

**THE EFFECT OF URBAN LANDSCAPES
AS BACKGROUND IMAGES ON PERCEPTION**

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Abstract

A previous study shows that background images have an effect on viewer's perception interpreting the emotion displayed by the face presented front. (Shimada et. al, 2007) Whilst such study uses lightening and flower garden scenes as background images, the present study will use urban and rural landscapes instead. To this aim eight photos were taken, which display each time one person with an expressionless face front. The background images were alternately skyscrapers, highway, a house with a garden and a forested earth road. The photos were showed to the participants (n:60) who were divided into two groups according to the places they have grown in (urban/rural) and they were asked to tell about the emotions of the person presented. The results agree with the previous studies revealing that the background image has an effect on interpreting the emotion of the person displayed on the foreground. People displayed in front of the skyscrapers were interpreted as happy and joyful by both groups, however forested background led the participants grew up in an urban environment to interpret the emotion of the people depicted front as fear, whilst the same expressionless face were interpreted as "sad" by the participants from rural areas.

Keywords: Background images, perception, urban landscapes, Kuleshov effect, emotions

Öz

Şehir Görüntülerinin Arkaplan Olarak Kullanılmasının Algı Üzerindeki Etkisi: Arka plandaki görüntünün, önde gösterilen kişinin duygusunun farklı yorumlanmasına neden olduğu daha önce yapılan bir araştırma ile ortaya konmuştu. (Shimada et. al, 2007) Söz

konusu çalışmada arka planda şimşek ve çiçek bahçesi kullanılırken, bu çalışmada şehir görüntüleri ile kır görüntüleri kullanılmış; gökdelenler, otoban, ağaçlı bir toprak yol ve bahçeli bir köy evinden oluşan dört görüntü ikisi kadın ikisi erkek olmak üzere yüzlerinde ifade bulunmayan dört farklı kişinin arkasına arkaplan görüntüsü olarak konulmuştur. Bu fotoğraflar cinsiyetlerine ve küçük bir kasabada ya da büyük bir şehirde yetişmiş olduklarına göre gruplandırılmış katılımcılara gösterilmiştir. Sonuçlar önceki çalışmayı onaylar nitelikte, ifadesiz yüzlerin farklı arkaplanlarla farklı ifadelere sahipmiş gibi algılandıklarını ortaya koymakla birlikte, bu algıda büyük şehirde ya da küçük bir kasabada büyümüş olmanın da etkisi olduğunu ortaya koymuştur. Gökdelen önündeki ifadesiz yüzler her iki grup tarafından mutlu ve neşeli olarak yorumlanırken; ağaçlı yol önündeki yüzler büyük şehirde yetişmiş olanlar tarafından korkmuş, küçük kasabada yetişmiş olanlar için hüzünlü olarak yorumlanmıştır.

Anahtar Kelimeler: Arkaplan görüntüsü, algı, şehir görüntüleri, Kuleshov efekti, duygular

I. Introduction

Background images are used for eliciting effective expressions in all visual art forms (painting, photography, theater, movies etc.). The importance of background images on perception is evidenced by many empirical studies (Palmer, 1975; Biederman, Mezzanotte, Rabinowitz, 1982; Davenport & Potter, 2004; De Graef, Christiaens & D'Ydewalle, 1990). It is also known that background images can affect the perception of the emotions displayed by the person presented on the foreground (Shimada et. al, 2007, 2009). However perceiving emotions is one of the most fundamental and controversial issues in studies of human behavior since Darwin. "Is there any relationship between face and emotions?", "Are facial expressions culturally bound or universal?", "Are any universals in expression biologically based?" are still asked questions in the fields of psychology: Developmental psychologists examine the age at which infants first show what can be considered an emotion. Social psychologists studying person perception focus usually on the face. Physiological psychologists concern with the role of the right hemisphere in the recognition, in the production of facial expression, and in the relationship between facial and autonomic measures of arousal as well. Although perception of emotion is bimodal, in other words emotions are expressed in the voice as well as on the face, there are many empirical studies concluding that the face is more important than the voice information for judging a portrayed

emotion. (Mehrabian & Ferris, 1967, Bugenthal, Kaswan, Love & Fox, 1970; Hess, Kappas & Scherer, 1988)

There are many studies on what exactly on the face let us interpret the emotion it displays. To give an example in point: Lyons et al. (2000) found that an upward tilt of the head produces a two dimensional retinal image with facial features associated with negative affect. Similarly a downward tilt produces a two-dimensional image of positive affect. A more recent study (Neth & Martinez, 2009) showed that the vertical distance between eyes, nose and mouth of an individual face is correlated with the perception of anger and sadness in face images displaying a neutral expression. When the vertical distance between eyes and mouth is made larger than that the average face (average distance within a population), the perception of sadness increases. A decrease of the same distance from that average face increases the perception of sadness.

On the other hand there has always been a discussion about the cultural differences on expression and perception of the emotions on the faces. Darwin was the one starting the discussion by arguing that certain emotional expressions are innate and the same for all people.

A. Cultural Differences by Interpreting the Emotions on the Face

Darwin (1872), identified six universal emotional expressions (anger, sadness, fear, surprise, happiness, and disgust) in his book *The Expression of the Emotions in Man and Animals*. According to his theory, all people were equipped with the capacity to express and perceive these emotions and their facial expressions. Unlike Darwin, anthropologists who support cultural relativity argued that the meanings of expressions were arbitrary and specific to each culture. (Birdwhistell, 1970; LaBarre, 1947). Contrary, some other researchers (Ekman, Sorenson, & Friesen, 1969; Izard, 1971) found out that there are constants across cultures in the emotional meanings of certain facial expressions as a result of number of studies made with infants, blind people, and other primates (Ekman, 1973).

Ekman (1972) used a "neurocultural" theory to explain how cultural as well as biological influences could contribute to the meaning and the use of facial expressions. Ekman & Friesen (1978) and Ekman & Oster (1972) demonstrated how each of the six universal emotional expressions identified by Darwin is created by moving particular facial muscles to certain positions, and several authors showed their universality (Ekman & Oster, 1979; Izard, 1994). On the other hand Ekman argued that the evidence of universals in facial

expression does not prove that they are innate. According to him universal connections between expressions and emotions could be learned which has a high probability of occurring in all cultures or could come up from a functional role of the movements in the emotional situation (Ekman, 1979).

A more recent study puts a kind of end to the discussions on the issue. The study made by Yuki, M. and his colleagues (2007) concluded that culture is a determining factor by interpreting facial emotions. The study revealed that in cultures where emotional control is the standard (close societies) focus is placed on the eyes to interpret emotions whereas in cultures where emotion is openly expressed, the focus is on the mouth to interpret emotion. Some scholars argued and some others showed as results of their empirical studies that there are differences not only within cultures but also within individuals by interpreting and revealing the emotions. They argued that a person's aims and motivations can influence how that person interprets a picture.

B. Personal Differences in Interpreting the Emotions on the Face

Levine, Chein and Murphy (1942) showed the same picture to two groups of people. One group was hungry and the other group was not. Those people in the group that were hungry often saw food in the ambiguous picture where as the non-hungry group tended not to see food in the picture. Scholars concluded that the hungry group was motivated by their hunger and that is why they perceived food within the picture.

Concerning the recent studies there are more evidences displaying the individual differences in perceiving the emotion. For instance it is now known that the more extraverted the subject is, the more their Amygdale (brain's key region in emotion) respond to the happy faces. (Canli T, Sivers H, Whitfield SL, Gotlib IH, 2002). The study, which investigated the influence of dispositional negative affect on brain activation, is another example displaying the individual differences. The greatest amount of activation in amygdale was observed in the participants who most strongly expressed a negative trait affect exhibited (Schaefer et. al, 2002).

Sex differences in emotional responses have also been demonstrated by many scholars, like better episodic emotional memory and greater physiological responses to emotional stimuli in women (Bradley et al., 2001; Canli et al., 2002; Wrase et. al., 2003).

Despite all above mentioned differences of displaying of and responses to emotions within genders and cultures, despite the fact that a film scene can bring one viewer to tears and leave another unaffected; there are at least film genres and they have millions of audiences agree upon the potential emotional responses to be revealed by the movies. Thus we can still make researches looking for the common responses to facial expressions displayed in real life, on photographs or in the movies, not guarantying to find some.

C. The Effect of Background Image on Interpretation of the Emotions

Another theoretical aspect of this study has to deal with how background images change the perception of emotion depicted by the person front. It is clear that we can't perceive people or objects isolated from their background images. In real life, objects and settings co-occur. Trees are in the garden, cars are on the street, imams are in the mosques. In behavioral studies it is found out that the consistency between object and the scene has positive effect on object perception (Palmer, 1975; Biederman, Mezzanotte, Rabinowitz, 1982) The findings of a recent study (Davenport & Potter, 2004). were in line with such studies. "A foreground object and the background of a scene seem to be processed interactively, reflecting knowledge about which objects and settings co-occur in the world" conclude Davenport and Potter. The studies used eye tracking measures also found out that objects presented in inconsistent settings are needed longer fixation time (De Graef, Christiaens & D'Ydewalle, 1990; Friedman, 1979; Henderson, Weeks & Hollingworth, 1999; Loftus & Mackworth, 1978).

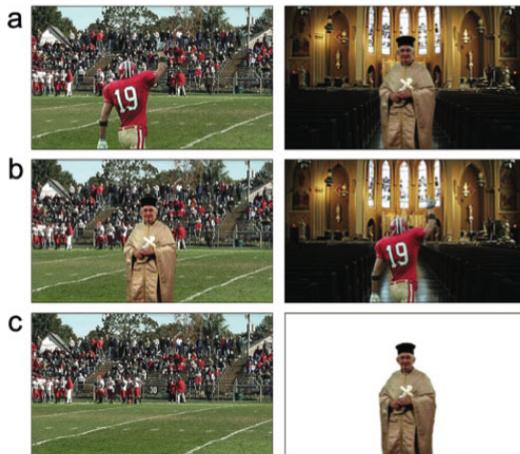


Figure 1: Examples of consistent scenes (a), inconsistent scenes (b), and isolated objects and backgrounds (c); from Davenport & Potter, 2004

The above mentioned studies leave no doubt about the effect of the background images on perception of the foreground image. What would be the case if the emotions have been implicated to the studies? If the person on the foreground image would display an emotion on his/her face? This question has already been asked by Shimada and his colleagues and their study showed that background images have an effect on viewer's perception interpreting the emotion displayed by the face presented front. Shimada and his colleagues (2007) showed their participants (n:10) six face images with fearful expression and they combined the images with three different background images, which were image of lightning, flower garden and black screen. They asked their subjects to rate the impressions and they measured the brain activation using fMRI besides.



Figure 2: Samples of face image with background image of lightening, flower garden and black screen. (Shimada et. al, 2007)

The scholars concluded that background images have effect on enhancing the fear impression of fear face images. The person depicted in front of an image of lightening perceived as more frightened by the participants.

Another study made by Shimada and his colleagues (2009) has also demonstrated the importance of background images. They combined an image of face displaying disgust with two different background images: one is worms and the other is a flower garden. As a result of fMRI scanning significant effects of the image of the worms minus the flower garden were assessed.

It is now known that the background images have also effect on interpreting the emotions depicted on the foreground. In the previous studies a “neutral” background image (black) was used; however neutral facial “expression” was not used. However we now from the film studies that there is an effect called Kuleshov effect, which is an editing effect demonstrated by the results of the alleged experiments, done by Russian filmmaker Lev Kuleshov in the late 1910s and early 1920s. It is presumed as an effect o the viewer

perceiving an expressionless face as if it displays different emotions when the face shot is edited alternately with various other shots (a plate of soup, a girl, a little girl's coffin). The results of the studies made by Goldberg (1951), Kuiper (1958) and Foley (1966) had also supported the Kuleshov effect. Now the question of “if the background image would have a kind of Kuleshov effect on the subjects” arises, which we will try to answer by our below shown study.

II. Methodology

A. Material

The material was 16 images of four (2 male and 2 female) people combined with four background images: skyscrapers, highway, a house with a garden and a forested earth road. Four persons displayed on the foreground were all wearing white T-shirts to eliminate possible estimations about the characters of the people as well as the effect of colors on perception.



Figure 3: Samples of face image with background images of skyscrapers, highway, a house with a garden and a forested earth road. Four different people (2 male, 2 female) were shown in front of all these background images.

B. Subjects

The subjects were 120 students (60 female 60 male) aged 18 to 22. Sixty of them were born and grew up in rural environment, whilst the other sixty in urban environment.

C. Method

The participants were required to rate the impression of the face they were shown by using questionnaire based on Plutchick’s eight basic emotional classes: anger, fear, sadness, joy, surprise, disgust and acceptance. They were also required to choose the intensity of impression of each class by the number of 0 to 6. The number 0 means that the subject felt nothing in this class, and the number 6 means that subject felt very strong in this class.

The participants saw the photos on a 92 inch white screen and each photo stayed 15 sec. on the screen. Each group saw the photos in a different order. Neither the same person nor the same background was displayed next to each other.

III. Findings

Below you see the percentages of mentioned emotions attributed to the persons depicted in front of a forested road. The only emotions marked by the participants were fear, sadness and acceptance. It was interesting to see that participants grew up in an urban environment interpreted the emotion (of the expressionless face) of the persons substantially as fear (%65 of female; %45 of male part.), whilst the participants born and grew up in rural environment as sadness. (%52 of female; %63 of male part)

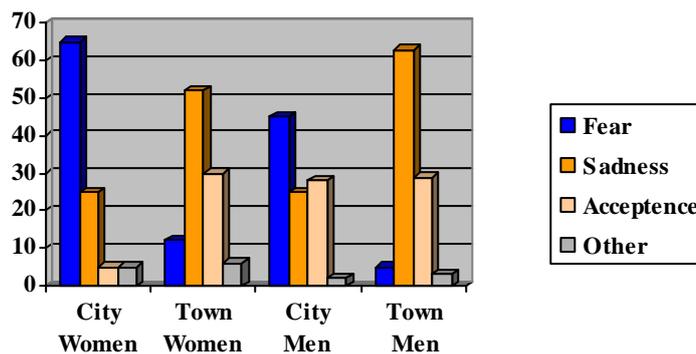


Figure 4: Percentages of three most mentioned emotions for the persons depicted in front of a forested road.

The below shown graphic shows the interpretation differences between the “urban” and “rural” people as well. For the participants who born and grew up in a rural environment,

the emotion of the person in front of a country house was interpreted as sadness, whilst for the participants who born and grew up in an urban environment the same expressionless face was depicting the emotion of joy. Anger was also mentioned emotion by the participants from rural environment.

Figure 5: Percentages of three most mentioned emotions for the persons depicted in front of a country house

Surprisingly, the emotion of people with in fact expressionless faces depicted in front of a background with skyscrapers was usually interpreted as happiness by the participants from rural environment. For the participants from urban environment (especially for the female participants) the background image of skyscrapers made them think that the person front accepts the situation he/she is in. The emotion of sadness was attributed to the persons in front of the skyscrapers usually by the participants grew up in an urban environment however it was still not the most mentioned emotions in contrast to my personal expectations.

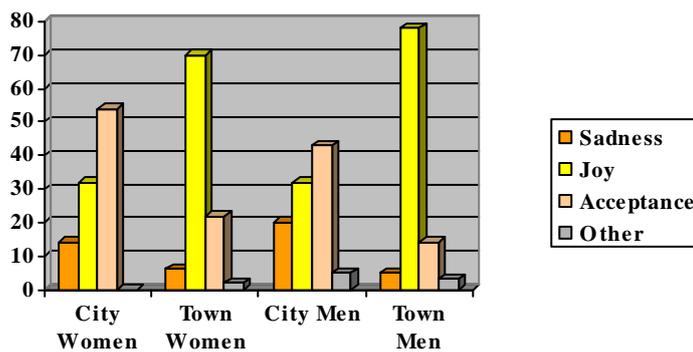


Figure 6: Percentages of three most mentioned emotions for the persons depicted in front of skyscrapers.

Another surprising result of the study was the interpretations about the image of people standing with a highway on their background. The emotion of the people depicted

front was interpreted as “surprised” by many of the participants but especially by the participants from urban environment. The people on the photographs were happy for many of the participants from rural environment

Figure 7: Percentages of three most mentioned emotions for the persons depicted in front of a highway.

IV. Conclusion and Discussion

The study is in line with the previous studies revealing that the background has an effect on interpreting the emotion of the person displayed on the foreground. The most remarkable result of this study was that, expressions are perceived on expressionless faces. Only 5 of the participants expressed that the person has no emotion on the face marking the rate zero on the list. Even such 5 participants thought that in some of the photos depicted persons have an emotion although the photos were always the same.

The results was surprising for us showing that the people displayed in front of the skyscrapers was interpreted as happy and joyful, whilst the people displayed in front of a forest road was interpreted as afraid by many of the participants.

Based not only on our personal affection to the nature, but also on a kind of common acceptance binding the words city and stress since Georg Simmel (1971)¹; we thought that the green backgrounds (both forested road and the country house) will make the participants

¹ Simmel argued that the increased concentration and diversity of people and ongoing activities in city cause stress on people living in the cities. Louis Wirth continued the argument of social atomism in his well known paper "Urbanism as a way of life," in 1938. The ‘low life’ inhabitants and dark, corrupt, claustrophobic, urban milieus were also represented in the film noir and gangster movies in the post war era.

interpret the emotion of the depicted persons as happy; however it seems that skyscrapers and highways give them an impression of success, especially for the ones born and grew in a rural environment. Probably attendant to horror film scenes set in forests; forested background let the participants grew up in an urban environment interpret the emotion of the people depicted front as fear, whilst the same expressionless face was interpreted as sad by the participants from rural environment. The background with a country house was also helping the participants grew up in a rural environment think the depicted people were sad. It can be thought that they were not happy in their homelands but there is no evidence to make such a conclusion. That is why a further study with in dept interviews is required.

There was no significant difference between the interpretations of female and male participants ($p>0.05$) but the difference was significant between the interpretations of participants grew up in an urban environment or rural environment. As mentioned before the only certain conclusion of the study is that people look for an emotion/meaning on the faces even they do not depict any emotion. To be asked for choosing an emotion from a list can have an effect on this result, however it must be noted that the ranks were between 0 and 6 the participants did not mark 0 but usually relatively high ranks like 3 or 4. The reasons of the interpretations of the participants must be studied in further studies. The effect of background images on perception of the emotions can also be studied for motion pictures as well.

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