How Does Congruency of Scent and Music Affect People's Emotions

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How does congruency of scent and music affect people's emotions

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ABSTRACT

It is widely believed that there is a relationship between scent and music. For example, there is a congruency among certain scents, music, and consumers' buying behaviors according to previous studies. There are results that demonstrated the congruency relationship between scent and music existed in terms of arousal, and the congruent configurations positively led to higher levels of approach and evaluation to the retail environment. However, in these previous studies, only a limited number of scents and music were investigated, which is not sufficient to conclude common characteristics of congruency between scent and music. How scents and music may affect people's emotions has not been well studied, either. Consequently, we are trying to evaluate how scent affected music appreciation using a number of different kinds of scents and minimal music, and also advance our understandings concerning the congruency relationship between them. We employed the Semantic Differential method, whereby we used a questionnaire to evaluate people's response to four kinds scents of different arousal and minimal music of different tempo. Specifically, participants are expected to evaluate their emotional responses toward the same piece of music while smelling four kinds of different arousal scents. We hypothesize that the arousal congruent scent enhances the experience of music appreciation rather than when they mismatch. The outcome could be applied in various situations. Besides congruently scented concert, which is expected to strengthen pleasant for audience, presents or many other daily relaxing items can also utilize these results to attain a fresh experience of scent and music.

1. INTRODUCTION

The notion that people's emotional response is determined based on the whole configuration of stimulus even though they perceive stimuli discretely is commonly accepted (e.g., Holahan, 1982). That is, mental images are usually created by combining olfactory, auditory, and visual inputs so that it can be claimed that there is a relationship between different senses such as olfactory and auditory sense. Actually, past studies have reviewed the relationship between scent and music, and they examined how the configuration of scent and music affected consumers' buying behaviors and evaluation to the retail environment (Anna S. Mattila and Jochen Wirtz, 2001). However, they failed to conclude the common characteristics of congruency between scent and music in arousal by means of applying limited numbers of scents and music. Therefore, to further our theoretical understanding of the relationship of scent and music in terms of arousal, we conducted a pilot study primarily by applying more scents from different categories and music to decide the proper stimulus to be investigated, and we are going to carry on the main experiment from now on.

2. METHOD

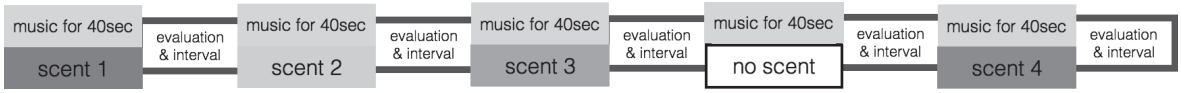
Since the stimulus used in our study need to be perceived as pleasant, with appropriate arousing dimensions, two pretest were conducted individually on scent and music to determine the stimulus. In the main experiment, we expect 20 participants to take part in the main experiment, using the stimulus decided in the pilot study. The 4 scents will be presented in the same way as in the preliminary study. However, another cup with cotton ball without scent will also be placed to form the control group.

2.1 Sample Preparation

We prepared a sample of each scent by putting 3 drops of essential oil on a cotton ball, which was then placed in one of 8 plastic sealable cups. This was repeated for 7 of the remaining scents. Each cup was labeled from No.1 to 8. During the pretest, participants opened each cup randomly and smelt. Then, they answered the question sheet to evaluate the scent on pleasure and arousal using Mehrabian and Russell (1974) twelve-item Semantic Differential method (e.g., unhappy-happy, despairing-hopeful, annoyed-pleased, stimulated-relaxed, calm-excited, dull-jittery) in a 7-point scale. Between scents, a cup of coffee powder was accessible to participants to refresh olfactory sense.

On the other hand, the pretest of music, was undergone on a different day from scent pretest, in order to avoid the interaction between scent and music. In this pretest, we applied two pieces of minimal music with gradual changes in tempo (*Phasing, and Pendulum* by Steve Reich), and edited each into two 40-second pieces with different tempo. Participants were required to listen to each piece of music by speaker. After 40 seconds, they answered the evaluation sheet of music in the same way as the pretest of scent.

2.2 Experimental Procedure



F*igure 1: Procedure of main experiment*

The main experiment is still under discussion. The procedure is as the figure above. Participants will open one of the 5 plastic cups randomly, and smell it while listening to a piece of music by speaker for 40 seconds. After that, they will make the evaluation of music and specify their emotions by means of a 7-point scale using SD Method, and answer several questions like how they enjoyed listening to this music, satisfied with the configuration, and the scent truly made music more pleasant by 7-point scale items (strongly disagree to strongly agree) taken from Westbrook and Oliver (1981) to obtain overall evaluations. Then, participants will continue to smell another scent while listening to the same music, and repeat the process for 4 times. After all these five kinds of scents (including control group), participants need to put these scents in the order of congruency with the music they heard. Then, they will have a short break outside this room. Meanwhile, we will ventilate the room by opening windows for 2 minutes to diffuse the scent. After the break, the experiment of the other tempo of music will be conducted in the same pattern.

3. RESULTS AND DISCUSSION

Table 1. Mean scores of scents on pleasure.

	unhappy-happy	annoyed-pleased	unsatisfied-satisfied	melancholic-contented	despair-hopeful	unpleasant-pleasant
ginger	2.42	2.75	2.25	2.50	2.75	2.50
marjoram sweet	3.08	3.33	3.08	3.33	3.58	3.50
cinnamon leaf	3.25	3.17	3.17	3.17	3.67	3.00
rose geranium	4.83	5.00	4.67	4.92	5.33	5.00
rose marry	4.17	3.92	3.75	4.25	4.42	3.75
fennel sweet	3.17	3.33	3.50	3.58	3.42	3.42
peppermint	5.33	5.17	5.17	5.42	5.75	5.00
lavender	4.67	4.17	4.25	4.33	4.50	4.25

Table 2. Mean scores of scents on arousal.

	calm-excited	unaroused-aroused	dull-jittery	relaxed-stimulated	sleepy-wide awake	sluggish-frenzied
ginger	3.50	3.50	3.83	5.00	4.92	4.00
marjoram sweet	4.58	4.08	4.50	5.33	5.33	4.67
cinnamon leaf	3.83	4.42	4.25	5.50	5.17	4.83
rose geranium	3.83	4.00	4.08	3.50	3.75	3.42
rose marry	4.75	4.58	4.75	4.92	5.58	5.08
fennel sweet	4.50	3.33	4.33	4.33	5.33	4.17
peppermint	5.33	5.33	5.17	4.25	5.50	5.17
lavender	4.00	4.25	4.75	4.25	4.75	4.50

Here is the result of the preliminary study. In total, there were 12 participants between the age of 23-27 taking part in this pretest. All of them are studying in University of Tsukuba.

Table 1 and Table 2 present the mean scores of the scent on pleasure and arousal. The former six pairs of adjective terms are focused on pleasure, while the latter six pairs of adjective terms are used to measure arousal. On the degree of pleasure, rosemary, lavender, rose geranium and peppermint scores higher than the other four scents. Based on the results of multiple comparison analysis, these four scents do not have significant difference among each other, but considerably different from the other four scents. On the other hand, peppermint and rosemary tend to have higher arousal than others, while rose geranium is perceived as low arousal in that it is significantly different from them. Though, the arousal of lavender does not appear obvious trend in this pretest, according to the huge amount of literature (e.g., Ross, 2010), we applied it as a kind of low-arousal scent in latter experiment. As a result, we decided to choose lavender and rose geranium to be used as low-arousing scents, and peppermint and rosemary for high-arousing scents in the main experiment.

Table 3 and Table 4 show the mean scores of music on pleasure and arousal. To attain two pieces of pleasant music with different arousal, according to this figure, it is clear that Phasing No.2 and Pendulum No.1 are qualified for these conditions.

4. CONCLUSIONS

According to the results of pilot experiment on scent, despite of deciding the proper stimulus to be used in the main experiment, some findings about the pleasure and arousal quality of scent are also revealed. The scent of ginger appears to be extremely unpleasant and high arousal, which absolutely coincides with the results from a previous study by K. Hiroyuki et al. (2008). They indicated that uncomfortable scent stimuli brought out activation of sympathetic nerve system meaning high arousal.

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