evaluated, the effect of affective prime is enhanced. The power of the study and findings derive from the following idea: if the emotional stimuli has an effect on evaluative judgements about the hospital when the evaluators are not real patients and the evaluations are done externally, in other words via a video, it could be anticipated that the affective stimulus would be more effective on real patients within the hospital or using the related technological units. As the previous studies show, the affective priming effects are enhanced when the individual's current need state or goal is matched with the target to be evaluated.

Previous studies have shown that telehealth could access and modify patient's emotions. According to the study of Gale and Sultan (2013), patients become physically and emotionally dependent on others and on medical technologies in the condition of chronic obstructive pulmonary disorder (COPD). In this case, it might be thought that patients would probably be more prone to affective stimuli as they are emotionally dependent on others. This is important, because in the current study, the results showed that even when the subjects are healthy people with a stable mood (as per their PANAS results); subliminally triggered affect had a manipulative role in their evaluative judgements. It is possible that a subject with an emotionally dependent psychological state would easily be affected in such a case. Therefore, it would be useful to conduct similar studies with real patients for different cases of health problems.

Moreover, studies suggest that (eg. Tustin, 2010), online health information seeking is related to patient dissatisfaction, great amount of which is due to the health employee's and doctor's empathy deprived relation with the patients. The interfaces in hospitals and their content are important also for the medical personnel of the hospital, who are the key for patient satisfaction. Empathy and helpfulness is known to be elated and altered by

positive and negative affect (Isen, 2001) which could be generated subliminally by the visuals used in any kind of interface. That might in turn effect patient satisfaction and could result with patient's seeking information on unreliable sources online.

5.2 Limitations

As explained in section 5.1, subliminal exposures are used five times inside the videos which could be considered as a small number of repetitions compared to the studies in the literature. As discussed before, this decision on the number of times was based on a possible familiarity and mere-exposure effect (Zajonc, 1987), considering the additive nature of subliminally elicited affect (Zajonc, 2000) which could be caused by the sequence of events. Further studies can be designed with different number of exposures, to see if there is a spectrum from the unconscious to a possible conscious perception.

The study is not conducted with real patients who are hypothesised to be influenced with a possible affective stimulus. The subjects rated the hospitals through a video watched on the screen, which would have been likely to be different than being inside the hospital itself. Future studies can be conducted using real hospital management system interfaces inside or outside hospitals with real patients.

CHAPTER 6

CONCLUSION

The present study investigated the effects of unconscious emotions induced by subliminal visual affective stimuli on evaluative judgements of the private hospital environment.

As supported by the statistical analysis, the study produced three anticipated results in line with the previous studies. First of all, the study supported the notion that affect could act as an informative function, aiding or manipulating the evaluative judgements on a given target in this specific case. In the baseline study, the subjects rated the hospitals in videos without any primes in neutral conditions and the ratings for the hospitals were not significantly different than each other. However, in the main study, when the same two hospitals were rated with happy and angry facial expressions as primes; the hospital primed by the happy pictures was rated with significantly higher scores than the one with angry pictures. The finding was consistent regardless of the hospital itself.

The findings were important for the presentation of technology by suppliers in our age, where any kind of health management tool is accessible for patients' own use for the needs about both administrative purposes such as appointment booking or patient records retrieval and medical issues such as getting the laboratory results. However, how presentation utilities shape customer (patient) decisions is not studied in detail.

Secondly, the findings supported the idea that the emotion elicited by an unknown source can be unconscious to the individual. The obscurity of the

source is proved with the prime perceptibility test analysis; as the subjects' guesses on the emotional expression in the subliminally flashed pictures was not significantly different than chance level. In fact, almost all subjects revealed that they had not even realized that the expression in the picture was changing when the flashing occurred, as some of them thought that it was an editing issue where the sequence jumped, until they were forced to choose an emotion they saw in the prime perceptibility task.

Thirdly, as previous studies stated, the free floating nature of an unconscious affect, which does not have an object as in the conscious emotions such as "to like of" or "to get angry about", resulted in the elicited affect. Attachment still occurs when the source of the elicitor is irrelevant with the given target.

Moreover, our study confirms that even when the individual's current goal or need state at the time of evaluation does not match with the target to be evaluated, the elicited affect still influenced the liking of the hospitals. This is observed in the general score given to the hospitals. The significance of results in the detailed questionnaire was not as high as the significance of results in the general scores, which is also in line with the previous studies related to the mechanisms underlying complex cognitive decisions. Still, the analysis of the question sub-groups' data collected from the main study provided significant differences based on the polarity of the primes (i.e. positive or negative).

This main finding regarding the irrelevance of the need state of subjects, makes this study a pioneer for further research in real hospital management systems. Use of interfaces inside or outside hospitals with real patients might create substantial results in customer preferences. This research might also be an initiator to call attention to the possible ethical problems that can arise in the absence of an audit mechanism on the materials used in technology.

The current study is an initial effort to combine the findings of the research on affect in decision making with the health informatics field. Based on our findings, subliminal affect has an important effect in hospital evaluation of potential patients. To the best of our knowledge, this study is the first to statistically investigate decisions of health customers on rating

hospitals for physical appearance, service quality, diagnosis-treatment performance and technology opportunities. In the future, based on our findings, the design of technological tools such as kiosks, queuing machines, telehealth and telemedicine technologies and related hospital management systems can be reshaped in terms of the visual presentations.

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APPENDICES

APPENDIX A: EVALUATION FORMS

A.1 CONSENT FORM (SAMPLE)

Gönüllü Katılım Formu:

Enformatik Enstitüsü Tıp Bilişimi Bölümü yüksek lisans tezi olarak, Asst.Prof.Dr.Didem Gökçay'ın danışmanlığında, Deniz Vidinli tarafından yapılan bu araştırmada, sizden 2 adet video izlemeniz ve sonrasında gerçekleştirilecek olan kısa anket sorularına cevap vermeniz istenmektedir. Araştırmanın amacı, kişilerin hastahane tercihlerini belirlemektir. Sizden alınan bilgiler hiçbir şekilde paylaşılmayacak olup, araştırmada yalnızca sayısal veriler, yanıtların sahiplerinden bağımsız olarak kullanılacaktır.
Her bir video 2 dakika olup, katılımcı videoları tek bir oturuşta aralıksız şekilde izleyecektir. Anket ile birlikte katılımcının ayırması gereken toplam süre 10 dakikayı geçmeyecek olup, katılım gönüllülük esasına dayanmakta ve kişi herhangi bir anda katılımdan vazgeçme konusunda özgürdür.
Araştırmayla ilgili her türlü soru ve sorunlarınız için irtibat bilgileri;

Deniz Vidinli
0541 523 88 38 denizvidinli@yahoo.com
şeklindedir.

Bu form; katılımcının, çalışmanın amacı konusunda bilgilendirildiğine ve gönüllü katılmayı kabul ettiğine yönelik beyanını belirtmektedir.

Katılımcı ad soyadı:

İmzası :

EK: Katılımcı tanıma formu

A.2 DEMOGRAPHIC QUESTIONS FORM (SAMPLE)

Katılımcı tanıma formu:

Kod ve grup: __(Deney personeli tarafından doldurulacaktır.)

1. Ad, soyad:

2.Cinsiyet :

3.Doğum tarihi:

4.Doğum yeri :

5.Büyüdüğünüz şehir/kasaba:

6.Okul/ bölüm / yıl:

7.Herhangi bir psikolojik rahatasızlığınız var mı? E / H
Evetc evabını verdiyseniz, lütfen belirtiniz_____

Bu rahatsızlığınız için bir ilaç tedavisi görüyor musunuz? E / H
Evetc evabını verdiyseniz, lütfen belirtiniz_____

8. Herhangi bir ciddi rahatsızlık ya da ameliyat geçirdiniz mi?
Evetc evabını verdiyseniz, lütfen belirtiniz_____

9. Hastane personeli olarak çalışma tecrübeniz var mı? E / H
Evetc evabını verdiyseniz, lütfen belirtiniz_____

10. En sevdiğiniz renk nedir?

_____

A.3 POSITIVE AND NEGATIVE AFFECT SCHEDULE (PANAS) FORM (SAMPLE)

Aşağıda bir takım duygu ifadeleri bulunmaktadır. Lütfen her bir duyguyu genelde yaşama sıklığınızı, yan taraftaki dereceleme ölçeğinde belirleyiniz.

	Asla	Çok Nadiren	Nadiren	Bazen	Sıkça	Çogunlukla	Daima
1. İlgili	1	2	3	4	5	6	7
2. Sıkıntılı	1	2	3	4	5	6	7
3. Heyecanlı	1	2	3	4	5	6	7
4. Mutsuz	1	2	3	4	5	6	7
5. Güçlü	1	2	3	4	5	6	7
6. Suçlu	1	2	3	4	5	6	7
7. Ürkmüş	1	2	3	4	5	6	7
8.Düşmanca	1	2	3	4	5	6	7
9. Hevesli	1	2	3	4	5	6	7
10. Gururlu	1	2	3	4	5	6	7
11. Asabi	1	2	3	4	5	6	7
12. Uyanık	1	2	3	4	5	6	7
13. Utanmış	1	2	3	4	5	6	7
14. ihamlı	1	2	3	4	5	6	7
15. Sinirli	1	2	3	4	5	6	7
16. Kararlı	1	2	3	4	5	6	7
17. Dikkatli	1	2	3	4	5	6	7
18. Tedirgin	1	2	3	4	5	6	7
19. Aktif	1	2	3	4	5	6	7
20.Korkmuş	1	2	3	4	5	6	7

A.4 HOSPITAL EVALUATION FORM (SAMPLE)

Bölüm-1:

0. Hastaneyi 5 üzerinden genel olarak değerlendiriniz :

		1	2	3	4	5
	Hastaneyi aşağıda listelenen kriterlere göre değerlendiriniz:	**Çok kötü**	**Kötü**	**Orta**	**İyi**	**Mükemmel**
1	Hastane dekorasyonunu (mobilyalar, koltuklar, duvar tabloları vs.) değerlendiriniz:					
2	Hastanede hakim olan ana renkleri (duvarlarda, koridorlarda, odalarda hakim olan renkler) değerlendiriniz:					
3	Filmde gördüğünüz kadarıyla, hastanede yer alan medikal teknolojileri değerlendiriniz:					
4	Filmde görebildiğiniz kadarıyla hastane temizliğini değerlendiriniz:					
5	Hastaneyi hizmet kalitesi hakkındaki tahmininiz üzerinden değerlendiriniz:					
6	Hastaneyi doktorlar ve diğer personelin memnuniyeti hakkındaki tahmininiz üzerinden değerlendiriniz:					
7	Hastaneyi hasta memnuniyeti hakkındaki tahmininiz üzerinden değerlendiriniz:					
8	Hastaneyi konaklama imkanları ve konukseverlik hakkındaki tahmininiz üzerinden değerlendiriniz:					
9	Hastaneyi hasta gizliliği hakkındaki tahmininiz üzerinden değerlendiriniz:					
10	Hastaneyi, hasta kayıttan, hastanın çıkış işlemlerine kadar geçen süre hakkındaki tahmininiz üzerinden değerlendiriniz:					
11	Hastaneyi teşhis imkanları hakkındaki tahmininiz üzerinden değerlendiriniz:					
12	Hastaneyi tedavi imkanları hakkındaki tahminiz üzerinden değerlendiriniz:					
13	Hastaneyi, ücretlendirme politikası hakkındaki tahminiz üzerinden değerlendiriniz:					
14	Hastaneyi olası medikal hataların sıklığı konusundaki tahminiz üzerinden değerlendiriniz: (çok kötü= çok sık, kötü=sık, orta=orta, iyi=seyrek, mükemmel=neredeyse hiç)					

Bölüm-2:

		Evet	Hayır
1	Filmde gösterilen hastane size herhangi bir şekilde tanıdık geldi mi?Eğer cevabınız evet ise, aşağıdaki 2-6.sorulara cevap veriniz.		
2	Hastanenin adı hakkındaki tahmininizi yazınız.		
		Evet	**Hayır**
3	Hastanenin tanıdık gelmesinin sebebi daha önce orada muayene olmuş ya da tedavi görmüş olmanız mı?		
4	Hastanenin tanıdık gelmiş olmasının sebebi, kişisel muayene nedenleri dışında mı (Ziyaret, başka bir yakının muayenesi ya da herhangi başka bir sebeple hastanede daha önce bulunmuş olma gibi) ?		
5	Hastanenin tanıdık gelmiş olmasının sebebi, daha önce bir yerde hastaneyi görmüş olmanız mı (örn. bir film, dizi ya da televizyonda) ?		
6	Hastanenin tanıdık gelmiş olmasının sebebi, videoda görmüş olduğunuz bir logo, işaret ya da tabelanın size ilgili sağlık grubunu anımsatması mı ?		

A.5 FORCED CHOICE QUESTION FORM (SAMPLE)

	1.video	2.video
Eğer muayene olacak ve/veya tedavi görecek olsaydınız, videolarda gösterilen hastaneleri nasıl sıralardınız? Her video için sıralamanızı 1, 2, şeklinde belirtin.		

A.6 PRIME PERCEPTIBILITY FORM (SAMPLE)

İzlediğiniz videoda görüntü kırpıştığında ekranın size göre hangi tarafındaki resmi gördüğünüzü işaretleyiniz.

	SOL	SAĞ
1		
2		
3		
4		
5		
6		

APPENDIX B: STATISTICAL TABLES

B.1 DEMOGRAPHICS INFORMATION OF THE PARTICIPANTS IN BASELINE STUDY

Demographics of Subjects in Baseline Study			
	Group-1	**Group-2**	**Total**
	H1H2	*H2H1*	
N	6.00	6.00	12.00
Age			
Mean	25.00	27.67	26.33
Range	18-37	21-33	18-37
Std. Dev.	8.44	4.08	6.47
Sex			
F	5.00	3.00	8.00
M	1.00	3.00	4.00
Education *(student or alumni)*			
Undergraduate	3.00	4.00	7.00
Graduate	3.00	2.00	5.00

B.2 DEMOGRAPHICS INFORMATION OF THE PARTICIPANTS IN MAIN STUDY

Demographics of Subjects in Main and Prime Perceptibility Experiment					
	Group-1	**Group-2**	**Group-3**	**Group-4**	**Total**
	H1A-H2H	*H2A-H1H*	*H1H-H2A*	*H2H-H1A*	
N	11.00	11.00	11.00	11.00	44.00
Age					
Mean	30.09	28.64	31.45	30.18	30.09
Range	23-35	23-35	25-55	25-36	23-55
Std. Dev.	3.59	3.83	8.19	3.71	5.12
Sex					
F	4.00	6.00	4.00	7.00	21.00
M	7.00	5.00	7.00	4.00	23.00
Education *(student or alumni)*					
Undergraduate	4.00	6.00	1.00	8.00	19.00
Graduate	7.00	4.00	8.00	1.00	20.00
Doctorate		1.00	2.00	2.00	5.00

B.3 PANAS FREQUENCIES FOR BASELINE STUDY

POSITIVE AFFECT SCALE																	
Questions	**q1**			**q3**					**q5**				**q9**				
Score	**4**	**5**	**6**	**3**	**4**	**5**	**6**	**7**	**3**	**4**	**5**	**6**	**3**	**4**	**5**	**6**	**7**
Frequency	6	2	4	2	3	3	3	1	1	6	4	1	2	2	3	3	2
Valid Percent	50.00	16.67	33.33	16.67	25.00	25.00	25.00	8.33	8.33	50.00	33.33	8.33	16.67	16.67	25.00	25.00	16.67
Cumulative Percent	50.00	66.67	100.00	16.67	41.67	66.67	91.67	100.00	8.33	58.33	91.67	100.00	16.67	33.33	58.33	83.33	100.00

Questions	**q10**						**q12**						**q14**				
Score	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**
Frequency	2	3	3	1	1	2	1	1	3	1	4	2	1	2	5	3	1
Valid Percent	16.67	25.00	25.00	8.33	8.33	16.67	8.33	8.33	25.00	8.33	33.33	16.67	8.33	16.67	41.67	25.00	8.33
Cumulative Percent	16.67	41.67	66.67	75.00	83.33	100.00	8.33	16.67	41.67	50.00	83.33	100.00	8.33	25.00	66.67	91.67	100.00

Questions	**q16**				**q17**				**q19**				
Score	**3**	**4**	**5**	**6**	**2**	**4**	**5**	**6**	**3**	**4**	**5**	**6**	**7**
Frequency	2	7	1	2	1	4	5	2	1	1	6	3	1
Valid Percent	16.67	58.33	8.33	16.67	8.33	33.33	41.67	16.67	8.33	8.33	50.00	25.00	8.33
Cumulative Percent	16.67	75.00	83.33	100.00	8.33	41.67	83.33	100.00	8.33	16.67	66.67	91.67	100.00

NEGATIVE AFFECT SCALE																	
Questions	**q2**				**q4**				**q6**				**q7**				
Score	**2**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**5**
Frequency	2	2	7	1	1	4	5	2	2	2	4	4	3	5	1	2	1
Valid Percent	16.67	16.67	58.33	8.33	8.33	33.33	41.67	16.67	16.67	16.67	33.33	33.33	25.00	41.67	8.33	16.67	8.33
Cumulative Percent	16.67	33.33	91.67	100.00	8.33	41.67	83.33	100.00	16.67	33.33	66.67	100.00	25.00	66.67	75.00	91.67	100.00

Questions	**q8**					**q11**					**q13**				
Score	**1**	**2**	**3**	**4**	**5**	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**
Frequency	2	5	2	2	1	2	2	5	2	1	1	2	5	3	1
Valid Percent	16.67	41.67	16.67	16.67	8.33	16.67	16.67	41.67	16.67	8.33	8.33	16.67	41.67	25.00	8.33
Cumulative Percent	16.67	58.33	75.00	91.67	100.00	16.67	33.33	75.00	91.67	100.00	8.33	25.00	66.67	91.67	100.00

Questions	**q15**					**q18**					**q20**		
Score	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	**2**	**3**	**4**
Frequency	1	3	6	1	1	1	2	3	5	1	5	4	3
Valid Percent	8.33	25.00	50.00	8.33	8.33	8.33	16.67	25.00	41.67	8.33	41.67	33.33	25.00
Cumulative Percent	8.33	33.33	83.33	91.67	100.00	8.33	25.00	50.00	91.67	100.00	41.67	75.00	100.00

B.4 PANAS DESCRIPTIVE VALUES FOR BASELINE STUDY

Descriptive Values of PANAS Scores in Baseline Study																				
	PA (Positive Affect)										NA (Negative Affect)										PA-NA (Difference)	
	SUMS					AVERAGE					SUMS					AVERAGE					SUMS	AVERAGE
N	12					12					12					12					12	12
Valid N	12					12					12					12					12	12
Minimum	36					3.6					21					2.1					0	0
Maximum	56					5.6					41					4.1					28	2.8
Mean	45.417					4.542					32.750					3.275					12.667	1.267
Std. Deviation	6.868					0.687					5.479					0.548					8.825	0.883
Questions	q1	q3	q5	q9	q10	q12	q14	q16	q17	q19	q2	q4	q6	q7	q8	q11	q13	q15	q18	q20		
Valid N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
Minimum	4.0	3.0	3.0	3.0	2.0	1.0	2.0	3.0	2.0	3.0	2.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	2.0		
Maximum	6.0	7.0	6.0	7.0	7.0	6.0	6.0	6.0	6.0	7.0	6.0	5.0	4.0	5.0	5.0	6.0	5.0	6.0	5.0	4.0		
Median	4.5	5.0	4.0	5.0	4.0	4.5	4.0	4.0	5.0	5.0	5.0	4.0	3.0	2.0	2.0	4.0	3.0	4.0	3.5	3.0		
Std. Deviation	0.94	1.27	0.79	1.38	1.75	1.60	1.08	0.97	1.08	1.03	1.24	0.89	1.11	1.31	1.24	1.19	1.08	1.03	1.14	0.83		

B.5 PANAS FREQUENCIES FOR PRIMED STUDY

POSITIVE AFFECT SCALE																
Questions	**q1**					**q3**						**q5**				
Score	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**	**7**	**2**	**3**	**4**	**5**	**6**
Frequency	1	2	12	15	14	4	10	12	13	2	3	2	2	19	11	10
Valid Percent	2.27	4.55	27.27	34.09	31.82	9.09	22.73	27.27	29.55	4.55	6.82	4.55	4.55	43.18	25.00	22.73
Cumulative Percent	2.27	6.82	34.09	68.18	100.00	9.09	31.82	59.09	88.64	93.18	100.00	4.55	9.09	52.27	77.27	100.00

Questions	**q9**					**q10**						**q12**					
Score	**3**	**4**	**5**	**6**	**7**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**
Frequency	6	5	17	11	5	4	8	11	12	6	3	3	7	3	14	9	8
Valid Percent	13.64	11.36	38.64	25.00	11.36	9.09	18.18	25.00	27.27	13.64	6.82	6.82	15.91	6.82	31.82	20.45	18.18
Cumulative Percent	13.64	25.00	63.64	88.64	100.00	9.09	27.27	52.27	79.55	93.18	100.00	6.82	22.73	29.55	61.36	81.82	100.00

Questions	**q14**					**q16**				
Score	**2**	**3**	**4**	**5**	**6**	**3**	**4**	**5**	**6**	**7**
Frequency	3	15	15	6	5	7	14	13	9	1
Valid Percent	6.82	34.09	34.09	13.64	11.36	15.91	31.82	29.55	20.45	2.27
Cumulative Percent	6.82	40.91	75.00	88.64	100.00	15.91	47.73	77.27	97.73	100.00

Questions	**q17**							**q19**					
Score	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**2**	**3**	**4**	**5**	**6**	**7**
Frequency	1	4	2	12	14	9	2	2	4	12	13	10	3
Valid Percent	2.27	9.09	4.55	27.27	31.82	20.45	4.55	4.55	9.09	27.27	29.55	22.73	6.82
Cumulative Percent	2.27	11.36	15.91	43.18	75.00	95.45	100.00	4.55	13.64	40.91	70.45	93.18	100.00

NEGATIVE AFFECT SCALE																		
Questions	**q2**					**q4**				**q6**					**q7**			
Score	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**
Frequency	7	2	17	16	2	10	7	19	8	5	17	9	8	5	13	14	8	9
Valid Percent	15.91	4.55	38.64	36.36	4.55	22.73	15.91	43.18	18.18	11.36	38.64	20.45	18.18	11.36	29.55	31.82	18.18	20.45
Cumulative Percent	15.91	20.45	59.09	95.45	100.00	22.73	38.64	81.82	100.00	11.36	50.00	70.45	88.64	100.00	29.55	61.36	79.55	100.00

Questions	**q8**					**q11**						**q13**					
Score	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	**6**
Frequency	14	21	2	5	2	2	8	15	11	5	3	3	13	13	10	4	1
Valid Percent	31.82	47.73	4.55	11.36	4.55	4.55	18.18	34.09	25.00	11.36	6.82	6.82	29.55	29.55	22.73	9.09	2.27
Cumulative Percent	31.82	79.55	84.09	95.45	100.00	4.55	22.73	56.82	81.82	93.18	100.00	6.82	36.36	65.91	88.64	97.73	100.00

Questions	**q15**						**q18**					**q20**				
Score	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**6**
Frequency	1	10	11	16	4	2	1	10	12	14	7	3	23	9	8	1
Valid Percent	2.27	22.73	25.00	36.36	9.09	4.55	2.27	22.73	27.27	31.82	15.91	6.82	52.27	20.45	18.18	2.27
Cumulative Percent	2.27	25.00	50.00	86.36	95.45	100.00	2.27	25.00	52.27	84.09	100.00	6.82	59.09	79.55	97.73	100.00

B.6 PANAS DESCRIPTIVE VALUES FOR PRIMED STUDY

Descriptive Values of PANAS Scores in Primed Study																				
	PA (Positive Affect)										NA (Negative Affect)										PA-NA (Difference)	
	SUMS					AVERAGE					SUMS					AVERAGE					SUMS	AVERAGE
N	44					44					44					44					44	44
Valid N	44					44					44					44					44	44
Minimum	28					2.8					18					1.8					-7	-0.7
Maximum	56					5.6					43					4.3					33	3.3
Mean	44.932					4.493					30.659					3.066					14.273	1.427
Std. Deviation	7.199					0.720					6.445					0.644					10.244	10.244
Questions	q1	q3	q5	q9	q10	q12	q14	q16	q17	q19	q2	q4	q6	q7	q8	q11	q13	q15	q18	q20		
Valid N	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44		
Minimum	2.0	2.0	2.0	3.0	2.0	1.0	2.0	3.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Maximum	6.0	7.0	6.0	7.0	7.0	6.0	6.0	7.0	7.0	7.0	6.0	5.0	5.0	4.0	5.0	6.0	6.0	6.0	5.0	6.0		
Median	5.0	4.0	4.0	5.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0	2.5	2.0	2.0	3.0	3.0	3.5	3.0	2.0		
Std. Deviation	0.99	1.30	1.04	1.18	1.37	1.52	1.10	1.06	1.37	1.24	1.12	1.04	1.21	1.11	1.12	1.24	1.18	1.15	1.08	1.02		

B.7 PRIME PERCEPTIBILITY BINOMIAL TEST

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Guess	264	.4621	.49951	.00	1.00

Binomial Test for Prime Perceptibiliy Task								
		Category	N	Mean	Std. Deviation	Observed Proportion	Test Proportion	Asymp. Sig. (2-tailed)
Guess	Group 1	incorrect	142			.54	.50	.242[a]
	Group 2	correct	122			.46		
	Total		264	0.46	0.50	1.00		

B.8 PRIME PERCEPTIBILITY CHI- SQUARE TEST

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Guess * Prime	264	100.0%	0	.0%	264	100.0%

Guess * Prime Crosstabulation					
			Prime		
			angry	happy	Total
Guess	incorrect	Count	78	64	142
		% within guess	54.9%	45.1%	100.0%
		% within prime	59.1%	48.5%	53.8%
		% of Total	29.5%	24.2%	53.8%
	correct	Count	54	68	122
		% within guess	44.3%	55.7%	100.0%
		% within prime	40.9%	51.5%	46.2%
		% of Total	20.5%	25.8%	46.2%
Total		Count	132	132	264
		% within guess	50.0%	50.0%	100.0%
		% within prime	100.0%	100.0%	100.0%
		% of Total	50.0%	50.0%	100.0%

Chi-Square Test for Independence of Guessing and Prime Type					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.987[a]	1	.084		
Continuity Correction[b]	2.575	1	.109		
Likelihood Ratio	2.993	1	.084		
Fisher's Exact Test				.108	.054
N of Valid Cases	264				

a. 0 cells (.0%) have expected count less than 5.The minimum expected count is 61.00.
b. Computed only for a 2x2 table

B.9 GENERAL SCORING ON HOSPITAL RATINGS IN BASELINE STUDY

B.9.1 FREQUENCY TABLES

Descriptive Statistics			
		H1 Score	H2 Score
N	Valid	12	12
	Missing	0	0
Mean		3.667	3.583
Median		4.000	3.500
Mode		4.00	3.00
Std. Deviation		0.888	0.669
Percentiles	25	3.00	3.00
	50	4.00	3.50
	75	4.00	4.00

Hospital 1 Score Frequencies					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Score	2.00	1	8.3	8.3	8.3
	3.00	4	33.3	33.3	41.7
	4.00	5	41.7	41.7	83.3
	5.00	2	16.7	16.7	100.0
	Total	12	100.0	100.0	

Hospital 2 Score Frequencies					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Score	3.00	6	50.0	50.0	50.0
	4.00	5	41.7	41.7	91.7
	5.00	1	8.3	8.3	100.0
	Total	12	100.0	100.0	

B.9.2 WILCOXON SIGNED-RANK TEST

Ranks				
		N	Mean Rank	Sum of Ranks
H2 Score - H1 Score	Negative Ranks	5[a]	5.00	25.00
	Positive Ranks	4[b]	5.00	20.00
	Ties	3[c]		
	Total	12		

a. H2_Score < H1_Score
b. H2_Score > H1_Score
c. H2_Score = H1_Score

Wilcoxon Signed Ranks Test Statistics of Baseline Study Hospital Ratings	
	H2-Score - H1-Score
Z	-.333[b]
Asymp. Sig. (2-tailed)	.739

b. Based on positive ranks.

B.10 GENERAL SCORING ON HOSPITAL RATINGS IN MAIN STUDY

B.10.1 FREQUENCY TABLES

Descriptive Statistics					
		H1 Happy	H2 Happy	H1 Angry	H2 Angry
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		3.773	3.591	3.136	3.205
Median		4.00	4.00	3.00	3.00
Mode		4.00	4.00	3.00	3.00
Std. Deviation		0.550	0.590	0.710	0.591
Percentiles	25	3.00	3.00	3.00	3.00
	50	4.00	4.00	3.00	3.00
	75	4.00	4.00	4.00	4.00

Hospital 1 Happy Prime					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Score	3.00	6	27.3	27.3	27.3
	3.50	1	4.5	4.5	31.8
	4.00	13	59.1	59.1	90.9
	4.50	1	4.5	4.5	95.5
	5.00	1	4.5	4.5	100.0
	Total	22	100.0	100.0	

Hospital 1 Angry Prime					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Score	2.00	4	18.2	18.2	18.2
	3.00	11	50.0	50.0	68.2
	4.00	7	31.8	31.8	100.0
	Total	22	100.0	100.0	

Hospital 2 Happy Prime					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Score	2.00	1	4.5	4.5	4.5
	3.00	7	31.8	31.8	36.4
	4.00	14	63.6	63.6	100.0
	Total	22	100.0	100.0	

Hospital 2 Angry Prime					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Score	2.00	2	9.1	9.1	9.1
	3.00	13	59.1	59.1	68.2
	3.50	1	4.5	4.5	72.7
	4.00	6	27.3	27.3	100.0
	Total	22	100.0	100.0	

B.10.2 NORMALITY TESTS

Descriptives[a]				
			Statistic	Std. Error
Score	Mean		3.7273	.11736
	95% Confidence Interval for Mean	Lower Bound	3.4832	
		Upper Bound	3.9713	
	5% Trimmed Mean		3.7020	
	Median		4.00	
	Variance		.303	
	Std. Deviation		.55048	
	Minimum		3.00	
	Maximum		5.00	
	Range		2.00	
	Interquartile Range		1.00	
	Skewness		-.109	.491
	Kurtosis		-.264	.953

a. Hos_id = Hospital1, Prime = Happy

Tests of Normality[a]						
	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score	.372	22	.000	.719	22	.000

a. Hos_id = Hospital1, Prime = Happy

b. Lilliefors Significance Correction

Descriptives[a]				
			Statistic	Std. Error
Score	Mean		3.1364	.15141
	95% Confidence Interval for	Lower	2.8215	
		Upper Bound	3.4512	
	5% Trimmed Mean		3.1515	
	Median		3.00	
	Variance		.504	
	Std. Deviation		.71016	
	Minimum		2.00	
	Maximum		4.00	
	Range		2.00	
	Interquartile Range		1.00	
	Skewness		-.203	.491
	Kurtosis		-.847	.953

a. Hos_id = Hospital1, Prime = Angry

Tests of Normality[a]						
	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score	.258	22	.001	.807	22	.001

a. Hos_id = Hospital1, Prime = Angry

b. Lilliefors Significance Correction

Descriptives[a]				
			Statistic	Std. Error
Score	Mean		3.5909	.12586
	95% Confidence Interval for	Lower	3.3292	
		Upper Bound	3.8526	
	5% Trimmed Mean		3.6515	
	Median		4.00	
	Variance		.348	
	Std. Deviation		.59033	
	Minimum		2.00	
	Maximum		4.00	
	Range		2.00	
	Interquartile Range		1.00	
	Skewness		-1.149	.491
	Kurtosis		.514	.953

a. Hos_id = Hospital2, Prime = Happy

Tests of Normality[a]						
	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score	.392	22	.000	.677	22	.000

a. Hos_id = Hospital2, Prime = Happy

b. Lilliefors Significance Correction

Descriptives[a]				
			Statistic	Std. Error
Score	Mean		3.1818	.12547
	95% Confidence Interval for	Lower	2.9209	
		Upper Bound	3.4427	
	5% Trimmed Mean		3.2020	
	Median		3.00	
	Variance		.346	
	Std. Deviation		.58849	
	Minimum		2.00	
	Maximum		4.00	
	Range		2.00	
	Interquartile Range		1.00	
	Skewness		-.025	.491
	Kurtosis		.011	.953

a. Hos_id = Hospital2, Prime = Angry

Tests of Normality[a]						
	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score	.349	22	.000	.754	22	.000

a. Hos_id = Hospital2, Prime = Angry

b. Lilliefors Significance Correction

B.10.3 MANN-WHITNEY U TEST

Ranks				
Prime Type		**N**	**Mean Rank**	**Sum of Ranks**
Hospital 1	Happy	22	27.70	609.50
	Angry	22	17.30	380.50
	Total	44		
Hospital 2	Happy	22	26.34	579.50
	Angry	22	18.66	410.50
	Total	44		

Mann-Whitney U Test Statistics[a] on Hospital Ratings in Main(Primed) Study		
	Hospital 1	Hospital 2
Mann-Whitney U	127.500	157.500
Wilcoxon W	380.500	410.500
Z	-2.918	-2.201
Asymp. Sig. (2-tailed)	.004	.028

a. Grouping Variable: PrimeType

B.10.4 MANN-WHITNEY U TEST WHEN THE TWO HOSPITAL DATA IS COMBINED

Ranks of Hospital Scores				
Prime		N	Mean Rank	Sum of Ranks
Hospital Scores	Happy	44	53.75	2365.00
	Angry	44	35.25	1551.00
	Total	88		

Mann-Whitney U Test Statistics[a] on Hospital Ratings in Main (Primed) Study (Hospital effect discarded)	
	Hospital Scores
Mann-Whitney U	561.000
Wilcoxon W	1551.000
Z	-3.739
Asymp. Sig. (2-tailed)	.000

a. Grouping Variable: Prime Type

B.11 CRONBACH ALPHA TESTS FOR SUBSCALES

B.11.1 FOR HOSPITAL 1:

Group-1:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.739	.739	3

Cronbach's alpha is **0.739**, which indicates a good level of internal consistency for our scale with this specific sample.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
H1Q1	7.0682	1.600	.695	.489	.494
H1Q2	7.1818	1.641	.558	.393	.666
H1Q4	6.7500	2.052	.457	.251	.768

One can see that removal of any question, except question 4, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of question 13 would lead to a small improvement in Cronbach's alpha, and we can also see that the Corrected Item-Total Correlation value was (0.457) for this item. This might lead us to consider whether we should remove this item.

Group-2:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.746	.751	6

One can see that Cronbach's alpha is **0.746**, which indicates a good level of internal consistency for our scale with this specific sample.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
H1Q5	15.4545	6.440	.703	.547	.657
H1Q6	15.9773	6.162	.663	.512	.658
H1Q7	15.5682	7.321	.425	.402	.726
H1Q8	15.8182	6.478	.598	.426	.679
H1Q9	15.8636	5.702	.527	.426	.706
H1Q13	16.0909	8.410	.086	.060	.803

One can see that removal of any question, except question 13, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of question 13 would lead to an improvement in Cronbach's alpha, and we can also see that the Corrected Item-Total Correlation value was low (0.086) for this item. This might lead us to consider whether we should remove this item.

Group-3:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.656	.684	5

Cronbach's alpha is **0.656**, which indicates a not very good level of internal consistency for our scale with this specific sample.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
H1Q3	14.1136	3.266	.447	.424	.599
H1Q10	14.6364	2.981	.336	.350	.641
H1Q11	14.2727	2.854	.493	.372	.564
H1Q12	14.3409	2.602	.666	.504	.482
H1Q14	14.7273	3.087	.217	.123	.712

One can see that removal of any question, except question 14, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of question 14 would lead to a good improvement in Cronbach's alpha, and we can also see that the Corrected Item-Total Correlation value was (0.217) for this item. This might lead us to consider removing this item.

B.11.2 FOR HOSPITAL 2:

Group-1:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.794	.798	3

Cronbach's alpha is **0.794**, which indicates a good level of internal consistency for our scale with this specific sample.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
H2Q1	6.9773	1.837	.792	.629	.555
H2Q2	6.8864	1.777	.622	.510	.749
H2Q4	6.6818	2.362	.527	.363	.826

One can see that removal of any question, except question 4, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of question 4 would lead to a small improvement in Cronbach's alpha,

and we can also see that the Corrected Item-Total Correlation value was not low (0.527) for this item. However, since our cronbach alfa value in overall is enough, it is not neccessary to remove any item.

Group-2:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.804	.804	6

We can see that Cronbach's alpha is **0.804**, which indicates a high level of internal consistency for our scale with this specific sample.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
H2Q5	15.8864	8.289	.393	.300	.808
H2Q6	16.1591	7.021	.608	.586	.763
H2Q7	16.0000	7.209	.714	.596	.744
H2Q8	16.0455	6.416	.765	.685	.722
H2Q9	16.2727	7.040	.606	.394	.764
H2Q13	16.1136	8.243	.323	.157	.826

We can see that removal of any question, except question 13, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of question 4 would lead to an improvement in Cronbach's alpha, and we can also see that the **Corrected Item-Total Correlation** value was not low (0.323) for this item. However, since our cronbach alfa value in overall is enough, it is not neccessary to remove any item.

Group-3:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.819	.819	4

Cronbach's alpha is **0.849**, which indicates a high level of internal consistency for our scale with this specific sample.

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H2Q3	9.8409	3.625	.485	.840
H2Q10	9.9091	3.340	.593	.794
H2Q11	9.9545	2.975	.745	.720
H2Q12	9.9091	3.108	.756	.719

We can see that removal of any question, except question 3 would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of question 3 would lead to a small improvement in Cronbach's alpha, and we can also see that the "**Corrected Item-Total Correlation**" value was not low (0.517) for this item. However, since our cronbach alfa value in overall is enough, it is not neccessary to remove any item.

According to the results, for the sake of overall consistency within groups we can decide to remove question 14 from the reserach questions, since it lowers the hospital-1's group-3 internal consistency at a remarkable amount. Despite it lowers the group-3 consistency a bit, it still results with a
0.819 correlation value which is high enough.

B.12 SUBSCALE SCORING ON HOSPITAL RATINGS IN BASELINE STUDY

Ranks				
		N	Mean Rank	Sum of Ranks
H2_Group1 - H1_Group1	Negative Ranks	4[a]	4.38	17.50
	Positive Ranks	7[b]	6.93	48.50
	Ties	1[c]		
	Total	12		
H2_Group2 - H1_Group2	Negative Ranks	7[d]	6.29	44.00
	Positive Ranks	5[e]	6.80	34.00
	Ties	0[f]		
	Total	12		
H2_Group3 - H1_Group3	Negative Ranks	6[g]	6.67	40.00
	Positive Ranks	5[h]	5.20	26.00
	Ties	1[i]		
	Total	12		

a. H2_Group1 < H1_Group1
b. H2_Group1 > H1_Group1
c. H2_Group1 = H1_Group1
d. H2_Group2 < H1_Group2
e. H2_Group2 > H1_Group2
f. H2_Group2 = H1_Group2
g. H2_Group3 < H1_Group3
h. H2_Group3 > H1_Group3
i. H2_Group3 = H1_Group3

Wilcoxon Signed Ranks Test Statistics of Baseline Study Hospital Subgroup Ratings			
	H2 Group1 - H1 Group1	H2 Group2 - H1 Group2	H2 Group3 - H1 Group3
Z	-1.403[b]	-.393[c]	-.630[c]
Asymp. Sig. (2-tailed)	.161	.694	.529

b. Based on negative ranks.
c. Based on positive ranks.

B.13 SUBSCALE SCORING ON HOSPITAL RATINGS IN MAIN STUDY

Ranks				
	Prime Type	**N**	**Mean Rank**	**Sum of Ranks**
H1 Group 1	Happy	22	28.18	620.00
	Angry	22	16.82	370.00
	Total	44		
H1 Group 2	Happy	22	28.93	636.50
	Angry	22	16.07	353.50
	Total	44		
H1 Group 3	Happy	22	27.02	594.50
	Angry	22	17.98	395.50
	Total	44		
H2 Group 1	Happy	22	26.02	572.50
	Angry	22	18.98	417.50
	Total	44		
H2 Group 2	Happy	22	24.84	546.50
	Angry	22	20.16	443.50
	Total	44		
H2 Group 3	Happy	22	26.25	577.50
	Angry	22	18.75	412.50
	Total	44		

Mann-Whitney U Test Statistics[a] of Main(Primed) Hospital Study Subgroup Ratings						
	H1 Group 1	H1 Group 2	H1 Group 3	H2 Group 1	H2 Group 2	H2 Group 3
Mann-Whitney U	117.000	100.500	142.500	164.500	190.500	159.500
Wilcoxon W	370.000	353.500	395.500	417.500	443.500	412.500
Z	-2.981	-3.345	-2.385	-1.849	-1.215	-1.960
Asymp. Sig. (2-tailed)	.003	.001	.017	.064	.224	.050

a. Grouping Variable: PrimeType

B.14 OPEN ENDED QUESTION ANSWERS

Subj_id	Hastanelerden daha çok beğendiğinizi seçerken hangi faktörü göz önünde bulundurdunuz? (örn. İlk/ikinci hastane daha... idi)
1	İlki daha yeni teknolojilere sahipmiş gibi geldi.
2	İkinci hastane daha temiz gibi görünüyordu ama ikisi de çok farklı değil.
3	İkinci hastane daha ferah ve yalındı.
4	İkinci hastane daha iç açıcı gibiydi ama ikisi de hemen hemen aynı gibi.
5	İlk hastane personeli daha güler yüzlüydü.
6	İlk hastanedeki cihazlar daha teknolojikti.
7	İkinci hastanede teşhis tedavi imkanları daha az kalabalık olduğu için daha iyi olabilir gibi geldi.
8	İkinci hastanede daha hızlı sonuç alınabilirmiş gibi göründü.
9	İlk hastaneyi dayımın çalıştığı hastaneye benzettim.
10	İlk hastane daha lükstü.
11	İlk hastanedeki hizmet, güleryüz, imkanlar daha iyi gibi geldi.
12	İkinci hastane daha tanıdık geldi, daha sakin ve ilgili olabilirler gibi hissettim.

TEZ FOTOKOPİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ☐

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı : .....
Adı : .....
Bölümü : .....

TEZİN ADI (İngilizce) : .....
.....
.....
.....
.....

TEZİN TÜRÜ : Yüksek Lisans ☐ Doktora ☐

1. Tezimin tamamı dünya çapında erişime açılsın ve kaynak gösterilmek şartıyla tezimin bir kısmı veya tamamının fotokopisi alınsın. ☐
2. Tezimin tamamı yalnızca Orta Doğu Teknik Üniversitesi kullancılarının erişimine açılsın. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) ☐
3. Tezim bir (1) yıl süreyle erişime kapalı olsun. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) ☐

Yazarın imzası ..... Tarih .....