

*Delphi Surveys for Development of Sub-domains, Factors, and Items of
Musical Self-Concepts Scales for Korean Secondary Students*

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Abstract

Musical self-concepts affect people's musical development and learning, and there have been several psychometric scales to measure musical self-concepts mainly in Western contexts. In order to develop Korean version of musical self-concept scales for secondary students, this study conducted Delphi surveys to identify sub-domains, factors and items of the scale. From November 2021 to May 2022, 21 experts in music education and psychometric assessment gave opinions on preliminary sub-domains, factors and items for musical self-concept scales. The Delphi surveys were conducted in two stages. First Delphi questionnaire consisted of Likert scales for validation of developed 4 sub-domains and 25 factors with open-ended questions was distributed to 15 experts; collected data and opinions were analyzed and reflected to the revised version of the scales, which consisted of 4 sub-domains and 23 factors. Second Delphi questionnaire was for validation of 138 scale items that are based on revised sub-domains and factors. 11 experts responded to the Likert scales for appropriateness of each item and gave open-ended opinions about them; items were revised based on statistical analysis of the collected data. Through the two-stage Delphi survey, Korean version of musical self-concept scales for secondary students consisted of 4 sub-domains, 23 factors and 138 items were arranged for Exploratory Factor Analysis of the scales.

Keywords: Musical Self-Concept Scales, Musical Identity, Korean Secondary Students, Musical Preference, Scale Development

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Introduction

This paper reports the process of verifying the validity of sub-domains, factors and questionnaire items of newly developed psychometric scales, the Musical Self-Concept Scales for Korean Secondary Students by using the expert Delphi technique. Musical self-concept is 'perception of who I am in the music field' (Svengalis, 1978; Vispoel, 1993; Spychiger, 2017; Jung, 2021a). In the modern society, self-directed life has become important (McLean & Syed, 2015), and the research and discussions on self-understanding and identity have recently made meaningful progress. This trend is also in the field of music and music education, and studies have discussed that musical self-understanding or musical self-concept have a great influence on musical development in relation to one's motivation for musical learning and activities (Hargreaves, MacDonald, Miell, 2002; 2012). It is because musical self-concepts affect one's thoughts and behaviors by allowing one to predict and decide what one should and can do. Musical self-concept is closely related to forming one's musical identities, which is more holistic view about myself in music. There have been many studies conducted to develop psychometric scales to measure individuals' musical self-concepts (Fiedler & Spychiger, 2017; Morin, et al., 2017; Spychiger, 2017; Svengalis, 1978; Vispoel, 1993), and most of them were developed in the Western culture contexts.

Musical self-concept is influenced by various contexts of a society such as history, culture, and education to which the individual belongs (Yeong, 2005), and thus the sub-domains and factors of the musical self-concept should be set differently depending on the given context. Therefore, beyond using the musical self-concept scales developed in the context of Western society as it is, this study was conducted to develop a musical self-concept scales for Korean secondary students considering their cultural or educational contexts. According to the affective domain psychometric instrument development procedure (McCoach, et. Al., 2013; DeVellis, 2022), the range of factors of musical self-concept was explored through literature review and analyzing prior Western based scales (Jung, 2021b).

The following matters were considered in developing the preliminary sub-domains and factors in the previous research stage. First, 'Self-understanding of musical ability' is commonly included in all prior scales, so it is also included to the preliminary sub-domain; and the factors of musical ability are 'music cognition', 'singing', 'instrumental playing', 'music creation', 'body movement', 'reading scores', and 'overall musical ability'. Second, in order to reflect the tendency of the recently developed scales to measure the degree of individuals' participation in musical activities other than musical ability, 'Voluntary participation on musical activities and training' was included as a sub-domain, by which to measure the "performative" aspect of musical identity (Hargreaves & Lamont, 2017). Third, 'Values of music' was set as a sub-domain to measure how much one put importance to the values or roles of music or musical activities such as 'regulation of emotion', 'social interaction', and 'willingness to continue musical activities. Finally, in order to develop a new scale to determine the degree of formation of music preferences and tastes, which is important in recent discussions on musical identity, Marcia (1980)'s four stages of identity development were applied to 'Development of musical preferences/taste' sub-domain (Dys, et al., 2017).

Subsequently, for the research stage of this paper, it aimed to verify the appropriateness of the developed preliminary sub-domains and factors for the context of Korea from experts' point of view followed by verifying the questionnaire items. In results of this phase of the study, a preliminary scale questionnaire items will be produced, and the final scale

questionnaire items will be selected through student surveys. Therefore, the research questions of this research stage are as follows.

1. 1st Delphi survey: What are the experts' opinions on the content validity of preliminary sub-domains and factors of the Musical Self-concepts Scales for Korean Secondary Students?
2. 2nd Delphi survey: What are the experts' opinions on the contents validity of preliminary questionnaire items developed according to the sub-domains and factors of Musical Self-concepts Scales for Korean Secondary Students?

Research Method

1. Research Procedure

Table 1 summarizes the entire research procedure for developing Musical Self-concepts Scales for Korean Secondary Students, and phase 2 and 3 are the process of validating the scales by Delphi surveys.

Phase	Procedure	Research Method	Results
1	Development of Preliminary Sub-domains and Factors of the scales	·Literature review ·Analysis of former scales ·Interviews on Korean secondary students	·Set preliminary sub-domains and factors of the scales: ·4 sub-domains, 25 factors
2	Validation of Preliminary Scale Sub-domains and Factors	·Delphi Surveys from experts(1 st) and Validation	·Confirmation of sub-domains ·4 sub-domains, 23 factors ·Development of preliminary questionnaire items
3	Validation of Preliminary Questionnaire Items	·Delphi Surveys from experts(2 nd) and Validation	·Item selection ·Development of preliminary survey scales
4	Preliminary Test: Factor Analysis and Item Selection	·Conduct preliminary survey to Korean secondary students ·Exploratory factor analysis	Extracting factors and item selection - Development of main survey scales
5	Conducting Main Test and Analysis	·Conduct main survey to Korean secondary students ·Exploratory factor analysis, confirmation factor analysis	·Optimizing scale length ·Production of final version survey scales

Table 1: Research Procedure for Scale Development

2. Research Participants

In order to validate the appropriateness of the sub-domains of the scales established through prior research and interviews, Delphi surveys were conducted by 15 experts for the 1st and 11 experts for the second (Ayre & Scally, 2014; DeVellis & Thorpe, 2022; McCouch, et al., 2013). The general characteristics of experts who participated in the Delphi survey are shown in Table 2.

Features	1st Delphi survey(15명)		2nd Delphi survey(11명)		
	<i>n</i>	Percentage(%)	<i>n</i>	Percentage(%)	
Gender	Male	3	20	2	18.2
	Female	12	80	9	81.8
Age	25~30	0	0	1	9.1
	30~39	1	6.7	4	36.4
	40~49	5	33.3	1	9.1
	50 above	9	60	5	45.4
Position	College Professors(Former)	11(2)	73.3(13.3)	5(2)	45.4(18.2)
	College Instructors	1	6.7	1	9.1
	Secondary School Music Teachers(Former)	2(1)	13.3(6.7)	5	45.5
	1~3	0	0	1	9.1
	3~5	1	6.7	0	0
Career Years	5~10	2	13.3	2	18.2
	10~15	3	20	2	18.2
	15 above	9	60	6	54.5
	Final Degree	Doctoral	13	86.7	6
Master's		2	13.3	4	36.4
Other		0	0	1(Artist Diploma)	6.7
Major of Final Degree	Music Education	13	86.6	9	81.8
	Educational Psychometry/Statistics	1	6.7	1	9.1
	Other	1(Gifted Education)	6.7	1(Voice)	9.1

Table 2: Information of Experts for Delphi Survey

3. Data Collection and Analysis

1) First Delphi Survey

The 1st Delphi survey was done from November 27 to December 11, 2021. The main contents and structure of the survey paper are as follows.

- Study Overview and Description
- Defining and explaining the main concepts of the study: the definition of musical self-concept and its relationship to musical identity
- Overview of preliminary sub-domains and factors of the scales: 4 sub-domains and 25 factors (Table 3)
- Explanation and definition of each sub-domain and factor and 5-point Likert scale and opinions to evaluate the appropriateness

After collecting expert response results, the appropriateness of each preliminary sub-domain and factor was reviewed. The analysis criteria are as follows. First, among the Likert scale responses of the expert group for each sub-domain and factor, it was judged to be appropriate if the response rate of 4 or 5 points was 80% or more, and the standard deviation was low ($sd < 0.9$). If the standard deviation is less than $sd \geq 0.9$ and the average value is less than 4, the appropriateness of the sub-domain and factor was examined more closely, whether to modify or delete it by reflecting the experts' suggestions (Lynn, 1986).

2) Second Delphi Survey

Reflecting the analysis of the results after the 1st Delphi survey, some sub-domains and factors were modified, deleted, and added; in result, 4 sub-domains with 23 factors were confirmed. Then, a total of 138 questionnaire items (6 for each factor), and the 2nd Delphi survey was conducted to validate the appropriateness of them. The survey was conducted about for two weeks from May 5 to 23, 2022. In the second survey, a 4-point scale was used to clarify the positive/negative judgment for each item (McCoach, et al., 2013, p.103). The main contents and composition of the survey are as follows.

- Study Overview and Description
- Definition and explanation of the main concepts of the study: the definition of musical self-concept and its relationship with musical identity
- Overview of sub-domains and factors of the scales: 4 sub-domains and 23 factors (Table 5)
- Description of each sub-domain and factor, 6 items for each factor and 4-point Likert scale and opinions to evaluate the appropriateness

After collecting expert response results, the appropriateness of 138 individual items was reviewed. The analysis criteria are as follows. First, it was judged that it was appropriate if the response rate of 3 or 4 points was more than 80%, and the standard deviation was low ($sd < 0.9$). If the standard deviation is high ($sd \geq 0.9$), and the average value is less than 3, the appropriateness of the sub-domain was examined more closely, whether to modify or delete it by reflecting the experts' suggestions (Lynn, 1986).

Results

1. First Delphi Survey

The results of the 1st expert survey are shown in <Table 4>. The sub-domain variable name is numbered to MS, which stands for Musical Self-concept, respectively, 'MS1. Self-understanding of musical ability', 'MS2. Voluntary participation in musical activities and training', and 'MS3. Musical values' and 'MS4. Development of musical preference and taste'.

Code. Sub-domain	Code. Factors	Code. Sub-domain	Code. Factors
MS1. Self- Understanding of musical ability	MS1.1. Music Perception	MS3. Musical values	MS3.1. Regulation of Emotion
	MS1.2. Singing		MS3.2. Social Interaction
	MS1.3. Instrument Playing		MS3.3. Self-Expression
	MS1.4. Music Creation		MS3.4. Important Hobby
	MS1.5. Body Movement with Music		MS3.5. Seeking Musical Careers
	MS1.6. Reading		MS3.6. Overall Importance/Value of Music
	MS1.7. Overall Musical Ability		MS3.7. Willing to Continue Musical Activities
MS2. Voluntary participation in musical activities and training	MS2.1. Music Listening	MS4. Development of musical preference/taste	MS4.1. Achievement
	MS2.2. Music Training		MS4.2. Moratorium
	MS2.3. Music Making(Playing and Creation) Activities		MS4.3. Foreclosure
	MS2.4. Participation to Music Events		MS4.4. Diffusion
	MS2.5. Searching Music Related Information		
	MS2.6. Writing about Music		
	MS2.7. Finance Expenses to Musical Activities		

Table 3: Preliminary Sub-domains and Factors

Code	Response			Code	Response		
	Rate on 4, 5	M	SD		Rate on 4, 5	M	SD
MS1	86.7	4.40	0.737	MS3	73.3*	4.27	1.033***
MS1.1	73.3*	4.27	1.033***	MS3.1	80.0	4.27	1.280***
MS1.2	93.3	4.67	0.617	MS3.2	93.3	4.73	0.594
MS1.3	80.0	4.47	0.834	MS3.3	100.0	4.93	0.258
MS1.4	73.3*	4.07	0.961***	MS3.4	100.0	4.67	0.488
MS1.5	60.0*	3.93**	1.033***	MS3.5	86.7	4.20	1.082***
MS1.6	86.7	4.47	0.915	MS3.6	86.7	4.40	1.121***
MS1.7	66.78*	4.13	1.060***	MS3.7	86.7	4.53	0.743
MS2	100.0	4.67	0.488	MS4	80.0	4.40	0.828
MS2.1	93.3	4.60	0.632	MS4.1	86.7	4.40	1.121***
MS2.2	93.3	4.60	0.632	MS4.2	66.7*	4.13	1.246***
MS2.3	100.0	4.80	0.414	MS4.3	73.3*	4.13	1.457***
MS2.4	100.0	4.67	0.488	MS4.4	66.7*	3.93**	1.438***
MS2.5	86.7	4.53	0.915				
MS2.6	73.3*	4.20*	1.146***				
MS2.7	86.7	4.33	0.900				

(*Response rate on 4,5<80%, **M<4, ***SD≥0.9)

Table 4: Results: 1st Delphi Survey

The analysis of expert opinion results for each sub-domain and factor, and explanations and modifications are as follows.

(1) MS1: Self-understanding of Musical Ability

First, the response rate of MS1.1 was lower than 80% and had high standard deviation, and there were opinions on the appropriateness of using music ‘perception’ for the factor name due to the wide range of meaning and differences for ‘perception’ among scholars. Hence, the name of the MS1.1 was changed to 'Music cognition and discrimination', and the definition was modified to 'evaluation of the ability to listen to music and distinguish or identify its characteristics.'

Second, the response rate of MS1.4 was lower than 80%, and there were many opinions on including more specific musical terms such as ‘composition’, ‘arrangement’, and ‘improvisation’ other than ‘creation’ to clarify the meaning. Therefore, those three terms were included to the factor name of 1.4 as ‘music creation (Composition, Arrangement, Improvisation).’

Third, MS1.5 did not satisfy the standards, and there were many opinions on if ‘body movement with music’ is for musical ability because it could be confused with dance or sports activities. Since there were also diverse discussion on ‘body movement with music’ during student interviews (Jung, 2022), it seems difficult to reach a common consensus on presenting body movement with music as a factor. Therefore, it was decided to exclude.

Fourth, MS1.7 did not satisfy the standards, and there were many opinions on whether it was necessary to present the ‘overall musical ability’. Some of the preceding foreign scales included a factor or items asking for the evaluation of overall musical ability, in addition to factors such as singing, instrumental playing, and composition (Spychiger, 2107; Svenalis, 1978; Vispoel, 1993). Paying attention to the psychometric expert's opinion that the overall musical ability can be measured by statistically combining the value results of musical ability factors, this factor was excluded.

Additional opinion about the MS1 was that the presented factors of musical ability were focused on musical performance, but understanding musical knowledge such as music theory also needs to be included in the range of ability. This has not been included as a musical ability in previous studies, but it is reasonable to consider the Korean music education context, which emphasizes the curriculum to understand music concepts and elements. Also, during the student interviews, many students expressed confidence for their musical ability based on their understanding of musical knowledge. Therefore, it was decided to add ‘Understanding and Knowledge in Music’ as a factor of MS1.

(2) MS2: Voluntary Participation in Music Activities and Training

For the MS2, although the standards of response rate and standard deviation were satisfied, there were opinions of using term ‘training’ because it could be considered too serious for non-music major students. Therefore, the name of MS2 was changed to ‘Voluntary participation in music activities and learning (practice).’

Factor MS2.6 needed to be reviewed because the response rate was less than 80%, and the standard deviation is above the standard. Experts’ opinions on MS2.6. ‘writing about music’

are as follows. 'listening' and 'writing' are highly related activities, so there was an opinion on integrating them rather than put it as an individual factor. Therefore, the factor was excluded because the writing activity may not be universally carried out activity and that it may not play an appropriate role as a factor due to its high correlation to other factors.

(3) MS3: Value of Music

For MS3.5(Seeking Musical Careers), there were opinions that questioned the appropriateness of it as a component of musical self-concept because it overlaps MS3.7(willing to continue musical activities). In the case of MS3.6(overall importance/value of music), there was an opinion on whether it was a necessary factor because it was considered to be the sum of other factors. In addition, there was a suggestion to include the aesthetic value of music. Accordingly, the researcher added the 'aesthetic value in music' factor instead of excluding 'willing to continue musical activities' and 'overall importance/value of music.'

(4) MS4: Development of Musical Preference/Taste

Sub-domain MS4 satisfied the validity criteria, while the factors in MS4 did not reach the standards. First of all, there were many opinions on use of more appropriate translation words for factors rather than using the terms from the theory as they were because the terms such as 'achievement', 'moratorium, foreclosure, and diffusion' are somewhat hard to understand. Therefore, the factor names for MS4 were changed to 'MS4.1: well-defined, MS4.2: suspended, MS4.3: conforming, and MS4.4: indifferent'. Second, the psychometric expert suggested that the measurement method for MS4 should be different from other sub-domains because the four factors of the MS4 shows the developmental phases of musical preference and taste. Hence, the statistical analysis method for MS4 will be reviewed based on the preliminary and main test results.

2. Second Delphi Survey

After the first Delphi, scales were revised and confirmed as 4 sub-domains and 23 factors (Table 5). Then, the second Delphi survey was conducted to verify the validity of 138 items developed for each factor. This section reports what was considered while developing questionnaire items for each sub-domain, and discusses experts' opinions on items, sub-domains, and factors that have not reached the validity criteria without presenting every analysis result.

Code. Sub-domain	Code. Factors	Code. Sub-domain	Code. Factors
MS1. Self- understanding of musical ability	MS1.1. Music Cognition and Discrimination	MS3. Musical Values	MS3.1. Regulation of Emotion
	MS1.2. Singing		MS3.2. Social Interaction
	MS1.3. Playing Instruments		MS3.3. Self-Expression
	MS1.4. Music Creation(Improvisation, Composition, Arrangement)		MS3.4. Meaningful Activity
	MS1.5. Score Reading		MS3.5 Aesthetic Value in Music
	MS1.6 . Understanding and Knowledge in Music		MS3.6. Will to Continue Musical Activities
MS2. Voluntary Participation on Musical Activity and Learning(Practice)	MS2.1. Music Listening	MS4. Development of Musical Preference/Taste	MS4.1. Well-defined
	MS2.2. Music Learning(Practice)		MS4.2. Suspended
	MS2.3. Music Playing		MS4.3. Conforming
	MS2.4. Music Creation		MS4.4. Indifferent
	MS2.5. Participation to Music Events: Audience		
	MS2.6. Searching Music Related Information		
	MS2.7. Finance Expenses to Musical Activities		

Table 5: Confirmed sub-domains and factors(4 sub-domains, 23 factors)

(1) MS1: Self-understanding of Musical Ability

MS1 is a sub-domain that evaluates what one thinks of one's ability in musical activities. According to previous studies, perception on one's own musical ability is influenced by absolute and relative (compare with others) evaluations along with others' feedback through various music experiences (Schmitt, 1979); also, those evaluations include not only current ability but also future development potential (Spychiger, 2017). Therefore, 36 scale items were developed with sentences that include the findings from those studies. As a result of the content validity analysis individual items in the MS1, only 1.1.6 (Friends ask me for help when it is difficult to identify characteristics of music while listening: 3,4 response ratio-72.7, M=3.18, SD=0.874) did not reached validity criteria. 1.1.6 was the only item that contains the request of others to mean others' recognition of one's musical ability, which is from a preceding scale (Austin, 1990). There were opinions that such an expression was likely not necessarily based on the others' perception of one's abilities but because of social friendship or personality. Accordingly, the item was revised to 'People around me admit that I'm good at identifying characteristics of music while listening.'

(2) MS2: Voluntary Participation in Music Activities and Learning (Practice)

The MS2 consists of items to evaluate whether one is participating in musical activities and learning(practice) with one's own initiative, which aims to assess musical self-concept according to one's participation in various musical activities based on one's own will (Müllensiefen, et al., 2014). Individual items for each factor were whether one participates in music activities(e.g., I listen to music because I want to do); whether one participates in music activities in one's spare time (e.g., Whenever I have time, I use my time to sing, practice musical instruments, and study music); whether one considers a waste of resources(time, money, etc.) to participate in music activities (e.g., I don't feel that creating/arranging music is waste of my time, I don't feel that musical activity is waste of money); whether one is immersed to musical activities(When I perform music, I lose track of

time and immerse myself in it); whether one prioritizes music activities (e.g., If I am given a variety of activities to choose from in and out of the school, I prefer to participate in online/offline concerts as an audience); and whether actively participating in music activities (When I don't understand something about music, I don't feel shame to ask my teacher or friends who know music better). As a result of the content validity analysis of 42 individual items in MS2, all met the validity criteria except 2.6.4 (I find, organize, and write about the information of music I want to know: 3, 4 response ratio-72.7, M=3.27, and SD=0.905). This item was revised to 'I find, organize, and record information about the music I am interested in.'

(3) Value of Music

MS3 consisted of items asking how meaningful and important the roles of music or music activities are to the respondents. As a result of the content validity analysis of 36 individual items in the MS3, all of the items except 3.4.3 (I don't want to live in a world without music: 3,4 response ratio-72.7, M=3.27, and SD=0.905) met the validity criteria. For the item, there were opinions that the expression of the item could be somewhat misleading and extreme expression. Accordingly, the item was revised to 'I don't want to stay in a place without music.'

(4) MS4: Development of Musical Preference.Taste

In MS4, six items were presented to explain the characteristics of each stage by dividing the factors into four developmental phases of musical preference/taste 'well-defined / suspended / conforming / indifferent' to determine how much one's musical preferences and tastes have been formed. To this end, it was intended to include the meaning of presence or absence of search for various music, and whether the commitment to a specific musical genre is high to make an item. Examples of items for each factor reflecting this include 'well-defined: There is definitely certain sort of music that I usually listen to', 'suspended: I listen to various music regardless of the atmosphere of music, 'conforming: I listen to or play a certain music because my parents and teachers recommended it', and 'indifferent: I think it's a waste of time to look for and listen to various music.'

As a result of the content validity analysis of 24 individual items in the MS4, all items met the validity criteria and that each item was appropriate for evaluating the factors. However, the individual items in the MS4 were revised and supplemented by reflecting some experts' opinions that the expression of the items was somewhat difficult or unclear. In addition, like the first Delphi, there is an opinion of a psychometric expert that the analysis method between the MS4 and other sub-domains should be differentiated, so it should be decided based on the results of preliminary tests.

Conclusion

This study used the Delphi survey to verify the validity of the sub-domains, factors, and questionnaire items of newly developed Musical Self-Concept Scales for Korean Secondary Students. As a result, 4 sub-domains, 23 factors, and 138 items were confirmed. Through the expert verification process, the sub-domains, factors, and items of the scale appropriate for the context of Korea were embodied, and the scales were differentiated and specialized from preceding scales in the following aspects.

First, in the MS1, the ‘body movement with music’ factor was excluded from the ‘Self-understanding of musical ability’ sub-domain, and the ‘understanding of knowledge in music’ factor was included. ‘Body movement’ had been included in several prior scales due to its high connectivity with music from various perspectives (Vispoel, 1993; Morin et al., 2017; Spsychiger, 2017; Fiedeler & Spsychiger, 2017). On the other hand, there was no prior scales that suggested the degree of knowledge understanding, such as music theory, as a musical ability. But when considering student interviews and Korean national music curriculum which put importance on understanding musical knowledge, including the ‘understanding of knowledge in music’ as a factor of musical ability seems reasonable.

Second, MS2 and MS3 considered the musical participation of non-musical majors developing the sub-domain names, factors, and items. Reflecting the expert's opinion that ‘training’ may be too serious for non-music majors, MS2 was revised to ‘Voluntary participation in music activities and learning (practice)’. In addition, if the ‘seeking musical career’ is included in the MS3 as a factor, non-music majors’ test results is likely to be low. Therefore, the factor is excluded.

Third, in accordance with recent discussions that value the relationship between music preferences/tastes and musical identity, ‘Development of music preferences and tastes’ was set as an MS4, and the developmental phases were presented as a factor based on Marcia (1980)’s theory. Since the MS4 is four factors that show step-by-step differences, it is necessary to use a different method from other sub-domains to analyze the results. Accordingly, based on the results of the preliminary and main student surveys in the future, it is necessary to devise a method for MS4.

Based on the questionnaire items developed and confirmed through this expert verification, preliminary and main surveys should be conducted for secondary school students to further verify the validity of factors and items through exploratory and confirmatory factor analysis. After the future process, the factors that make up the Musical Self-Concept Scales for Korean Secondary Students will be more systematic, and the scales will be standardized by selecting discriminating items from among a number of items included in the preliminary test.

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