

Cross Modality Leading to Sonic Seasoning with Music for Integrative Medicine (IM)

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Abstract

Integrative Medicine (IM) has been evaluated more for long, authors have managed Shikoku Island Division, Integrative Medicine Japan (IMJ). IM includes music therapy, which can conduct to decrease stressful matter and increase human well-being, associated with special condition such as smell, flavor and tasting. It means cross modality of human sensation, leading to sonic seasoning. Some examples include sweet drinks, chocolate, seafood restaurant, coffee, and so on. Related with crossmodal pairing, sonic seasoning will be more required for academic and commercial fields. The perspectives for music and nutrition in IM region will be expected to develop in the future.

Keywords: Integrative medicine (IM); Integrative Medicine Japan (IMJ); Music therapy; Cross modality; Sonic seasoning; Crossmodal pairing

Commentary

Integrative medicine (IM) has been developed for decades across the world. It involves complementary and alternative medicine (CAM) as well as usual Western Medicine (WM) [1]. IM can cover wide range of medicine, which means patient-oriented medicine from bio-psycho-social points of view. Authors have managed various activities of IM, music therapy and nutritional therapy for Shikoku Island Division, Integrative Medicine Japan (IMJ) for long [2]. Along our practice and research, the relationship of music and food has been important. In other words, the perspectives of our sensation such as auditory, smelling and flavor would be described in this article.

IM can have broad related fields of medicine, health, music, nutrition and technology. For these research, significant interactions have found in various axes. Especially, the fields of music therapy, music information, medical technology have been observed for meaningful discussion [3]. Music therapy has been accepted for many people and developed for the need for medical circumstance. Two aspects have been present for listening and recognizing music. The former is the psychological and psychiatric effect of adapting music, where everyone can feel and tune the musical rhythm. The latter is the auditory effect of analyzing music sound in the air, where everyone can hear it through electric signal from ear to brain [4]. From bio-psycho-social points of view, we have our human society around us. Adequate adaptation of this activity to our life will bring medical and cultural evolution of music. Furthermore, it will make bring the diversity of music forms and human life across the world.

Music therapy has been recognized as most acceptable treatment in the area of psychotherapy in IM. For assessment of the influence of stress, to evaluate clinical effect of therapeutic intervention of music would be required [5]. Studies on the relationship of music listening and psychological stress-related outcomes were found [6]. The protocol included 47 studies, 2,747 subjects and 76 effect sizes. The results showed moderate effect on stress-

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related outcomes associated with $p < 0.001$ and mean effect size and $d = 0.723$. Research has continued for giving calmness and relaxation by music [3]. Then, the interventions of music therapy were conducted to decrease stressful matter and increase human well-being, associated with special condition such as smell, flavor and tasting [7].

Human being has some senses, such as seeing, hearing and tasting. Recent research has been in focus for various combinations of modality. In cognitive science and psychology, the phenomenon where some perceptions are influenced each other has been called cross modality [8]. For example, a drink containing a red-colored sweetener may be associated with a strawberry flavor. A similar phenomenon is synesthesia, which causes not only normal sensations but also different types of sensations for a stimulus [9].

For cross modality of auditory and tasting, we can have various experience of mutual influences in our daily lives [8]. In other words, an experience may be present for simultaneous tasting a musical piece and the flavor food. A variety of food include coffee, chocolate, whiskey, wine, cognac and so on [10]. There are various related factors which are involved in the situation, such as time place, occasion, color, shape, mood, texture stimulus and others. Formerly, two modalities of listening and tasting were considered to be unrelated. As a matter of fact, however, they have mutual interaction each other. The relationship of perceptual research has been observed as "sonic seasoning" [11].

The cross-modal reaction is shared by the majority of people [12]. There is now widespread evidence that background music may give some bias of food choices in many places. People cannot be aware of this phenomenon [13]. When people estimate the tasting experience for certain food or treat, various bias may be involved in this appreciation [14]. The more one like the music, the more one will evaluate the tasting experience fantastic [15]. Emotions play a strong role, especially when it is related to cross-modal mapping or pairing of flavorful stimuli [16].

In the field of medicine, historical episode of reflexes of Pavlov's dog has been widely known, which is a one-to-one correspondence [17]. On the other hand, with cross modality, auditory stimuli do not always produce a constant response. Pairs of stimuli presented with different sensory modality can be associated. There are unpredictable new reactions from the medical, cultural and individual personal axes.

An example will be presented for cross modality. There is a Fat Duck restaurant in UK [18]. Before starting the dish "Sound of the sea", inserting a pair of earbuds would be encouraged. The visitors can listen to the sound of waves and seagulls on the beach. This is the representative dish for long. By the comparative research, the combination of music and tasting can bring significantly better evaluation. They do not feel salty taste than listening to another soundscape [19].

Another example is coffee shop case. A wireless headphones are provided simultaneously when a cup of coffee is served. The crucial

matter is to give a multisensory experience of tasting and listening [20]. Another café serves an augmented glassware with less sugar, where the guest can keep seating for long time with listening sweet music in the room [21]. Thus, the pairing music and flavor will be developed for continuing experiential opportunities and apps.

The impressive situation is found in the case of chocolate. When BGM shows positive merrily mood rather than negative grave mood, people feel sweeter and purchase more. Music texture may change human feeling, leading to positive behavioral activity. Thus, efficacy triggered by emotional music may be more prominent than those by cross modally-related music. Related with crossmodal pairing, sonic seasoning will be more known for casual circumstances and be more required for academic and commercial fields [22]. We can expect that many artists, food designers and medical personnel will develop the perspectives for music and nutrition in IM region in the future [23].

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