

## Preliminary Study: Construction of the Indonesian Family Function Measuring Instruments

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### Abstract

This study aimed to measure a family function with high school students using the principal component analysis (PCA) technique. The target population was Senior high school students (SMA) with a sample size of 319 respondents obtained through random sampling technique. Principal Component Analysis was then applied to analyze construct validity, orthogonal rotation, and varimax extraction. The results showed eight factors, including love, education, socialization, environmental development, economy, religion, reproduction, socio-culture, and future protection, each with a correlation coefficient of 0.000, can measure different independent and unrelated aspects. Also, a Gutman method applied on an Internal consistency reliability test yielded  $\lambda = 0.983$ , implying it is possibly used to assess a family function.

**Keywords:** family function, validity, reliability, factor analysis, principal component analysis.

Received 31 August 2021/Accepted 10 October 2021 ©Author all rights reserved

### Introduction

According to Adnyawati (2009), Arkan (2006), Fadzul, Saputra, Ekawati, Periantalo (2016) and Rochaniningsih (2014), many cases of risky behavior in Indonesian cities and villages are an iceberg phenomenon. These behaviors include student deaths due to brawls and unwanted pregnancies, practicing premarital sex, drug abuse, pornography, sexual harassment, rape, and crimes in motorcycle gangs.

Jessor (2014) explained that the studies on risky behavior base on protective and risk factors. Risk factors are traits, environments, situations, and events that reduce psychopathology in a person. Conversely, protective factors protect, buffer, mitigate or even reduce the influence of risk on a person's development and behavior. These factors also describe a person's ability to resist the impact of risky behavior for optional development despite the high risks involved.

Jessor (1993) and Jessor & Turbin (2014) established that weak protective factors and vulnerability draw a person to consciously or unconsciously controlled behavior.

Ekawati et al. (2016) stated that lack of parental supervision, a weak protective factor, can make students turn homes into sexual palaces, porn watching, and drug abuse zones. Fleming, Catalano, Hagertu, Abbot (2010). Parsai, Voisine, Mersiglia, Kulis, Nieri (2009) supported this, stating that family situations and conditions play a role in increasing students' risky behaviors.

A malfunctioning family social system and poor relationship between the parent and children also causes the rise of deviant behavior among adolescents. Fleming, Catalano, Hagertu, Abbot (2010) established that some family roles and functions change over time, forcing adolescents to seek them outside, according to Rochaniningsih (2014). Efendi & Makhfudli (2009) supported this study, stating that divorce, juvenile delinquency, and other problems affect family functionality, making adolescents look for other alternatives elsewhere.

The family is the first and main shaper in developing adolescents' self-identity through the principle of mutual honing, compassion, and care. It provides better reinforcement that forms self-identity, allowing adolescents to the identity confusion phase that draws them into risky behavior.

Miller, Ryan, Keitner, Bishop, Epstein (2000) and Skinner, Steinhauer, Sitarenios (2000) stated that McMaster and Steinhauer's concepts of an ideal family function are the key to building self-identity. McMaster's model reveals that a family function solves a clinical problem-oriented conception, shaping the structural and organizational nature of the family system. This model explores transaction patterns among members in healthy and unhealthy families. Furthermore, it identifies six dimensions of family function, including problem-solving, communication, roles, affective responses, affective involvement, and behavioral control.

Steinhauer's model explains that family function assessment builds communication, affective expression, role performance, task completion, involvement, control, values, and norms. The assessment also attracts the success of achieving basic tasks through the development stages. The family plays a role in achieving these tasks that eventually determine whether adolescents will succeed or fail to realize their life goals (Saifullah & Djuwairiyah, 2019; Skinner, Steinhauer, Sitarenios, 2000). Skinner, Steinhauer, Sitarenios (2000) stated that fulfilling these tasks includes delineating the development of all family members, providing a sense of security, and

ensuring sufficient cohesion to maintain the family as a unit functioning effectively as part of the community.

Strengthening family functions in Indonesia is a development program described in Regulation Number 87 of 2014. The Regulation states that family functions include religion, social culture, love, protection, socialization and education, economy, and environmental development.

Family functions in the regulation are not well defined, requiring measurement indicators to be studied further. In case the studies succeed, these indicators can help evaluate family development programs. Furthermore, they can be used to assess the GenReIndonesia Youth Counseling Information Center (PIK-R) activities monitored by the National Population and Family Planning Agency. Evaluation of family function will see scientifically tested measuring instruments to break through the difficult conceptual psychological attribute.

Measurement instruments to be used include the Family Assessment Device for love (Epstein, Baldwin, Bishop, 1983; Miller, Ryan, Keitner, Bishop, Epstein., 2000), the Brief Family Relationship Scale (BFRS) (Fok, Allen, Henry, Team., 2014), Family Assessment Model (FAM), and Brief FAMs (Skinner, Steinhauer, Sitarenios., 2000). Economics is intended to use The Family Affluence Scale (FAS) in Czech Republic (Hobza, Hamrik, Bucksch, De Clercq., 2017). The Inventory of Father Involvement (IFI) (Hawkins, Bradford, Palkovitz, Christiansen, Day, Call, 2002) and The Feetham Family Functioning Survey (FFFS) (Roberts & Feetham, 1982) is expected to measure socialization and education. Environmental Literacy (Liang et al., 2018) shall assess environmental development, while the Family Sex Communication Quotient (FSCQ) (Jackson, Sifers, Warren, Velasques., 2003) is going to evaluate reproductive function. The Faith Activity in The Home Scale (FAITHS) (Martin, White, Perlman ., 2003) will measure religion while The Familial Ethnic Socialization Measure (Umaña-Taylor & Fine, 2004) is proposed for measuring social-cultural family aspects. Moreover, the Family Protection Scale (Clarke, Cooper, Creswell., 2013) is counted upon for evaluating protection.

The Family Protection Scale cannot be used directly because it uses old literature or references and foreign languages; hence it is biased. Each of the above measuring instruments is also yet to meet the criteria for family functions according to the Indonesian Government Regulation Number 87 of 2014, requiring more modifications. Clarke, Cooper, Creswell. (2013), Fok, Allen, Henry, Team (2014), and Hobza, Hamrik, Bucksch, De Clercq (2017) stated that modifications are expected to increase the reliability of these instruments.

## Method

This study used various procedures, including constructing measuring instruments, analyzing the scale's psychometric properties, and implementing the results. Implementation of results aimed to obtain a valid, reliable, and standard psychological scale that makes report analysis more systematic. The construction of the measuring instrument involved several stages, as follows:

### *Determination of Constructs, Components, and Behavioral Indicators*

The construction of the measuring instrument began with determining the constructs of the family function to be measured. Printed books, journals, and other literature sources were applied to review the constructs and their components. This literature study discovered eight constructs, including religion, socio-cultural, love, protection, reproductive, socialization, economic, and environmental development functions. Each function contained behavioral indicators, which were reviewed by validators before being used as the blueprint in item writing to guarantee the internal validity of the scale construct that will be made.

### *Scaling Format*

Azwar (2017) established that scaling determines the subject's response to the result, helping evaluate how the value will be assigned. In the construction of this scale, the Likert scale model was chosen with 5 levels of value, including Very Appropriate (SS), Appropriate (S), Not Appropriate (TS), and Very Inappropriate (STS).

### *Item Writing*

After formulating the components and indicators of the construct into a blueprint, this study grouped items according to their predetermined proportions. When writing the initial item to be tested, 120 favorable and unfavorable statements were obtained. Before testing, grouped items were passed to researchers, colleagues, constructivists, subjects, and grammar experts for review to achieve logical validity of the measuring instrument.

### *Psychometric Property Analysis*

Psychometric property analysis was applied to analyze data from the measuring instrument trials. The construct analyses used include Principal Component Analysis (PCA), factorial

validity test, orthogonal rotation, and varimax extraction. PCA analyzed components that met the analysis requirements, and varimax extraction assessed the formation of factors against a set of existing components. Furthermore, the reliability test determined the validity of the measuring instrument through internal consistency and Gutmann's method. Norm-making and interpretation were achieved through hypothetical norms for overall and each scoring component on the scale.

#### *Respondent*

A random sampling technique helped to collect a sample size of 319 from students spread in the city of Jambi. Before the study, respondents received a research-informed consent, which included their needs, risks attached to the research, the responsibility of researchers when they are harmed, and compensation.

#### **Result**

The results of the constructed method to be implemented included the final scale, the psychometric property values that supported the validity and reliability of the scale, and the norm with the interpretation of the scale.

#### *Factorial Validity Test*

The components of the final scale were obtained through the first psychometric property analysis of the results from the trial data. Principal Component Analysis (PCA), one of the leading forms of psychometric property analysis, was applied in the factorial validity test. This aimed to formulate initial items into a new component through the reduction of variables harboring variances. The PCA analysis transformed new components into smaller and more specific independent components.

Orthogonal rotation and extraction of varimax analysis from the 8 formulated components created the same number of new components, each with a combination of observed variables and correlation with the constituent components.

Grouping was influenced by variables that overlapped with components, the similarities between items and variables, or their relationship with each other, making it difficult to form new components.

Based on the PCA, new labels and definitions were assigned to new components in the following order; religion, socio-cultural, love, reproductive, education and socialization, environmental development, economic, and future protection function. Table I below describes the results of the component analysis.

Table I  
 Results of Component Analysis of Family Function Measuring Instruments

	Love Function	Educational Socialization Function	Environmental Development Function	Economic Function	Religion Function	Reproductive Function	Socio-Cultural Function	Future Protection Function
No	29,30,31,32	46,53,54,	112,113,114,1	50,82,83,	2,3,4,5,6	62,63,65,	18,20,	75,76,77,
Item	,33*,34,35,3 6,37,41,42, 43,44	99,104,105, 107,108, 109,110	15,116, 117,118, 119,120	86,88,89, 90,91,92, 98,100	,7,8,9,12 ,13,14, 15	67,68,69	21,24,25 ,27 ,28	78

The preparation of the final scale reduced the initial 120 items to 73 through component analysis with coefficient values starting from 0.409 to 0.808. This showed that items have a fairly good to a very good relationship as observed variables in main components, and the scale can measure the family function of Senior High School students.

*Construct Validity Test*

Periantalo (2015) established that the construct analysis test aimed to determine the strength of the measuring instrument on theoretical construct after the construct validity test that examines the correlation between the components in the scale. In the construct validity test, the same components support each other because they show similar results (Periantalo, 2015), as illustrated in table 2 below.

Table 2  
*Construct Validity Test*

	Love Function	Educational Socialization Function	Environmental Development Function	Economic Function	Religion Function	Reproductive Function	Socio-Cultural Function	Future Protection Function
Love Function	1.000	.	.	.	.	.	.	.
Educational Socialization Function	-0.000	1.000	.	.	.	.	.	.
Environmental Function	-0.000	-0.000	1.000	.	.	.	.	.
Economic Function	-0.000	-0.000	-0.000	1.000	.	.	.	.
Religion Function	-0.000	-0.000	-0.000	-0.000	1.000	.	.	.
Reproductive Function	0.000	-0.000	0.000	-0.000	-0.000	1.000	.	.
Socio-Cultural Function	0.000	-0.000	-0.000	-0.000	0.000	0.000	1.000	.
Future Protection Function	-0.000	-0.000	0.000	0.000	-0.000	-0.000	-0.000	1.000

*Reliability Test*

The psychometric property analysis aimed to determine the validity and reliability of the measuring instrument. A reliable measuring instrument has a scale that shows consistent or accurate results, while a valid one has a scale that can be trusted for measuring the construct.

The results show the coefficient of Cronbach's  $\alpha$  is 0.954, Guttman's  $\lambda_6$  is 0.977, and McDonald's  $\omega$  is 0.958, implying the Guttman's  $\lambda_6$  method is more reliable. Azwar (2017) explained that the minimum coefficient of the measuring instrument is 0.900, showing that Guttman's  $\lambda_6$  method can be trusted to measure the construct. Each component tested with the same analytical technique showed that only the socio-cultural and future protection functions have reliability below 0.900. The socio-cultural component scored a reliability coefficient of 0.782 on Cronbach's  $\alpha$ , 0.780 on Guttman's  $\lambda_6$ , and 0.772 on McDonald's  $\omega$ . Similarly, the future protection component obtained a reliability coefficient of 0.752 on

Cronbach's  $\alpha$ , 0.733 on Guttman's  $\lambda_6$ , and 0.701 on McDonald's  $\omega$ . Anggoro & Widihiarso (2015) stated that according to De Vaus, reliability has a satisfactory value with a coefficient of 0.70, implying that the reliability of the socio-cultural function component and the future protection function can be used. However, they should have other measurements that support their components to be accepted.

Table 3  
*Reliability Test*

Measuring Instrument	Cronbach's $\alpha$	Gutmann's $\lambda_6$	McDonald's $\omega$
Family Function	0.954	0.977	0.958
Component			
Love Function	0.925	0.923	0.924
Educational Socialization Function	0.901	0.879	0.904
Environmental Development Function	0.910	0.907	0.909
Economic Function	0.873	0.865	0.887
Religion Function	0.868	0.865	0.874
Reproductive Function	0.845	0.843	0.840
Socio-Cultural Function	0.782	0.780	0.772
Future Protection Function	0.752	0.733	0.701
N	319	319	319

#### *Norms and Interpretations*

Azwar (2017) established that measuring instruments use norms to interpret the subject's response to the results (Azwar, 2017). However, the norm relies on hypothetical norms to evaluate the overall score of the measuring instrument and the components.

#### *Norms of Family Function Measuring Instruments*

The family function in this measuring tool is the ability of each member to fulfill roles that promote love, nurture, and care for each other for more quality time. The components of this function include love, education and socialization, environment, economy, religion, reproduction, socio-culture, and future protection with norms described in table 4 below.



Table 4  
*Hypothetical Norms for Measuring Family Functions*

Classification	Score
The family function has a very important role	$\geq 256$
The family function has a role	$\geq 219 - 255$
The family function has a sufficient role	$\geq 146 - 218$
The family function has no role	$\geq 110 - 145$
The family function has no very important role	$< 110$

#### *Norms of Component Measuring Instruments*

This study grouped the norms of component measuring instruments to explain how the dynamics of family functions affect individuals.

#### *Hypothetical Norms of the Love Function*

The love function is every action taken to achieve emotional closeness among family members. This function is the source of children's affection, love, goodness, and happiness with the ability to also unite the family, community, nation, and state (Wirdhana et al., 2013).

Epstein, Baldwin, Bishop (1983) and Miller, Ryan, Keitner, Bishop, Epstein (2000) stated that The Family Assessment Device (FAD) measures the love component. This measuring instrument attracts emotional openness, involvement of the family in solving problems, and pride in being a family member. Furthermore, the love function has norms, and interpretations explained in table 5 below.

Table 5  
*Hypothetical norms of love the components*

Classification	Score
Really has the love function	≥ 46
Has a love function	≥ 39 – 45
Sufficiently have the love function	≥ 26 – 38
Does not have the love function	≥ 20 – 25
Completely lacks the love function	< 20

*Hypothetical Norms of Educational and Socialization Functions*

Socialization and education functions are family actions that educate members in various aspects, including forming, fostering, and understanding family, society, and state norms or values. Jailani (2014) established that the family should prioritize creating a continuous educational process to mold intelligent and well-mannered successors. Fachrudin (2016) supported this, stating that family processes including interaction, socialization, communication, and behavior educate children.

Socialization spreads habits, values, and rules in society that allow children to learn ways of creating their personalities and acceptable behaviors (Yulia, 2018). Roberts & Feetham revealed that The Feetham Family Functioning Survey (FFFS) measures educational and socialization components to explore caring, family support for education, attitudes, obedience, friendship, and community ties. Furthermore, this component has norms, and interpretations explained in table 6 below.

Table 6  
*Hypothetical norms of socialization and educational function*

Classification	Score
Really have the socialization and educational functions	≥ 39
Have the socialization and educational functions	≥ 33 – 38
Sufficiently have socialization and educational functions	≥ 23 – 32
Does not have the socialization and educational functions	≥ 17 – 21
Completely lacks socialization and educational functions	< 17

*Hypothetical Norms of the Environmental Development Function*

Environmental development function refers to actions that instill and develop positive attitudes and behaviors in each family member towards the environment, measured through Environmental literature (Liang et al., 2018). This measurement instrument explores environmental sensitivity, values, issues, and engagement. In general, the environmental development component has norms, and interpretations explained in table 7 below.

Table 7

*Hypothetical norms of the environmental function*

Classification	Score
Really has an environmental development function	$\geq 32$
Has an environmental development function	$\geq 27 - 31$
Sufficiently has an environmental development function	$\geq 18 - 26$
Has no environmental development function	$\geq 14 - 17$
Completely has no environmental development function	$< 14$

*Hypothetical Norms of the Economic Function*

The economic function refers to every action taken to fulfill the needs of family members. The family has an economic component that teaches family members financial planning and intelligence (Wirdhana et al., 2013). Rahmah (2016) established that fulfilling this component should not negatively affect the family.

Hobza, Hamrik, Bucksch, De Clercq (2017) stated that Family Affluence Scale (FAS) measures the economic component, exploring fulfillment of basic, educational, and self-development needs. Table 8 below discusses the norms and interpretations of this function.

Table 8

*Hypothetical norms of the economic function*

Classification	Score
Really has an economic function	≥ 39
Has an economic function	≥ 33 – 38
Sufficiently has an economic function	≥ 22 – 32
Has no economic function	≥ 17 – 21
Completely has no economic function	< 17

*Hypothetical Norms of the Religion Component*

Religion function is the family's efforts to provide teachings that instill, develop and foster family members to understand and practice righteousness. The religious function is expected to form family characters that show kindness to other humans and the natural environment. Saputra, Ekawati, Islamiah (2020) stated that attitudes and actions that uphold a sense of love, concern for others, and respecting religious or cultural differences actualize religion in the family.

Martin, White, Perlman (2003) revealed that Faith Activities in The Home Scale (FAITH) measures religion. This measurement instrument explores various aspects, including the obligation to worship, pray, read scriptures, practice religious values, and using media to broaden religious knowledge. Furthermore, the function has norms and interpretations shown in table 9 below.

Table 9

*Hypothetical norms of the religious the function*

Classification	Score
Really has a religious function	≥ 42
Has a religious function	≥ 36 – 41
Sufficiently has a religious function	≥ 24 – 35
Has no religious function	≥ 18 – 23
Completely has no religious function	< 18

Zulhaini (2019) stated that the family should be a forum for providing religious teachings to children, allowing them to view life that matches their attitude, physical and intellectual development for better future life and knowledge at school. Maulidiyah (2018) added that parents are obligated to be role models to instill religious values in their children through behavior and words.

#### *Hypothetical Norms of the Reproductive Function*

The reproductive function refers to the family's efforts in enhancing knowledge on sexual and reproductive issues to help family members avoid risky sexual behaviors. Warren & Neer (1996) established that communicating sexual problems with children improves their sexual health.

The Family Sex Communication Quotient (FSCQ) measures this component function, disclosing information regarding sexual and reproductive health, the urgency of sexual knowledge, and parental involvement in sexual and reproductive health education. Furthermore, this component has norms and interpretations shown in table 10 below.

Table 10  
Hypothetical norms of the reproductive function

Classification	Score
Really has a reproductive function	$\geq 21$
Has a reproductive function	$\geq 18 - 20$
Sufficiently has a reproductive function	$\geq 12 - 17$
Has no reproductive function	$\geq 9 - 11$
Completely has no reproductive function	$< 9$

#### *Hypothetical Norms of the Socio-Cultural Function*

The socio-cultural function is the ability of the family to instill, foster, and maintain cultural values in each member. An effectively functioning family is the forum for instilling and maintaining noble cultural values in children. According to Wirdhana et al. (2013), the socio-

cultural function teaches children how to behave and maintain acceptable values as they grow up.

Umaña-Taylor & Fine (2004) revealed that Familial Ethnic Socialization measures the socio-cultural function, exploring the cultural values, involvement in cultural activities, and upholding culture. Moreover, table 11 below shows the norms and interpretations of this component.

Table 11  
*Hypothetical norms of the socio-cultural function*

Classification	Score
Really has a socio-cultural function	$\geq 25$
Has a socio-cultural function	$\geq 21 - 24$
Sufficiently has a socio-cultural function	$\geq 14 - 20$
Has no socio-cultural function	$\geq 11 - 13$
Completely has no socio-cultural function	$< 11$

*Hypothetical Norms of Future Protection Function*

The future protection is every family effort to protect and monitor the adequacy of each member according to their individual needs. Birol (2016) and Clarke, Cooper, Creswell. (2013) established that Family Protection Scale (FPS) measures this function to assess the direct involvement of parents in purchasing goods, spending, and allocating daily money. The future protection component has the norms and interpretations illustrated in table 12 below.

Table 12  
*Hypothetical norms of future protection function*

Classification	Score
Really has a future protection function	$\geq 14$
Has a future protection function	$\geq 12 - 13$
Sufficiently has a future protection function	$\geq 8 - 11$
Has no future protection function	$\geq 6 - 7$
Completely has no future protection function	$< 6$

## Discussion

Miller, Ryan, Keitner, Bishop, Epstein (2000) and Skinner, Steinhauer, Sitarenios (2000) stated family concepts of family function include McMaster and Steinhauer. These two models focus on the conception of family-oriented transaction patterns among members concerned with family health according to family function dimensions (Miller, Ryan, Keitner, Bishop, Epstein., 2000).

Multiple family function measurement instruments exist (Clarke, Cooper, Creswell., 2013; Epstein, Baldwin, Bishop., 1983; Fok, Allen, Henry, Team., 2014; Hawkins et al., 2002; Jackson et al., 2003; Miller et al., 2000; Roberts & Feetham, 1982; Skinner, Steinhauer, Sitarenios., 2000 and Umaña-Taylor & Fine, 2004). However, they do not meet the standards of the Regulation Number 87 of 2014. This regulation states that 8 family functions include religion, social culture, love, protection, socialization and education, economy, and environmental development.

According to Clarke, Cooper, Creswell (2013), Fok, Allen, Henry, Team (2014) & Hobza, Hamrik, Bucksch, De Clercq (2017), measuring instruments for the eight functions have not seen major language upgrades in the last 10 years; hence they are still biased. The recently constructed measuring instrument produced 73 statement items with fairly impressive validity and reliability. Construct analysis validity test showed that these item statements can formulate the 8 main components that create the scale construct. One of the 8 main components can change from the protection to a future protection function because the items collecting it have different meanings | 3, 9, 9, 11, 12, 6, 7, and 4 items were collected with their respective components including love, education and socialization, environmental development, economy, religion, reproduction, social culture, and future protection.

The correlation coefficient ranged from 0.409 to 0.808, implying that the components in constructing this family function scale are independent and do not affect each other. This explains why reviewing and rearranging the constructs of other measuring tools strengthened each component to stand-alone and meet the needs (Clarke, Cooper, Creswell., 2013; Fok , Allen, Henry, Team., 2014; Hawkins et al., 2002; Jackson et al., 2003; Miller, Ryan, Keitner,

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Bishop, Epstein., 2000; Roberts & Feetham, 1982; Skinner, Steinhauer, Sitarenioset., 2000; Umaña-Taylor & Fine, 2004).

The highest reliability test scored 0.977 with the Guttman's  $\lambda_6$  method, proving to be more reliable than others, including 0.954 Cronbach's  $\alpha$ , which obtained 0.954, and McDonald's  $\omega$  0.958. Clarke, Cooper, Creswell (2013), Fok, Allen, Henry, Team (2014) & Hobza, Hamrik, Bucksch, De Clercq. (2017) established that this measuring instrument achieved higher reliability than the one used in the previous study, whose Cronbach alpha was below 0.80.

Future studies are expected to examine more respondents and create programs that support government agencies and social institutions in their quest to measure family functions using instruments with better psychometric properties. Advanced measurement instruments are expected to evaluate the family function of most Indonesian communities, allowing programs for strengthening families to reach a wider target audience.

## **Conclusion**

Family function measuring instruments with scientifically tested psychometric constructs and reliability should be standardized according to Regulation Number 87 of 2014. Regulated measuring instruments can be used to evaluate family development programs and the activities of the GenRe Indonesia Youth Counseling Information Center (PIK-R) monitored with the National Population and Family Planning Agency. This allows the government to reach the target population when implementing programs that strengthen families, especially adolescents.

## **Acknowledgments**

This study used a basic scheme from the Faculty of Medicine and Health Sciences, Jambi University. The authors are grateful to the Principal of the Jambi Province Senior High School, the study location, and the Youth Counseling Information Center, Faculty of Medicine and Health Sciences (PIK-Bandura), which coordinated the trial of the measuring instrument.



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