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# The Role of Passion in Psychometrics Course during Covid-19 Pandemic

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#### **ABSTRACT**

The Covid-19 pandemic has made changes in almost all aspects of life. Likewise, the learning process for students has also changed. Interestingly, students showed a higher enthusiasm for learning. During the pandemic, the changes were not planned. Passion grows first, then individuals are ready to make changes. The research objective is to prove that passion predicts readiness to change in the learning attitude of students with considering the existence of grit. The participants consisted of 233 students (age: 19-24 years old, male = 18%; female = 82%) who were taking Psychometrics courses at the Faculty of Psychology. Instruments used are The passion inventory, Inventory of readiness for changes and The Short Grit Scale inventory. The data processing method uses the Structural Equation Modelling by testing the measurement model and structural model and by applying the SPSS version 22 and LISREL version 8.80. The results of this research showed a fit model and a positive, significant structural model for passion as a predictor of the readiness to change of students' learning. Passion together with grit as a predictor also shows a fit model and positive, significant structural model.

**Keywords:** Readiness to change, passion, grit, covid-19 pandemic

#### 1. INTRODUCTION

During the Covid-19 pandemic, students were required to study from home using e-learning facilities. The lecturers of Faculty of Psychology, one of private university in West Jakarta face challenges in teaching Psychometrics courses as most students regard it as a difficult subject. Psychometrics is not only about psychology, but is also a combination of statistics and mathematics. With the changes in the learning methods from classroom meetings to e-learning during the pandemic, it is necessary to monitor the development of the students' learning, especially in terms of their interest in learning. Based on the number of students submitting their assignments in 7 meetings, 92% of the students on average turned in their assignments. The assignments submitted by students are taken into account as the students' attendance since the assignments are done during class hours.

Under the university policy, the minimum required attendance for students in class is 79% of 14 class meetings, with a maximum absence of 3 meetings. During the Covid-19 pandemic using e-learning facilities, there was an increase in attendance of 13%. This phenomenon was studied by observing the changes in the students' attitude and behavior. During the pandemic, it is apparent that students have developed a stronger passion towards learning as indicated by a higher attendance rate compared to that before applying the e-learning method.

The stronger passion of these students is reinforced by the

students' answers in the questionnaires on their seriousness in understanding the Covid-19 pandemic and the need to make adjustments in their learning. From 197 students, 93% stated that the Covid-19 pandemic is a serious condition. This seriousness is also apparent in the students' attitude in adjusting the learning process (88%).

The students' awareness of the pandemic and their awareness of the need for changes in learning has stimulated the growth of a passion for learning. Students showed a serious attitude/behavior by working harder in their studies. It can be said that the development of a stronger passion is influenced by environmental factors. This statement is supported by [1] that a person can be proactive and is bound to his/her environment or vice versa as a function of social environment support. The growth of passion is a process of internalization that involves the process of awareness to make changes. The internalization process is sometimes in line with one's choices, behavior and the emerging values that have significant meaning [2].

When passion influences someone to make a change, the psychological aspect that needs to be considered is grit which is a trait that is an innate factor [3]. According to Duckworth [3], grit is the persistence and passion to achieve long-term goals. His research proved that conscientiousness is one of the Big-Five personality dimensions that has shown to have a positive relationship with grit. This means control of the social environment,

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thinking before acting, delaying pleasure, obeying the rules, planned, organized, and prioritizing tasks are related to the spirit to achieve long-term goals [4]. Thus, in this study, grit is a factor that needs to be considered in its relationship to passion in learning and is positioned as a moderator [5].

#### 1.1. Related Work

All this time experts maintain that the concept of change is based on a planned change [6]. This means that there are conditions that are already established, and then planned to make changes. It was said by [7], a person who is declared ready to change would show the behavior of accepting the planned change. The individual is prepared first to change, then his/her passion would grow [8]. Whereas during the Covid-19 pandemic, changes that were made were not planned, individuals had to accept the changes. The awareness of individuals towards the seriousness of the pandemic is a manifestation of the growth of passion [9]. Individuals need to have passion first, then they would be ready to undergo a change [10].

This explanation emphasizes the different concepts in terms of positioning passion and the readiness for changes in learning [8]. Passion was only considered to develop after individuals were ready to change. Whereas during the Covid-19 pandemic, passion played a role in preparing to change. Thus, during the Covid-19 pandemic, the readiness for changes in learning was influenced by passion [11]. In this research, the readiness for change is positioned as a dependent variable and passion as an independent variable [12].

The position of the variables is important to be studied to prove that the students' readiness to learn is predicted by passion which is moderated by grit of the students taking Psychometrics courses in private university of West Jakarta during the Covid-19 pandemic.

#### 1.2. Our Contribution

The contribution of this research is that when students have a passion for learning, there will be changes in them. Grit is an aspect that strengthens the occurrence of these changes. So, this study is to prove that passion predicts readiness to change in learning by considering the existence of grit.

First of all, it is necessary to test that the role of passion as an independent variable can predict readiness to change. If it is proven, then proceed with testing that grit is a variable that needs to be considered in the relationship. Grit is positioned as an independent variable as well as positioned as a moderator variable [13]. Through this testing, the most appropriate position for grit whether as an independent variable or as a moderator variable will be identified.

This study aims to answer the following questions:

Q1a: Does the fit model between passion and grit predict readiness to change?

Q1b: Does the structural model of passion positively and significantly predict readiness to change?

Q2a: Does the fit model between passion and grit predict readiness to change?

Q2b: Does the structural model of passion and grit positively and significantly predict readiness to change? Q3a: If grit acts as a moderator, does the model fit in the relationship of passion and readiness to change?

Q3b: Does the structural model positively and significantly predict the relationship of passion and readiness to change?

The purpose of the study is described in the following hypotheses:

Hypothesis 1: Passion positively predicts readiness to change.

Hypothesis 2: Passion and grit positively predict readiness to change.

Hypothesis 3: Grit as a moderator in the relation of passion and readiness to change.

#### 1.3. Paper Structure

The paper is organised as follows. Section 2 served as methods section, which include the characteristics of research participants, measures used, and the description of how the data will be analysed. Section 3 consists of statistical analysis result of Structural Equation Modelling (SEM) using LISREL version 8.80 and discussion of the result, which include measurement model and structural model. In Section 4, we conclude the paper and suggestion for future research.

## 2. BACKGROUND

#### 2.1. Method

#### 2.1.1. Participants and Data Collection

The number of participants in this research consisted of 233 university students (age: 19-24 years old, male = 18%; female = 82%). Participants are students in their 4th semester and are taking a Psychometrics course at the Faculty of Psychology, private university.

#### 2.1.2. Instruments

In this study, the Inventory of readiness for changes in learning during the Covid-19 pandemic was adapted by applying the basic concept of readiness to change from Holt [10]. The inventory consists of 3 dimensions, namely appropriateness, operational definition of accuracy to make changes, change efficacy with an operational definition of confidence in one's ability to change and personally beneficial with an operational definition beneficial to individuals. The number of items is 12 and each dimension consists of 4 items. Inventory using the Likert scale number 1 illustrates "strongly disagree" until



number 5 which illustrates "strongly agree". Examples of appropriateness items are "I will benefit from changes due to Covid-19". Examples of change efficacy items are "when I have to change, there are some adjustments that I can't make". Examples of personally beneficial items are "I am worried about myself because I cannot adjust to changes at the moment".

The passion inventory [14] consists of harmonious passion, which maintains that learning is in line with all aspects of life, and obsessive passion, which involves learning activities that control themselves and non-criteria passion, which considers learning as something that is less valuable. This non-criteria passion is a negative aspect of the passion criteria. This adjustment was made in order to distinguish the dimensions of the harmonious passion and the obsessive passion. There are 12 items and each dimension consists of 4 items. The inventory uses a Likert scale, from number 1 which illustrates "strongly disagree" to number 5 that illustrates "strongly agree". Examples of harmonious passion items are "New things that I discovered, make me more appreciative of the need for change". Examples of obsessive passion items are "I cannot leave the activities that I have been doing ". Examples of non-criteria passion items are "I lack the enthusiasm to do new activities".

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The Short Grit Scale inventory [3], [16] uses a short version of 8 items consisting of 2 dimensions. The dimension of consistency of interest is defined as the tendency of individuals who focus on pursuing the same goal all the time and the dimension of perseverance of effort is defined as the tendency of individuals to overcome failure to achieve long-term goals. The inventory uses a Likert scale, consisting of number 1 which illustrates "strongly disagree" up to number 5 that illustrates "strongly agree". Examples of items of consistency of interest are "New ideas or tasks sometimes distract me from pre-existing ideas or tasks". An example of items of perseverance of effort is "The obstacles do not make me give up".

#### 2.2. Statistical Analysis

Equation Modeling. First of all, the measurement model was tested using the Confirmatory Factor Analysis method to obtain valid items that construct the construct variable. Valid items on each dimension, is then made into a composite score using the maximum likelihood extraction and the varimax rotation. The composite score is a manifest variable in the structural model testing. In accordance with hypothesis 3, structural model tests were performed. The data was processed using IBM-SPSS-Statistic22 software and LISREL version 8.80 software. The hypothesis testing of the theoretical model uses a correlation matrix from a sample of variable X, referred to as S and is used to estimate  $\Sigma$ . Each element of  $\Sigma$  is equated with elements of S. The null hypothesis tested is S =  $\Sigma$  or S-  $\Sigma$  = 0. If not rejected or not significant, this means the theoretical model is supported by the data or it is said that the model is fit. This test is referred to as a test of goodness of fit. After the model is declared fit with the data, proceed with testing of the loading factor. If the loading factor has a negative value it means that it is the opposite to the conceptualized one and by using t-test, the significant value can be obtained. If the value of t > 1.96, it is said to be significant, which means that X as a valid indicator is measured by  $\xi$  or the validity is measured by a factor.  $\xi$  is a construct or latent variable measured by X. Since most psychological variables are variables that cannot be measured directly or as latent variables, it is necessary to test with SEM. The general structural equation model of SEM [17] is a structural model equation:  $\eta = B\eta + \Gamma\xi + \zeta$ , the measurement model equation for y is  $y = \Lambda y \eta + \varepsilon$  and the measurement model equation for x is  $x = \Lambda x \xi + \delta$ .

We tested the hypotheses by applying a Structural

## 2.3. Measurement Model

The measurement model testing results show that the 5 dimensions have a goodness of fit P-value > 0.05. This means that the empirical data obtained is in accordance with the theoretical model being built. On the appropriateness dimension there is 1 item that is invalid and on the change efficacy dimension there are 2 items that are invalid and negative. Thus the composite score appropriateness dimension uses 3 items, the change efficiency dimension uses 2 items while the other dimensions use 4 items. See table 1.

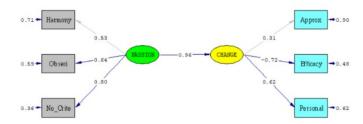


Table 1. Measurement Model

	Dimensi	No Item	Factor loading	t-value	eror	Item Analysis	Factor loading	t-value	eror	ANALISIS ITEM
READINESS TO CHANGE	Appropriateness	1	0,91	6,11	0,15	Valid	0,91	6,11	0,15	Item valid
		2		No Sig.		Valid		No Sig.		Item tidak valid
		3	0,55	5,27	0,1	Valid	0,55	5,27	0,1	Item valid
		4	0,33	4,03	0,08	Valid	0,33	4,03	0,08	Item valid
	Change efficacy	5	0,18	2,04	0,09	Valid	0,18	2,04	0,09	Item valid
		6	0,52	2,87	0,18	Valid	0,52	2,87	0,18	Item valid
		7	0,06	No Sig.	0,12	Not Valid	0,06	No Sig.	0,12	Item tidak valid
		8	-0,67	-2,86	-2,86	Negative-Valid	-0,67	-2,86	-2,86	Item valid - negatif
	Personally beneficial	9	0.46	5,96	0,08	Valid	0,46	5,96	0,08	Item valid
		10	0,86	8,51	0,1	Valid	0,86	8,51	0,1	Item valid
		11	0,54	6,54	0,08	Valid	0,54	6,54	0,08	Item valid
		12	0,17	2,18	0,08	Valid	0,17	2,18	0,08	Item valid
GRIT	Consistency of interest	13	0,44	5,94	0,07	Valid	0,44	5,94	0,07	Item valid
		14	0,7	10,28	0,07	Valid	0,7	10,28	0,07	Item valid
		15	0,78	11,54	0,07	Valid	0,78	11,54	0,07	Item valid
		16	0,69	10,3	0,07	Valid	0,69	10,3	0,07	Item valid
		17	0,56	8,59	0,06	Valid	0,56	8,59	0,06	Item valid
	Perseverance of effort	18	0,93	14,65	0,06	Valid	0,93	14,65	0,06	Item valid
		19	0,54	7,98	0,07	Valid	0,54	7,98	0,07	Item valid
		20	0,79	12,38	0,06	Valid	0,79	12,38	0,06	Item valid
PASSION	Harmonious	21	0,7	10,9	0,06	Valid	0,7	10,9	0,06	Item valid
		22	0,77	11,09	0,07	Valid	0,77	11,09	0,07	Item valid
	passion	23	0,68	10,51	0,06	Valid	0,68	10,51	0,06	Item valid
		24	0,68	9,42	0,07	Valid	0,68	9,42	0,07	Item valid
	Obsessive passion	25	0,59	9,36	0,06	Valid	0,59	9,36	0,06	Item valid
		26	0,56	8,75	0,06	Valid	0,56	8,75	0,06	Item valid
		27	0,85	14,43	0,06	Valid	0,85	14,43	0,06	Item valid
		28	0,9	15,46	0,06	Valid	0,9	15,46	0,06	Item valid
	Non-criterian passion	29	0,61	8,75	0,07	Valid	0,61	8,75	0,07	Item valid
		30	0,7	10,48	0,07	Valid	0,7	10,48	0,07	Item valid
		31	0,8	12,05	0,07	Valid	0,8	12,05	0,07	Item valid
		32	0,68	10.34	0.07	Valid	0.68	10.34	0.07	Item valid

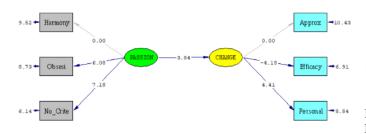
#### 2.4. Structural Model

Hypothesis testing 1. Passion predicts readiness to change is proven by a model that fits with  $\chi^2 = 8.18$ , df = 6 and goodness of fit, P value > 0.05. The loading factor of 0.96 shows a strong relationship and t-value > 1.96 shows a significant relationship. Thus hypothesis 1 is proven that passion positively predicts readiness to change. See Figure 1a., Figure 1b.



Chi-Square=8.18, df=6, P-value=0.22551, RMSEA=0.040

**Figure 1a.** Standardized Solution Path Analysis of Passion Predicts Readiness to Change



Chi-Square=8.18, df=6, P-value=0.22551, RMSEA=0.040

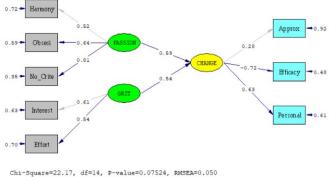
**Figure 1b.** T-values Path Analysis of Passion Predicts Readiness to Change

In the structural relationship of passion with its dimensions namely harmony passion, obsessive passion and non-criteria passion, it has a loading factor > 0.5 and is significant (t-value > 1.96). This means that the dimensions of passion play a strong role in shaping passion as a construct variable. Since different elements may occur in the relationship of readiness to change, the dimension of change efficacy needs to be considered because it is a variable that has a negative and significant loading factor. This dimension becomes a dimension that is not aligned with other dimensions, thereby reducing the contribution to readiness to change as a construct variable. The appropriateness dimension has a loading factor below < 0.5 and significant (t-value > 1.96). Only the personally beneficial dimension has a loading factor > 0.5 and significant (t-value > 1.96).

When viewed from the determination coefficient (R<sup>2</sup>) the passion for readiness to change has a value of 93%. This means that passion is able to predict 93% readiness to change. Whereas the other 7% is predicted by other factors not taken into account in this study. In the passion construct variable, the most significant dimension to construct is the non-criteria passion (64%), while in readiness to change, it is the change efficacy (52%). Thus, even though the change efficacy has a negative loading factor but it does not reduce the contribution to the readiness to change.

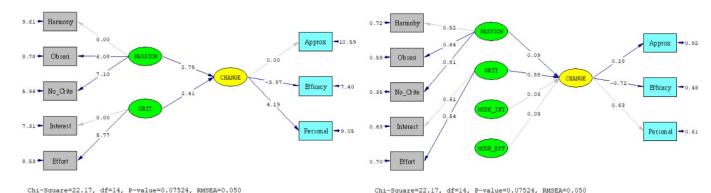
Hypothesis testing 2. Based on theoretical concepts, that there is a strong relationship between passion and readiness to change, it is necessary to consider grit. However, the position of grit in its relationship to passion with readiness to change, must be determined.

Passion together with grit predicts readiness to change as proven by the model that fits with  $\chi^2=22.17$ , df = 14 and goodness of fit, P value > 0.05. Factor loading > 0.50 and t-value > 1.96 show a significant relationship. Thus hypothesis 2. is proven that passion and grit positively predicts readiness to change. See Figure 2a., Figure 2b.



**Figure 2a.** Standardized Solution Path Analysis of Passion and Grit Predict Readiness to Change





**Figure 2b.** T-values Path Analysis of Passion and Grit Predict Readiness to Change

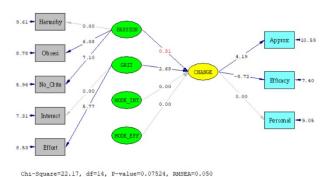
In the structural relationships, passion and grit turned out that harmony passion, obsessive passion and non-criteria passion, consistency of interest and perseverance of effort all have simultaneously a loading factor > 0.5 and significant (t-value > 1.96). This means that all dimensions play a role in building passion and grit as construct variables.

Similar to the previous discussion, the change efficacy dimension on the readiness to change with a loading factor which is negative and significant, the appropriateness dimension has a loading factor below < 0.5 and significant (t-value > 1.96) and only the personally beneficial dimension has a loading factor > 0.5 and significant (t-value > 1.96).

When viewed from the determination coefficient (R2), the dimensions of passion with grit on readiness to change have a value of 100%. This means that there are no other factors that need to be taken into account because the dimensions have been able to predict the readiness to change. The greatest dimension contributing to the passion construct variable with grit is the non-passion criteria (65%), while in the readiness to change, it is the change efficacy (52%).

Hypothesis testing 3. Passion predicts readiness to change by being moderated by grit and is a proven model to fit with  $\chi^2=22.17$ , df = 14 and goodness of fit, P value > 0.05. Grit moderation consists of consistency of interest and perseverance of effort which has an effect on the relationship of passion and readiness to change. This moderating effect causes the relationship of passion and the readiness-to-change to be insignificant (t-value < 1.96) with a loading factor < 0.50. Thus, grit is proven not to have role as a moderator. See Figure 3a., Figure 3b.

**Figure 3a.** Standardized Solution Path Analysis of Grit Dimensions as a Moderator



**Figure 3b.** T-values Path Analysis of Grit Dimensions as a Moderator

#### 3. RESULT AND DISCUSSION

The Covid-19 pandemic is a condition that must be accepted (WHO, 2020). Liang, Ren, Cao, Hu, Qin, Li, May [18] examined teenagers and adults aged 14 to 35 years in China, and revealed that 40.4% of 584 participants had psychological problems and 14.4% had symptoms of PTSD (post-traumatic stress disorder). The Centers for Disease Control, USA reports that 29% of Covid-19 cases involving ages 20 to 44 years showed results that the pandemic has influenced the young age and the impact of the pandemic is not only physical but also psychological symptoms. Understanding adolescents' motivations to engage in social distancing may inform strategies to increase social distancing engagement, reduce pathogen transmission, and identify individual differences in mental and social health during the COVID-19 pandemic [19].

Nobody had expected the pandemic to spread so vastly and no one was prepared. Under this condition, the individual must quickly make changes so that plans that were made can continue to run. In general, an individual's readiness to change is an attitude of willingness to accept and to support plans for change [20]. This statement is not consistent under the Covid-19 pandemic where changes were not planned, but the changes must be accepted if one should want to continue the learning process. Similarly, in the learning process of students, students must quickly



adjust to new conditions so as not to be overwhelmed by the pandemic that can cause physical and psychological problems. The results of the study explained that during the Covid-19 pandemic in which no changes of plans were made, passion has been proven to have a role in predicting the readiness to change of the students' learning. Moreover, if passion is juxtaposed with grit, students will be ready to change more quickly.

As an affirmation, Bernerth [21] argues that readiness to change is more than just understanding and believing change, but readiness is a collection of thoughts and intentions towards specific change efforts. Thus, this shows that readiness to change is an important aspect for individuals to deal with changes and implement them at an early stage which is referred to as the unfreezing phase. Given that readiness to change is a form of attitude, according to Ramdhani [22], an individual's attitude is directly related to cognition, affection, and intention.

Passion is an empirical approach to motivation and personality that emphasizes the importance of inner resources in personal development [1]. The self-determination theory explains that there are intrinsic motivations or autonomous motivations and extrinsic motivations. Intrinsic motivation is when someone does an activity based on interest, it will be done on their own volition and become an autonomous behavior. On the other hand, extrinsic motivation is when someone does an activity that is driven by pressure or necessity, so it is called controlled behavior. Both of these motivations stimulates a person's awareness to quickly make changes. During this pandemic, one's awareness to immediately change, generally starts from controlled motivation, then reinforced by autonomous motivation.

The motivation theory is associated with human behavior as a function of consciousness or unconsciousness (nonconscious) or the existence of motives that govern behavior. Motivation is the main potential to make someone "shift" with energy that provides direction for its behavior. A person can be proactive and be attached to his environment or conversely become passive and alienated, largely as a function of the support of his social environment [1]. Thus, after realizing that the Covid-19 pandemic is a serious condition, one would direct his behavior, to be proactive or passive which would become the student's choice. Students who take Psychometrics courses choose to be ready to change in learning.

Intrinsic motivation and extrinsic motivation play a role because there are psychological basic needs namely competence, autonomy, relatedness. When these basic needs are met it can improve one's motivation and mental health. By fulfilling these basic psychological needs it will be easier for someone to internalize so that intrinsic motivation appears, reflecting one's interests and values. However, behavior based on extrinsic motivation can also be intrinsic through the process of identifying and accepting the value of extrinsic behavior, that is when the behavior can be integrated with values and beliefs.

Students who regard themselves to be competent, are autonomy and when related to their environment, they could easily internalize themselves, that the condition of this pandemic needs to be responded positively. The process of self-internalization becomes important, both consciously and unconsciously, fostering student's passion that shifts attitudes and behaviors to change as a result of the changes in their environment.

When discussing about passion as a factor that is influenced by the environment, Duckworth [23] suggests grit is a positive trait based on an individual's perseverance of effort combined with the passion for a particular long-term goal or end state. This perseverance of effort promotes the overcoming of obstacles or challenges that lie on the path to accomplishment and serves as a driving force in achievement realization. A person with high grit tries to achieve something that he has chosen. When they fail, they will rise up and strive to achieve it. In grit, there is passion or consistency of interest and perseverance of effort [23]. Someone who maintains a goal and has a high degree of consistency is said to have strong persistence.

According to Jachimowicz, Wihler, Bailey, and Galinsky [5], passion is the main element of grit and empirically has a positive relationship between perseverance and performance. Passion is very important for perseverance because the combination of passion and perseverance adds to the involvement of individuals in their activities. An individual may become more focused and carry out activities related to passionate efforts. Furthermore, it is emphasized by Jachimowics et al. [5] the combination of perseverance and passion causes individuals to devote much greater cognitive effort, namely concentration becomes more intense.

The influence of passion and grit -associated with readiness to change in learning of students- is proven to have a positive effect. When passion plays as a predictor, it can predict the readiness for change up to 93%, which is very high. It is important to understand that for passion to grow, it is largely triggered by environmental factors which are internalized within the individual. On the other hand, grit is the trait that the individual already has as an innate factor. Passion together with grit (perseverance) is a mutually reinforcing blend so that it becomes more focused on trying to be passionate and trying to optimize cognitive use.

#### 4. CONCLUSION

Under the Covid-19 pandemic where changes were not planned, the role of passion is important as a predictor of the readiness to change in learning of students. It has been proven that grit strengthens the role of passion as a predictor. Grit acts as an important variable because in grit there is passion expressed as perseverance. Thus, in this research that is associated with readiness to change in learning of the students, grit cannot be positioned as a moderator. This research is important because thus far changes have always been planned, whereas during the current pandemic, changes are not planned and each individual must be prepared to accept the changes.



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