

## Original Article

## Predicting Non-Suicidal Self-injury in Secondary High School Students Based on Affective and Emotional Composite Temperament Model (AFECT)

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### Abstract

**Background & Objective:** Non-Suicidal Self-injury has a high frequency in adolescence, and several studies have pointed to the role of temperamental variables in the occurrence of these behaviors. This study aimed to predict self-injury behaviors in secondary high school students based on the Affective and Emotional Composite Temperament Model.

**Materials & Methods:** This study was descriptive-correlational and its statistical population was all secondary high school students in Namin in Ardabil province, in which 205 students were selected using a multi-stage cluster sampling method and were examined by Affective and Emotional Composite Temperament questionnaires and self-injury questionnaire. Data analysis was performed using SPSS software version 20, Pearson correlation test, and stepwise regression.

**Results:** The dimensions of Emotional Temperament with a stepwise correlation coefficient of 37%, can predict about 13% of the changes related to self-injury behaviors and volition negatively and inhibition positively were able to significantly predict self-injury behaviors. In addition, the dimensions of Affective Temperament can explain and predict with a correlation coefficient of 395%, about 16% of the changes related to self-injury behaviors and depressive, volatile and disinhibited behaviors negatively and euthymia positively could predict self-injury behaviors.

**Conclusion:** The results showed that the AFECT model can explain and predict self-injury behaviors in students. Therefore, the results of this study have important implications for use of the AFECT model intending to identify groups exposed to self-injury behaviors and can be used to design preventive interventions for these behaviors.

**Keywords:** Non-Suicidal Self-injury, Affective and Emotional Composite Temperament Model, Students

### Introduction

Adolescence is one of the most sensitive stages of life and it is considered as a period of transition from childhood to adulthood (1). Various studies have shown that adolescence and youth is a period full of changes and challenges that can be turned into a period for progress by proper awareness and training (1,2). Transition from childhood to adolescence is associated with psychological and environmental pressures and

changes, so that adolescents may face many challenges such as educational pressures, problems in family relationships and a new living environment (3). Many adolescents and young adults go through this stage without any problems, but others may commit self-injury behavior to relieve situational and psychological pressures (4).

Non-suicidal self-injury refers to a range of intentionally self-injury behaviors, with or without suicide, and typically involves behaviors such as cutting, scratching, hitting, or burning the skin (5). Various terms such as intentional self-

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harm, para-suicide, and self-mutilation have been used to describe self-injury behavior (6).

Shafer and Jacobsen have proposed a new diagnostic class called “non-suicidal self-injury syndrome” for self-injury behaviors (7), which means intentional destruction of body tissues without attempting suicide, which is repetitive behavior and usually begins between the ages of 14-24 (8). According to research, the most commonly used methods for self-injury behaviors include cutting the body, burning, hitting oneself, preventing wounds from healing, pulling and plucking hair, and breaking bones (5, 9).

Many studies show that self-injury is a behavioral disorder with a high frequency, especially in adolescents, so that there is a high rate of self-injury behaviors among school-age students (10). The prevalence of non-suicidal self-injury behaviors is higher in adolescents than in other age groups (11, 12). This rate is 12 to 20 percent in adolescence and about 4 to 7 percent in adulthood (13). In Iran, research shows the prevalence of 4.2- 26.8 self-injury behaviors among students (4). According to researches, 77% of adolescents with a history of self-injury have attempted suicide at least once (14, 15) and the risk of death due to suicide is very high in the first six months after self-injury behavior. The risk of both behaviors is very high (10) which highlights the importance of investigating the causes and preventing the occurrence of these behaviors.

In various studies, the factors that affect the occurrence of self-injury behaviors have been investigated. These factors include biological variables such as abnormal regulation of serotonin and defects in endogenous opioids such as endorphins (16), and psychological variables such as problems in emotion regulation (17), avoidant attachment style and anxiety (8,16,18), problems in interpersonal and family relationships (19), childhood misbehavior (17), dysfunctional coping strategies (16) and coexistence with other psychiatric disorders such as personality disorders, especially borderline personality disorder, bipolar disorder type I, mood and anxiety disorders, eating disorders, post-traumatic stress disorder and substance and alcohol abuse (20). One of the factors influencing the occurrence of self-injury behavior is Temperament and Personality traits.

Temperament is the inherited basis of emotions and learning that are acquired through emotional

and automatic behaviors and are seen as observable habits early in life that remain constant throughout life (21, 22). Temperament affects the evaluation of events, quantitative and qualitative bias of initial perception, immediate evaluation of the stimulus and the individual's reaction to stimuli. Thus, temperament acts as a center of gravity to influence and be influenced by other areas such as Behavior, Cognition, Perception, Attention, Communication, Intention, Creation and Emotion and acts as a connecting force between these sectors (23).

Recently, Lara et al. (2012) proposed a model based on the temperamental aspects, known as Affective and Emotional Composite Temperament Model (AFECT), which incorporates many of the concepts expressed by Eysenck (24), Gary (25), Costa and McCrae (26), Akiskal (27), Watson and Clark (28) and Cloninger (29). According to Lara, the above models have examined a single subject with different words. This model tries to put the concepts proposed in mentioned theories together in the form of a coherent model and is based on the assumption that temperament plays a central role and link between Behavior, Perception, Attention, Cognition, Mood and Emotion (30).

The AFECT model includes six emotional temperaments: Volition, Anger, Inhibition, Sensitivity, Coping and Control. Also, from the combination of the mentioned emotional dimensions, twelve affective dimensions including Depression, Anxious, Apathetic (Internalized types), Obsessive, Hyperthymia, Euthymia (Stable types), Volatile, Cyclothymic, Dysphoric (Unstable types) and Irritable, Disinhibited, disinhibited (Externalized types) occur [21, 30].

The basic premise of this model is that temperament is a key element in understanding mental health and psychopathology and temperamental traits can be considered as a risk or protective factors for the development of mental disorders (23, 30). In connection with the relationship between temperamental and personality variables with self-injury behaviors, some studies have identified a number of these factors. For example, research has shown that self-injury behaviors are associated with high harm avoidance (31), high negative excitability (14, 32), deficiencies in emotional skills, and self-destructiveness (14).

Most of the research on personality traits and

self-injury behaviors is related to Costa and McCrae's five-factor theory, so that various studies have shown that people with self-injury behaviors have high neuroticism and openness to experience and in extraversion, conscientiousness and pleasure are low (16, 32). In general, in previous research, relationship between temperamental and personality traits and self-injury behaviors has been shown. The AFECT model incorporates the concepts discussed in previous models, discusses Affective and Emotional temperament more broadly and accurately, and provides a more precise classification of temperamental components related to mental health and psychopathology (21). The AFECT model is in line with the previous theory of temperament (23). Using this model, students at risk of self-injury behavior can be identified and subjected to psychological interventions and treatments.

Considering that the AFECT model, compared to previous biological theories, includes a wider range of Temperaments, behaviors and personality disorders, and provides an understanding of the pathological and health aspects in a single framework for clinical professionals (23), and so far no research has investigated the relationship between Affective and Emotional Temperament and self-injury behaviors, the present study was conducted to predict self-injury behaviors in secondary high school students based on Affective and Emotional Composite Temperament Model.

### **Materials & Methods**

The present study is a descriptive correlational study and its statistical population was all secondary high school students in Namin in Ardabil province that were selected using multi-stage cluster sampling method. Since the highest incidence of self-injury behaviors is between the ages of 14-24 (8), and usually secondary high school students are in this age range, so this study was conducted only on secondary high school students. After obtaining the necessary permissions and referring to the Education Department of Namin, District one was selected from districts one and two of Ardabil and then from among eight secondary high schools, 4 high schools (two high schools for girls and two high schools for boys) were randomly selected. Considering that the number of secondary school students in Namin was ۴۷۳, according to

Krejcie-Morgan table, ۲۱۴ students were selected as the sample size and were examined using questionnaires Lara (2012) Affective and Emotional Temperament Questionnaire and Sansone et al. (1998) Self-injury Questionnaire. Of these, ۹ questionnaires were omitted due to incompleteness. Finally, 205 questionnaires were analyzed. After collecting information, data were analyzed using SPSS software, Pearson correlation test and stepwise regression.

### **Affective and Emotional Composite Temperament Questionnaire (AFECT):**

This scale was developed by Lara et al. (30). 52 questions on this scale measure the Emotional Temperament. Which includes 6 components: volition, Anger, Inhibition, Sensitivity, Coping, Control on a 7-point Likert scale, and 12 questions Measures Affective Temperament includes depression, anxious, apathetic, obsessive, hyperthymia and euthymia, volatile, cyclothymic and dysphoric, irritable, disinhibited on a 5-point Likert scale. The 3 questions also provide general information about a person's emotional temperament. Lara et al. (2012) obtained Cronbach's alpha coefficients in 5 dimensions of emotional temperament in the range of 0.87 to 0.90 and for the inhibition dimension of 0.75. Cronbach's alpha results in the subscales of this test were 0.95 for volition 0.86 for anger, 0.80 for inhibition, 0.88 for sensitivity, 0.91 for coping and 0.94 for control Obtained. In Iran, Chlabianloo et al. (2016) examined the psychometric properties of this scale. In their study factor analysis method was used to evaluate the construct validity of AFECT questionnaire. Exploratory factor analysis showed that this scale can have 4, 5 and 6 factors, which finally in confirmatory factor analysis, the highest fit was obtained for the 6-factor model. Factor 1 showed four dimensions, factors 2 and 3 each showed one dimension, factor 4, showed two dimensions, factor 5 and factor 6 also each showed one dimension, which showed the total results of 10 dimensions. The reliability coefficient of the whole test through internal consistency (Cronbach's alpha coefficient) was 0.82 and from test-retest was 0.85 Obtained. Cronbach's alpha for subscales of this scale was between 0.49- 0.89 that indicated the good internal consistency of the entire AFECT scale and its subscales. (33).

**Sansone et al.'s Self-injury Questionnaire**

**(SHI):** This scale was developed by Sansone (1998) and has 22 items (with yes/no answer) that examines respondents' history of self-injury (34). A study of the validity of this questionnaire with a cut-off point of 5, led to the accurate classification of 84% of the respondents who were considered to have borderline personality disorder based on the diagnostic interview (35). Subsequent research has shown the convergent validity of this scale with self-report tools that assess borderline personality disorder, depression, and a history of childhood abuse and in the study of Marvili, Mirza Hosseini and Monirpour (2018) Cronbach's alpha of this questionnaire was 0.74 (18).

**Results**

A total of 205 students (101 boys and 104 girls) participated in this study. 65 students were from the first grade of high school (35 boys and 30 girls), 73 students were from the second grade (36 boys and 37 girls) and 67 students were from the third grade of high school (32 boys and 35 girls) and their average age was 16.5 years. After data collection, data were analyzed using Pearson correlation coefficient and stepwise regression.

Table 1 shows the results of correlation between the dimensions of Emotional

Affective Temperament of the AFECT model with self-injury behaviors.

The results of Table 2 show that anger, inhibition and sensitivity of the AFECT model have a positive and significant relationship with self-injury behaviors and the dimensions of volition, coping and control have a significant negative relationship with self-injury behaviors. Also, the contents of Table 3 show that depressive, dysphoric, volatile, irritable and disinhibited dimensions have positive and significant relationship with self-injury behaviors and the euthymia has a significant negative relationship with self-injury behaviors.

Also, to evaluate the power of Affective and Emotional dimensions of AFECT model in predicting self-injury behaviors, stepwise multiple regression analysis was used. Table 3 shows the results of predicting self-injury behaviors from the dimensions of Emotional Temperament and Table 4 shows the results of predicting self-injury behaviors from the dimensions of Affective Temperament of the AFECT model.

The results in Table 3 show that dimensions of Emotional Temperament with a step-by-step correlation coefficient of 37%, can predict about 13% of the changes related to self-injury behaviors and volition negatively and inhibition positively could significantly predict Self-injury behaviors. Besides, the dimensions of Affective

**Table 1.** Correlation matrix of dimensions of Emotional Temperament with self-injury behaviors

	Self- injury	volition	anger	inhibition	sensitivity	coping	control
Self- injury	1						
volition	-0.322**	1					
anger	0.181**	-0.302**	1				
inhibition	0.203**	-0.070	0.034	1			
sensitivity	0.172**	-0.078	0.197**	0.338**	1		
coping	-0.155**	0.466**	-0.262**	-0.081	-0.144**	1	
control	-0.266**	0.614**	-0.284**	0.014	-0.165**	0.590**	1

P<. /05

Temperament of AFECT model with self-injury behaviors and Table 2 shows the results related to the correlation between the dimensions of

Temperament can explain and predict with a correlation coefficient of 395%, about 16% of the changes related to Self-injury behaviors and

dimensions of depressive, volatile and positively Predict Self-injury behaviors. disinhibited were negatively and euthymia

**Table 2.** Correlation matrix of dimensions of Affective Temperament with self-injury behaviors

	Self-injury	depressive	anxious	apathetic	cyclothymic	dysphoric	volatile	obsessive	euthymia	hyperthymia	irritable	disinhibited	euphoric
Self-injury	1												
depressive	0.193**	1											
anxious	0.017	0.321**	1										
apathetic	0.099	0.189**	0.246**	1									
cyclothymic	0.046	0.155**	0.247**	0.226**	1								
dysphoric	0.155**	0.089	0.218**	0.326**	0.108**	1							
volatile	0.197**	0.346**	0.146**	0.383**	0.132**	0.446**	1						
obsessive	-0.050	0.041	0.206**	0.050	-0.034	0.129**	0.066	1					
euthymia	-0.179**	0.049	0.092	-0.105**	0.033	-0.046	-0.021	0.233**	1				
hyperthymia	-0.059	-0.144**	-0.090	-0.156**	-0.020	-0.056	-0.126**	0.121**	0.233**	1			
irritable	0.192**	0.219**	0.017	0.236**	0.132**	0.312**	0.218**	0.146**	0.201*8	0.028	1		
Disinhibited	0.248*8	-0.013	0.051	0.024	-0.028	0.073	0.028	0.015	0.164**	0.033	0.187	1	
euphoric	0.026	0.004	0.021	0.145**	0.188**	0.186**	0.236**	-0.070	0.015	-0.053	0.233**	0.030**	1

P<0.05

**Table 3.** Regression analysis of dimensions of the Emotional Temperament concerning self-injury behaviors

variable	$\beta$	t	Sig.	R	R <sub>2</sub>
volition	-0.310	-5.044**	0.000		
anger	0.091	1.365	0.147		
inhibition	0.182	2.880**	0.004	0.370	0.137
sensitivity	0.148	2.324	0.021		
coping	-0.007	-0.091	0.927		
control	0.144	-0.547	0.585		

**Table 4.** Regression analysis of dimensions of the Affective Temperament concerning self-injury behaviors

variable	$\beta$	t	Sig.	R	R <sub>2</sub>
depressive	0.141	2.087**	0.000		
anxious	0.056	-0.827	0.409		
apathetic	-0.003	0.042	0.967		
cyclothymic	-0.008	0.125	0.901		
dysphoric	0.039	0.539	0.581		
volatile	0.139	2.064**	0.004	0.395	0.161
obsessive	-0.036	-0.549	0.583		
euthymia	-0.149	-2.349**	0.002		
hyperthymia	-0.093	-1.373	0.171		
irritable	0.098	1.478	0.141		
Disinhibited	0.233	3.679**	0.000		
euphoric	0.046	0.686	0.493		

## Discussion

This study aimed to predict self-injury behaviors in Students based on Affective and Emotional Composite Temperament Model. The results of this study showed that the dimensions of anger, inhibition and sensitivity of the AFECT model have a positive and significant relationship with self-injury behaviors and the dimensions of volition, coping and control have a significant negative relationship with self-injury behaviors. Also, Emotional Temperament of volition and inhibition was able to predict self-injury behaviors. The dimensions of depressive, dysphoric, volatile, irritable and disinhibited of Affective Temperament had a positive and significant relationship with self-injury behaviors and the euthymia dimension with self-harm behaviors had a significant negative relationship. Among them, depressive, volatile, Disinhibited and euthymia were able to predict self-injury behaviors.

According to Affective and Emotional Composite Temperament Model, anger occurs when a person's desires fail or an unpleasant event occurs (30). The result is in line with the research of Khanipour et al. (36) and Oconnor, Rasmusse & Hawton (37). In these studies, it was found that anger and impulsivity in people with self-injury behaviors are more than other people. Klonsky & Muehlenkamp, on the other hand, introduce anger as one of the pre-emotional states of self-injury behavior (20). Inhibition is derived from the combination of fear (worry, shyness, and fear) and caution (accuracy, risk aversion, and consideration) (21). Dimensions of this temperament include the general tendency to negative emotions such as fear, sadness, anger, and hatred, and refers to the withdrawal from the experience of new stimuli and the tendency to experience negative emotions in the face of a new stimulus (38). This finding is in line with studies such as Joyce et al. (39), Klonsky et al. (14) and Hashemi Razini, Dehghan and Rasouli (32) who showed that self-injury behaviors are associated with high negative excitability and harm avoidance. On the other hand, sensitivity is due to vulnerability to withdrawal and rejection in interpersonal relationships (being criticized and rejected in relationships) and everyday life events (such as frustrations, failures, and traumas) (40). According to the researchers conducted by Latina et al. (39), You, Zheng, Lin, Leung (40) and Hamza et al. (41), Bolandi (36)

and Woo Kyeong Lee (42), there are problems in the relations between Individual and social interactions of individuals with self-injury behaviors have shown, the result can be considered in line with the above research.

Volition includes positive emotion, motivation, and energy, and coping refers to how one copes with challenges and solves personal problems that ultimately lead to personal development (21, 43). The concept of volition and coping in the AFECT model is closely related to the self-directiveness character proposed in Cloninger theory (21, 30). Self-directiveness is related to a person's ability to control order and behavioral adaptation to the environment and to choose appropriate goals and values (29). In addition, coping refers to how a person faces problems and their ability to find solutions and use experiences for greater adaptation (21).

The Emotional Temperament of control also includes the increase in awareness and attention, decision-making capacity and planning strategies, controlling the environment by attention and sense of organization, task and adequacy (30) and related to self-directiveness character in Cloninger model and conscientiousness from a five-factor model and it is a factor that is generally related to executive functions (23).

This finding is in line with study conducted by Patrick et al. (2016) who found in a study of prisoners that 67% of those who have self-injury behaviors stated that they committed this behavior simply to vent their Emotions (44). Brackman et al. (45), Cerutti et al. (46), Glenn and Klonsky (47) and Fox et al. (48) in their research have pointed to the role of emotion regulation and management problems, the source of external control, feeling of lack of control over events and ineffective coping strategies in the occurrence of self-injury behavior.

Therefore, coping strategies that a person uses when faced with problems and unpleasant experiences play an important role in how he/she reacts when faced with unpleasant events and experiences, and the more person can cope, control the environment, are less likely to show self-injury behaviors when experiencing unpleasant events, failures, and emotional problems.

Among the affective temperament, depressive, dysphoric, volatile, irritable and disinhibited, had

a positive and significant relationship with self-injury behaviors and euthymia had a significant negative relationship with self-injury behaviors. This finding can be explained by the fact that Lara (2012) divides Affective Temperament into four categories: stable, unstable, internalized, and externalized. Depressive is associated with the highest degree of internalization in the category of internalized temperament. dysphoric and volatile are in the category of unstable, irritable and disinhibited are in the category of externalized temperament and euthymia is in the category of stable temperament. (30, 49). Dysphoric is associated with high activation and inhibition, volatile is associated with unbalanced regulation of activation and inhibition, irritable is associated with high innovation and moderate harm avoidance, and disinhibited is related to deterrence and low harm avoidance (30, 43, 50).

In addition, euthymia has a negative and significant relationship with the dimensions of anger. This temperament is the most stable type with balanced activation and inhibition and is characterized by moderate innovation and harm avoidance and high control (23, 48, 51), which are protective factors against violence, aggression, impulsivity and mood instability (42, 51).

Overall, the results of this study show that the dimensions of Affective and Emotional Temperament of the AFECT model have a significant relationship with self-injury behaviors and also the AFECT model is effective in explaining and predicting self-injury behaviors in Students that can be used in research and clinical fields.

One of the limitations of this study was the use of a questionnaire to collect information about self-harming behaviors. Given that self-injury behavior is a behavior with different motives and causes, it is suggested that similar studies be conducted using exploratory and in-depth methods such as interviews to gather information about self-injury behaviors and its relationship with temperamental and personality characteristics. Also, considering that the present study was conducted on secondary high school students in District 1 of Namin in Ardabil province, care should be taken in generalizing the results. Therefore, it is suggested that similar studies be conducted in other regions and cities and examine the relationship between these variables. Due to the difference in age groups of first and secondary high school students, this

study was conducted only on secondary high school students, therefore, it is suggested that in future studies, first high school students be used and compared with secondary high school students. Self-injury is a high-frequency behavior in adolescence (8). Numerous studies have pointed to the inability of people with self-harming behavior to react effectively to unfortunate events and emotions and to perform Self-injury behaviors as a way to get rid of unpleasant emotions immediately (10, 12, 14). Since Temperamental components affect how people interpret events, how they react to events, and their ability to manage and regulate emotion (21, 23), one of the applications of this study in clinical and therapeutic situations is the use of Affective and Emotional Composite Temperament scale to identify students who are at risk or have Self-injury behaviors to reduce the rate of these behaviors by a timely and effective intervention. Also, using other intervention programs such as emotion regulation training programs, students learn the skills needed to control and manage emotions.

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### **Conflict of Interests**

The authors have not any conflict of interest.

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## مقاله پژوهشی

## پیش بینی رفتارهای خود آسیبی بدون قصد خودکشی در دانش آموزان دوره دوم متوسطه بر اساس مدل ترکیبی سرشت‌های عاطفی هیجانی

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### چکیده

**زمینه و هدف:** خود آسیبی بدون قصد خود کشی رفتاری با فراوانی بالا در نوجوانی است و پژوهش‌های متعددی به نقش متغیرهای سرشتی بر بروز این رفتارها اشاره کرده‌اند. هدف این پژوهش پیش بینی رفتارهای خود آسیبی در دانش آموزان متوسطه دوره دوم بر اساس مدل ترکیبی سرشت‌های عاطفی-هیجانی بود.

**مواد و روش‌ها:** پژوهش حاضر یک مطالعه توصیفی از نوع همبستگی بوده و جامعه آماری آن تمامی دانش آموزان دوره دوم متوسطه شهر نمین در استان اردبیل بودند که از میان آنان تعداد ۲۰۵ دانش آموز با استفاده از روش نمونه گیری خوشه‌ای چندمرحله‌ای انتخاب شده و با پرسشنامه سرشت‌های ترکیبی عاطفی-هیجانی و پرسشنامه آسیب به خود مورد بررسی قرار گرفتند. تحلیل داده‌ها با استفاده از نرم افزار SPSS-v.20، آزمون همبستگی پیرسون و رگرسیون گام به گام انجام شد.

**نتایج:** ابعاد سرشت هیجانی با ضریب همبستگی گام به گام ۰/۳۷، حدود ۱۳ درصد از تغییرات مربوط به رفتارهای خود آسیبی را تبیین و پیش بینی می‌کند. ابعاد اراده به صورت منفی و بازداری به صورت مثبت توانستند رفتارهای خود آسیبی را پیش بینی نمایند. ابعاد سرشت عاطفی نیز در مجموع توانستند با ضریب همبستگی ۰/۳۹۵، حدود ۱۶ درصد از تغییرات مربوط به رفتارهای خود آسیبی را تبیین و پیش بینی کنند که ابعاد افسرده، تغییر پذیر و بازداری‌زدا به صورت منفی و بعد متعادل به صورت مثبت توانستند رفتارهای خود آسیبی را پیش بینی نمایند.

**نتیجه‌گیری:** نتایج پژوهش نشان داد که مدل AFFECT قادر به تبیین و پیش بینی رفتارهای خود آسیبی در دانش آموزان است. بنابراین نتایج پژوهش حاضر تلویحات مهمی در زمینه استفاده از مدل AFFECT با هدف شناسایی گروه‌های در معرض رفتار خود آسیبی داشته و می‌توان از آن به منظور طراحی مداخلات پیشگیرانه برای این رفتارها و پیامدهای آن استفاده نمود.

**کلمات کلیدی:** خود آسیبی بدون قصد خود کشی، مدل ترکیبی سرشت‌های عاطفی-هیجانی، دانش آموزان

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