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# EFFECTIVENESS OF LIVE MUSIC PERFORMANCES IN DUBROVNIK BASED HOTELS, BARS AND RESTAURANTS

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## **Abstract**

Hearing is one of the 5 senses that humans can feel, among touch, sight, smell and taste. Consciously or subconsciously, people absorb sounds which can make them restless or relaxed. The soundscape of a particular place greatly affects the atmosphere that can be attractive or repulsive to someone. Music as such could manipulate with our feelings and it gives us the sense of belonging. After some time, places that provide live music could strengthen their brand recognition and bring the overall performance to the next level. This research focused on just hotels, bars and restaurants in wider Dubrovnik area. Through the following results of how Dubrovnik stands with live music performances many owners and managers could be inspired and encouraged to introduce live music in their venues.

**Key words:** music in hospitality, live music performances, event management, Dubrovnik destination, branding

## **Introduction**

Senses enable organisms to perceive the world around them. Although in today's fast living world humans absorb the biggest amount of the information, feelings and experiences through eyes, the hearing is still very important sense. Sounds influence brain immediately and reflexively, making people to behave in a specific manner, both consciously and subconsciously (Juslin and Västfjäll, 2008). Just like food, the sounds also have specific characteristics that our brains might recognize as more or less familiar, comfortable or enjoyable. The music is an art of combining different sounds into a logical arrangement in order to create a product that is intended for specific type of reason. The characteristics of music that influence someone's mood and create perception are the tempo (expressed in beats per minute) and type of rhythm (Caldwell and Hibbert, 2002; Milliman, 1986), volume fluctuation from quiet to loud (Guéguen et al., 2008), the simplicity or complexity of arrangement (North and Hargreaves, 1996) and finally the musical genre, the reason of making such a song combined with circumstances, culture, technology and location where that music was made (Magnini and Thelen, 2008; North et al., 2003; Wilson, 2003). Considering all this, music as such plays very important role in our lives and it helps us to feel better in various situations. Also, in a wider context, the music creates a specific cultural dimension that somehow may give people the sense of identity and belonging.

## Aspects of musical importance: Psychological

Sound is a powerful manipulating tool. There are numerous researches on how music influences human behavior and the results are interesting. In one research article, after conducting a comprehensive experiment the authors (Kemp, Williams, Min and Chen, 2019) proved that the congruency between human emotions and music really exists. They came up with the statement that people will grade product and service quality better when they are exposed to music. Also, people not exposed to music would not make efforts to feel better as people exposed to music. Why is that? This part of the introduction is about considering different psychological impacts of sounds to consumers experience and decision making.

The sounds are waves that have their own amplitude and frequency. After the waves reach human ear, they travel as neural impulses through the brain, carrying the information to the auditory cortex, from which that information interacts with all other parts of the brain (Zatorre, 2005; Zatorre et al., 2002). Sound impulses have direct impact on other brain activities as they are constantly interfering and connecting to other stimulus. For example, some music may perfectly match with certain food selection and create such a huge congruency that improves the perception of food quality (Seo and Hummel, 2011) as well as the sense of authenticity of a dish (Spence et al., 2011). Some other research (Woods et al., 2011) emphasizes that loud noises cause the decrease of sweet and salt stimulus, but increase the crunchy feeling, as well as the intensity of umami flavored food (Yan and Dando, 2015). Properly used loud music also increases arousal (Witt et al., 2008), pleasure (Baker, Levy and Grewal, 1992; Garlin and Owen, 2006) and level of excitement (Pham et al., 2011). Loudness also has impact on alcohol consumption (Guéguen et al., 2008), especially on adolescent boys

(Van de Goor et al., 1990). It is the other way around with low volume (Nilsson, 2009b), slow tempo, predictable music, which increases the relaxation level (Pham et al., 2011). Research also examined how the pitch of certain music impacts the food taste perception (Crisinel et al., 2012) and beverage consumption (McElrea and Standing, 1992), as well as how different genre of music influence wine taste (North, 2012).

Music is a good tool to control the length of the stay. Any kind of music is better than no music, if you want to keep customers at one place (Sullivan, 2002). Compatibility of music and environment encourages customers to stay even longer (Milliman, 1982; 1986). However, people eat more quickly when faster tempo music is playing (Milliman, 1986), which can also be useful if your venue is small and you want a fast guests turnover.

#### Aspects of musical importance: Sociological

Music defines humans and helps them in their socializing since prehistoric times. Everywhere across the globe individual talents use sounds that are present and accessible in their environment (instruments, vocals, technology) to create songs, anthems, invocations, rituals, lullabies, dance grooves etc. Almost every culture from any country in the world, both rural and urban, has its music that somehow identifies that community. That same music emerged from humans' natural sense for rhythm and melody, but also from the sense of belonging. In 2009, during Midem international event for music community, the study about the influence of music on different cultures was introduced. Out of 8500 surveyed participants from 13 different cultural backgrounds, 63% of them responded that they are passionate about music. That indicates the universal importance of music. There are numerous sociological arguments conducted through numerous studies on how to use music to connect and satisfy people and

consequently improve the business that you are in.

Today music is very accessible since most of the population uses media on daily basis. As most of the music today exists as a file that can easily be transmitted through the internet and it is not a physical thing anymore (like it was the case with LPs and CDs in the past), it is way harder to target specific social group considering their musical taste as everyone may be exposed to any existing musical style. In another experiment, conducted by Max Planck Institute also in 2009, the same piece of music was given to participants in Germany and in Africa. Although these people have 2 totally different cultural background, the results were relatively the same. This suggests that music, as everything else today, became globalized and more diverse. However, music is still very powerful tool for targeting specific demographical segment.

It has been proven that any kind of music encourages eye contact and smiling in a group of people (Dollins, 1956) and lengthen the guests stay as it reduces all the negative background noise (Areni, 2003). Music also creates a sense of importance of a particular establishment for the people exposed to it (Kemp, Williams, Min and Chen, 2019) and it increases the productivity of employees from 6 to 11% (Wyatt and Langdon, 1937). However, a lot of employees report that music on their workplace annoys them (Uhrbock, 1961) and even 21% of them prefer no music. One study examined that music have negative impact on overall performance if it's too repetitive (Areni, 2003).

### Types of musical performance: Music as an ambience

Music is influential, still very dominant kind of art and it gives value to an experience of some place if its finely selected. However, live musical performances do not always have to be exhibition of some kind and music does not have to be the reason of someone's visit. The term "background music" refers to a music that is not purposely played to attract someone's attention, but its rather present to give a nice ambience. It is not intended for people to hang out on it, even though the boundary between background and foreground is very subjective. The biggest indicator that determines this is the loudness (expressed in decibels). Ideally, the volume of ambient music is somewhere between 55 and 70 dB, as the music above 80 dB is too loud and it is intended for specific concerts and music bellow 50 dB is hardly audible (Baker and Cameron, 1996; Witt, 2008). Usually, music played at this loudness does not concern people a lot and it is not as exposed to criticism as foreground or performance type of music.

It is important to consider that background noise is not the same as background music. The noise refers to any kind of a sound within the audible area, it is less controllable than music and it is harder to maintain (standards and employee action must be set). Loud background noises do not always mean something negative. In present times, it is more and more trendy to be louder, considering the fact that over 33% of establishments in New York have louder background noise than it is legally allowed (it is required to wear ear protection) (Buckley, 2012).

In the other hand, ambient music really increases the overall experience of some place



(Garlin and Owen, 2006; Turley and Milliman, 2000). Furthermore, it has been proven that background music helps in sales (Areni and Kim, 1993; Mattila and Wirtz, 2001; Milliman, 1982, 1986; North et al., 1997; Yalch and Spangenberg, 1993), influences perceptions of the venue (Hui et al., 1997; Mattila and Wirtz, 2001; Yalch and Spangenberg, 1993), as well as buying intentions (Baker, Levy and Grewal, 1992) and interaction between guests and employees (Dube et al., 1995; Hui et al., 1997).

#### Types of musical performances: Music as a brand

In contrary to background music, there is music that is enough loud, eccentric, interesting, specific and genre determined that attracts guests by itself. In this approach music is positioned as a core element and it becomes the reason of someone's attendance, length of the stay and consequently someone's positive (or negative) experience. Music may be something that defines individual's personality and brand identity of some place.

Brand allows individuals to express themselves by helping them to determine who are they and what are some of their characteristics (Kleine, Kleine and Kernan, 1993). Musical genres are nothing more than a brand and every style of music has different effect on customers intentions and perceived ambience (Wilson, 2003). In research (Magnini and Thalen, 2008) conducted to support this musical connectivity with branding, one group of undergraduate students was brought to restaurant with classical music and second group was brought to the restaurants without music at all. The results showed that students rated the restaurant with classical music as "more intelligent and decorative". Furthermore, another research proved that classical music (North, Hargreaves and Shilcock, 2003) and jazz music (Areni, 2003) have more influence on consumer intentions than other genres. In the other hand, it is proven

that people are more concentrated on music when upbeat music is being played in contrary to classical and jazz music (Wilson, 2003). Pop music influences the perception of time spent when eating (Sullivan, 2002) and diminishes the perceived waiting time (Bailey and Areni, 2006). Some music, especially happy drinking songs, increase both the time and expenditure of the customers at the bar (Jacob, 2006). Ethnicity and music are also congruent. It is proven that French music has significant impact on selling French wines and vice versa with German music and German wines (North, Hargreaves and McKendrick, 1999).

People differentiate those brands due to brands personality (Halliday, 1996). Firms can definitely use music as a competitive advantage as every genre has something different that attracts people. On the long-term period musical style can emotionally foster people (Biel, 1993) and consequently be trustful and loyal to it like any other brand.

## **Methods**

This research is focused on the impact of live music on ambience and overall reputation of certain bar, hotel or restaurant. The goal was to find out where Dubrovnik stands as a destination in terms of live music entertainment. Unfortunately, it is unable to do the live observation, surveys or interviews due to the pandemic of coronavirus, so the data will be examined through content analysis method from previously posted Trip Advisor reviews. Trip advisor is commonly used web page where people all around the world search for the opinions and information about some service, but also leave star rates and reviews based on their particular experience. It gives reliable feedback and it is generally considered as measurable instrument for examining the quality of certain service. The profile of people on TripAdvisor is enough various to give a realistic picture of live music engagement in

particular area (the research is not done only on musicians, or any other exceptional segment of people). The reviews that were examined are all written in English and the examining period was last 2 years (from April 1.2019 to April 1.2021).

The instrument for information processing was done in the excel program using spreadsheet. To include reviews from various stand points and backgrounds, following types of service providers were examined: hotels from 3 to 5 stars, bistros, taverns, restaurants, cafe bars, beach bars, cocktail bars, wine bars and pubs. The important variables in this research were: how many reviews these hotels, restaurant and bars had in past 2 years, how many times live music was mentioned positively, and how much negatively, what was the reason for leaving a negative comment, what was the star rate on trip advisor, how often place had a live music and how important live music is for that place (is music usually ambiental or is it brandable), how big is the place and what is usual type of live music setting (solo, duo or a band).

## **Results**

As expected, this research shows that Dubrovnik is not considered as a destination that cherishes musical performances. Generally, much more often is the case that live music is just part of an ambience (39 out of 50 places), instead of being a core element of a certain place (11 out of 50 places). In Dubrovnik region many places do not provide live music at all, although they have the possibility to do that. There are also places that provide live music but do not have a single review mentioning live music. Sometimes it was challenging to find reviews that mention live music. The reviews that mention live music are more frequent in April, May, October and November than during the season. Usually, people do not write the whole review about live music performance and mostly they do not mention it in a title of the review. Most commonly live music is just mentioned as the added value. The sample size

encompasses 20 different hotels (3217 reviews) and restaurants (2618 reviews).

Unfortunately, there is a small number of bars that provide live music in Dubrovnik, so the research is done on just 10 different bars (375 reviews). In 50 different types of hotels, restaurants and bars (the average TripAdvisor rate of 4.32), with different size and understanding of musical performance, out of 6210 reviews, musical performance is mentioned 409 times, which is 7%. Out of 409 reviews that mention live music, 378 comments are positive about the experience (92% of total mentioned times) and 31 negative (8% of total mentioned times). The smallest quantity of live music reviews have hotels with 131 out of all reviews (4%). In the restaurants, live music is mentioned in 206 of all reviews (8%). The live music is most likely to be mentioned in bars, where 72 out of all reviews mention live music (19%). Hotels have the most negative reviews on live music (18%), and restaurants and bars share the same place (only 3 % of negative reviews).

*Table 1: Overall results of the research*

	number	percentage
Total number of reviews (From April, 1 <sup>st</sup> 2019 to April 1 <sup>st</sup> 2021)	6210	
Total number of reviews mentioning live music	409	
Total number of positive reviews mentioning live music	378	92%
Total number of negative reviews mentioning live music	31	8%
Average TripAdvisor rate	4.316667	

*Table 2: Overall results per segment*

	hotels	restaurants	bars
percentage of reviews where live music is mentioned	4%	8%	19%
percentage of positive reviews	82%	97%	97%
percentage of negative reviews	18%	3%	3%

The reasons for negative reviews are following poor performance quality (11 out of 31), loudness (6 out of 31), old fashioned repertoire, repetitive repertoire, lack of enthusiasm (3 out of 31), segregation of entertainment only for French guests (2 out of 31), music stops too early, complaint on just one particular song (Game of Thrones theme) and piano man ignoring the requests (1 out of 31). The size of the hotel, or a bar doesn't have much influence on positivity or negativity of the review (there is similar quantity of negative comments in both small bars/hotels and in large bars/hotels). Also, the size of the hotel is not influencing the number of reviews mentioning music. However, size matters in restaurants and bars, where smaller restaurants and bars have more comments that mention live music than larger ones. Hotels where music is being played rarely have much more bad comments (35% negative reviews) than hotels where live music is performed more often (12% negative reviews). Restaurants where music is being played rarely have a bit more bad comments on live music (7% negative reviews) than restaurants where live music is performed more often (just 1% negative reviews). There is a bit more reviews that mention live music in hotels that place music as a very important brandable element (6% out of all hotel reviews) than in hotels where live music is rarely present (2% out of all hotel reviews). In restaurants where music is placed as more important live music was mentioned in 23% of the reviews, which is almost five times more mentions of live music than in restaurants where music is just part of the ambience, where that percentage is only 5%. In bars where music is placed as more important live music was mentioned in 33% of the review, which is 3 times more mentions of live music than in bars where music is just part of the ambience, where that percentage is only 11%. Hotels that usually have bands have more positive reviews on musical performance (86% reviews positive) than hotels with solo&duo type of gig (77% reviews positive). The type of a setting, whether its solo, duo or band, doesn't have much influence on

positivity or negativity of the review in bars and restaurants. 5 out of 6 negative reviews occurred in restaurants where the band is usual type of setting, and 3 out of 5 of those reviews mention loudness as a reason for a negative comment. There are double times more reviews in restaurants where the band is performing (12%) in contrary with restaurants where solo or duo type of performance is usual (6%). However, in Dubrovnik it is more likely that person will mention live music in a bar with solo or duo setting (26%) than in setting where there is a band (15%). Musical performance is mentioned more in daily active bars, like coffee bars and beach bars (28%) than in evening active bars, like pubs (12%), wine bars and cocktail bars (17%). Type of a bar doesn't influence much the positivity or negativity of the review. 3-star hotels have much more negative reviews on live music (32%) than 4 (12%) or 5-star (17%) hotels. The number of the star of the hotel does not influence the quantity of reviews that mention live music. There is a bit more percentage of reviews about live music in bistros (12%) than in taverns (6%) and other restaurants (8%).

## **Discussion**

Most of the venues in Dubrovnik region decided to set music as a part of the ambience rather than pushing it as a core value and reason for someone's visit, but still comments on bad quality of the performance is the most often critique when it comes to live music. Maybe the performance needs to be delivered differently than it is traditionally organized (the performer in the corner of the venue performing its repertoire) in order to get more positive comments. People today like to be involved in the overall atmosphere and the role of the musician is not to just play music, but also to make an entertainment. For example, more reviews that mention live music were found in service providers who have a band than in places where solo or duo type of setting is usual. That's because band is more interesting to watch and it

strains more energy from the audience.

Remarkable data is that people are more likely to comment in smaller venues, during the day and during the edge of the season, simply because the atmosphere is more intimate and they have more focus on music. One more interesting data is that 18% of the reviews about live music in hotels are negative, in contrary to bars and restaurants where that percentage is 3%. The reason for that is probably because people expect more from the place in which they stay in for a few days than from the place where their length of the stay is short termed. It is easier to choose different bar or restaurant if the music doesn't fit you, but it is harder to change the hotel because its time consuming.

These results are more and less expected. Dubrovnik as a destination has a high turnover of the guests and service providers do not have to push music as something that will attract people for a long term. It seems that music is just desirable, but not needed. The city is full of tourists during the season and people do not care much about the bad reviews, as they know that they will have new guests each day. Although live music is not so often mentioned in reviews, it is still a good hook for the by passers and it will always be a competitive advantage. Useful data is the percentage of positive and negative comments that mention live music out of all reviews, which is 92% positive and 8% negative. This means that music brings value and music can really influence the whole picture of a destination, if used properly.



## References

1. Areni, C.S. & Kim, D. (1993). "The Influence of Background Music on Shopping Behavior: Classical Versus Top-Forty Music in a Wine Store". in *NA - Advances in Consumer Research 20*, eds. Leigh McAlister and Michael L. Rothschild, Provo, UT : Association for Consumer Research, pp. 336-340.
2. Areni, C.S. (2003). "Examining managers' theories of how atmospheric music affects perception, behaviour and financial performance". *Journal of Retailing and Consumer Services* 10(5):263-274.
3. Bailey, N. & Areni, C.S. (2006). "When a Few minutes sound like a lifetime: Does atmospheric music expand or contract perceived time?". *Journal of Retailing* 82(3), pp. 189-202.
4. Baker, J. & Cameron, M. (1996). "The effects of the service environment on affect and consumer perception of waiting time: An integrative review and research propositions". *Journal of the Academy of Marketing Science* 24(4), 338–349.
5. Baker, J. & Levy, M. & Grewal, D. (1992). "An experimental approach to making retail store environment decisions". *Journal of Retailing* 68(4):445-460.
6. Biel, A.L. (1993). "How Brand Image Drives Brand Equity". *Journal of Advertising Research*, 6, RC6~RC1.
7. Buckley, R.C. (2012). "Sustainable Tourism: Research and Reality". *Annals of Tourism Research* 39(2).
8. Caldwell, C. & Hibbert, S.A. (2002). "The influence of music tempo and musical preference on restaurant patrons' behavior". *Psychology & Marketing*, pp. 895-917.

9. Crisinel, A.S. & Cosser, S. & King, S. & Jones, R. & Petrie, J. & Spence, C. (2012). "A bittersweet symphony: Systematically modulating the taste of food by changing the sonic properties of the soundtrack playing in the background". *Food quality and preference* 24, 201/204.
10. Dollins, J.& Angelino, H. & Mech, E.V. (1956). "Trends in the "fears and worries" of school children as related to socio-economic status and age". *The Journal of Genetic Psychology: Research and Theory on Human Development* 89, 263–276.
11. Dubé, L. & Labatt, J. & Chebat, J.C. & Morin, S. (1995). "The effects of background music on consumers' desire to affiliate in buyer-seller interactions". *Psychology & Marketing* 12(4), pp. 305-319.
12. Garlin, F. V. & Owen, K. (2006). "Setting the tone with the tune: A meta-analytic review of the effects of background music in retail settings". *Journal of Business Research*, 59(6), 755–764.
13. Guéguen, N. & Jacob, C. & Le Guellec, H. & Morineau, T. & Lourel, M. (2008). "Sound level of environmental music and drinking behavior: a field experiment with beer drinkers". *Alcoholism, Clinical and Experimental Research*, 32(10):1795-8.
14. Halliday, J. (1996). "Empiricism in vocational education and training". *Educational Psychology and Theory* 28(1), pp. 40-56.
15. Hul, M.K. & Dube, L. & Chebat, J.C. (1997). "The impact of music on consumers' reactions to waiting for services". *Journal of Retailing* 73(1), pp. 87-104.
16. Jacob, T. & Seilhamer, R. A. & Bargeil, K. & Howell, D. N. (2006). "Reliability of lifetime drinking history among alcohol dependent men". *Psychology of Addictive Behaviors* 20(3), 333–337.

17. Juslin, P. & Västfjäll, D. (2008). "Emotional responses to music: The need to consider underlying mechanisms". *Behavioural and brain sciences* 31, pp. 559–621.
18. Kemp, E.A. & Williams, K. & Min, D.J. & Chen, H. (2019). "Happy feelings: examining music in the service environment". *International Hospitality Review* 33(1), pp. 5-15.
19. Kleine, R.E. & Kleine, S.S. & Kernan, J.B. (1993). "Mundane Consumption and the Self: A Social-Identity Perspective". *Journal of Consumer Psychology* 2(3), pp. 209-235.
20. Magnini, V.P. & Thelen, S.T. (2008). "The Influence of Music on Perceptions of Brand Personality, Décor, and Service Quality: The Case of Classical Music in a Fine-Dining Restaurant". *Journal of Hospitality & Leisure Marketing*, pp. 286-300.
21. Mattila, A.S. & Wirtz, J. (2001). "Congruency of scent and music as a driver of in-store evaluations and behavior". *Journal of Retailing* 77(2), pp. 273-289.
22. McElrea, H. & Standing, L.G. (1992). "Fast Music Causes Fast Drinking". *Perceptual and Motor Skills* 75(2):362.
23. Milliman, R.E. (1982). "Using Background Music to Affect the Behavior of Supermarket Shoppers". *The Journal of Marketing* 46(3), pp. 86-91.
24. Milliman, R.E. (1986). "The Influence of Background Music on the Behavior of Restaurant Patrons". *Journal of Consumer Research* 13(2), pp. 286-289.
25. Milliman, R.E. (1986). "The Influence of Background Music on the Behavior of Restaurant Patrons". *Journal of Consumer Research*, 13(2), pp. 286-289.
26. Nilsson, L.G. & Nilsson, E. (2009). "Overweight and cognition". *Scandinavian Journal of Psychology* 50(6), pp. 660-667.
27. North, A. C., & Hargreaves, D. J. (1996). "Situational influences on reported musical preference". *Psychomusicology: A Journal of Research in Music Cognition* 15(1-2), 30–45.

28. North, A.C. & Hargreaves, D.J. & McKendrick, J. (1997). "In-store music affects product choice". *Nature* 390, pp. 132.
29. North, A.C. & Hargreaves, D.J. & McKendrick, J. (1999). "The influence of in-store music on wine selections". *Journal of Applied Psychology* 84(2), 271–276.
30. North, A.C. & Shilcock, A. & Hargreaves, D.J. (2003). "The Effect of Musical Style on Restaurant Customers' Spending". *Environment and Behavior* 35(5):712-718.
31. North, A.C. & Shilcock, A. & Hargreaves, D.J. (2003). "The Effect of Musical Style on Restaurant Customers' Spending". *Environment and Behaviour* 35(5).
32. North, A.C. (2012). "The effect of background music on the taste of wine". *British Journal of Psychology* 103(3), pp. 293-301.
33. Pham, T.A. & Kawai, S. & Murata, K. (2011). "Visualization of the synergistic effect of lithium acetate and single-stranded carrier DNA on *Saccharomyces cerevisiae* transformation". *Citation Current genetics* 57(4): 233-239.
34. Seo, H.S. & Hummel, T. (2011). "Auditory-olfactory integration: congruent or pleasant sounds amplify odor pleasantness". *Chemical Senses* 36(3):301-9.
35. Spence, J.R. & Mayhew, C.N. & Rankin, S.A. & Kuhar, M.F. & Vallance, J.E. & Tolle, K. & Hoskins, E.E. & Kalinichenko, V.V. & Wells, S.I. & Zorn, A.M. & Shroyer, N.F. & Wells, J.M. (2011). "Directed differentiation of human pluripotent stem cells into intestinal tissue in vitro". *Nature*, 470(7332):105-9.
36. Sullivan, D.F. (2002). "The variables of positive change". *Special Issue: Building Robust Learning Environments in Undergraduate Science, Technology, Engineering, and Mathematics* 2002(119), pp. 87-92.

37. Turley, L.W. & Milliman, R.E. (2000). "Atmospheric effects on shopping behavior: A review of the experimental evidence". *Journal of Business Research* 49(2), 193–211.
38. Uhrbrock, R.S. (1961). "Music on the job: Its influence on worker morale and production". *Personnel Psychology* 14, pp. 9–38.
39. Van de Goor, A.J. & Verruijt, C.A. (1990). "An overview of deterministic functional RAM chip testing". *Computing Surveys* 22(1).
40. Wilson, J. (2003). "The Concept of Education Revisited". *Journal of philosophy of education*, 37(1), pp. 101-108.
41. Witt, C.M. & Reinhold, T. & Brinkhaus, B. & Roll, S. & Jena, S. & Willich, S.N. (2008). "Acupuncture in patients with dysmenorrhea: a randomized study on clinical effectiveness and cost-effectiveness in usual care". *American Journal of Obstetrics and Gynecology* 198(2):166.e1-8.
42. Woods, A.T. & Lloyd, D.M. & Kuenzel, J. & Gonda, H. (2011). "Effect of background noise on food perception". *Food Quality and Preference* 22(1).
43. Wyatt, S. & Langdon, J.N. & Stock, F.G.L. (1937). "Fatigue and Boredom in Repetitive Work". *Industrial Health Research Board*. Report. no. 77.
44. Yalch, R.F. & Spangenberg, E. (1993). "Using Store Music for Retail Zoning: A Field Experiment". in NA - Advances in Consumer Research 20, eds. Leigh McAlister and Michael L. Rothschild, Provo, UT : *Association for Consumer Research*, pp. 632-636.
45. Yan, K.S. & Dando, R. (2015). "A crossmodal role for audition in taste perception". *Journal of Experimental Psychology: Human Perception and Performance* 41(3):590-6.
46. Zatorre, R.J. & Belin, P. & Penhune, V.B. (2002). "Structure and function of auditory cortex: music and speech". *Trends in Cognitive Sciences* 6(1).

47. Zatorre, R.J. (2005). “Music, the food of neuroscience?”. *Nature* 434, pp. 312–315.