

MUSICAL METAPHORS: INNATE AND OBJECTIVE



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MUSICAL METAPHORS: INNATE AND OBJECTIVE

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ÖZET

Son dönemdeki yaklaşımda olduğu gibi biliş somutlaştırılmıştır ve müziğin anlam metaforikliği metafor teorisi, bilişsel müzikoloji ve bilişsel dilbilimde daha çok araştırılan ve bilişsel bilim adamlarının bakış açısıyla incelenmesi gereken bir konudur. Müzikologlar, müzik teorisinde müzik sisteminin kendisini tanımlamak için metaforlar kullanır; müzik psikologları ayrıca bir tonun vücutta daha yüksek bir yerde rezonansa girmesi nedeniyle daha yüksek olması veya tonun müzik spektrumundaki yeri gibi kavramsal olması gibi algısal gerçekleri tanımlamak için metaforlar kullanır. Bu kavramsal kısım bize, bu tür bir metaforun, bilişsel sistemin daha karmaşık bir aktivitesinden, müziğin biliş sırasında çevrenin insan duruşu ve bedensel hareketle karmaşık bir etkileşiminden kaynaklandığını anlatır. Müziği anlatırken metaforlar her zaman dikkate alınır. Araştırmamda, Mihailo Antovic'in (2009) 5 farklı ses sunduğu çalışmasına benzer yöntemler kullanarak, görüntü şemaları adı verilen bedensel metaforlar üzerinde araştırma yaparak, müziği tanımlarken insan duruşu ve hareketinin nasıl etkileşime girdiğini analiz ederek müzikal metaforların doğuştan ve nesnel olup olmadığını belirlemeye çalışacağım. Çocuklara uyaranları verir ve onlardan deneyimlerini tanımlamalarını ister ve ardından konu cevaplarını görüntü şemalarını ve kavramsal metafor teorisini kullanarak analiz eder. Sonuçlar, müzikal anlamının metaforik olduğunu ve deneklerin metaforlarında algısal imaj şemalarının kullanıldığını gösterdi. Bu araştırmada daha geniş bir yaş aralığını inceledim ve müzik enstrümanı çalanlarla çalmayanların müzik anlayışlarının da metaforik olup olmadığını ve metaforlarında ne tür imaj şemaları kullandıklarını karşılaştırdım. Analiz etmek için 9 farklı ses uyaranı ve 7 farklı görüntü şeması kullandım. Araştırma sonuçlarına göre metaforlarda en çok kuvvet imgesi şemalarına ilişkin beden-çevre etkileşimleri kullanılmıştır.

Anahtar kelimeler: Kavramsal Metaforlar, İmge Şemaları, Müzik Metaforları, Kavramsal Harmanlama?

ABSTRACT

As in the recent approach cognition is embodied and metaphor theory of meaning metaphoricity of music is a topic that is mostly studied in cognitive musicology and cognitive linguistics and should be studied from the perspective of cognitive scientists. Musicologists use metaphors to describe the musical system itself in the music theory, music psychologists also use metaphors to describe perceptual facts like a tone is higher as in it resonates somewhere higher in the body or conceptual as in the tone's place in the musical spectrum. This conceptual part tells us that this kind of metaphor derives from a more complex activity of the cognitive system, a complex interaction of the environment with human posture and bodily movement during cognition of music. Metaphors are always in account when describing music. In my research I will try to determine if the musical metaphors are innate and objective by analysing how human posture and movement interacts in describing music by researching on bodily metaphors called image schemas using methods similar to Mihailo Antovic(2014) where he presents 5 different sound stimuli to children subjects and asks them to describe their experience and then analysing the subject answers using the image schemas and conceptual metaphor theory. The results showed musical comprehension is metaphorical and image schemas employed in subjects metaphors. In this research I examined a broader age range and compared musical instrument players and non players to see if their comprehension of music is also metaphorical and which image schemas they employ in metaphors. I used 9 different sound stimuli and 7 different image schemas to analyse with. According to results of this study, body-environment interactions which are related to force image schemas utilized in the metaphors the most.

Key words: Conceptual Metaphor Theory, Image Schemas, Musical Metaphors, Conceptual Blending Theory, Embodied Mind

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1. INTRODUCTION

In Conceptual Metaphor Theory (CMT), it is argued that understanding occurs by simulating one concept via another and thinking is metaphor. (Lakoff & Johnson, 1980) It became an issue that metaphors are not only an artistic tool for poetry but a way of thinking and understanding in the Lakoff and Johnson's book "Metaphors we live By". The definition for conceptual metaphor is "to understand one thing in terms of another" (Lakoff & Johnson, 1980) means that thinking and trying to understand the elements of experience A by matching them to the elements of another (experience B). We try to map the new concept's elements to the one we already know.

Image schemas are the basic, primary concepts for metaphors; they are the ones that we cannot liken to another concept and they are about body's postural adjustments, movements and interactions.

Conceptual Blending Theory (CBT) is another theory of thought and meaning (Fauconnier & Turner, 2008) it differs from CMT with its domains and interactions of the domains' and it is possible that some of the basic image schemas or metaphors emerged by blending. As they (image schemas) emerge they are also functioning to help emerge others," image schemas are connectors to create meanings" in CBT (Ox, 2015).

Metaphors occur not only in language but also in and between other modalities like music, visuals, spoken language, gesture. If it is true that metaphor is the way of thinking, understanding, reason and action; metaphors should be multimodal (Forceville & Urios-Aparisi, 2009), it should appear in other modes such as understanding music. There are many empirical studies about music and metaphor which shows music comprehension is metaphorical and also in music theory most of the terms to explain musical rules are metaphorical and the metaphors are about bodily movement and posture.

In my thesis I will determine if music perception is metaphorical in different age groups, gender groups and musical instrument player and non player groups and which image schemas people mostly use in their metaphors and if the schemas employed are similar when explaining what they hear among these groups by analysing the metaphors used for describing musical experience and similarities of schemas in metaphors in different groups. In Antovic's study he tested musically trained and non trained children with 5 different sound stimuli and examined the children's descriptions of the stimuli

with 5 different image schemas, he presented stimuli to the subjects and asked them to explain verbally “how was the sounds like ?” after the responses gathered he analysed the responses to see if metaphors are engaged in the responses and which schemas employed in the metaphors. As a result he found out that music cognition is metaphorical and image schemas were applied and matched with specific sound stimuli. He did the research with image schemas to see if human posture and body movements play a role when constructing metaphors about music. He also determined which metaphor process CMT or CBT was utilized in subjects’ metaphors by analysing the domains of metaphors. I will do the analysis with 7 schemas and 9 stimuli and with different groups of subjects than Antovic’s (2009) and with different description methods.



2.LITERATURE REVIEW

2.1. Conceptual Metaphor Theory

According to conceptual metaphor theory (CMT) our thinking and acting system is dependent on our conceptual system by comparing one concept to another (Lakoff & Johnson, 1980). The structures of information provide the understanding of what we perceive, and the rules of these structures arise from our body's physical features and their relationship with the outside world. The location, the orientation of the body within the world, the body's interaction with abstract objects and with other people from the time we were born. We perceive the world in terms of inferences we create from all modes of involvement of our body with the environment. (Johnson, 1987)

In conceptual metaphors there are two domains of concepts: the first one is the source domain which is the one we take as a "source" to understand with, and the second domain which is the target domain; the one we will unwittingly explain to ourselves in terms of the source domain. We approach to a concept as a source and try to map its features to the features of the target domain concept. Take the example LIFE IS A JOURNEY metaphor (see Figure 1); in this example we try to understand the concept of life, which is the target domain, by simulating a journey (the source domain), we try to understand the target via the source. We think of life as a journey and match the similarities in between. A journey is about paths you need to cross, it has destinations where we need to use vehicles for transportation, moving from location to location just as life includes stages, goals, and relationships. (Kövecses, 2002)

Table 1

"Life is a Journey" Metaphor Mapping

Source Domain		Target Domain
JOURNEY		LIFE
Journeyer	→	Life liver
Journey event	→	Life span
Journey destination	→	Main Life Goal
Journey stops	→	Short Term Life Goals
Path traced by sequence of motion	→	Course of Life
Locations along journey	→	Life Stages
Journey difficulties	→	Life Difficulties
Manner of journey	→	Lifestyle
Journey Companion	→	Life Companion
Vehicles in journey	→	Relationships in Life

Note From “Metaphors We Live By”, by Lakoff, G., & Johnson, M., 1981, University of Chicago Press.

By this mapping we assign meaning to life and grasp the concept of life. As we perceive the world, we produce mappings in our mind, we create or assign meanings through those mappings and we refer to this process as thinking. Human thinking process is to understand a perceived object or concept by simulating another meaningful object or concept (Lakoff & Johnson, 1980; Lakoff & Turner, 1989) The mapping is asymmetrical in that target domains' features cannot be thought of in terms of source domains. The target domain is more abstract, it is easier to think of life as a journey than journey as life. (Lakoff & Johnson, 1980; Kövecses, 2002)

2.2. Metaphorical Linguistic Expressions

There is a distinction between metaphorical linguistic expressions and conceptual metaphors. Linguistic expressions are sentences generated by or employ the mappings of conceptual metaphors. Linguistic expressions are the evidence to conceptual metaphors. Here is a list of the metaphorical linguistic expressions that stem from the “life is a journey” metaphor;

- He is without direction in his life.
- I’m where I want to be in life.
- I’m at a crossroads in my life.
- She’ll go places in life.
- He’s never let anyone get in his way.

These expressions provide tangible evidence for the mapping (See Table1).
(Kovecses,2002).

2.3. Image Schemas

Are there any basic concepts that we cannot metaphorize to other concepts? In the famous “more is up” metaphor (Lakoff & Johnson, 1980), where the target is “more” and the source is “up”, we cannot reverse it and say “up” is “more” because “up” is a concept we encounter more than “more”. We can orient our sight vertically as our body provides, we see other objects standing upright, we live in this world governed by gravity where every object erects, we stand upright in the world and remain in this posture without any effort. “Up” and “down” may be the most commonly experienced

concepts in life, therefore, they are one of the most dominant concepts both abstractly in thinking, and physically in our neurological system. Up-down is about verticality and it is stronger than “more” which is a metaphor for quantity (Kövecses, 2002) because it has been experienced more often. These spatial and orientational metaphors are stronger metaphors such as up-down, front-back, in-out and primarily drawn by sensory-motor functions and the bodily shape, posture and orientation (Grady, 2010).

Metaphors may be grouped according to several features. In terms of functioning there are three types of conceptual metaphors: structural, ontological, in which we connect the concepts with objects or personify them, and orientational metaphors (Lakoff, 1987; Kövecses, 2002). Orientational metaphors serve as the main organisers of other metaphors. They can also be grouped through their foundation, knowledge-based or image-based. Image based metaphors orient the knowledge-based ones. Orientational metaphors are image based and they are called image schema metaphors or image schemas. (Johnson, 1987)

Image schemas are the core metaphors and mostly based on the sensory, motor interaction of our body with the world. They are the concepts we cannot think in terms of another concept. These schemas reflect the physical structures of thought and meaning creation which is the interconnection between the action and vision systems in human brains and the neural pathways linking sensory, motor and visual parts, enables us to think and reason the world as our body perceives it.

We can see the colours not because the colour itself is there, but because our visual system's way of perceiving light waves allows us to create the colours. We can hear a range of frequencies as our auditory system perceives them. We stay in balance with vestibular systems; just like colour and sound, meanings and thoughts do not exist in the world by themselves, we create and assign meanings as our body and brain's physical features allow us. The thinking process is actually physical; it is about energy going from one synapse to another. As much frequent as a specific thought is produced the stronger the neural pathway becomes and facilitates its ease of use in subsequent thoughts. This phenomenon proves why spatial, orientational image schemas or primary metaphor are the strongest ones. They organise the other metaphors due to frequent experience of up-down, front-back, in-out orientations, since our body stands vertically in the world, since we live in cities and our body contains our organs. (Lakoff, 1987)

Lakoff and Johnson argue that source domains are more abstract and can be influenced by culture, but Grady says that primary metaphors are opposite and mostly

about sensory perception rather than cultural (Lima, 2006). Metaphors like an “argument is a war” and not “argument is dance” are cultural image schemas like more is up does not depend on culture because what shaped “more is up” metaphor is about sensory information, our bodies’ position in the world. I am also hypothesising that the schemas different cultured (language speaking) people use are similar, it does not depend on their culture.

Image Schemas are occurring every time when we experience something. The body schema (Gallegher & Cole, 1995) which consist of all our bodily systems from nerve endings to posture maintaining and other automatically happening things in our bodies which we do not have to pay attention to do or even be aware of. The continuity and ongoingness of the image schemas is like the body schema’s even if we are not performing any action we engage with image schemas by imagination, observation or emotional experiences (Gibbs & Colston, 1995; Hampe, 2005).

The term “image schema” presented by Mark Johnson in his book “The Body in the Mind” and of George Lakoff’s “Women, Fire and Dangerous” as continuously forming patterns by representing the body - world - brain interaction mostly arising from experience. Image schemas are the roots of conceptualization, they are like the basic functions of metaphor and understanding. (Ox, 2015) Here is a list of image schemas (see Figure 2). We live *in* our bodies, we are *containing* of organs, live *in* houses in cities, sheds, cottages, huts in forests or containers made out of bamboos we are constantly going *out* of a room and going *into* another. We inhale and exhale our lungs *expand* and *deflate*. We stand vertically, we stay straight standing up nevertheless the gravity, trees, plants grow *up towards* the sun, we constantly check the temperature unawarely in order to see if our bodies can survive in the current temperature, we need to grab an apple and take it to our mouth and bite it and swallow it to eat an apple, we can walk to *front* or *back* as our body allows...We live in time we do same things everyday *repeatedly*, we *live in cycles*. These kind of experiences we encounter consistently, created the basic templates in our brains as mental imagery and thoughts and we continuously use those as source domains continuously to understand the world and assign meanings. How we move through space, how we involve ourselves with the objects are the grounding events for image schemas. I will try to discover some of these image schematic concepts in my study. I will talk about the schemas I chose and how I grouped them in Methods chapter.

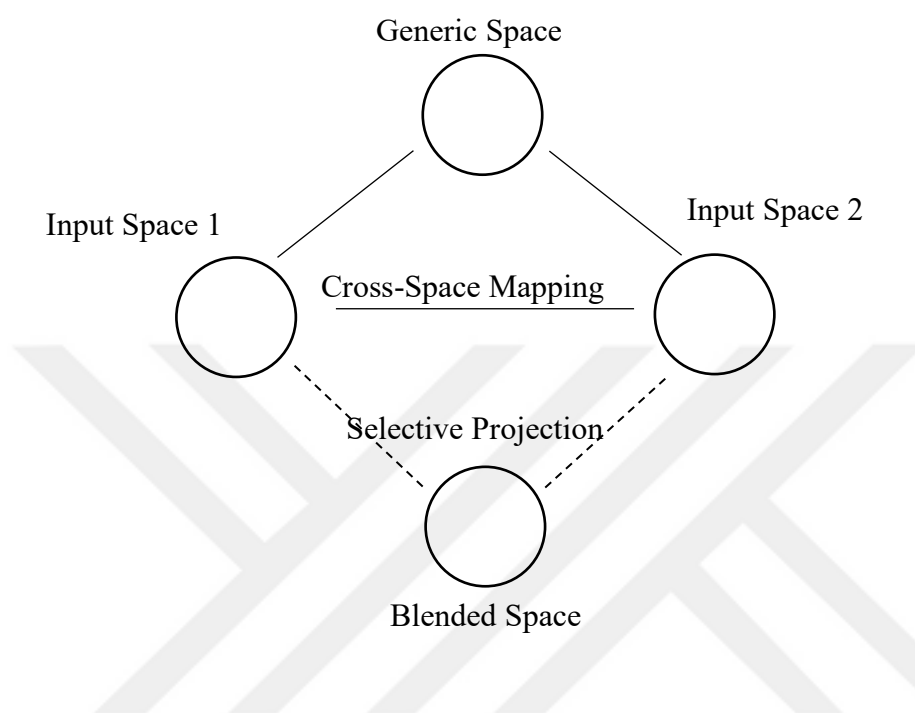
Table 2*List of Image Schemas Mandler, Turner*

CONTAINMENT	NEAR-FAR
BALANCE	SCALE
COMPULSION	PART-WHOLE
BLOCKAGE	MERGING
COUNTERFORCE	SPLITTING
RESTRAINT	FULL-EMPTY
REMOVAL	MATCHING
ENABLEMENT	SUPERIMPOSITION
ATTRACTION	ITERATION
MASS-COUNT	CONTACT
PATH/PATH-SOURCE-GOAL	PROCESS
LINK	SURFACE
CENTER-PERIPHERY	ONJECT
CYCLE	COLLECTION
VERTICALITY	LOCOMOTION

Note From “Image Schemas” by Todd Oakley Oakley, 2012, The Oxford Handbook of Cognitive Linguistics. 10.1093/oxfordhb/9780199738632.013.0009.

2.4. Conceptual Blending Theory

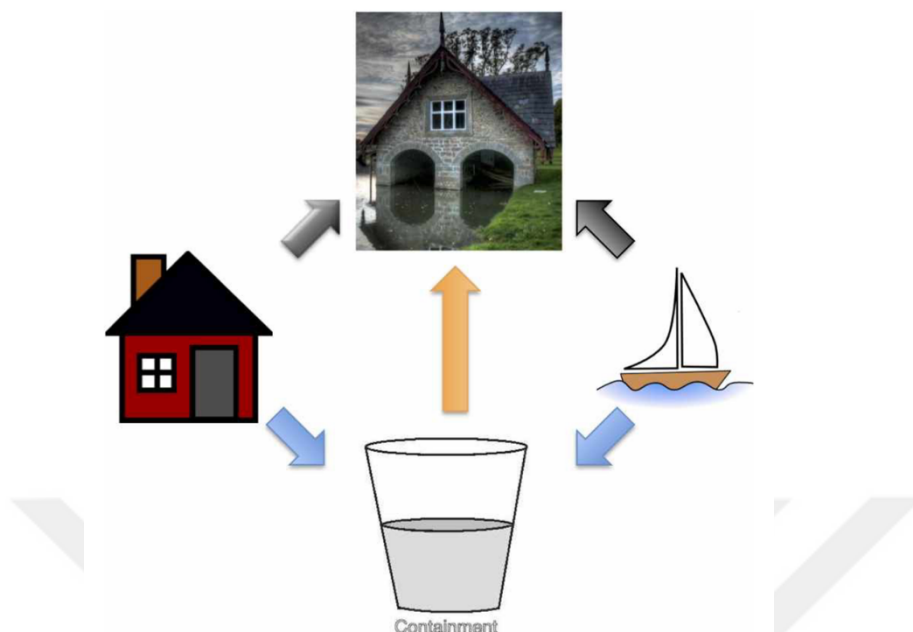
Different from CMT’s domains, CBT has mental spaces. In CMT conceptual domains map to each other to understand one domain in terms of another, however CBT involves the blending of mental spaces to create or assign meanings. Blending theory was designed to represent the system of concept creation and creative nature of thought (Fauconnier & Turner, 2003) (See Figure 1).

Figure 1*“Mental Spaces and Descriptions*

Note From “Mental Spaces” by Fauconnier, Gilles, 1987, Linguistics and Philosophy
 10 (2):247-260.

Blending theory utilizes conceptualizations’ different elements and features to generate a new meaning. The similarities between concepts map to each other and sometimes with some image schemas in blended space and similarities get identified in generic space. Through this identification of shared features a new meaning; an emergent property is formed. Two concepts which are familiar get integrated to create new concepts and new meanings. In the example (See Figure 2) features of a house and features of a boat are combined with containment concept and formed new concept which is a boat house.

Figure 2
Conceptual Blending Example



Sometimes two domains are not sufficient to comprehend certain concepts. In CBT it is needed to have multiple domains or mental spaces. Gibbs also suggests that image schemas are emergent products of blendings of body (Gibbs, 2010), world and brain experiences and interactions. Therefore, image schemas serve as both the emergent outputs of these blendings and they can also be inputs or connectors in blending process.

In this research I will assume some of the metaphorical linguistic expressions (responses of the subjects) are outcomes of CBT because the metaphor domains are from different modes and explore the image schemas applied in metaphors.

2.5. Metaphor in Music and Metaphor Multimodality

In this study “musical metaphors” refer to the people’s description of their musical experiences. Multimodality in music is another important topic for this study. Conceptualization domains are not limited to language, domains can incorporate different modalities as language to image or language to music (Forceville & Urios-Aparisi, 2009).

Music is mostly described using metaphors rather than technical terms. This holds true even when discussing technical musical theory concepts which usually incorporate terminology. Due to its intrinsic nature, understanding music involves using

metaphors not differently from thought, understanding and other cognitive processes as analysed by Zibowski (Zibkowski, 2008). By pointing out how vital they are to comprehend the meaning behind musical elements Scruton, (Scruton, 2009) highlights their value stating that without them, we would perceive sound particles with silence in between, devoid of meaning. (Forceville, 2009). Thus, role for metaphorical language is wider than just capturing musical expressions.

Metaphors have different modes of transformation when blending musical concepts with image schematic and emotional concepts, thus displaying their multimodality. Through this blending process, new meanings and interpretations emerge. For example, studies like the one conducted by Thomas Fritz et al. (2009) show that African native people could detect three different emotions when exposed to certain music (See Figure 3). This evidence confirms that people can perceive emotions through music (Fritz et al., 2009), firmly established earlier by Cooke (1959) in his dictionary-like approach detailing how particular tonalities corresponded to specific emotions (Özkul, 2011).

Figure 3

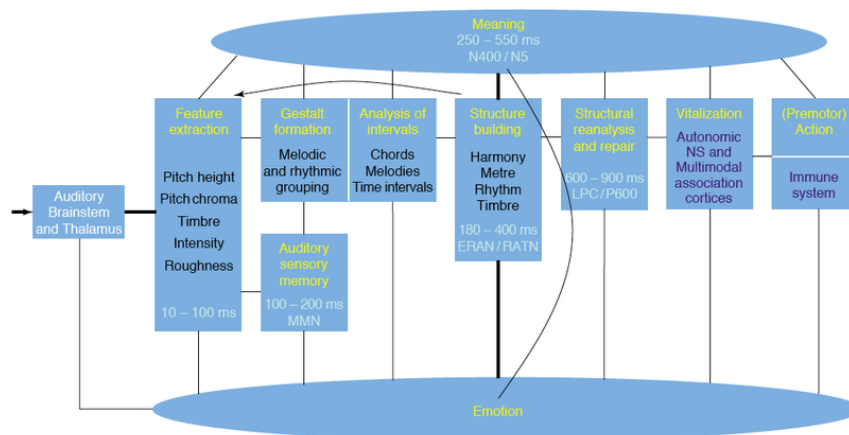
Thomas Fritz et. Al.'s (2009) experiment



Note From “Universal Recognition of Three Basic Emotions in Music”, by Thomas Fritz et. Al, 2009, Current Biology, Volume 19, Issue 7, 2009, Pages 573-576, ISSN 0960-9822,

Figure 4

Neurocognitive Model of Music Perception, Koelsch & Siebel (2005)

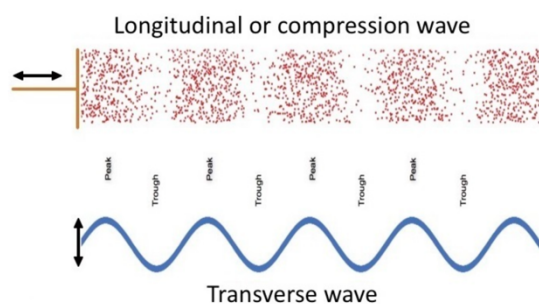


Note From “Toward a Neural Basis of Music Perception”, By Koelsch & Siebel, 2005,

In this neurocognitive model of music perception (See Figure 4) it shows that interpreting music requires engaging various modes within our brains such as emotions, sound features and action system. (Koelsh & Siebel, 2005)

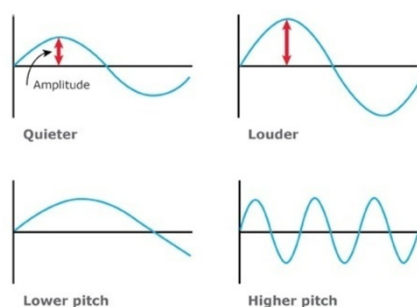
When we hear sound, it is actually the waves moving through air. Unlike the waves in the ocean which are perpendicular to the ocean the sound waves travel longitudinal from the source like a speaker. Source’s vibration go back and forth continuously resulting the air molecules being moved and the waves propagate around outward. When the source vibrates back and forth it makes the molecules in the air touch each other and they transfer this touch to the nearest molecules and this transfer happens repeatedly which means the movement of the source which is the vibration at the beginning from the source must occur repeatedly. This creates a back-and-forth motion which causes the air molecules to expand in some places with the low pressure and compress in others with the higher pressure perpetually. Representation of this longitudinal wave is called transverse wave as seen in Figure 3. The frequency of this wave is how many repetitions does the source pulses in a second, how many cycles the wave completes in a second and the measurement of it is hertz. The perception of sound waves frequency is called pitch (See Figure 4). The loudness is determined by the soundwaves amplitude (Nagel,n.d.) (See Figure 4).

Figure 3
Sound Wave



Note. From Sound – visualising sound waves. Science Learning hub Pokapū Akoranga pūTaiao, n.d. (<https://psych.athabascau.ca/html/https://www.sciencelearn.org.nz/resources/2814-sound-visualising-sound-waves/Biotutorials/25/part1.html>). Copyright by The University of Waikato Te Whare Wānanga o Waikato

Figure 4
Pitch, Loudness



Note. From Sound – visualising sound waves. Science Learning hub Pokapū Akoranga pūTaiao, n.d. (<https://psych.athabascau.ca/html/https://www.sciencelearn.org.nz/resources/2814-sound-visualising-sound-waves/Biotutorials/25/part1.html>). Copyright by The University of Waikato Te Whare Wānanga o Waikato

When these sound waves reach to ears our ear, drums move with the waves motion, they vibrate with the waves, in ears there are specific receptors for specific pitch ranges, after the sound waves reach to the receptors, relevant receptor transfers it to the relevant part in brain and hearing happens.

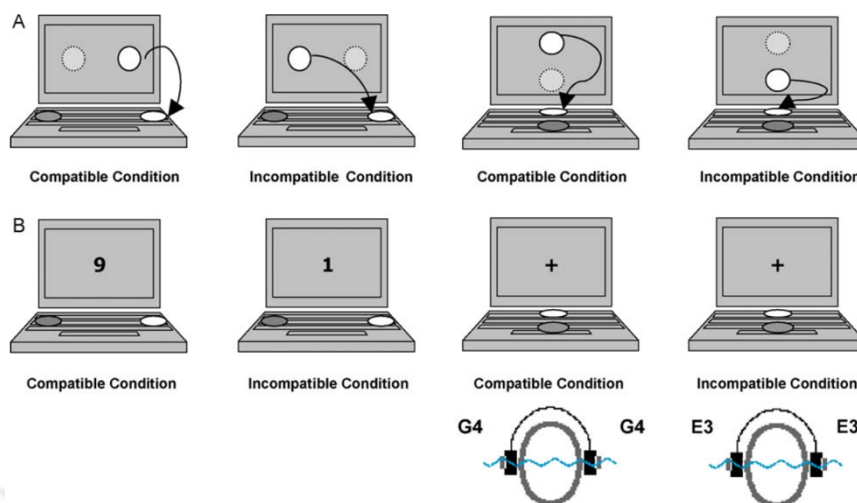
In summary the frequency is the amount of a sound waves vibration if it vibrates at fast speed, it is high frequency and high pitch to human ear. If the vibration of the sound wave is slow it is low frequency which is low pitch to human ear. Pitch is the perceptual property of frequency. Loudness is the perceptual property of amplitude. A note is the name people give to pitches to understand and use them better. Tone or timbre of the sound is about the quality of sound. Only a single sound wave is the pure

frequency. When we hear a note from instruments the sound we hear is combination of multiple frequency sound waves. What determines an instruments tone is the volume (amplitude) of these different frequencies (Nagel, n.d.).

In Western music theory pitch is associated with the vertical axis with high pitches meaning up and low pitches symbolizing down, presumably on account of how sound waves vibrate inside our bodies (Ashley, 2004; Urista, 2001). Studies have revealed that pitch perception correlates with localization on the vertical axis. For instance certain studies suggest that high pitched sounds usually occur at higher spatial locations while low pitched sounds at lower ones locations (Pratt, 1935; Trimble, Roffler, & Buttler; Dimmick & Gaylord; Cabrera & Tilley, 2023).

Densil Cabrera and Steven Tilley (2003) delved into human perception of locating sound in their work in 2003. This study aimed to determine how humans orient sound in space. However, their approach lacked the consideration of the issue referred as orientation bias and they tried to eliminate it by using an x-y axis board that covered both vertical and horizontal areas where respondents could change the plugs' locations. According to the findings published later on (Mudd, 1963), these experiments proved that people don't perceive sound's spatial representation generally limited along only one dimension but have linkage between high notes being aligned towards right-up and low notes towards left-down. A more recent study using reference tones and stimuli with varied frequencies indicated a spatial representation of pitch height termed SMARC effect (2003), where people responded faster to high-pitch sound using keys "P" and "6" while react faster to low-frequency sounds by pressing "Q" and spacebar keys. These results indicate that the brain somehow connects pitch height with physical locations as high frequencies correlate spatially with right-up orientation and low-frequency sounds with left-down (see Figure 5).

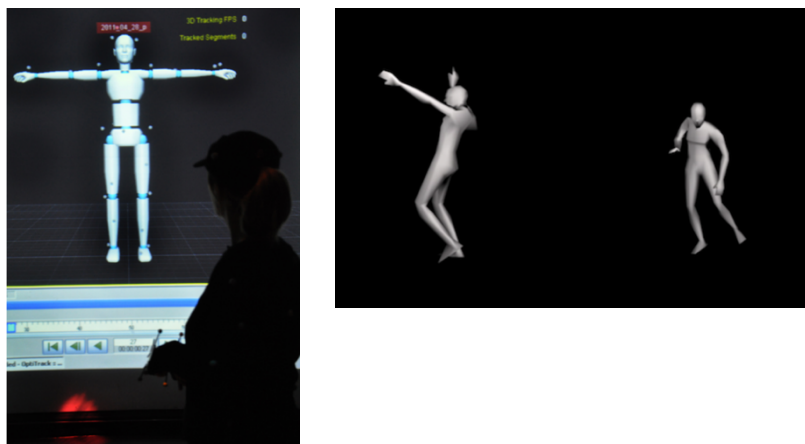
Figure 5
SMARC



Numerous academic studies underline how pitch perception correlates with spatiality. In some studies metaphorical antonym pairs linked high or low pitches with specific qualities like higher pitches matching with brighter lights or sharper corners and lighter colors. (Walker&Smith, 1984: Marks, 1982, 1987).

Additionally research has delved deeper into how pitch perception links with bodily motion between spatial locations. Eitan and Granot (2004) revealed that changes in pitch can be perceived kinesthetically, with subjects describing changes in distance, pace, vertical location, and motion (Eitan & Granot, 2004) of sound they perceived.

Moreover, research conducted by Leman's team highlights how emotions conveyed through music can transfer effectively via dance movements. In this study titled "The Influence of Music and Emotion on Dance Movement", participants wore sensors that captured 3D (See Figure 8) representations of dancing individuals' motions as they listened to specific pieces of music beats and tempos. Later, others watched these dance performances through recorded videos and accurately reported about the different emotional states expressed by the dancers during their routine (Van Dyck & Leman, 2014). This study illuminates how interconnected music is with human emotions expressed through bodily movement in dance.

Figure 6*Calibration of Body Movements, 3D Figures of Dancers*

Antovic (2009) carried out research on Serbian and Romani children with regards to their usage of metaphors while describing their musical experiences. In his research he asked Serbian and Romani children to describe their experiences about five different pitch, tone, articulation related sound stimuli and analysed the descriptions if there are metaphors and which image schemas they used in metaphors. As the result of the study he determined that children did not use only one schema as source domains and contrary to CMT predictions, kids utilized different source domains when using metaphors according to this particular study's findings; aligning better with CBT.

For our current research project referencing Antovic's paper serves as our primary source material; we'll be following methods quite similar those outlined in that paper. (Antovic, 2009) Different than his I used different age, gender groups and musical instrument playing groups. Also additional schemas when analysing. The metaphors assumed they are emergent of CBT because different domains are used (Antovic, 2009) and they are multimodal.

Metaphors play a vital role, not just limited simply to linguistics but extend beyond language when it comes down music, utilizing multiple modalities, playing a central part towards understanding, describing and theorizing about music, engaging modes such as emotions, sound features, and action system, gesture are a must during musical perception.

Pitch perception happens to be closely interconnected with spatiality & bodily motion representing that musical perception actually entails both embodied & cognitive process. Hence going further to demonstrate how emotions can transfer through music

into other domains apart from simply just the music one – namely dancing. In conclusion, the use of multiple modalities in metaphors plays a crucial role in many aspects related to the field of Music.

2.6. Summary and Relationship Between Topics

The diagram (See Figure 7) shows the interrelationships between the topics related to the present research.

Figure 7

Relationship of the Topics

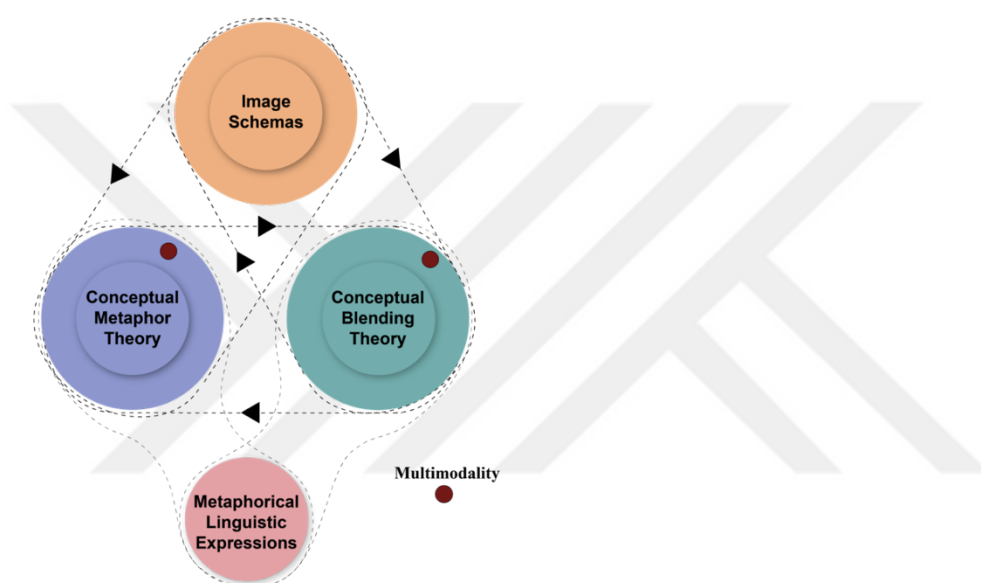


Image schemas represent root concepts that cannot be simulated by another concept, for metaphorical mappings these image schemas are the cognitive tools to provide the understanding of concepts. In CBT image schemas play a twofold function. They can be emergents of CBT and they can be bridges for mappings in CBT. Additionally, they can also function as source domains within CMT.

Furthermore, rather than image schematic concepts, other concepts can be comprehended through CMT can be effectively used in CBT, also concepts emerged from CBT can be applied in CMT.

It is evident that mapping from different modalities has an important role in these processes. Image schemas that emerge through CBT develop through multimodal interactions involving the world, body and brain, various modes including the ones relating real-world surroundings, sensations' interactions and cognitive functions. For both CBT and CMT it is considered a wider set of modes rather than language alone.

Transitions amongst modalities may language to music, music to images, images to emotions, and even combinations of emotions, images, and music and among other diverse modes, all strongly connected with multimodal usage.

Through the use of metaphors in language, metaphorical linguistic expressions act as outputs and tangible evidence of metaphor mappings. These processes take form of full sentences that embody those connections, they carry and transfer metaphorical meanings.

In the experiment, the participants' descriptions of sounds which are their responses are the metaphorical linguistic expressions. In this research by examining these expressions the underlying image schemas in the metaphors will be discovered.

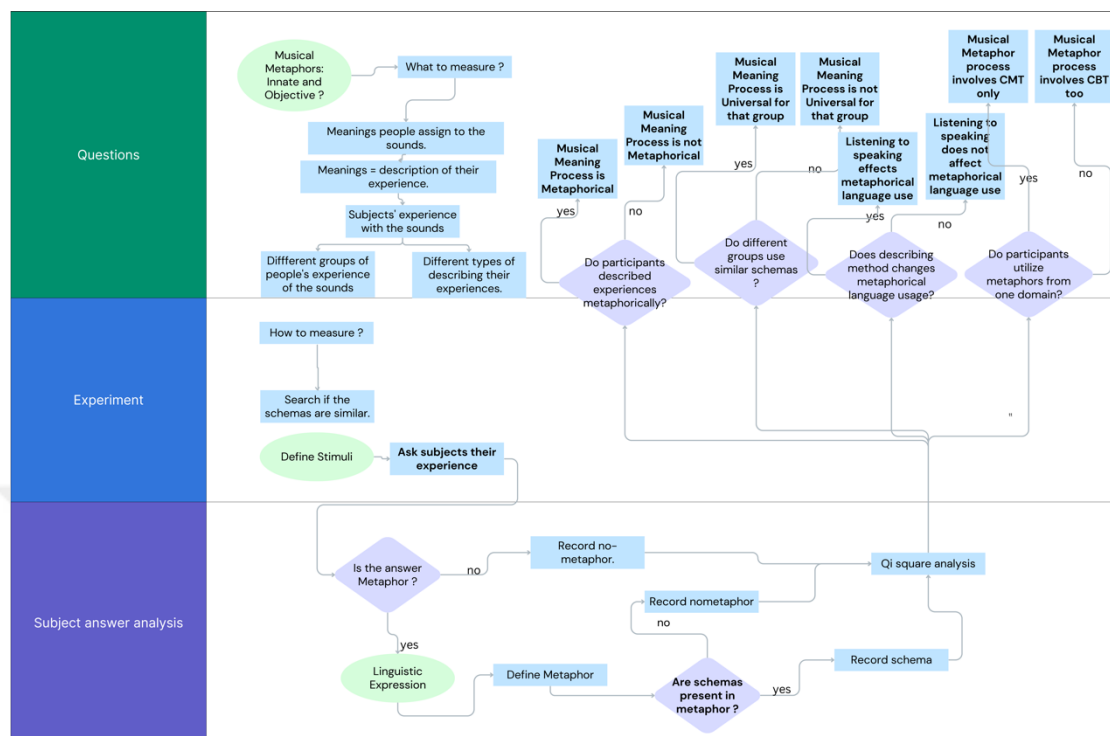
2.7. Aim and Hypothesis

This study differs from others with participants being not oriented to use spatial or bodily movement metaphors while describing they were free when describing. My aim is to determine if people use metaphorical language to describe their experience of different musical experiences and if they use image schemas in their metaphors. Beside the other studies I will explore not only verticality, force or path image schemas but also if schemas like containment, balance, center-periphery, cycle being applied to metaphors.

My first hypothesis aims to discover that if subjects will use metaphorical language when describing their experiences with the sounds and if metaphorical language use would change according to demographic features like age and gender. Also if playing a musical instrument would affect the metaphorical language utilization.

My second hypothesis is that the image schemas employed in metaphors in the responses would be similar for different demographic and instrument player and non-player groups.

Third hypothesis is to see if typing and drawing part metaphors change.

Figure 8*Flow Diagram of the Study*

So my hypothesis are as follows; (1) Participants will use metaphorical language to describe their experiences. Musical instrument playing and demographics will not affect the metaphorical language rates. (2) Demographics and instrument playing will not affect the image schema types in the metaphors of the subjects. (3) Schemas utilized by respondents in typing and drawing parts in their metaphors would differ.

3. METHODOLOGY

In this study I tried to discover metaphorical language use and the image schema utilization during conceptualization of some basic musical rules. 77 Subjects presented with 9 different sound stimuli and asked to describe their experiences with the sounds with 4 different description methods in 4 parts. Experiment conducted online as a website. After all subjects completed the experiment three different researchers analysed the subject answers to create a subjective result from the responses. Researchers analysed the subjects' responses by deciding one or two of the seven schemas and they filled a table with their decided schemas.

Metaphorical language use rates and the schemas utilized by the participants analysed according to age, gender and instrument player or non-player groups.

3.1. Participants

Table 3
Participants

	X ± SS	M (Min - Max)
Age	32,01± 7,39	30 (20 - 51)
	N	%
Gender		
Male	46	59,7
Female	31	40,3
Instrument Playing		
Yes	28	36,4
No	49	63,6
Total	77	100

Research included a group of volunteer subjects total 77 (31 females and 46 males) ranging from ages 20 to 51 years old (M=32,01; STD=7,39). This experiment took part as online in the domain of doexponline.com. 49 of the subjects were not playing a musical instrument and 28 of them were playing. None of the subjects stated having any hearing disorders or any history of hearing disorders. None of the participants were familiar with the material used in the study. Participants signed a consent form before the experiment. The study was approved by the Science-Ethics Committee of Yeditepe University.

After the subject answers collected three different researchers independently will determine which schemas are present in each subject answer and record in the table for statistical analysis.

3.2.Apparatus

All participants completed the experiment on their own personal computer or mobile devices and on their preferred browser. They were free to use their headphones or speakers of their personal computers or mobile phones to listen to the auditory stimuli and also free to use their preferred microphone for the sound recording session of the experiment.

The app consists of 3 parts: a clientside frontend application, a backend server, and a Content Management System (CMS). The frontend application is the web page visitors will experience. It was written using Next.js/React.js with the Typescript language. A responsive design system was used in order to make the app usable in both desktop and mobile devices. Also, native HTML elements were used for components such as the audio player, dropdown selectors and multiple selection boxes in order to present the visitors with components they're already familiar with.

The backend is the program that serves the frontend application, and collects the visitors' answers under the CMS. it was written using node.js, with the Typescript language. The CMS is an interface that stores the visitors' answers in a Relational Database (RDBMS). It also provides a CRUD (create/read/update/delete) system for the questions, and visitors' submissions. The database engine used is SQLite. The relational model provides filtering and cross-referencing methods between: visitors' details (age/gender/name etc.), questions, answers, submissions (collection of a single visitor's answers). These 3 sub-systems are running in a Virtual Private Server (VPS), as a containerized Docker application, under Ubuntu Server OS.

3.3. Sound Stimuli

3.3.1. Stimuli

In this research I am investigating the interaction of human posture and bodily movement in describing different pitch, tempo, articulation and tone relations via metaphors and which image schemas are employed in those metaphors. I choosed basic relations to see if these relations' correspond with the interaction of human body with the sounds would differ for different groups. I choosed 9 different pitch, tempo, articulation and tone relations; nine different sound stimuli were prepared by recording piano and çello on ableton 9 live software. First stimulus is about articulation of the pitches; the same note piano (soft,weak) and forte (strong) this basic rule in previous studies associated with force schemas (Antpvic, 2009),stimulus 02 is about the

articulation(Antovic, 2009); same sequence played staccato and legato this sound associated with link schema before which is not in this study (Antovic, 2009) I wanted to see if it corresponds with another schema, third stimuli is again related with low and high pitches (pitch change) this time moving sequentially from low to high(Antovic, 2009); same sequence upward and downward, this sound was also perceived as motion(Antovic, 2009) , recorded playing on piano, stimulus 04 is about the tempo change(Antovic, 2009) which perceived as musical motion before (Antovic, 2009); same sequence with 70 bpm and 140 bpm, stimulus 05 is low and high pitches; C4 -C5 (Antovic, 2009) as low and high pitched sounds were perceived before as coming from up and down locations (Antovic, 2009), stimulus 06 is gliss up and down, stimulus 07 is a tone relation; dissonant and consonant notes recorded playing with piano, I thought this sound will have the conceptualization with balance schema the most., stimulus 08 is arpeggios with three different octaves which are again low to high. Stimulus 09 crescendo and decrescendo, this articulation relation perceived as movement of an object from near to far in Eitan and Granots research (Eitan & Granot, 2004), I also thought stimulus 06 and stimulus 09 can be perceived via containment or cycle schemas since they have repetitions they can be perceived as circular movement around. All the stimuli arranged in ableton. Sounds arranged as listenable with all kinds of audio transferring tool not special frequencies included for people to listen with any device and hear the same.

Figure 9

Sound Stimuli

Stimulus 01



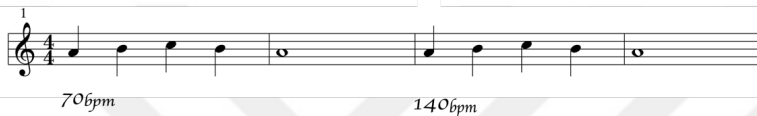
Stimulus 02



Stimulus 03



Stimulus 04



Stimulus 05



Stimulus 06



Stimulus 07



Stimulus 08



Stimulus 09



3.3.2. Sound Stimuli Features

A table of the sound features was created to analyse the subject answers (See Table 4). The features of sound stimuli were described because they will be the target domains or one of the mental spaces in mapping processes to find which schemas are present in the subject answers.

Table 4

Features of Sound Stimuli

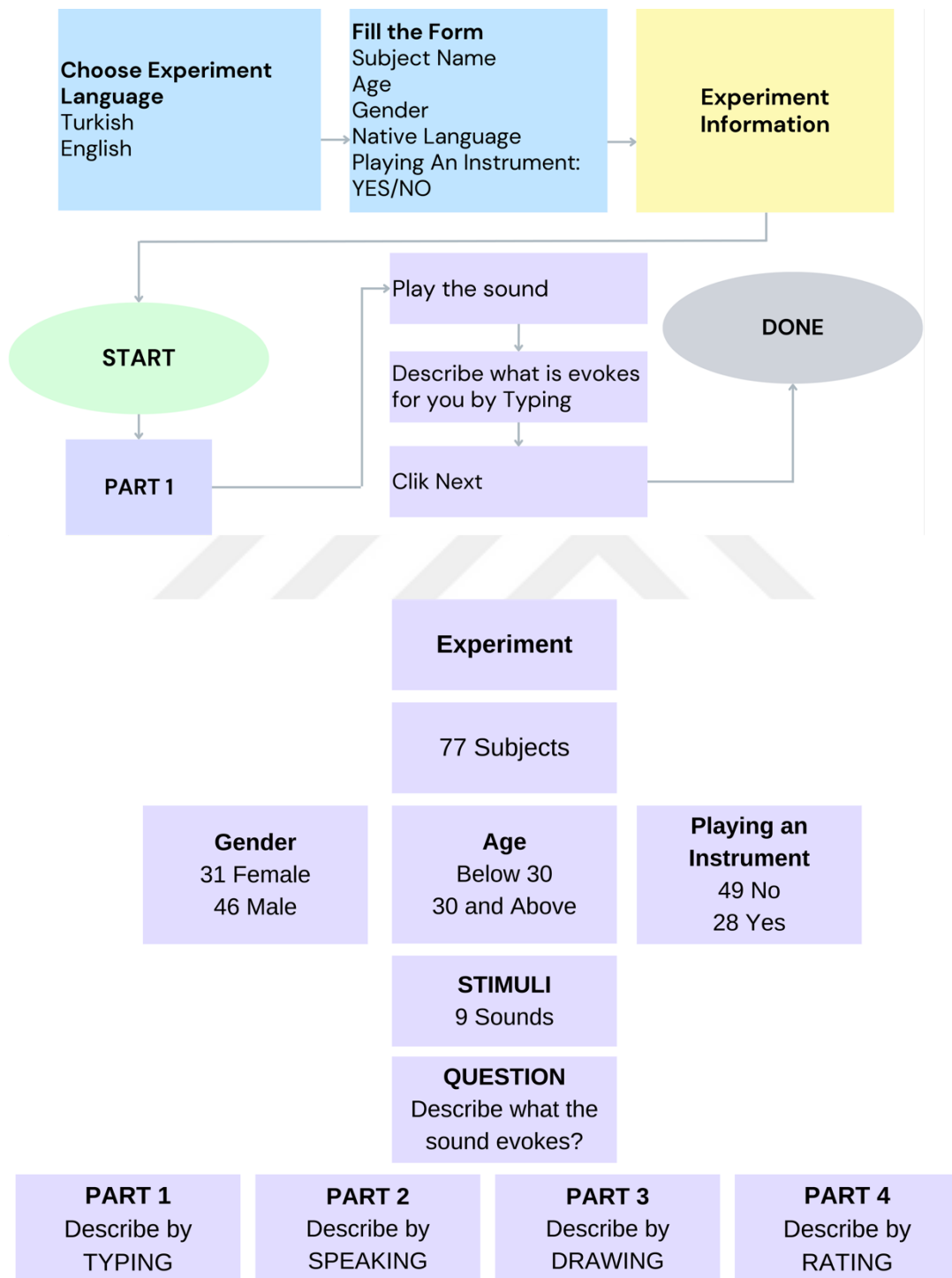
Sound Stimuli	Features
Stimulus 01 (S01)	Sound
Piano- Forte	Piano Tone
	Forte Tone
	Synamic
	Change of Dynamic
Stimulus 02 (S02)	Sound
Staccato - Legato	Tone Duration
	Shortest Tone
	Short Tone
	Longest Tone
	Pauses Between Tones
Stimulus 03 (S03)	Sound
Upward - Downward	Organization of Tones
	Tones
	Pitch Sequencing Towards Final Tone
	Pitch Sequencing Towards Initial Tone
Stimulus 04 (S04)	Sound
70 bpm – 140 bpm	Sequence of Tones
	70 Bpm
	140 Bpm
	Change of Tempo
Stimulus 05 (S05)	Sound
High-low	Low Frequency
	High Frequency
	Key
	Change of Frequency
Stimulus 06 (S06)	Sound
Glissando	Organization of Tones
3 Times	Pitch Sequencing Towards Final Tone
	Pitch Sequencing Towards Initial Tone
	Iteration
Stimulus 07 (S07)	Sound
Dissonance - Consonance	Tense Tones

	Stable Tones
	Tension
	Change of Tension
Stimulus 08 (S08)	Sound
Arpeggios in 3 Octaves	Organization of Tones
	Sequence of Tones
	High Frequency
	Mid Frequency
	Low Frequency
	Key
	Change of Frequency
	Iteration
Stimulus 09 (S09)	Sound
Crescendo – Decrescendo	Loud Tone
	Quiet Tone
	Loudness
	Change of Loudness

3.5. Procedure

Figure 10

Experiment's Flow Diagram and Components



The experiment could be conducted in both English and Turkish languages. Participants were invited to describe their experiences evoked by sound stimuli. There were four sessions; typing on a keyboard; speaking and recording; drawing into a box with drawing tool; rating antonym pairs based on the relation of the pairs with participants experiences.

Participants were assured that they were free to tell whatever they wanted to for typing, speaking and drawing sessions no limitations were imposed on them.

Before the experiment participants had to allow for the application to record their voice via microphone in their browsers. They were informed that they will need functioning audio devices like earphones or speakers to listen and a microphone to speak. For listening effectively if there is ambient noise around specifically having headphones recommended.

At the beginning of the experiment, participants selected their language English or Turkish. (See Figure 12). Next, they were requested to fill the form to provide personal details including their name, gender identity, sexual orientation and their native language and they were asked if they play an instrument as a yes/no question. We did not use native language as it was not a proper discriminator, also the sexual orientation we did not use because very less people gave the information.

Detailed instructions were provided at every session's introduction before each four part. There were trials for each part. For those not wanting to participate or in an environment cluttered by noise during speaking sessions could skip speaking part. The experiment design did not limit the time for participants to respond.

During the research study, a total of 53 pages of questions were provided; each included one page per 9 stimuli and 1 trial for four sessions. 4 single pages were designed for participant information and instructions were 11 pages. Participants had permission to listen to the sound stimuli in each question for limited times before responding which could be done while audio is playing or after playing the audio.

In summary, this approach differs from prior studies (Gaylord, 2014; Eitan & Granot, 2006; Pratt, 2017; Eitan & Timmers, 2010) in that participants could give the descriptions without any limitations and express themselves freely.

The experiment started with the typing session, where participants were presented with nine sounds and asked to type what each sound "evoked" for them. To proceed to the next question, participants could simply click the "NEXT" button.

In the second session they need to describe what the sounds evoke in them by speaking. They had the option to skip all the speaking questions. They needed to play the sound, click “RECORD” to record their speaking and click “STOP RECORDING” to stop and save their recordings. They can go to the next question by clicking to the “NEXT” button.

In the third session participants were instructed to describe their experiences through drawing. Drawing session aimed to see if listening to speaking effects the results to explore if there are differences in the metaphorical language usage and differences in types of image schemas used to depict their auditory experience.

Drawing responses as a method of expression have been used in previous studies, including Mark Leman's musical gestural study (Leman, 2010). The selection of drawing as a response method in this study was motivated by the anticipation of increased use CBT because it would promote multimodality as suggested by Kövecses (2002) and to see if thinking to speaking changes the results.

Participants were instructed to listen to the sound and draw their response directly into the drawing box. On personal computers, participants could create lines by clicking the mouse clicker and moving the mouse. On mobile devices, participants were required to touch, hold, and move their fingers to draw on the screen. To see the participants drawings' start points a red mark was pointed as a visual cue for each line touch. Once participants completed their drawings, they could proceed to the next question.

In the fourth session, participants were assigned the task of rating antonym pairs on a scale of 1 to 5, according to the level of compatibility between the pairs and the evoked experiences of the sound stimuli. This part was influenced by a previous study of Eitan and Timmers (2010)

Once all the questions were completed, participants were required to click on the "Done" button to save their answers. In each set of four sessions, the sound stimuli remained same but they were presented in a different order for each part. To ensure accurate data recording, every participant's response was matched with their unique ID number and stored in the database. This helped easy analysis by linking the recorded answers to the corresponding results page of the experiment.

3.6 Image Schemas

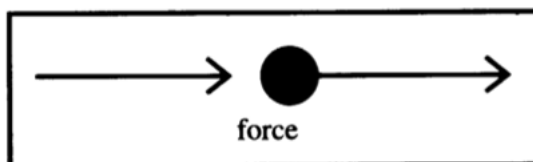
3.6.1. Selecting Image Schemas

While analyzing participant responses, 7 image schemas were noted. I took the image schema grouping of Urista where she categorizes them into three groups first one is the spatial orientation of the human body the schemas in this group are containment, verticality and center-periphery, second group is the temporal schemas which is about time and motion, path and cycle schemas are in this group, lastly the third group is force group and the force and balance schemas are the members of this group. Here is a list of selected schemas and their body-environment relations with their features and images;

3.6.1.1. Force schema

The "force" schema involves a transition from one state to another with an applied force. This schema captures how an object or entity transforms through external or internal influences; in our bodies this experiences as our lungs expansion during breathing. In music, pitch features can sound different in magnitudes again with applied force from the producer. CHANGE, pitches are forces, pitches are sizes, pitch sequencing is motion. (Johnson, 1987)

Figure 11
Force Schema



Note From “Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music”, by Janna Saslaw, 1996, Journal of Music Theory, Autumn, 1996, Vol. 40, No. 2 (Autumn, 1996), pp. 217-243

Features;

- A force vector (a force) with a certain magnitude
- And a certain direction
- An entity acted upon by a force
- A potential trajectory the entity follows with the force

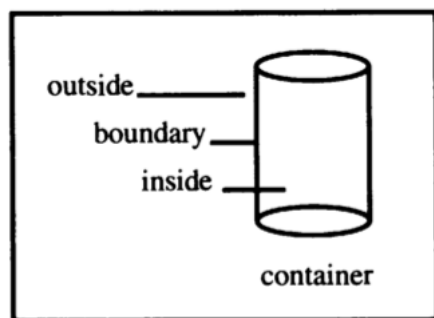
(Johnson, 1987, p.4)

3.6.1.2. *Containment schema*

We experience boundaries and being inside our bodies. Our bodies contain organs and blood, our skin is the boundary to our smaller components. We live in big containers, buildings and in bigger containers cities. Our existence allows us to embody the schema container. We also experience it figuratively exposing to an idea or containing of beliefs. In music compositions contain pitches. (Johnson, 1987,p. 21-22)

Figure 12

Containment Schema



Note From “Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music”, by Janna Saslaw, 1996, *Journal of Music Theory* , Autumn, 1996, Vol. 40, No. 2 (Autumn, 1996), pp. 217-243

Features

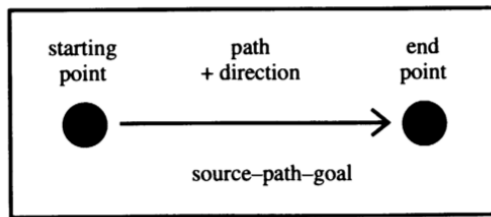
- Boundaries
- In – out orientation
- Protection from or resistance to external forces
- In – out location
- Accessible or inaccessible to observer

(Johnson, 1987, p.21-22)

3.6.1.3. *Path schema*

Most processes in life have a start, a duration and an ending (Lakoff, 1987). This pattern not only occurs in physical movements, also in thoughts.(Johnson, 1987, p. 113) "START-PATH-END," image schema is observable in domains such as music, where pitches are conceptualized as paths of musical motion.

Figure 13
Path Schema



Note From “Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music”, by Janna Saslaw, 1996, *Journal of Music Theory* , Autumn, 1996, Vol. 40, No. 2 (Autumn, 1996), pp. 217-243

Features;

- Source point A – from point A
- Terminal (goal) point B – toward point B
- A vector tracing between them (path) - destination
- A relation (force vector moving from A to B) – direction
- (Starting location onto initial state.
- Goal (final location) onto final state.
- Motion along path onto intermediate actions.)

3.6.1.4. Cycle schema

The cycle schema plays a vital role in exploring the concept of time, we frequently perceive a recurring pattern with its ongoing motion which has identical start and end points. As waves that oscillate between upward and downward movements within a given wavelength. Cycles also carry moments of tension during their rising phase followed by relaxation as they descend. Departure and return become central concepts with this schema. (Johnson, 1987, pg.119) In music where pitches are sequenced metaphorically according to this pattern with cyclical melodic and harmonic sequences repeating. PROCESS, TENSION, RELAXATION, RELEASE, REPEAT, musical/pitch sequencing is cycle.

Figure 14
Cycle Schema

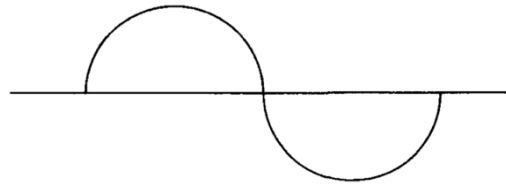
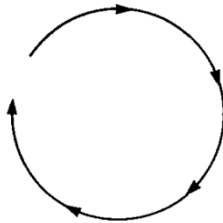


FIGURE 23. CYCLIC CLIMAX

Note From “The Body in the Mind”, by Mark Johnson, 1987, The University of Chicago Press, Chicago 60637, © by The University of Chicago

Features;

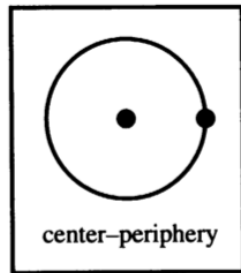
- Initial state
- A sequence of connected events
- End at the initial state(to start a new one)
- Forward - moving sequence,
- Built-up and release (climatic structure)
- Multiple, overlapping, sequential
- Both harmonious and conflicting relations
- Temporality

(Johnson,1987, p.119-120-121)

3.6.1.5. Center-periphery schema

Our perception is around our bodies and allows us to experience the outside world. We can change our focus between objects. Everything can become unperceptible beyond an horizon. Until that horizon it is easy to perceive what is around us. It is not only about the perception of physical objects but also about our values in life as our prioritizations and also social life as in where we see ourselves in our surrounded circle of people. (Johnson, 1987, p. 124-125).

Figure 15
Center-periphery Schema



Note From “Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music”, by Janna Saslaw, 1996, *Journal of Music Theory* , Autumn, 1996, Vol. 40, No. 2 (Autumn, 1996), pp. 217-243

Features;

- Near – Far
- Scale to define nearness to the center
- Superimpose a CONTAINER schema – center as inner and outer relative to it ,
- Inner – outer pattern
- Center – periphery Orientation
- Imposition of subject-object orientation
- Inmost dimension === Self – Other === Mine – Thine

(Johnson, 1987, p.125)

3.6.1.6. Balance schema

Without being aware, our bodies are capable of processing and maintaining a posture that allows us to stay balanced. Any disturbance to this equilibrium can put us at risk for falling or breaking things around us. When we fare off-balance tension can arise; however relaxation happens once stability is restored. In music composition combinations and harmony between pitches represent balance which replicates same concepts.

Figure 16
Balance Schema

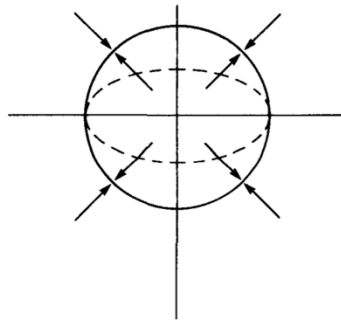


FIGURE 20. EQUILIBRIUM

Note From “The Body in the Mind”, by Mark Johnson, 1987, The University of Chicago Press, Chicago 60637, © by The University of Chicago

Features;

- Equilibrium
- Loss of equilibrium
- Center
- Vertical, horizontal axis
- Forces (gravity...)

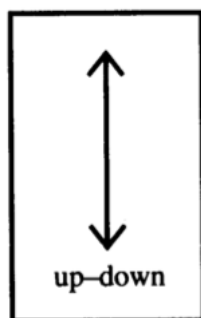
(Johnson, 1987, p. 74-87)

3.6.1.7. Verticality schema

Underlying aspect of this schema is gravity and the body's physical form allowing us to maintain an upright posture, move in various directions (front, back, right, left). (Johnson, 1987, p.xiv)

In the realm of music, pitches can be metaphorically represent heights. Additionally, pitches can be associated with vertical motion and the ascending or descending movement of a composition. UP, DOWN, pitches are heights, pitches are vertical motion.

Figure 17
Vetricality Schema



Note From “Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music”, by Janna Saslaw, 1996, *Journal of Music Theory* , Autumn, 1996, Vol. 40, No. 2 (Autumn, 1996), pp. 217-243

Features;

- Up-down /orientation
- Up-down location

(Johnson,1987, p.xiv)

3.6.1.8. No metaphor

This is for the answers like “This is a piano sound”.

For grouping of image schemas there is not a definite answer. However there is the question to ask in the process of grouping "What properties are shared by the most significant image schemas and how can they be classified?" (Oakley, 2007). I used Urista’s grouping of the schemas as I mentioned earlier. In her paper she discovers the schemas basic musical concepts and in different theories of tonalities (Urista, 2001). Her grouping is based on spatial orientation, time and casual interaction which are spatial schemas; containment, center-periphery, verticality, temporal schemas; path, cycle and force schemas; force, balance.

Table 5*Schema Grouping of Urista*

Group	Schemas
SPATIAL ORIENTATION	CONTAINMENT, CENTER-PERIPHERY, VERTICALITY
TEMPORAL	PATH, CYCLE
FORCE	FORCE, BALANCE

Note From “Embodying Music Theory: Image schemas as sources for musical concepts and analysis, and as tools for expressive performance”, by Diane Urista, 2001, Bell & Howell Information and Learning, 300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA 800-521-0600

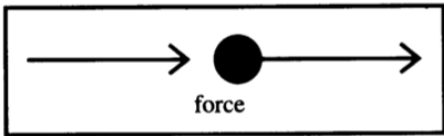
When determining which schemas to examine in this study “spatial orientation”, “time” and “force” were the core considerations.

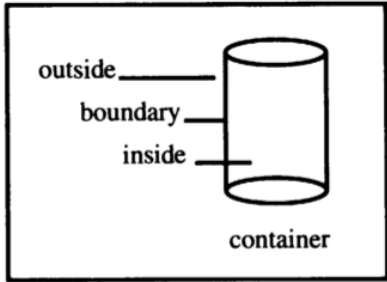
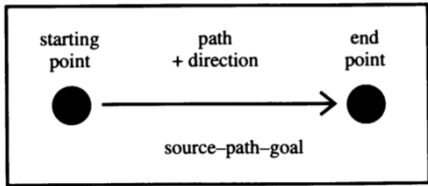
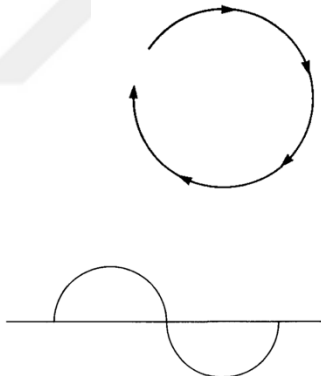
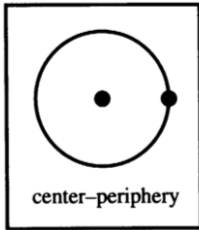
With this approach I could gain insights into the cognitive processes and metaphorical conceptualizations employed by participants. Determining the image schemas and their features will also give me the advantage of evaluating the participant responses with more confidence.

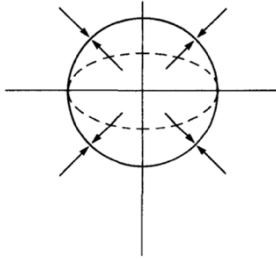
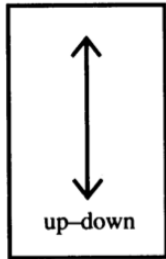
3.6.2. Image Schema Features

Table 5 for features of Image schemas were created from the features in section 3.6.1 for researchers to determine which schema is present in subject’s metaphors.

Table 6*Image Schema Features and Figures*

Schema Number In Experiment	Image Schemas and Figures	Image Schema Features
M01	Force Schema 	A force vector (a force) with a certain magnitude A certain direction An entity acted upon by a force A potential trajectory the entity follows with the force

M02	Containment Schema 	-Boundaries -In – out orientation -Protection from or resistance to external forces -In – out location -Accessible or inaccessible to observer
M03	Path Schema 	-Source point A – from point A -Terminal (goal) point B – toward point B -A vector tracing between them (path) - destination -A relation (force vector moving from A to B) – direction
M04	Cycle Schema  FIGURE 23. CYCLIC CLIMAX	-Initial state -A sequence of connected events -End at the initial state(to start a new one) -Forward - moving sequence, -Built-up and release (climatic structure) -Multiple, overlapping, sequential -Both harmonious and conflicting relations -Temporality
M05	Center-Periphery Schema 	-Near – Far -Scale to define nearness to the center -Superimpose a CONTAINER schema – center as inner and outer relative to it , -Inner – outer pattern -Center – Periphery Orientation -Imposition of subject-object orientation

		-Inmost dimension === Self – Other === Mine – Thine
M06	Balance Schema 	-Equilibrium -Loss of equilibrium -Center -Vertical, horizontal axis -Forces (gravity...)
M07	Verticality Schema 	-Up-down /orientation -Up-down location

3.7. Data Analysis Data Cleaning and Pre-Processing and Analysis

Here is the flow diagram of the research (See Figure 10).

The speaking session was excluded due to the fact that majority of participants skipped that session. Additionally, I excluded the rating section from the analysis as participants encountered technical difficulties on certain devices.

During the analysis of subject answers in the typing and drawing sections, first thing to do was to identify metaphors in the responses. If metaphors were detected in the answers, it was proceeded to determine which schemas were employed by examining the features that corresponded with image schemas (Table 5).

To maintain objectivity when analysing the subject answers three different researcher analysed the responses. Each researcher was asked to choose one of the image schemas for each response according to the features of the schemas table (table 5) and enter the schema into the corresponding cell.

Firstly if the response is a linguistic expression the metaphor/conceptualization which the linguistic expression proves examined. As in the linguistic expression “*I’m at a crossroads in my life*” or “*She’ll go places in life.*” are the expressions for “Life

is a journey” metaphor. If the response itself is a metaphor like “Journey” the first step skipped. Once the presence of a metaphor was identified, the metaphor for specific schemas features were examined. By analysing these specific features within the metaphors, the first schema being utilized to establish mappings with sound stimuli ascertained.

As an example, in the response "scream," there is a change in loudness (amplitude of the wave) and the distance which the sound expands with force, perceived as differences in both distance and loudness. It was observed both the "scream" response and the piano/forte sounds reflects changes in loudness and expansion in distance by an applied force. When analysing this musical conceptualization, it is concluded that image schemas “center-periphery” and “force”, were present in the metaphor to identify these shared similarities, researchers asked to choose which is the most and first and which is the second schema they think is present in the metaphor. Here are the steps to analyse participant answers to find which schemas are present;

1. Identify the metaphor or conceptualization employed by the participant.
2. Define the specific features of the metaphor.
3. Determine the image schema
4. Analyse the reasons why these particular image schemas are present in the metaphorical space

During the analysis process a table was created with rows of all the subjects names and columns with the information of participant number, musical instrument playing, age, gender and all sounds for each part. For the answers for stimuli 01 in typing part, it was coded as p01s01 and in drawing part it was p03s01 so there were 18 coded answers for each question. For every subject there were 9x2 sessions (typing and drawing) total of 18 responses.

At the completion of the five steps indicated and analysis of three researchers the necessary data tables were created for analysis of frequency, percentage, chi-square and Fleiss Kappa analysis to be conducted with SPSS 28 software .

4.RESULTS

For results after creating chi-square tables two other tables created for every subject group. First tables contained the percentages of subjects who used metaphors (See Table 7). For second tables for each subject groups I put the mostly used schemas for each sound stimulus (See Table 6).

4.1. According to Age Difference

Age groups determined as below 30 and 30 and above years old. For stimuli 01 piano - forte, 02 staccato- legato, 03 upward-downward, 04 bmp change, 05 high - low, 06 3 times glissando, 08 arpeggios in 3 octaves and 09 crescendo – decrescendo there was no statistically significant difference in two age groups and metaphor usage were high for both groups and for all three researchers ($X^2=3,055$, $p>0,05$). (appendix)

In sound stimuli 07 dissonance - consonance for first ($X^2=4,820$, $p<0,05$) and third ($X^2=4,430$, $p<0,05$) researchers there is statistically significant difference with the age group of below 30 utilized metaphors more than the 30 and above age group.

Results for sound stimulus 07 dissonance – consonance did not support the first hypothesis for age groups but for other stimuli the first hypothesis supported.

The schemas utilized in metaphors for different age groups showed statistically significant differences for sound stimuli 01 piano-forte for first researcher ($X^2=15,611$, $p<0,05$) in utilization of schemas with below 30 years old age group is higher.

For other stimuli there was no statistically significant difference in utilizing of any schemas.

Results for stimulus 01 piano-forte sounds did not support the second hypothesis as the age difference affected the image schema types utilized in metaphors. For other stimuli the second stimuli was supported; age difference did not affect the schema types employed by subjects.

Table 7*Age, Schemas Utilized*

Sound Stimuli	Below 30			30 and Above		
	1.Expert	2.Expert	3.Expert	1.Expert	2.Expert	3.Expert
Stimulus 01 Piano - Forte	Force	Cycle, Verticality	Cycle, Balance	Balance	Balance	Force
Stimulus 02 Staccato - Legato	Path	Balance	Balance	Path	Balance	Path
Stimulus 03 Upward - Downward	Verticality	Cycle	Verticality, Cycle	Verticality	Cycle, Balance	Balance
Stimulus 04 70 bpm – 140 bpm	Path	Balance	Balance	Path, Cycle, Balance	Balance	Balance
Stimulus 05 High - Low	Balance	Balance	Balance	Balance	Balance	Path, Balance
Stimulus 06 Glissando 3 Times	Balance	Balance	Balance	Balance	Balance	Balance
Stimulus 07 Dissonance - Consonance	Balance	Balance	Force	Balance	Balance	Balance
Stimulus 08 Arpeggios in 3 Octaves	Path	Cycle, Balance	Path	Path	Balance	Path
Stimulus 09 Crescendo - Decrescendo	Path	Balance	Path	Path	Cycle	Path

Table 8
Age, Metaphorical Language Rates

Sound Stimuli	Below 30			30 and Above		
	Expert 1	Expert 2	Expert 3	Expert 1	Expert 2	Expert 3
Stimulus 01 Piano - Forte	%72,7	%81,8	%66,7	%75,0	%81,8	59,1%
Stimulus 02 Staccato - Legato	75,8%	90,9%	96,7%	81,8%	86,4%	59,1%
Stimulus 03 Upward - Downward	51,5%	84,8%	54,5%	50,0%	75,0%	59,1%
Stimulus 04 70 bpm – 140 bpm	75,8%	81,8%	60,6%	70,5%	72,7%	56,8
Stimulus 05 High - Low	78,8%	87,9%	66,7%	77,3%	81,8%	61,4%
Stimulus 06 Glissando 3 Times	84,8%	84,8%	63,6%	88,6%	79,5%	70,5%
Stimulus 07 Dissonance - Consonance	93,9%	90,9%	75,8%	75,0%	79,5%	52,3%
Stimulus 08 Arpeggios in 3 Octaves	75,8%	72,7%	75,8%	79,5%	77,3%	61,4%
Stimulus 09 Crescendo - Decrescendo	87,9%	97,0%	66,7%	88,6%	88,6%	61,4%

4.2. According to Gender

According to gender groups there was no statistically significant differences both in metaphorical language use and schemas employed in the subjects' metaphors. There was also no difference found in three reserchers' anlaysis for any of the sound stimuli.

Results supports that gender is not playing any role in metaphorical language use and the schema type differences in metaphors. Both first hypothesis and second hypothesis were supported for gender groups.

Table 9

Gender Metaphorical Language Rates Results

Sound Stimuli	Male			Female		
	Expert 1	Expert 2	Expert 3	Expert 1	Expert 2	Expert 3
Stimulus 01 Piano - Forte	71,7%	80,4%	63,0%	77,4%	83,9%	61,3
Stimulus 02 Staccato - Legato	78,5%	91,3%	65,2%	80,6%	83,9%	61,3%
Stimulus 03 Upward - Downward	54,3%	82,6%	65,2%	45,2%	74,2%	45,2%
Stimulus 04 70 bpm – 140 bpm	73,9%	71,7%	63,0%	71,0%	83,9%	51,6%
Stimulus 05 High - Low	78,3%	87,0%	63,0%	77,4%	80,6%	64,5%
Stimulus 06 Glissando 3 Times	84,8%	78,3%	76,1%	90,3%	87,1%	54,8%
Stimulus 07 Dissonance - Consonance	84,8%	82,6%	63,0%	80,6%	87,1%	61,3%
Stimulus 08 Arpeggios in 3 Octaves	78,3%	73,9%	69,6%	77,4%	77,4%	64,5%
Stimulus 09 Crescendo - Decrescendo	89,1%	91,3%	65,2%	87,1%	93,5%	61,3%

Table 10
Gender, Schemas Utilized

Sound Stimuli	Male			Female		
	1.Expert	2.Expert	3.Expert	1.Expert	2.Expert	3.Expert
Stimulus 01 Piano - Forte	Force	Balance	Force	Force	Cycle,Balance	Force
Stimulus 02 Staccato - Legato	Path	Balance	Path	Verticality	Balance	Path
Stimulus 03 Upward - Downward	Verticality	Cycle	Balance	Cycle, Verticality	Cycle	Balance
Stimulus 04 70 bpm – 140 bpm	Path	Balance	Balance	Path	Balance	Balance
Stimulus 05 High - Low	Balance	Balance	Balance	Balance	Cycle	Path
Stimulus 06 Glissando 3 Times	Cycle	Balance	Balance	Cycle, Balance	Balance	Balance
Stimulus 07 Dissonance - Consonance	Balance	Balance	Balance	Path, Balance	Cycle, Balance	Force
Stimulus 08 Arpeggios in 3 Octaves	Path	Balance	Path	Path	Balance	Path
Stimulus 09 Crescendo - Decrescendo	Path, Cycle	Balance	Path	Path	Cycle	Path

4.3. According to Playing an Instrument

For the groups that concerns playing an instrument and for the stimuli 01 piano – forte, 02 staccato - legato, 03 upward - downward, 04 tempo change, 05 high – low pitch change, 07 dissonance and consonance, 09 crescendo - decrescendo there was no statistically significant difference found in metaphorical language use.

For the stimulus 06 three times glissando according to second researcher the group of non-players of an instrument were higher in metaphorical language use ($X^2=9,092$, $p<0,05$).

Also for stimulus 08 arpeggios in three octaves according to first ($X^2=4,756$, $p<0,05$) and second ($X^2=5,053$, $p<0,05$) researchers there was difference in metaphorical language use with non-players on a higher rate.

Distributions showed that stimulus 06 which is glissando three times and stimulus 08 arpeggios in three octaves had differences in metaphorical language. This can show that instrument player group is more familiar with this kind of sound rule and they used terms without employing metaphors.

Schema usage in stimulus 02 staccato - legato for second researcher there was a statistically significant difference in schema usage ($X^2=12,362$, $p<0,05$), non-players used schemas more than instrument players when describing the stimuli 02.

There was no statistically significant differences in other stimuli for any researchers in between this groups.

Stimulus 02 staccato – legato sounds results are not supporting the second hypothesis, non-player group used image schemas more than player. Again this can mean that instrument playing group has the information of the sound rule and they did not use image schemas when describing their experiences.

Table 11

Musical Instrument Playing Metaphorical Language Rates

Sound Stimuli	Playing an Instrument			Not Playing an Instrument		
	Expert 1	Expert 2	Expert 3	Expert 1	Expert 2	Expert 3
Stimulus 01 Piano - Forte	71,4%	78,6%	64,3%	75,5%	83,7%	61,2%
Stimulus 02 Staccato - Legato	78,6%	85,7%	64,3%	79,6%	89,8%	63,3%
Stimulus 03 Upward - Downward	50,0%	75,0%	57,1%	51,0%	81,6%	57,1%
Stimulus 04 70 bpm – 140 bpm	64,3%	71,4%	60,7%	77,6%	79,6%	57,1%

Stimulus 05 High - Low	78,6%	78,6%	71,4%	77,6%	87,8%	59,2%
Stimulus 06 Glissando 3 Times	78,6%	64,3%	64,3%	91,8%	91,8%	69,4%
Stimulus 07 Dissonance - Consonance	75,0%	75,0%	64,3%	87,8%	89,8%	61,2%
Stimulus 08 Arpeggios in 3 Octaves	64,3%	60,7%	71,4%	85,7%	83,7%	65,3%
Stimulus 09 Crescendo - Decrescendo	89,3%	92,9%	64,3%	87,8%	91,8%	63,3%

Table 12
Musical Instrument Playing, Schemas Utilized

Sound Stimuli	Playing an Instrument			Not Playing an Instrument		
	1.Exper t	2.Expert	3.Expert	1.Expert	2.Expert	3.Expert
Stimulus 01 Piano - Forte	Force	Verticality , Cycle	Force	Force	Balance	Force
Stimulus 02 Staccato - Legato	Path	Balance	Balance	Path	Verticalit y	Path
Stimulus 03 Upward - Downward	Vertical ity	Cycle	Path	Verticalit y	Cycle	Balance
Stimulus 04 70 bpm – 140 bpm	Path	Balance	Balance	Path	Balance	Balance
Stimulus 05 High - Low	Balance	Balance	Path	Balance	Balance	Balance
Stimulus 06 Glissando 3 Times	Path	Balance	Path	Balance	Balance	Balance
Stimulus 07 Dissonance - Consonance	Balance	Balance	Path	Path	Balance	Balance

Stimulus 08 Arpeggios in 3 Octaves	Verticality	Cycle	Path	Path	Balance	Path
Stimulus 09 Crescendo - Decrescendo	Force	Cycle, Verticality	Force	Force	Balance	Force

4.4. Researchers Analysis

To prevent subjectivity three different researchers analysed the subject answers. Fleiss Kappa analysis conducted to determine if all researchers agree in their analysis.

Table 13
Fleiss' and Kappa Analysis of Agreement

Sound Stimuli	Schema	1.Researcher		2.Researcher		3.Researcher		X2	p	Fleiss Kappa
		N (%)	% (Column)	N (%)	% (Column)	N (%)	% (Column)			
Stimulus 01	Force	23 (13,7)	40,4	5 (3,0)	7,9	21 (12,5)	43,8	40,54 3	0,000 *	0,341
	Containment	5 (3,0)	8,8	3 (1,8)	4,8	2 (1,2)	4,2			
	Path	7 (4,2)	12,3	2 (1,2)	3,2	6 (3,6)	12,5			
	Cycle	3 (1,8)	5,3	13 (7,7)	20,6	6 (3,6)	12,5			
	Center-Periphery	4 (2,4)	7,0	8 (4,8)	12,7	1 (0,6)	2,1			
	Balance	10 (6,0)	17,5	17 (10,1)	27,0	10 (6,0)	20,8			
	Verticality	5 (3,0)	8,8	15 (8,9)	23,8	2 (1,2)	4,2			
Stimulus 02	Force	4 (2,2)	6,6	3 (1,7)	4,4	6 (3,4)	12,2	23,72 7	0,022 *	0,295
	Containment	2 (1,1)	3,3	1 (0,6)	1,5	0	0			
	Path	20 (11,2)	32,8	10 (5,6)	14,7	17 (9,6)	34,7			
	Cycle	5 (2,8)	8,2	11 (6,2)	16,2	4 (2,2)	8,2			
	Center-Periphery	5 (2,8)	8,2	4 (2,2)	5,9	2 (1,1)	4,1			
	Balance	8 (4,5)	13,1	24 (13,5)	35,3	15 (8,4)	30,6			
	Verticality	17 (9,6)	27,9	15 (8,4)	22,1	5 (2,8)	10,2			
Stimulus 03	Force	1 (0,7)	2,6	2 (1,4)	3,3	4 (2,8)	9,1	23,72 0	0,022 *	0,509
	Containment	3 (2,1)	7,7	1 (0,7)	1,6	3 (2,1)	6,8			
	Path	6 (4,2)	15,4	3 (2,1)	4,9	6 (4,2)	13,6			
	Cycle	6 (4,2)	15,4	24 (16,7)	39,3	7 (4,9)	15,9			
	Center-Periphery	4 (2,8)	10,3	1 (0,7)	1,6	2 (1,4)	4,5			
	Balance	6 (4,2)	15,4	17 (11,8)	27,9	14 (9,7)	31,8			
	Verticality	13 (9,0)	33,3	13 (9,0)	21,3	8 (5,6)	18,2			
Stimulus 04	Force	8 (5,0)	14,3	7 (4,4)	11,9	8 (5,0)	17,8	21,60 0	0,042 *	0,327
	Containment	2 (1,3)	3,6	1 (0,6)	1,7	0	0			
	Path	19 (11,9)	33,9	7 (4,4)	11,9	13 (8,1)	28,9			

	Cycle	10 (6,3)	17,9	6 (3,8)	10,2	3 (1,9)	6,7			
	Center-Periphery	1 (0,6)	1,8	4 (2,5)	6,8	1 (0,6)	2,2			
	Balance	11 (6,9)	19,6	26 (16,3)	44,1	18 (11,3)	40,0			
	Verticality	5 (3,1)	8,9	8 (5,0)	13,6	2 (1,3)	4,4			
Stimulus 05	Force	4 (2,3)	6,7	1 (0,6)	1,5	4 (2,3)	8,2			
	Containment	5 (2,9)	8,3	2 (1,1)	3,1	1 (0,6)	2,0			
	Path	11 (6,3)	18,3	10 (5,7)	15,4	14 (8,0)	28,6			
	Cycle	5 (2,9)	8,3	15 (8,6)	23,1	6 (3,4)	12,2	17,09	0	0,146 0,461
	Center-Periphery	9 (5,2)	15,0	7 (4,0)	10,8	3 (1,7)	6,1			
	Balance	18 (10,3)	30,0	21 (12,1)	32,3	18 (10,3)	36,7			
	Verticality	8 (4,6)	13,3	9 (5,2)	13,8	3 (1,7)	6,1			
Stimulus 06	Force	2 (1,1)	3,0	2 (1,1)	3,2	6 (2)	11,5			
	Containment	6 (3,3)	9,0	1 (0,5)	1,6	2 (6)	3,8			
	Path	10 (5,5)	14,9	2 (1,1)	3,2	10 (10)	19,2			
	Cycle	18 (9,9)	26,9	10 (5,5)	15,9	7 (18)	13,5	26,11	2	0,010 * 0,233
	Center-Periphery	4 (2,2)	6,0	4 (2,2)	6,3	3 (4)	5,8			
	Balance	23 (12,6)	34,3	34 (18,7)	54,0	21 (23)	40,4			
	Verticality	4 (2,2)	6,0	10 (5,5)	15,9	3 (4)	5,8			
Stimulus 07	Force	6 (3,4)	9,4	2 (1,1)	3,1	11 (6,2)	22,9			
	Containment	4 (2,3)	6,3	1 (0,6)	1,5	0	0			
	Path	15 (8,5)	23,4	8 (4,5)	12,3	14 (7,9)	29,2			
	Cycle	9 (5,1)	14,1	15 (8,5)	23,1	6 (3,4)	12,5	31,10	4	0,002 * 0,250
	Center-Periphery	6 (3,4)	9,4	6 (3,4)	9,2	1 (0,6)	2,1			
	Balance	20 (11,3)	31,3	32 (18,1)	49,2	16 (9,0)	33,3			
	Verticality	4 (2,3)	6,3	1 (0,6)	1,5	0	0			
Stimulus 08	Force	6 (3,5)	10,0	3 (1,8)	5,2	7 (4,1)	13,5			
	Containment	5 (2,9)	8,3	1 (0,6)	1,7	2 (1,2)	3,8			
	Path	22 (12,9)	36,7	6 (3,5)	10,3	25 (14,7)	48,1			
	Cycle	7 (4,1)	11,7	18 (10,6)	31,0	6 (3,5)	11,5	45,48	5	0,000 * 0,235
	Center-Periphery	7 (4,1)	11,7	3 (1,8)	5,2	0	0			
	Balance	5 (2,9)	8,3	20 (11,8)	34,5	10 (5,9)	19,2			
	Verticality	8 (4,7)	13,3	7 (4,1)	12,1	2 (1,2)	3,8			
Stimulus 09	Force	6 (3,2)	8,8	5 (2,7)	7,0	6 (3,2)	12,2			
	Containment	4 (2,1)	5,9	2 (1,1)	2,8	0	0			
	Path	21 (11,2)	30,9	7 (3,7)	9,9	18 (9,6)	36,7			
	Cycle	12 (6,4)	17,6	22 (11,7)	31,0	6 (3,2)	12,2	26,82	9	0,008 * 0,394
	Center-Periphery	7 (3,7)	10,3	4 (2,1)	5,6	5 (2,7)	10,2			
	Balance	15 (8,0)	22,1	26 (13,8)	36,6	14 (7,4)	28,6			
	Verticality	3 (1,6)	4,4	5 (2,7)	7,0	0	0			

Fleiss Kappa analysis was conducted to see the level of agreement of three researchers. After the Kappa value is determined the level of agreement is determined with the classification of Landis and Koch (1977).

Table 14

Landis and Koch (1977)

Value of K	Strength on Agreement
<0,20	Slight
0.21-0.40	Fair
0.41-0.60	Moderate
0.61-0.80	Substantial
0.81-1.00	Almost Perfect

Note From “The measurement of observer agreement for categorical data”, 1977, Biometrics, 33(1), 159–174.

According to Landis and Koch strength on agreement values I analysed the researchers agreement degrees.

Table 15

Agreement Table for Stimuli

Stimulus	K value	Agreement
Stimulus 01 Piano - Forte	0,341	Fair
Stimulus 02 Staccato - Legato	0,295	Fair
Stimulus 03 Upward - Downward	0,509	Moderate
Stimulus 04 70 bpm – 140 bpm	0,327	Fair
Stimulus 05 High - Low	0,461	Moderate
Stimulus 06 Glissando	0,233	Fair

3 Times		
Stimulus 07 Dissonance - Consonance	0,250	Fair
Stimulus 08 Arpeggios in 3 Octaves	0,235	Fair
Stimulus 09 Crescendo - Decrescendo	0,394	Fair

In stimuli 01 piano - forte, 02 staccato - legato, 04 tempo change, 06 3 times glissando, 07 dissonance - consonance, 08 arpeggios in three octaves, 09 crescendo - decrescendo researchers' agreement level is fair.

In stimuli 03 upward – downward scales and 05 high – low pitch change researchers agreement level is moderate. As a result researchers agreed in fair and moderate levels and we can count this test as reliable.

5.DISCUSSION

5.1. First Hypothesis: Metaphorical Language

The main hypothesis proposed that, descriptions to sounds of participants would mainly rely on metaphors. Although this proved true for most participants and played a significantly dominant role in constructing meaning and interpretation, exceptions were existent. In some cases participants described musical tones without metaphors and instead they identified instruments or used technical unmetaphorical terms.

Findings support the first hypothesis and confirm that individuals predominantly used metaphors to describe nine different musical relationships. The Results provide evidence to metaphors serve as a key cognitive mechanism to perceive and understand the stimuli and embracing musical meaning.

As embodied mind theory posits the utilization of metaphors among participants can be linked to their bodily experiences that were shaped by their interactions with the environment. The inference that musical meaning is grounded in embodiment can be supported with the first hypothesis and with the participants conceptualizations which are based on image schemas.

For stimulus 01 piano-forte mapping of change in articulation linked with Force mostly as expected. Second stimulus staccato and legato associated with path and balance in typing and with cycle in drawing part. Upward and downward scale linked with verticality in both description parts but also with cycle in typing part. Tempo changes are mainly mapped to the path schema in both parts also with cycle in typing part. The mapping of pitches is linked with balance in typing part and with path and cycle in drawing part. Upward and downward scaling with repetition is linked to balance in typing and cycle in drawing part. Dissonance and consonance perceived as path in both parts, additionally with balance in typing part and force in drawing part. Arpeggios in three different octaves associated with path in both parts. Lastly stimulus 09 – crescendo and decrescendo anticipated which are mapped using schemas path in both parts, force in typing part and verticality in drawing part.

5.2. Second Hypothesis: Image Schema Utilizations

In the secondary hypothesis it was postulated that notable disparities would not exist in the conceptualizations among individuals within different demographics and musical instrument players and those non-players. I will discuss the results for each stimuli for this second hypothesis.

5.2.1. Sound Stimulus 01

First stimulus two tones, one played in piano (which means pressing the piano keys weakly and outputting a quiet sound) and the other in forte (strongly pressing the keys and creating a strong loud sound) tested the “musical force” metaphor. These tones had the change in dynamic.

In the distributions there was no statistically significant differences for any subject group and for three experts. The second hypothesis was supported for stimulus 01.

Table 16
Sound Stimulus 01 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Force	Cycle, Verticality	Cycle, Balance
	Above 30	Balance	Balance	Force
Gender	Male	Force	Balance	Force
	Female	Force	Cycle, Balance	Force
Instrument Playing	Yes	Force	Verticality, Cycle	Force
	No	Force	Balance	Force

When we examine the results in terms of schemas employed in metaphorical descriptions there are no significant differences for stimulus 01. The schemas employed by subjects to the descriptions of sound stimuli 01 highest percentage schemas were force, balance, cycle.

As a result according to Urista’s grouping (See Table 4) the mostly used schemas; force and balance are belong to the force group. It can be asserted that perception of weaker and stronger sounds is closely connected with the aspects of body movement and postural adjustments as a reaction to force. As seen in the previous studies(Antovic, 2009; Eitan & Timmers, 2010).

5.2.2. Sound Stimulus 02

Stimulus 2 is composed of two same sequences played on piano with different articulations staccato and legato. Staccato is where player plays the notes with pauses between the notes and legato means player plays the notes connected, without pausing between the notes smoothly. This stimuli metaphorically associated with pitches are links metaphor which is not present in this study.

For image schemas employed in stimulus 02 metaphors in the distributions there was a statistically significant difference for instrument player and non-player groups according to second researcher ($X^2=12,362$, $p<0,05$). When discussing the schemas we can exclude second researchers analysis in instrument group.

There was no difference for other researchers or other subject groups.

The second hypothesis was approved for gender and age groups but not approved for musical instrument player or non-player groups for stimulus 02.

Table 17
Sound Stimulus 02 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Path	Balance	Balance
	Above 30	Path	Balance	Path
Gender	Male	Path	Balance	Path
	Female	Verticality	Balance	Path
Instrument Playing	Yes	Path	Balance	Balance
	No	Path	Verticality	Path

If we examine the schema-sound matching the mostly perceived schemas are path and balance. Path and balance are belong to two different groups in Urista's organization of schemas (See Table 4). It can be concluded from this study that staccato and legato articulation relation was perceived both as temporal and force related body-environment interactions.

5.2.3. Sound Stimulus 03

Same sequence of notes played upward and downward meaning through lower to higher note in the sequence and thorough higher to lower note in the sequence. It has the change of pitch gradually.

For stimulus 03 distributions there is no statistically significant difference in any subject groups or in analysis of any researchers. Second hypothesis was verified for sound stimuli 03.

Table 18

Sound Stimulus 03 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Verticality	Cycle	Verticality, Cycle
	Above 30	Verticality	Cycle, Balance	Balance
Gender	Male	Verticality	Cycle	Balance
	Female	Cycle, Verticality	Cycle	Balance
Instrument Playing	Yes	Verticality	Cycle	Path
	No	Verticality	Cycle	Balance

For gradually changing pitch towards upwards and downwards, schemas verticality and cycle had the highest rates. High and low pitch movement was perceived via up-down verticality schema which shows the sound data transferred and comprehended as up-down. Cycle schema perception can mean that the sound's gradual increase or decrease mapped with the cyclic climax structure's build up and release (table 5) during construction of this metaphor.

This schemas depict upward-downward scale created the sense of time and spatial orientation (See Table 4)

5.2.4. Sound Stimulus 04

Stimulus 04 again played on piano and recorded in ableton software. It contains of two separate same tone sequences differ in bpm(beats per minute). One is 70 bpm which is slower and the second is played at 140 bpm which is faster.

In stimulus 04 distributions there is no statistically significant difference in any subject groups or in analysis of any researchers. Second hypothesis was verified for sound stimuli 04.

Table 19

Sound Stimulus 04 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Path	Balance	Balance
	Above 30	Path, Cycle, Balance	Balance	Balance
Gender	Male	Path	Balance	Balance
	Female	Path	Balance	Balance
Instrument Playing	Yes	Path	Balance	Balance
	No	Path	Balance	Balance

Tempo change perceived via balance and path schemas which are the groups of force and time (See Table 4). Metaphors related to balance and path utilized by subjects.

5.2.5. Sound Stimulus 05

Stimulus 05 testing pitches, metaphorically associated with the concept of heights, representing the verticality schema(ref). The pitches were played on piano and recorded. The sound composed of both low and high frequency tones, other characteristics of the tones were the same.

In the distributions there was no statistically significant differences of utilized schemas in any groups or researcher analysis. Second hypothesis again approved for sound stimuli 05.

Table 20
Sound Stimulus 05 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Balance	Balance	Balance
	Above 30	Balance	Balance	Path, Balance
Gender	Male	Balance	Balance	Balance
	Female	Balance	Cycle	Path
Instrument Playing	Yes	Balance	Balance	Path
	No	Balance	Balance	Balance

Different than previous studies (ref) for relation of high-low pitched sounds, verticality schema was not the most frequently utilized schema in metaphors. The reason for this can be that in this study researchers were allowed to choose other schemas.

In high-low pitched sounds metaphors balance schema has the highest rate. High-low pitch change perceived with the balance schema in this study.

5.2.6. Sound Stimulus 06

Glissando up- down.

There was no statistically significant differences found in schemas employed by the subjects in their metaphors for sound stimuli 06 in different groups of subjects or according to three researchers.

Second hypothesis proved to be true for sound stimulus 06.

Table 21
Sound Stimulus 06 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Balance	Balance	Balance
	Above 30	Balance	Balance	Balance
Gender	Male	Cycle	Balance	Balance
	Female	Cycle, Balance	Balance	Balance
Instrument Playing	Yes	Path	Balance	Path
	No	Balance	Balance	Balance

When discovering the schemas in metaphors of subject answers balance schemas again for this stimuli is the highest.

5.2.7. Sound Stimulus 07

Dissonance – Consonance.

There was no statistically significant differences found in schema usage of subjects in their descriptions of sound stimuli 07 for demographics or instrument playing groups and no differences in researchers analysis.

Second hypothesis has gain approval for stimuli 07.

Table 22
Sound Stimulus 07 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Path	Balance	Balance
	Above 30	Path	Balance	Path
Gender	Male	Balance	Balance	Balance
	Female	Path, Balance	Cycle, Balance	Force
Instrument Playing	Yes	Balance	Balance	Force
	No	Balance	Balance	Balance

Balance and path is the mostly used schemas for disconance and conconance tones. It was expected to have balance schema in this stimuli because the tone relation is about the sounds that are harmonious with each other or not harmonious. Unexpectedly path schema was also utilized by the subjects. This shows that comprehension of diconant and consonant tones is related to force and time.

5.2.8. Sound Stimulus 08

Arpeggios 3 octaves

In distributions of subject answers for sound stimuli 08 there was no statistically significant difference for any groups or researcher analysis.

Second hypothesis approved for stimuli 08.

Table 23
Sound Stimulus 08 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Path	Cycle, Balance	Path
	Above 30	Path	Balance	Path
Gender	Male	Path	Balance	Path
	Female	Path	Balance	Path
Instrument Playing	Yes	Verticality	Cycle	Path
	No	Path	Balance	Path

Arpeggios played in three different octaves perceived mostly via path schema.

5.2.9. Sound Stimulus 09

Crescendo – decrescendo .

There was no statistically significant differences in age, gender or instrument playing groups and in researchers' analysis.

Second hypothesis approved this time for the sound stimuli 09.

Table 24
Sound Stimulus 09 Schemas

		1.Expert	2.Expert	3.Expert
Age	Below 30	Path	Balance	Path
	Above 30	Path	Cycle	Path
Gender	Male	Path, Cycle	Balance	Path
	Female	Path	Cycle	Path
Instrument Playing	Yes	Force	Cycle, Verticality	Force
	No	Force	Balance	Force

For crescendo and decrescendo there was an expected schema which was center-periphery but it was not the highest rated schemas in metaphors. Reason for that was in previous researches (Eitan & Granot, 2004) this kind of sound stimuli perceived as near-far motion. In this study path was the mostly utilized schema and it can also be about near far motion. Also it is in time group. Force schema also has a higher rate of usage in metaphors. Crescendo and decrescendo creates a volume difference during the sound plays and this difference perceived with force and time groups of Urista (see Table 4).

In summary for the second hypothesis was that the subjects' demographics or instrument playing or not playing status would not change the schemas utilized in respondents' descriptions of the sound stimuli. It was not approved only for second stimulus instrument player and non-player groups for second researcher. It was approved for age and gender groups in second stimuli and for all other stimuli in the study.

Subjects applied similar schemas in their metaphors when describing sounds regardless of their groups.

5.3. Third Hypothesis: Sound-Schema Matching According to Description Type

Mostly used schemas matched with sound stimuli and compared the results with drawing to see if description method changes the schema matches. (see Table 24)

Table 25
Schemas According to Description Method

Stimuli	Schema	
	Typing	Drawing
Stimulus 01 Piano - Forte	Force, Balance	Force, Path
Stimulus 02 Staccato - Legato	Path, Balance	Cycle
Stimulus 03 Upward - Downward	Cycle, Verticality	Verticality
Stimulus 04 70 bpm – 140 bpm	Balance, Path	Path, Cycle
Stimulus 05 High - Low	Balance	Path, Cycle
Stimulus 06 Glissando	Balance	Cycle

3 Times		
Stimulus 07 Dissonance - Consonance	Balance, Path	Force, Path
Stimulus 08 Arpeggios in 3 Octaves	Path	Path
Stimulus 09 Crescendo - Decrescendo	Force, Path	Path, Verticality

For stimuli 02, 05 and 06 drawing and typing part showed differences. For other stimuli schemas used were same but with additional schemas too. Hypothesis three was supporting description type would change the schemas and it is approved.

In the processes of thinking for drawing and thinking for typing image schemas utilized by the subjects differed.

6. CONCLUSIONS

Taking inspiration from Antovic's research on Serbian and Romani children (Antovic, 2009) I designed this study to examine metaphorical language in relation to music perception across different demographic groups. By exposing participants to stimuli and asking them to describe their experiences the aim was to uncover the metaphorical language usage and identifying the underlying image schemas. First hypothesis suggested that metaphorical language usage may not differ among groups. It was supported for gender groups, gender was not a discriminative feature for metaphorical language use during describing musical rules. Instrument playing affected the subject answers metaphorical language utilization for stimulus 06 glissando and for stimulus 08 arpeggios up and down three times. According to this results it can be concluded that familiarity with the musical rules changed the metaphorical description for some of the sound stimuli. Also for stimulus 07 dissonance and consonance sounds there was a difference between age groups, below 30 group used metaphorical language more than the older aged group. This can show that for the sounds which are harmonious together and not harmonious together perceived metaphorically by younger aged group and not metaphorical by older aged group. Second hypothesis that certain image schemas would not change across groups supported by the results except sound stimulus 02 staccato legato. Results showed differences among instrument player and non-player groups. For other stimuli there was no differences in any groups for image schemas in subjects metaphors. This showed the universality of metaphors and image schemas. Stimulus 02 staccato and legato is a much known musical rule maybe that is the reason why instrument players did not employed metaphors as much as non-players.

Third hypothesis discovered the image schemas used in two different processes, typing and drawing had different results for image schemas utilized, could be a research topic for future studies since it can highlight the metaphor process in two different modes of thinking.

The current research has revealed a strong connection between metaphor and nine specific musical relationships. These findings support the embodied mind theory, which emphasizes the role of metaphor and image schemas in how we mentally process and attribute meaning to musical experiences.

This study showed something interesting: when we looked at different groups, it became more clear that we could better understand things through mental structures called image schemas. These mental structures help us understand the world around us.

Exploring how metaphors help us find meaning in music can enhance our comprehension of what metaphors are and how they interact with mental images when we experience and convey music.

In this study, another objective is to delve into the theories of Conceptual Metaphor, Conceptual Blending, and the role of image schemas in understanding how we use metaphorical language to perceive music. We aimed to examine whether the way people perceive music with metaphorical language is consistent across various demographic groups, including different ages, genders, and whether they play musical instruments or not. Moreover, we sought to determine which image schemas are most commonly employed in metaphors and whether these schemas exhibit similarities among different groups and in various description processes.

Conceptual Metaphor Theory, as proposed by Lakoff and Johnson, suggests that our understanding of concepts occurs when we use one idea to simulate or understand another. This means that our thinking is essentially metaphorical in nature. Metaphors aren't just tools; they're cognitive mechanisms that influence our thoughts, reasoning, and actions. By linking abstract concepts with more concrete ones through source and target domains, we can gain a better grasp of these abstract ideas. Image schemas, which are based on our sensory and motor experiences in the world, act as the fundamental building blocks of metaphors and play a vital role in how we perceive and make sense of our surroundings.

In contrast, the Conceptual Blending Theory (CBT), developed by Fauconnier and Turner, takes a different approach. This theory underscores the significance of blending different mental spaces to create new meanings and concepts. According to CBT, when we blend these mental spaces or domains, it can lead to the formation of image schemas and metaphors, offering insights into how metaphors are created and serve cognitive functions.

The research findings suggest that metaphors don't solely arise through the Conceptual Metaphor Theory (CMT) process. Instead, they also emerge from the combination of schemas and concepts through the framework of CBT. In particular, participants didn't rely on a single mental structure when describing their experiences with sounds; they incorporated several mental structures in their metaphors. This

discovery confirms that comprehending music doesn't depend solely on mapping out one source domain; rather, it involves blending multiple domains into a single conceptualization process through CBT. This is supported by the analysis of participant responses, as they assigned meaning to sounds by drawing from more than two mental frameworks.

This study goes beyond by expanding these theories into the domain of music perception. It's recognized that metaphors aren't confined to just language; they also apply to various forms, including music. The presence of metaphors in everyday language and music theory underscores their vital role in comprehending and interpreting musical experiences. Through this research, we've delved into the relationships between music and metaphors, revealing how they function across different modes.

In summary, this research adds valuable insights to the increasing body of knowledge concerning the role of metaphors and image schemas in the perception of music.

Expanding this research can lead to a deeper understanding of metaphor theories and image schemas. We can delve into how these schemas are not only formed and structured physically in the human body and brain but also figuratively in the human mind. It's important to approach this topic from an evolutionary perspective as well. The findings from this research, or its expansion, can offer more insights to researchers studying objective reality. Another closely related topic to this research is the empathy process, as both metaphors and empathy have their roots in observation, imagery, and interactions with the environment.

Through our analysis of participants with diverse backgrounds, our objective is to provide insights into how people perceive, understand, and metaphorically describe music. This research underscores the significance of considering different modalities and cognitive processes to unravel the connections between language, music, and cognition. Ultimately, it reinforces that metaphors are more than just tools; they are

fundamental instruments for comprehending the world around us, whether expressed through words, musical notes, or even bodily movements.

With these discoveries, we take a significant step toward comprehending the interplay between music, metaphor, and the human mind. This is an exciting prospect for researchers eager to explore and uncover knowledge in this intriguing field of study.



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Appendix A: List of Abbreviations

CMT	-	Conceptual Metaphor Theory
CBT	-	Conceptual Blending Theory



Appendix B: Chi Square Analysis Tables for Each Sound

Table B01. S01 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Collumn)	N (%)	% (Collumn)		
1.Researcher	Metaphor						
	Yes	20 (26,0)	71,4	37 (48,1)	75,5	0,154	0,694
	No	8 (10,4)	28,6	12 (15,6)	24,5		
	Schemas					8,739	0,155
	Force	11 (19,3)	55,0	12 (21,1)	32,4		
	Containment	0	0	5 (8,8)	13,5		
	Path	3 (5,3)	15,0	4 (7,0)	10,8		
	Cycle	2 (3,5)	10,0	1 (1,8)	2,7		
	Center-periphery	1 (1,8)	5,0	3 (5,3)	8,1		
	Balance	1 (1,8)	5,0	9 (15,8)	24,3		
	Verticality	2 (3,5)	10,0	3 (5,3)	8,1		
2.Researcher	Metaphor						
	Yes	22 (28,6)	78,6	41 (53,2)	83,7	0,312	0,577
	No	6 (7,8)	21,4	8 (10,4)	16,3		
	Schemas					8,656	0,159
	Force	4 (6,3)	18,2	1 (1,6)	2,4		
	Containment	0	0	3 (4,8)	7,3		
	Path	0	0	2 (3,2)	4,9		
	Cycle	6 (9,5)	27,3	7 (11,1)	17,1		
	Center-periphery	1 (1,6)	4,5	7 (11,1)	17,1		
	Balance	5 (7,9)	22,7	12 (19,0)	29,3		
	Verticality	6 (9,5)	27,3	9 (14,3)	22,0		
3.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	30 (39,0)	61,2	0,071	0,790
	No	10 (13,0)	35,7	19 (24,7)	38,8		
	Schemas					4,308	0,695
	Force	9 (18,8)	50,0	12 (25,0)	40,0		
	Containment	0	0	2 (4,2)	6,7		
	Path	3 (6,3)	16,7	3 (6,3)	10,0		
	Cycle	3 (6,3)	16,7	3 (6,3)	10,0		
	Center-periphery	0	0	1 (2,1)	3,3		
	Balance	2 (4,2)	11,1	8 (16,7)	26,7		
	Verticality	1 (2,1)	5,6	1 (2,1)	3,3		

Chi-square Test

Table B02. S02 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Collumn)	N (%)	% (Collumn)		
1.Researcher	Metaphor						
	Yes	22 (28,6)	78,6	39 (50,6)	79,6	0,011	0,915
	No	6 (7,8)	21,4	10 (13,0)	20,4		
	Schemas						
	Force	1 (1,6)	4,5	3 (4,9)	7,7	3,941	0,750
	Containment	0	0	2 (3,3)	5,1		
	Path	7 (11,5)	31,8	13 (21,3)	33,3		
	Cycle	2 (3,3)	9,1	3 (4,9)	7,7		
	Center-periphery	2 (3,3)	9,1	3 (4,9)	7,7		
	Balance	5 (8,2)	22,7	3 (4,9)	7,7		
	Verticality	5 (8,2)	22,7	12 (19,7)	30,8		
2.Researcher	Metaphor						
	Yes	24 (31,2)	85,7	44 (57,1)	89,8	0,281	0,716
	No	4 (5,2)	14,3	5 (6,5)	10,2		
	Schemas						
	Force	0	0	3 (4,4)	6,8	12,362	0,030*
	Containment	1 (1,5)	4,2	0	0		
	Path	5 (7,4)	20,8	5 (7,4)	11,4		
	Cycle	1 (1,5)	4,2	10 (14,7)	22,7		
	Center-periphery	1 (1,5)	4,2	3 (4,4)	6,8		
	Balance	13 (19,1)	54,2	11 (16,2)	25,0		
	Verticality	3 (4,4)	12,5	12 (17,6)	27,3		
3.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	31 (40,3)	63,3	0,008	0,929
	No	10 (13,0)	35,7	18 (23,4)	36,7		
	Schemas						
	Force	2 (4,1)	11,1	4 (8,2)	12,9	6,615	0,221
	Path	5 (10,2)	27,8	12 (24,5)	38,7		
	Cycle	0	0	4 (8,2)	12,9		
	Center-periphery	1 (2,0)	5,6	1 (2,0)	3,2		
	Balance	9 (18,4)	50,0	6 (12,2)	19,4		
	Verticality	1 (2,0)	5,6	4 (8,2)	12,9		

Chi-Square Test, * $p < 0,05$

Table B03. S03 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Collumn)	N (%)	% (Collumn)		
1.Researcher	Metaphor						
	Yes	14 (18,2)	50,0	25 (32,5)	51,0	0,007	0,931
	No	14 (18,2)	50,0	24 (31,2)	49,0		
	Schemas					5,452	0,508
	Force	0	0	1 (2,6)	4,0		
	Containment	1 (2,6)	7,1	2 (5,1)	8,0		
	Path	4 (10,3)	28,6	2 (5,1)	8,0		
	Cycle	1 (2,6)	7,1	5 (12,8)	20,0		
	Center-periphery	1 (2,6)	7,1	3 (7,7)	12,0		
	Balance	1 (2,6)	7,1	5 (12,8)	20,0		
	Verticality	6 (15,4)	42,9	7 (17,9)	28,0		
2.Researcher	Metaphor						
	Yes	21 (27,3)	75,0	40 (51,9)	81,6	0,476	0,490
	No	7 (9,1)	25,0	9 (11,7)	18,4		
	Schemas					3,459	0,858
	Force	0	0	2 (3,3)	5,0		
	Containment	0	0	1 (1,6)	2,5		
	Path	1 (1,6)	4,8	2 (3,3)	5,0		
	Cycle	11 (18,0)	52,4	13 (21,3)	32,5		
	Center-periphery	0	0	1 (1,6)	2,5		
	Balance	5 (8,2)	23,8	12 (19,7)	30,0		
	Verticality	4 (6,6)	19,0	9 (14,8)	22,5		
3.Researcher	Metaphor						
	Yes	16 (20,8)	57,1	28 (36,4)	57,1	0,000	1,000
	No	12 (15,6)	42,9	21 (27,3)	42,9		
	Schemas					7,460	0,255
	Force	1 (2,3)	6,3	3 (6,8)	10,7		
	Containment	1 (2,3)	6,3	2 (4,5)	7,1		
	Path	4 (9,1)	25,0	2 (4,5)	7,1		
	Cycle	3 (6,8)	18,8	4 (9,1)	14,3		
	Center-periphery	2 (4,5)	12,5	0	0		
	Balance	3 (6,8)	18,8	11 (25,0)	39,3		
	Verticality	2 (4,5)	12,5	6 (13,6)	21,4		

Chi-Square Test

Table B04. Stimulus 04 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Collumn)	N (%)	% (Collumn)		
1.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	38 (49,4)	77,6	1,581	0,209
	No	10 (13,0)	35,7	11 (14,3)	22,4		
	Schemas						
	Force	5 (8,9)	27,8	3 (5,4)	7,9	10,604	0,064
	Containment	2 (3,6)	11,1	0	0		
	Path	5 (8,9)	27,8	14 (25,0)	36,8		
	Cycle	4 (7,1)	22,2	6 (10,7)	15,8		
	Center-periphery	0	0	1 (1,8)	2,6		
	Balance	1 (1,8)	5,6	10 (17,9)	26,3		
	Verticality	1 (1,8)	5,6	4 (7,1)	10,5		
2.Researcher	Metaphor						
	Yes	20 (26,0)	71,4	39 (50,6)	79,6	0,663	0,416
	No	8 (10,4)	28,6	10 (13,0)	20,4		
	Schemas						
	Force	3 (5,1)	15,0	4 (6,8)	10,3	8,004	0,207
	Containment	1 (1,7)	5,0	0	0		
	Path	1 (1,7)	5,0	6 (10,2)	15,4		
	Cycle	4 (6,8)	20,0	2 (3,4)	5,1		
	Center-periphery	2 (3,4)	10,0	2 (3,4)	5,1		
	Balance	6 (10,2)	30,0	20 (33,9)	51,3		
	Verticality	3 (5,1)	15,0	5 (8,5)	12,8		
3.Researcher	Metaphor						
	Yes	17 (22,1)	60,7	28 (36,4)	57,1	0,094	0,760
	No	11 (14,3)	39,3	21 (27,3)	42,9		
	Schemas						
	Force	3 (6,7)	17,6	5 (11,1)	17,9	2,376	0,909
	Path	5 (11,1)	29,4	8 (17,8)	28,6		
	Cycle	1 (2,2)	5,9	2 (4,4)	7,1		
	Center-periphery	1 (2,2)	5,9	0	0		
	Balance	6 (13,3)	35,3	12 (26,7)	42,9		
	Verticality	1 (2,2)	5,9	1 (2,2)	3,6		

Chi-Square Test

Table B05. Stimulus 05 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1. Researcher	Metaphor						
	Yes	22 (28,6)	78,6	38 (49,4)	77,6	0,011	0,917
	No	6 (7,8)	21,4	11 (14,3)	22,4		
	Schemas						
	Force	2 (3,3)	9,1	2 (3,3)	5,3	2,403	0,921
	Containment	1 (1,7)	4,5	4 (6,7)	10,5		
	Path	5 (8,3)	22,7	6 (10,0)	15,8		
	Cycle	2 (3,3)	9,1	3 (5,0)	7,9		
	Center-periphery	2 (3,3)	9,1	7 (11,7)	18,4		
	Balance	7 (11,7)	31,8	11 (18,3)	28,9		
	Verticality	3 (5,0)	13,6	5 (8,3)	13,2		
2. Researcher	Metaphor						
	Yes	22 (28,6)	78,6	43 (55,8)	87,8	1,107	0,336
	No	6 (7,8)	21,4	6 (7,8)	12,2		
	Schemas						
	Force	0	0	1 (1,5)	2,3	2,041	0,978
	Containment	1 (1,5)	4,5	1 (1,5)	2,3		
	Path	4 (6,2)	18,2	6 (9,2)	14,0		
	Cycle	5 (7,7)	22,7	10 (15,4)	23,3		
	Center-periphery	3 (4,6)	13,6	4 (6,2)	9,3		
	Balance	6 (9,2)	27,3	15 (23,1)	34,9		
	Verticality	3 (4,6)	13,6	6 (9,2)	14,0		
3. Researcher	Metaphor						
	Yes	20 (26,0)	71,4	29 (37,7)	59,2	1,155	0,283
	No	8 (10,4)	28,6	20 (26,0)	40,8		
	Schemas						
	Force	2 (4,1)	10,0	2 (4,1)	6,9	4,067	0,755
	Containment	1 (2,0)	5,0	0	0		
	Path	7 (14,3)	35,0	7 (14,3)	24,1		
	Cycle	3 (6,1)	15,0	3 (6,1)	10,3		
	Center-periphery	1 (2,0)	5,0	2 (4,1)	6,9		
	Balance	5 (10,2)	25,0	13 (26,5)	44,8		
	Verticality	1 (2,0)	5,0	2 (4,1)	6,9		

Chi-Square Test

Table B06. Stimulus 06 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	22 (28,6)	78,6	45 (58,4)	91,8	2,775	0,096
	No	6 (7,8)	21,4	4 (5,2)	8,2		
	Schemas						
	Force	2 (3,0)	9,1	0	0	10,425	0,071
	Containment	3 (4,5)	13,6	3 (4,5)	6,7		
	Path	6 (9,0)	27,3	4 (6,0)	8,9		
	Cycle	5 (7,5)	22,7	13 (19,4)	28,9		
	Center-periphery	1 (1,5)	4,5	3 (4,5)	6,7		
	Balance	4 (6,0)	18,2	19 (28,4)	42,2		
	Verticality	1 (1,5)	4,5	3 (4,5)	6,7		
2.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	45 (58,4)	91,8	9,092	0,003*
	No	10 (13,0)	35,7	4 (5,2)	8,2		
	Schemas						
	Force	0	0	2 (3,2)	4,4	3,056	0,871
	Containment	0	0	1 (1,6)	2,2		
	Path	1 (1,6)	5,6	1 (1,6)	2,2		
	Cycle	3 (4,8)	16,7	7 (11,1)	15,6		
	Center-periphery	2 (3,2)	11,1	2 (3,2)	4,4		
	Balance	9 (14,3)	50,0	25 (39,7)	55,6		
	Verticality	3 (4,8)	16,7	7 (11,1)	15,6		
3.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	34 (44,2)	69,4	0,212	0,646
	No	10 (13,0)	35,7	15 (19,5)	30,6		
	Schemas						
	Force	0	0	6 (11,5)	17,6	13,308	0,016*
	Containment	1 (1,9)	5,6	1 (1,9)	2,9		
	Path	8 (15,4)	44,4	2 (3,8)	5,9		
	Cycle	2 (3,8)	11,1	5 (9,6)	14,7		
	Center-periphery	1 (1,9)	5,6	2 (3,8)	5,9		
	Balance	5 (9,6)	27,8	16 (30,8)	47,1		
	Verticality	1 (1,9)	5,6	2 (3,8)	5,9		

Chi-Square Test, * $p < 0,05$

Table B07. Stimulus 07 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	21 (27,3)	75,0	43 (55,8)	87,8	2,066	0,151
	No	7 (9,1)	25,0	6 (7,8)	12,2		
	Schemas					5,034	0,486
	Force	2 (3,1)	9,5	4 (6,3)	9,3		
	Containment	1 (1,6)	4,8	3 (4,7)	7,0		
	Path	3 (4,7)	14,3	12 (18,8)	27,9		
	Cycle	3 (4,7)	14,3	6 (9,4)	14,0		
	Center-periphery	2 (3,1)	9,5	4 (6,3)	9,3		
	Balance	10 (15,6)	47,6	10 (15,6)	23,3		
	Verticality	0	0	4 (6,3)	9,3		
2.Researcher	Metaphor						
	Yes	21 (27,3)	75,0	44 (57,1)	89,8	2,852	0,108
	No	7 (9,1)	25,0	5 (6,5)	10,2		
	Schemas					3,373	0,866
	Force	1 (1,5)	4,8	1 (1,5)	2,3		
	Containment	0	0	1 (1,5)	2,3		
	Path	1 (1,5)	4,8	7 (10,8)	15,9		
	Cycle	5 (7,7)	23,8	10 (15,4)	22,7		
	Center-periphery	2 (3,1)	9,5	4 (6,2)	9,1		
	Balance	12 (18,5)	57,1	20 (30,8)	45,5		
	Verticality	0	0	1 (1,5)	2,3		
3.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	30 (39,0)	61,2	0,071	0,790
	No	10 (13,0)	35,7	19 (24,7)	38,8		
	Schemas					3,329	0,526
	Force	5 (10,4)	27,8	6 (12,5)	20,0		
	Path	6 (12,5)	33,3	8 (16,7)	26,7		
	Cycle	1 (2,1)	5,6	5 (10,4)	16,7		
	Center-periphery	1 (2,1)	5,6	0	0		
	Balance	5 (10,4)	27,8	11 (22,9)	36,7		

Chi-Square Test

Table B08. Stimulus 08 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	42 (54,5)	85,7	4,756	0,029*
	No	10 (13,0)	35,7	7 (9,1)	14,3		
	Schemas					10,621	0,068
	Force	2 (3,3)	11,1	4 (6,7)	9,5		
	Containment	0	0	5 (8,3)	11,9		
	Path	5 (8,3)	27,8	17 (28,3)	40,5		
	Cycle	3 (5,0)	16,7	4 (6,7)	9,5		
	Center-periphery	1 (1,7)	5,6	6 (10,0)	14,3		
	Balance	1 (1,7)	5,6	4 (6,7)	9,5		
	Verticality	6 (10,0)	33,3	2 (3,3)	4,8		
2.Researcher	Metaphor						
	Yes	17 (22,1)	60,7	41 (53,2)	83,7	5,053	0,025*
	No	11 (14,3)	39,3	8 (10,4)	16,3		
	Schemas					4,357	0,674
	Force	1 (1,7)	5,9	2 (3,4)	4,9		
	Containment	0	0	1 (1,7)	2,4		
	Path	2 (3,4)	11,8	4 (6,9)	9,8		
	Cycle	5 (8,6)	29,4	13 (22,4)	31,7		
	Center-periphery	0	0	3 (5,2)	7,3		
	Balance	5 (8,6)	29,4	15 (25,9)	36,6		
	Verticality	4 (6,9)	23,5	3 (5,2)	7,3		
3.Researcher	Metaphor						
	Yes	20 (26,0)	71,4	32 (41,6)	65,3	0,305	0,581
	No	8 (10,4)	28,6	17 (22,1)	34,7		
	Schemas					7,056	0,180
	Force	3 (5,8)	15,0	4 (7,7)	12,5		
	Containment	0	0	2 (3,8)	6,3		
	Path	9 (17,3)	45,0	16 (30,8)	50,0		
	Cycle	4 (7,7)	20,0	2 (3,8)	6,3		
	Balance	2 (3,8)	10,0	8 (15,4)	25,0		
	Verticality	2 (3,8)	10,0	0	0		

Chi-Square Test, * $p < 0,05$

Table B09. Stimulus 09 Instrument Playing Metaphor Rates and Schemas

		Playing an Instrument		Not Playing an Instrument		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	25 (32,5)	89,3	43 (55,8)	87,8	0,040	0,841
	No	3 (3,9)	10,7	6 (7,8)	12,2		
	Schemas					3,451	0,797
	Force	3 (4,4)	12,0	3 (4,4)	7,0		
	Containment	1 (1,5)	4,0	3 (4,4)	7,0		
	Path	7 (10,3)	28,0	14 (20,6)	32,6		
	Cycle	6 (8,8)	24,0	6 (8,8)	14,0		
	Center-periphery	2 (2,9)	8,0	5 (7,4)	11,6		
	Balance	6 (8,8)	24,0	9 (13,2)	20,9		
	Verticality	0	0	3 (4,4)	7,0		
2.Researcher	Metaphor						
	Yes	26 (33,8)	92,9	45 (58,4)	91,8	0,026	0,872
	No	2 (2,6)	7,1	4 (5,2)	8,2		
	Schemas					3,009	0,859
	Force	2 (2,8)	7,7	3 (4,2)	6,7		
	Containment	0	0	2 (2,8)	4,4		
	Path	4 (5,6)	15,4	3 (4,2)	6,7		
	Cycle	8 (11,3)	30,8	14 (19,7)	31,1		
	Center-periphery	1 (1,4)	3,8	3 (4,2)	6,7		
	Balance	10 (14,1)	38,5	16 (22,5)	35,6		
	Verticality	1 (1,4)	3,8	4 (5,6)	8,9		
3.Researcher	Metaphor						
	Yes	18 (23,4)	64,3	31 (40,3)	63,3	0,008	0,929
	No	10 (13,0)	35,7	18 (23,4)	36,7		
	Schemas					4,922	0,307
	Force	4 (8,2)	22,2	2 (4,1)	6,5		
	Path	6 (12,2)	33,3	12 (24,5)	38,7		
	Cycle	2 (4,1)	11,1	4 (8,2)	12,9		
	Center-periphery	3 (6,1)	16,7	2 (4,1)	6,5		
	Balance	3 (6,1)	16,7	11 (22,4)	35,5		

Chi-Square Test

Table B10. Stimulus 01 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	24 (31,2)	72,7	33 (42,9)	75,0	0,051	0,822
	No	9 (11,7)	27,3	11 (14,3)	25,0		
	Schemas						
	Force	15 (26,3)	62,5	8 (14,0)	24,2	15,611	0,007*
	Containment	1 (1,8)	4,2	4 (7,0)	12,1		
	Path	2 (3,5)	8,3	5 (8,8)	15,2		
	Cycle	2 (3,5)	8,3	1 (1,8)	3,0		
	Center-periphery	2 (3,5)	8,3	2 (3,5)	6,1		
	Balance	0	0	10 (17,5)	30,3		
	Verticality	2 (3,5)	8,3	3 (5,3)	9,1		
2.Researcher	Metaphor						
	Yes	27 (35,1)	81,8	36 (46,8)	81,8	0,000	1,000
	No	6 (7,8)	18,2	8 (10,4)	18,2		
	Schemas						
	Force	3 (4,8)	11,1	2 (3,2)	5,6	7,450	0,258
	Containment	0	0	3 (4,8)	8,3		
	Path	0	0	2 (3,2)	5,6		
	Cycle	8 (12,7)	29,6	5 (7,9)	13,9		
	Center-periphery	3 (4,8)	11,1	5 (7,9)	13,9		
	Balance	5 (7,9)	18,5	12 (19,0)	33,3		
	Verticality	8 (12,7)	29,6	7 (11,1)	19,4		
3.Researcher	Metaphor						
	Yes	22 (28,6)	66,7	26 (33,8)	59,1	0,461	0,497
	No	11 (14,3)	33,3	18 (23,4)	40,9		
	Schemas						
	Force	13 (27,1)	59,1	8 (16,7)	30,8	7,786	0,194
	Containment	0	0	2 (4,2)	7,7		
	Path	1 (2,1)	4,5	5 (10,4)	19,2		
	Cycle	3 (6,3)	13,6	3 (6,3)	11,5		
	Center-periphery	1 (2,1)	4,5	0	0		
	Balance	3 (6,3)	13,6	7 (14,6)	26,9		
	Verticality	1 (2,1)	4,5	1 (2,1)	3,8		

Chi-Square Test, * $p < 0,05$

Table B11. Stimulus 02 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	25 (32,5)	75,8	36 (46,8)	81,8	0,421	0,517
	No	8 (10,4)	24,2	8 (10,4)	18,2		
	Schemas					4,996	0,581
	Force	1 (1,6)	4,0	3 (4,9)	8,3		
	Containment	0	0	2 (3,3)	5,6		
	Path	8 (13,1)	32,0	12 (19,7)	33,3		
	Cycle	4 (6,6)	16,0	1 (1,6)	2,8		
	Center-periphery	2 (3,3)	8,0	3 (4,9)	8,3		
	Balance	4 (6,6)	16,0	4 (6,6)	11,1		
	Verticality	6 (9,8)	24,0	11 (18,0)	30,6		
2.Researcher	Metaphor						
	Yes	30 (39,0)	90,9	38 (49,4)	86,4	0,386	0,725
	No	3 (3,9)	9,1	6 (7,8)	13,6		
	Schemas					4,984	0,579
	Force	2 (2,9)	6,7	1 (1,5)	2,6		
	Containment	0	0	1 (1,5)	2,6		
	Path	5 (7,4)	16,7	5 (7,4)	13,2		
	Cycle	5 (7,4)	16,7	6 (8,8)	15,8		
	Center-periphery	3 (4,4)	10,0	1 (1,5)	2,6		
	Balance	11 (16,2)	36,7	13 (19,1)	34,2		
	Verticality	4 (5,9)	13,3	11 (16,2)	28,9		
3.Researcher	Metaphor						
	Yes	23 (29,9)	69,7	26 (33,8)	59,1	0,917	0,338
	No	10 (13,0)	30,3	18 (23,4)	40,9		
	Schemas					3,459	0,685
	Force	3 (6,1)	13,0	3 (6,1)	11,5		
	Path	6 (12,2)	26,1	11 (22,4)	42,3		
	Cycle	2 (4,1)	8,7	2 (4,1)	7,7		
	Center-periphery	2 (4,1)	8,7	0	0		
	Balance	7 (14,3)	30,4	8 (16,3)	30,8		
	Verticality	3 (6,1)	13,0	2 (4,1)	7,7		

Chi-Square Test

Table B12. Stimulus 03 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	17 (22,1)	51,5	22 (28,6)	50,0	0,017	0,895
	No	16 (20,8)	48,5	22 (28,6)	50,0		
	Schemas					7,856	0,238
	Force	0	0	1 (2,6)	4,5		
	Containment	2 (5,1)	11,8	1 (2,6)	4,5		
	Path	4 (10,3)	23,5	2 (5,1)	9,1		
	Cycle	3 (7,7)	17,6	3 (7,7)	13,6		
	Center-periphery	0	0	4 (10,3)	18,2		
	Balance	1 (2,6)	5,9	5 (12,8)	22,7		
	Verticality	7 (17,9)	41,2	6 (15,4)	27,3		
2.Researcher	Metaphor						
	Yes	28 (36,4)	84,8	33 (42,9)	75,0	1,111	0,292
	No	5 (6,5)	15,2	11 (14,3)	25,0		
	Schemas					5,417	0,511
	Force	0	0	2 (3,3)	6,1		
	Containment	0	0	1 (1,6)	3,0		
	Path	2 (3,3)	7,1	1 (1,6)	3,0		
	Cycle	14 (23,0)	50,0	10 (16,4)	30,3		
	Center-periphery	0	0	1 (1,6)	3,0		
	Balance	7 (11,5)	25,0	10 (16,4)	30,3		
	Verticality	5 (8,2)	17,9	8 (13,1)	24,2		
3.Researcher	Metaphor						
	Yes	18 (23,4)	54,5	26 (33,8)	59,1	0,159	0,690
	No	15 (19,5)	45,5	18 (23,4)	40,9		
	Schemas					8,561	0,167
	Force	0	0	4 (9,1)	15,4		
	Containment	2 (4,5)	11,1	1 (2,3)	3,8		
	Path	4 (9,1)	22,2	2 (4,5)	7,7		
	Cycle	4 (9,1)	22,2	3 (6,8)	11,5		
	Center-periphery	1 (2,3)	5,6	1 (2,3)	3,8		
	Balance	3 (6,8)	16,7	11 (25,0)	42,3		
	Verticality	4 (9,1)	22,2	4 (9,1)	15,4		

Chi-Square Test

Table B13. Stimulus 04 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	25 (32,5)	75,8	31 (40,3)	70,5	0,267	0,605
	No	8 (10,4)	24,2	13 (16,9)	29,5		
	Schemas					5,942	0,416
	Force	4 (7,1)	16,0	4 (7,1)	12,9		
	Containment	0	0	2 (3,6)	6,5		
	Path	12 (21,4)	48,0	7 (12,5)	22,6		
	Cycle	3 (5,4)	12,0	7 (12,5)	22,6		
	Center-periphery	0	0	1 (1,8)	3,2		
	Balance	4 (7,1)	16,0	7 (12,5)	22,6		
	Verticality	2 (3,6)	8,0	3 (5,4)	9,7		
2.Researcher	Metaphor						
	Yes	27 (35,1)	81,8	32 (41,6)	72,7	0,870	0,351
	No	6 (7,8)	18,2	12 (15,6)	27,3		
	Schemas					7,454	0,262
	Force	2 (3,4)	7,4	5 (8,5)	15,6		
	Containment	0	0	1 (1,7)	3,1		
	Path	3 (5,1)	11,1	4 (6,8)	12,5		
	Cycle	4 (6,8)	14,8	2 (3,4)	6,3		
	Center-periphery	0	0	4 (6,8)	12,5		
	Balance	15 (25,4)	55,6	11 (18,6)	34,4		
	Verticality	3 (5,1)	11,1	5 (8,5)	15,6		
3.Researcher	Metaphor						
	Yes	20 (26,0)	60,6	25 (32,5)	56,8	0,111	0,739
	No	13 (16,9)	39,4	19 (24,7)	43,2		
	Schemas					4,513	0,528
	Force	2 (4,4)	10,0	6 (13,3)	24,0		
	Path	6 (13,3)	30,0	7 (15,6)	28,0		
	Cycle	1 (2,2)	5,0	2 (4,4)	8,0		
	Center-periphery	0	0	1 (2,2)	4,0		
	Balance	9 (20,0)	45,0	9 (20,0)	36,0		
	Verticality	2 (4,4)	10,0	0	0		

Chi-Square Test

Table B14. Stimulus 05 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1. Researcher	Metaphor						
	Yes	26 (33,8)	78,8	34 (44,2)	77,3	0,025	0,874
	No	7 (9,1)	21,2	10 (13,0)	22,7		
	Schemas						
	Force	2 (3,3)	7,7	2 (3,3)	5,9	1,908	0,965
	Containment	1 (1,7)	3,8	4 (6,7)	11,8		
	Path	5 (8,3)	19,2	6 (10,0)	17,6		
	Cycle	2 (3,3)	7,7	3 (5,0)	8,8		
	Center-periphery	4 (6,7)	15,4	5 (8,3)	14,7		
	Balance	9 (15,0)	34,6	9 (15,0)	26,5		
	Verticality	3 (5,0)	11,5	5 (8,3)	14,7		
2. Researcher	Metaphor						
	Yes	29 (37,7)	87,9	36 (46,8)	81,8	0,526	0,468
	No	4 (5,2)	12,1	8 (10,4)	18,2		
	Schemas						
	Force	0	0	1 (1,5)	2,8	2,812	0,921
	Containment	1 (1,5)	3,4	1 (1,5)	2,8		
	Path	4 (6,2)	13,8	6 (9,2)	16,7		
	Cycle	8 (12,3)	27,6	7 (10,8)	19,4		
	Center-periphery	2 (3,1)	6,9	5 (7,7)	13,9		
	Balance	9 (13,8)	31,0	12 (18,5)	33,3		
	Verticality	5 (7,7)	17,2	4 (6,2)	11,1		
3. Researcher	Metaphor						
	Yes	22 (28,6)	66,7	27 (35,1)	61,4	0,229	0,632
	No	11 (14,3)	33,3	17 (22,1)	38,6		
	Schemas						
	Force	3 (6,1)	13,6	1 (2,0)	3,7	7,838	0,220
	Containment	0	0	1 (2,0)	3,7		
	Path	4 (8,2)	18,2	10 (20,4)	37,0		
	Cycle	2 (4,1)	9,1	4 (8,2)	14,8		
	Center-periphery	3 (6,1)	13,6	0	0		
	Balance	8 (16,3)	36,4	10 (20,4)	37,0		
	Verticality	2 (4,1)	9,1	1 (2,0)	3,7		

Chi-Square Test

Table B15. Stimulus 06 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	28 (36,4)	84,8	39 (50,6)	88,6	0,022	0,737
	No	5 (6,5)	15,2	5 (6,5)	11,4		
	Schemas					6,518	0,359
	Force	2 (3,0)	7,1	0	0		
	Containment	4 (6,0)	14,3	2 (3,0)	5,1		
	Path	2 (3,0)	7,1	8 (11,9)	20,5		
	Cycle	8 (11,9)	28,6	10 (14,9)	25,6		
	Center-periphery	1 (1,5)	3,6	3 (4,5)	7,7		
	Balance	9 (13,4)	32,1	14 (20,9)	35,9		
	Verticality	2 (3,0)	7,1	2 (3,0)	5,1		
2.Researcher	Metaphor						
	Yes	28 (36,4)	84,8	35 (45,5)	79,5	0,356	0,550
	No	5 (6,5)	15,2	9 (11,7)	20,5		
	Schemas					2,812	0,921
	Force	1 (1,6)	3,6	1 (1,6)	2,9		
	Containment	1 (1,6)	3,6	0	0		
	Path	2 (3,2)	7,1	0	0		
	Cycle	3 (4,8)	10,7	7 (11,1)	20,0		
	Center-periphery	3 (4,8)	10,7	1 (1,6)	2,9		
	Balance	13 (20,6)	46,4	21 (33,3)	60,0		
	Verticality	5 (7,9)	17,9	5 (7,9)	14,3		
3.Researcher	Metaphor						
	Yes	21 (27,3)	63,6	31 (40,3)	70,5	0,400	0,527
	No	12 (15,6)	36,4	13 (16,9)	29,5		
	Schemas					3,654	0,796
	Force	1 (1,9)	4,8	5 (9,6)	16,1		
	Containment	1 (1,9)	4,8	1 (1,9)	3,2		
	Path	4 (7,7)	19,0	6 (11,5)	19,4		
	Cycle	4 (7,7)	19,0	3 (5,8)	9,7		
	Center-periphery	2 (3,8)	9,5	1 (1,9)	3,2		
	Balance	8 (15,4)	38,1	13 (25,0)	41,9		
	Verticality	1 (1,9)	4,8	2 (3,8)	6,5		

Chi-Square Test

Table B16. Stimulus 07 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	31 (40,3)	93,9	33 (42,9)	75,0	4,820	0,028*
	No	2 (2,6)	6,1	11 (14,3)	25,0		
	Schemas						
	Force	5 (7,8)	16,1	1 (1,6)	3,0	4,846	0,600
	Containment	2 (3,1)	6,5	2 (3,1)	6,1		
	Path	8 (12,5)	25,8	7 (10,9)	21,2		
	Cycle	3 (4,7)	9,7	6 (9,4)	18,2		
	Center-periphery	3 (4,7)	9,7	3 (4,7)	9,1		
	Balance	9 (14,1)	29,0	11 (17,2)	33,3		
	Verticality	1 (1,6)	3,2	3 (4,7)	9,1		
2.Researcher	Metaphor						
	Yes	30 (39,0)	90,9	35 (45,5)	79,5	1,851	0,174
	No	3 (3,9)	9,1	9 (11,7)	20,5		
	Schemas						
	Force	1 (1,5)	3,3	1 (1,5)	2,9	5,499	0,479
	Containment	1 (1,5)	3,3	0	0		
	Path	5 (7,7)	16,7	3 (4,6)	8,6		
	Cycle	9 (13,8)	30,0	6 (9,2)	17,1		
	Center-periphery	2 (3,1)	6,7	4 (6,2)	11,4		
	Balance	12 (18,5)	40,0	20 (30,8)	57,1		
	Verticality	0	0	1 (1,5)	2,9		
3.Researcher	Metaphor						
	Yes	25 (32,5)	75,8	23 (29,9)	52,3	4,430	0,035*
	No	8 (10,4)	24,2	21 (27,3)	47,7		
	Schemas						
	Force	8 (16,7)	32,0	3 (6,3)	13,0	7,622	0,086
	Path	5 (10,4)	20,0	9 (18,8)	39,1		
	Cycle	5 (10,4)	20,0	1 (2,1)	4,3		
	Center-periphery	1 (2,1)	4,0	0	0		
	Balance	6 (12,5)	24,0	10 (20,8)	43,5		

Chi-Square Test, * $p < 0,05$

Table B17. Stimulus 08 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	25 (32,5)	75,8	35 (45,5)	79,5	0,157	0,692
	No	8 (10,4)	24,2	9 (11,7)	20,5		
	Schemas					10,319	0,098
	Force	1 (1,7)	4,0	5 (8,3)	14,3		
	Containment	3 (5,0)	12,0	2 (3,3)	5,7		
	Path	10 (16,7)	40,0	12 (20,0)	34,3		
	Cycle	5 (8,3)	20,0	2 (3,3)	5,7		
	Center-periphery	0	0	7 (11,7)	20,0		
	Balance	2 (3,3)	8,0	3 (5,0)	8,6		
	Verticality	4 (6,7)	16,0	4 (6,7)	11,4		
2.Researcher	Metaphor						
	Yes	24 (31,2)	72,7	34 (44,2)	77,3	0,210	0,647
	No	9 (11,7)	27,3	10 (13,0)	22,7		
	Schemas					8,016	0,198
	Force	2 (3,4)	8,3	1 (1,7)	2,9		
	Containment	0	0	1 (1,7)	2,9		
	Path	5 (8,6)	20,8	1 (1,7)	2,9		
	Cycle	6 (10,3)	25,0	12 (20,7)	35,3		
	Center-periphery	1 (1,7)	4,2	2 (3,4)	5,9		
	Balance	6 (10,3)	25,0	14 (24,1)	41,2		
	Verticality	4 (6,9)	16,7	3 (5,2)	8,8		
3.Researcher	Metaphor						
	Yes	25 (32,5)	75,8	27 (35,1)	61,4	1,782	0,182
	No	8 (10,4)	24,2	17 (22,1)	38,6		
	Schemas					7,575	0,137
	Force	2 (3,8)	8,0	5 (9,6)	18,5		
	Containment	1 (1,9)	4,0	1 (1,9)	3,7		
	Path	15 (28,8)	60,0	10 (19,2)	37,0		
	Cycle	3 (5,8)	12,0	3 (5,8)	11,1		
	Center-periphery	2 (3,8)	8,0	8 (15,4)	29,6		
	Balance	2 (3,8)	8,0	0	0		

Chi-Square Test

Table B18. Stimulus 09 Age Range, Metaphor Rates and Schemas

		Below 30		30 & Above		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	29 (37,7)	87,9	39 (50,6)	88,6	0,010	0,919
	No	4 (5,2)	12,1	5 (6,5)	11,4		
	Schemas					5,185	0,537
	Force	4 (5,9)	13,8	2 (2,9)	5,1		
	Containment	1 (1,5)	3,4	3 (4,4)	7,7		
	Path	8 (11,8)	27,6	13 (19,1)	33,3		
	Cycle	7 (10,3)	24,1	5 (7,4)	12,8		
	Center-periphery	3 (4,4)	10,3	4 (5,9)	10,3		
	Balance	6 (8,8)	20,7	9 (13,2)	23,1		
	Verticality	0	0	3 (4,4)	7,7		
2.Researcher	Metaphor						
	Yes	32 (41,6)	97,0	39 (50,6)	88,6	2,025	0,230
	No	1 (1,3)	3,0	5 (6,5)	11,4		
	Schemas					8,364	0,188
	Force	3 (4,2)	9,4	2 (2,8)	5,1		
	Containment	1 (1,4)	3,1	1 (1,4)	2,6		
	Path	6 (8,5)	18,8	1 (1,4)	2,6		
	Cycle	6 (8,5)	18,8	16 (22,5)	41,0		
	Center-periphery	2 (2,8)	6,3	2 (2,8)	5,1		
	Balance	12 (16,9)	37,5	14 (19,7)	35,9		
	Verticality	2 (2,8)	6,3	3 (4,2)	7,7		
3.Researcher	Metaphor						
	Yes	22 (28,6)	66,7	27 (35,1)	61,4	0,229	0,632
	No	11 (14,3)	33,3	17 (22,1)	38,6		
	Schemas					5,437	0,250
	Force	3 (6,1)	13,6	3 (6,1)	11,1		
	Path	6 (12,2)	27,3	12 (24,5)	44,4		
	Cycle	5 (10,2)	22,7	1 (2,0)	3,7		
	Center-periphery	3 (6,1)	13,6	2 (4,1)	7,4		
	Balance	5 (10,2)	22,7	9 (18,4)	33,3		

Chi-Square Test

Table B19. Stimulus 01 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	33 (42,9)	71,7	24 (31,2)	77,4	0,311	0,577
	No	13 (16,9)	28,3	7 (9,1)	22,6		
	Schemas					1,867	0,972
	Force	12 (21,1)	36,4	11 (19,3)	45,8		
	Containment	3 (5,3)	9,1	2 (3,5)	8,3		
	Path	4 (7,0)	12,1	3 (5,3)	12,5		
	Cycle	2 (3,5)	6,1	1 (1,8)	4,2		
	Center-periphery	2 (3,5)	6,1	2 (3,5)	8,3		
	Balance	6 (10,5)	18,2	4 (7,0)	16,7		
	Verticality	4 (7,0)	12,1	1 (1,8)	4,2		
2.Researcher	Metaphor						
	Yes	37 (48,1)	80,4	26 (33,8)	83,9	0,147	0,701
	No	9 (11,7)	19,6	5 (6,5)	16,1		
	Schemas					4,082	0,721
	Force	3 (4,8)	8,1	2 (3,2)	7,7		
	Containment	3 (4,8)	8,1	0	0		
	Path	2 (3,2)	5,4	0	0		
	Cycle	6 (9,5)	16,2	7 (11,1)	26,9		
	Center-periphery	4 (6,3)	10,8	4 (6,3)	15,4		
	Balance	10 (15,9)	27,0	7 (11,1)	26,9		
	Verticality	9 (14,3)	24,3	6 (9,5)	23,1		
3.Researcher	Metaphor						
	Yes	29 (37,7)	63,0	19 (24,7)	61,3	0,024	0,876
	No	17 (22,1)	37,0	12 (15,6)	38,7		
	Schemas					4,427	0,696
	Force	12 (25,0)	41,4	9 (18,8)	47,4		
	Containment	2 (4,2)	6,9	0	0		
	Path	5 (10,4)	17,2	1 (2,1)	5,3		
	Cycle	3 (6,3)	10,3	3 (6,3)	15,8		
	Center-periphery	0	0	1 (2,1)	5,3		
	Balance	6 (12,5)	20,7	4 (8,3)	21,1		
	Verticality	1 (2,1)	3,4	1 (2,1)	5,3		

Chi-Square Test

Table B20. Stimulus 02 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	36 (46,8)	78,3	25 (32,5)	80,6	0,064	0,800
	No	10 (13,0)	21,7	6 (7,8)	19,4		
	Schemas					5,510	0,493
	Force	3 (4,9)	8,3	1 (1,6)	4,0		
	Containment	2 (3,3)	5,6	0	0		
	Path	13 (21,3)	36,1	7 (11,5)	28,0		
	Cycle	4 (6,6)	11,1	1 (1,6)	4,0		
	Center-periphery	2 (3,3)	5,6	3 (4,9)	12,0		
	Balance	5 (8,2)	13,9	3 (4,9)	12,0		
	Verticality	7 (11,5)	19,4	10 (16,4)	40,0		
2.Researcher	Metaphor						
	Yes	42 (54,5)	91,3	26 (33,8)	83,9	0,971	0,472
	No	4 (5,2)	8,7	5 (6,5)	16,1		
	Schemas					3,757	0,777
	Force	2 (2,9)	4,8	1 (1,5)	3,8		
	Containment	0	0	1 (1,5)	3,8		
	Path	8 (11,8)	19,0	2 (2,9)	7,7		
	Cycle	6 (8,8)	14,3	5 (7,4)	19,2		
	Center-periphery	2 (2,9)	4,8	2 (2,9)	7,7		
	Balance	15 (22,1)	35,7	9 (13,2)	34,6		
	Verticality	9 (13,2)	21,4	6 (8,8)	23,1		
3.Researcher	Metaphor						
	Yes	30 (39,0)	65,2	19 (24,7)	61,3	0,123	0,725
	No	16 (20,8)	34,8	12 (15,6)	38,7		
	Schemas					7,467	0,159
	Force	5 (10,2)	16,7	1 (2,0)	5,3		
	Path	9 (18,4)	30,0	8 (16,3)	42,1		
	Cycle	4 (8,2)	13,3	0	0		
	Center-periphery	0	0	2 (4,1)	10,5		
	Balance	8 (16,3)	26,7	7 (14,3)	36,8		
	Verticality	4 (8,2)	13,3	1 (2,0)	5,3		

Chi-Square Test

Table B21. Stimulus 03 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	25 (32,5)	54,3	14 (18,2)	45,2	0,625	0,429
	No	21 (27,3)	45,7	17 (22,1)	54,8		
	Schemas					4,795	0,625
	Force	1 (2,6)	4,0	0	0		
	Containment	2 (5,1)	8,0	1 (2,6)	7,1		
	Path	5 (12,8)	20,0	1 (2,6)	7,1		
	Cycle	2 (5,1)	8,0	4 (10,3)	28,6		
	Center-periphery	3 (7,7)	12,0	1 (2,6)	7,1		
	Balance	3 (7,7)	12,0	3 (7,7)	21,4		
	Verticality	9 (23,1)	36,0	4 (10,3)	28,6		
2.Researcher	Metaphor						
	Yes	38 (49,4)	82,6	23 (29,9)	74,2	0,797	0,372
	No	8 (10,4)	17,4	8 (10,4)	25,8		
	Schemas					7,212	0,239
	Force	2 (3,3)	5,3	0	0		
	Containment	1 (1,6)	2,6	0	0		
	Path	3 (4,9)	7,9	0	0		
	Cycle	11 (18,0)	28,9	13 (21,3)	56,5		
	Center-periphery	1 (1,6)	2,6	0	0		
	Balance	10 (16,4)	26,3	7 (11,5)	30,4		
	Verticality	10 (16,4)	26,3	3 (4,9)	13,0		
3.Researcher	Metaphor						
	Yes	30 (39,0)	65,2	14 (18,2)	45,2	3,042	0,081
	No	16 (20,8)	34,8	17 (22,1)	54,8		
	Schemas					3,906	0,735
	Force	4 (9,1)	13,3	0	0		
	Containment	2 (4,5)	6,7	1 (2,3)	7,1		
	Path	5 (11,4)	16,7	1 (2,3)	7,1		
	Cycle	5 (11,4)	16,7	2 (4,5)	14,3		
	Center-periphery	1 (2,3)	3,3	1 (2,3)	7,1		
	Balance	8 (18,2)	26,7	6 (13,6)	42,9		
	Verticality	5 (11,4)	16,7	3 (6,8)	21,4		

Chi-Square Test

Table B22. Stimulus 04 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	34 (44,2)	73,9	22 (28,6)	71,0	0,081	0,776
	No	12 (15,6)	26,1	9 (11,7)	29,0		
	Schemas					5,982	0,411
	Force	7 (12,5)	20,6	1 (1,8)	4,5		
	Containment	1 (1,8)	2,9	1 (1,8)	4,5		
	Path	9 (16,1)	26,5	10 (17,9)	45,5		
	Cycle	7 (12,5)	20,6	3 (5,4)	13,6		
	Center-periphery	0	0	1 (1,8)	4,5		
	Balance	7 (12,5)	20,6	4 (7,1)	18,2		
	Verticality	3 (5,4)	8,8	2 (3,6)	9,1		
2.Researcher	Metaphor						
	Yes	33 (42,9)	71,7	26 (33,8)	83,9	1,522	0,217
	No	13 (16,9)	28,3	5 (6,5)	16,1		
	Schemas					4,049	0,727
	Force	5 (8,5)	15,2	2 (3,4)	7,7		
	Containment	1 (1,7)	3,0	0	0		
	Path	3 (5,1)	9,1	4 (6,8)	15,4		
	Cycle	3 (5,1)	9,1	3 (5,1)	11,5		
	Center-periphery	1 (1,7)	3,0	3 (5,1)	11,5		
	Balance	16 (27,1)	48,5	10 (16,9)	38,5		
	Verticality	4 (6,8)	12,1	4 (6,8)	15,4		
3.Researcher	Metaphor						
	Yes	29 (37,7)	63,0	16 (20,8)	51,6	0,996	0,318
	No	17 (22,1)	37,0	15 (19,5)	48,4		
	Schemas					2,822	0,841
	Force	6 (13,3)	20,7	2 (4,4)	12,5		
	Path	8 (17,8)	27,6	5 (11,1)	31,3		
	Cycle	2 (4,4)	6,9	1 (2,2)	6,3		
	Center-periphery	0	0	1 (2,2)	6,3		
	Balance	12 (26,7)	41,4	6 (13,3)	37,5		
	Verticality	1 (2,2)	3,4	1 (2,2)	6,3		

Chi-Square Test

Table B23. Stimulus 05 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	36 (46,8)	78,3	24 (31,2)	77,4	0,008	0,930
	No	10 (13,0)	21,7	7 (9,1)	22,6		
	Schemas						
	Force	3 (5,0)	8,3	1 (1,7)	4,2	3,053	0,841
	Containment	2 (3,3)	5,6	3 (5,0)	12,5		
	Path	7 (11,7)	19,4	4 (6,7)	16,7		
	Cycle	4 (6,7)	11,1	1 (1,7)	4,2		
	Center-periphery	4 (6,7)	11,1	5 (8,3)	20,8		
	Balance	11 (18,3)	30,6	7 (11,7)	29,2		
	Verticality	5 (8,3)	13,9	3 (5,0)	12,5		
2.Researcher	Metaphor						
	Yes	40 (51,9)	87,0	25 (32,5)	80,6	0,552	0,529
	No	6 (7,8)	13,0	6 (7,8)	19,4		
	Schemas						
	Force	1 (1,5)	2,5	0	0	6,665	0,327
	Containment	1 (1,5)	2,5	1 (1,5)	4,0		
	Path	5 (7,7)	12,5	5 (7,7)	20,0		
	Cycle	9 (13,8)	22,5	6 (9,2)	24,0		
	Center-periphery	2 (3,1)	5,0	5 (7,7)	20,0		
	Balance	16 (24,6)	40,0	5 (7,7)	20,0		
	Verticality	6 (9,2)	15,0	3 (4,6)	12,0		
3.Researcher	Metaphor						
	Yes	29 (37,7)	63,0	20 (26,0)	64,5	0,017	0,895
	No	17 (22,1)	37,0	11 (14,3)	35,5		
	Schemas						
	Force	2 (4,1)	6,9	2 (4,1)	10,0	3,096	0,902
	Containment	1 (2,0)	3,4	0	0		
	Path	9 (18,4)	31,0	5 (10,2)	25,0		
	Cycle	4 (8,2)	13,8	2 (4,1)	10,0		
	Center-periphery	1 (2,0)	3,4	2 (4,1)	10,0		
	Balance	11 (22,4)	37,9	7 (14,3)	35,0		
	Verticality	1 (2,0)	3,4	2 (4,1)	10,0		

Chi-Square Test

Table B24. Stimulus 06 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	39 (50,6)	84,8	28 (36,4)	90,3	0,519	0,471
	No	7 (9,1)	15,2	3 (3,9)	9,7		
	Schemas					3,308	0,836
	Force	1 (1,5)	2,6	1 (1,5)	3,6		
	Containment	5 (7,5)	12,8	1 (1,5)	3,6		
	Path	5 (7,5)	12,8	5 (7,5)	17,9		
	Cycle	9 (13,4)	23,1	9 (13,4)	32,1		
	Center-periphery	3 (4,5)	7,7	1 (1,5)	3,6		
	Balance	14 (20,9)	35,9	9 (13,4)	32,1		
	Verticality	2 (3,0)	5,1	2 (3,0)	7,1		
2.Researcher	Metaphor						
	Yes	36 (46,8)	78,3	27 (35,1)	87,1	0,972	0,324
	No	10 (13,0)	21,7	4 (5,2)	12,9		
	Schemas					4,462	0,695
	Force	0	0	2 (3,2)	7,4		
	Containment	1 (1,6)	2,8	0	0		
	Path	2 (3,2)	5,6	0	0		
	Cycle	6 (9,5)	16,7	4 (6,3)	14,8		
	Center-periphery	2 (3,2)	5,6	2 (3,2)	7,4		
	Balance	19 (30,2)	52,8	15 (23,8)	55,6		
	Verticality	6 (9,5)	16,7	4 (6,3)	14,8		
3.Researcher	Metaphor						
	Yes	35 (45,5)	76,1	17 (22,1)	54,8	3,813	0,051
	No	11 (14,3)	23,9	14 (18,2)	45,2		
	Schemas					5,272	0,511
	Force	4 (7,7)	11,4	2 (3,8)	11,8		
	Containment	0	0	2 (3,8)	11,8		
	Path	6 (11,5)	17,1	4 (7,7)	23,5		
	Cycle	6 (11,5)	17,1	1 (1,9)	5,9		
	Center-periphery	2 (3,8)	5,7	1 (1,9)	5,9		
	Balance	15 (28,8)	42,9	6 (11,5)	35,3		
	Verticality	2 (3,8)	5,7	1 (1,9)	5,9		

Chi-Square Test

Table B25. Stimulus 07 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	39 (50,6)	84,8	25 (32,5)	80,6	0,226	0,635
	No	7 (9,1)	15,2	6 (7,8)	19,4		
	Schemas					3,833	0,745
	Force	4 (6,3)	10,3	2 (3,1)	8,0		
	Containment	4 (6,3)	10,3	0	0		
	Path	8 (12,5)	20,5	7 (10,9)	28,0		
	Cycle	5 (7,8)	12,8	4 (6,3)	16,0		
	Center-periphery	3 (4,7)	7,7	3 (4,7)	12,0		
	Balance	13 (20,3)	33,3	7 (10,9)	28,0		
	Verticality	2 (3,1)	5,1	2 (3,1)	8,0		
2.Researcher	Metaphor						
	Yes	38 (49,4)	82,6	27 (35,1)	87,1	0,289	0,591
	No	8 (10,4)	17,4	4 (5,2)	12,9		
	Schemas					7,127	0,249
	Force	1 (1,5)	2,6	1 (1,5)	3,7		
	Containment	1 (1,5)	2,6	0	0		
	Path	5 (7,7)	13,2	3 (4,6)	11,1		
	Cycle	5 (7,7)	13,2	10 (15,4)	37,0		
	Center-periphery	3 (4,6)	7,9	3 (4,6)	11,1		
	Balance	22 (33,8)	57,9	10 (15,4)	37,0		
	Verticality	1 (1,5)	2,6	0	0		
3.Researcher	Metaphor						
	Yes	29 (37,7)	63,0	19 (24,7)	61,3	0,024	0,876
	No	17 (22,1)	37,0	12 (15,6)	38,7		
	Schemas					4,988	0,254
	Force	4 (8,3)	13,8	7 (14,6)	36,8		
	Path	9 (18,8)	31,0	5 (10,4)	26,3		
	Cycle	3 (6,3)	10,3	3 (6,3)	15,8		
	Center-periphery	1 (2,1)	3,4	0	0		
	Balance	12 (25,0)	41,4	4 (8,3)	21,1		

Chi-Square Test

Table B26. Stimulus 08 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	36 (46,8)	78,3	24 (31,2)	77,4	0,008	0,930
	No	10 (13,0)	21,7	7 (9,1)	22,6		
	Schemas					3,079	0,838
	Force	5 (8,3)	13,9	1 (1,7)	4,2		
	Containment	3 (5,0)	8,3	2 (3,3)	8,3		
	Path	13 (21,7)	36,1	9 (15,0)	37,5		
	Cycle	4 (6,7)	11,1	3 (5,0)	12,5		
	Center-periphery	5 (8,3)	13,9	2 (3,3)	8,3		
	Balance	2 (3,3)	5,6	3 (5,0)	12,5		
	Verticality	4 (6,7)	11,1	4 (6,7)	16,7		
2.Researcher	Metaphor						
	Yes	34 (44,2)	73,9	24 (31,2)	77,4	0,122	0,726
	No	12 (15,6)	26,1	7 (9,1)	22,6		
	Schemas					3,769	0,789
	Force	2 (3,4)	5,9	1 (1,7)	4,2		
	Containment	1 (1,7)	2,9	0	0		
	Path	4 (6,9)	11,8	2 (3,4)	8,3		
	Cycle	11 (19,0)	32,4	7 (12,1)	29,2		
	Center-periphery	2 (3,4)	5,9	1 (1,7)	4,2		
	Balance	12 (20,7)	35,3	8 (13,8)	33,3		
	Verticality	2 (3,4)	5,9	5 (8,6)	20,8		
3.Researcher	Metaphor						
	Yes	32 (41,6)	69,6	20 (26,0)	64,5	0,215	0,643
	No	14 (18,2)	30,4	11 (14,3)	35,5		
	Schemas					4,365	0,521
	Force	5 (9,6)	15,6	2 (3,8)	10,0		
	Containment	1 (1,9)	3,1	1 (1,9)	5,0		
	Path	15 (28,8)	46,9	10 (19,2)	50,0		
	Cycle	2 (3,8)	6,3	4 (7,7)	20,0		
	Balance	8 (15,4)	25,0	2 (3,8)	10,0		
	Verticality	1 (1,9)	3,1	1 (1,9)	5,0		

Chi-Square Test

Table B27. Stimulus 09 Gender, Metaphor Rates and Schemas

		Male		Female		X ²	p
		N (%)	% (Column)	N (%)	% (Column)		
1.Researcher	Metaphor						
	Yes	41 (53,2)	89,1	27 (35,1)	87,1	0,074	0,528
	No	5 (6,5)	10,9	4 (5,2)	12,9		
	Schemas					6,428	0,373
	Force	5 (7,4)	12,2	1 (1,5)	3,7		
	Containment	2 (2,9)	4,9	2 (2,9)	7,4		
	Path	11 (16,2)	26,8	10 (14,7)	37,0		
	Cycle	5 (7,4)	12,2	7 (10,3)	25,9		
	Center-periphery	4 (5,9)	9,8	3 (4,4)	11,1		
	Balance	11 (16,2)	26,8	4 (5,9)	14,8		
	Verticality	3 (4,4)	7,3	0	0		
2.Researcher	Metaphor						
	Yes	42 (54,5)	91,3	29 (37,7)	93,5	0,133	0,716
	No	4 (5,2)	8,7	2 (2,6)	6,5		
	Schemas					2,361	0,942
	Force	3 (4,2)	7,1	2 (2,8)	6,9		
	Containment	1 (1,4)	2,4	1 (1,4)	3,4		
	Path	3 (4,2)	7,1	4 (5,6)	13,8		
	Cycle	12 (16,9)	28,6	10 (14,1)	34,5		
	Center-periphery	3 (4,2)	7,1	1 (1,4)	3,4		
	Balance	17 (23,9)	40,5	9 (12,7)	31,0		
	Verticality	3 (4,2)	7,1	2 (2,8)	6,9		
3.Researcher	Metaphor						
	Yes	30 (39,0)	65,2	19 (24,7)	61,3	0,123	0,725
	No	16 (20,8)	34,8	12 (15,6)	38,7		
	Schemas					1,255	0,940
	Force	3 (6,1)	10,0	3 (6,1)	15,8		
	Path	12 (24,5)	40,0	6 (12,2)	31,6		
	Cycle	3 (6,1)	10,0	3 (6,1)	15,8		
	Center-periphery	3 (6,1)	10,0	2 (4,1)	10,5		
	Balance	9 (18,4)	30,0	5 (10,2)	26,3		

Chi-Square Test