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Predictive Relationships among Reward Addiction - Punishment Sensitivity and Reward Addiction - School Burnout in Middle School

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Abstract

Sensitivity to punishment and reward addiction in the academic context are considerably new areas of study. In recent years, the importance of school burnout has also increased. This study was conducted to identify the relationships between middle school students' reward addiction, sensitivity to punishment in the academic context and school burnout. Firstly, a scale of reward addiction in the academic context for middle school students was developed, and then, the relationships among reward addiction, sensitivity to punishment and school burnout were examined. The participants of the study were 741 students studying at five state middle schools in Eskisehir. The Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) analyses of the scale developed in the study showed that it had construct validity for two factors, and CFA analyses results indicated that they had reliable coefficients. To test the relationship between reward addiction and sensitivity to punishment, CFA and Path Analysis were conducted. According to the results, as the students' levels of reward addiction increased, their sensitivity to punishment also increased. The variable of reward addiction explained 60% of the variance in sensitivity to punishment. The Multiple Regression Analysis conducted to determine whether middle school students' reward addiction in the academic context predicts their levels of school burnout showed that reward addiction was a significant predictor of school burnout.

Keywords

Reward addiction
Punishment sensitivity
School burnout
Academic context
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Introduction

Even though learning is a valuable activity by itself, learning experiences may not alwayse include appropriate life experiences. This is because in learning contexts, some of the attitudes of individuals being interacted with (parents, teachers) may lead to school burnout syndrome (Aypay, 2011, 2012) and some practices being exposed (rewarding, punishing) may lead to reward addiction or punishment sensitivity in students (Ilegbusi, 2013; Maag, 2001). Educational contexts are often associated with reward and punishment practices due to their nature. Both parents and teachers apply such practices at home and school for many purposes such as changing negative student behaviours, enabling active student participation to learning activities, and teaching students the habit of fulfilling their duties and responsibilities related to school and learning. Reward is a pleasant stimulus that is presented to an individual to make him/her perform a desired and approved behaviour more often after performing this behaviour (Reynolds, 1975). This process which is conducted to increase the possibility of repeating the desired behaviours in education systems is called rewarding. On the other hand, punishment is an unpleasant stimulus that is presented to an individual to eliminate an undesired and unapproved behaviour from his/her behaviour repertoire after performing this behaviour (Reynolds, 1975). This process which is conducted to decrease the possibility of repeating the undesired behaviours in education systems is called punishment.

Much has been said about the effects of reward and punishment. For example, although the importance of rewarding is widely known as an formation strategy to behaviours (Cameron & Pierce, 1994; Ching, 2012; Covington, 2000; Deci, Koestner, & Ryan, 1999; Pintrich, 2000), there are conclusive findings that point to destructive and negative effects of particularly standardised rewards such as loss of internal motivation, the quality of the work done and decreasing its quality in terms of creativity (Amabile, 1996; Deci et al., 1999; Eisenberger, Pierce, & Cameron, 1999). In addition, Deci et al. (1999) point out the danger of individuals' expecting to be rewarded if a reward is given frequently although they are not conditioned for the duty.

With regard to rewarding, findings from studies conducted using high technology tools show that conditioned rewards (those that are known at the beginning) have a feature that causes addiction (Delgado, Locke, Stenger, & Fiez, 2003; Knutson, Adams, Fong, & Hommer, 2001). The findings of these studies have revealed that the reactions of human brain to stimuli that cause addiction, and to reward stimuli are considerably similar. In both cases, this effect disappears after a short-time relief, and the need for a new dose arises (Pink, 2009). Approaching Deci et al.'s (1999) statements based on these findings, it can be argued that even unexpected rewards may have the risk of causing addiction in the process.

In spite of the short-term and quickly observed benefits of punishment bring another practice that parents and teachers use as a strategy for forming behaviour, there are studies emphasising that it disrupts students' psychological state and leads to negative results by damaging their academic future. For example, Ahmad, Said, and Khan (2013) found that punishment negatively affected student learning and motivation in the classroom. Naz, Khan, Daraz, Hussain, and Khan's (2011) findings revealed that punishment cause lower class participation, create distraction, drop-out, loss of self-confidence, fear and hesitation, inhibition of their learning and creativity, and reluctance. Arif and Rafi (2007) also found that punishment caused academic decline in students.

Even though punishment is a procedure that aims to eliminate negative behaviours from individuals' repertoire of behaviours, it was reported in a study (Arif & Rafi, 2007) that it causes students to perform more negative behaviours. In another study, it was found that punishment caused students to develop negative feelings, thoughts and behaviours towards both themselves and other people by negatively affecting their feelings, thoughts and personality structures (Aypay, 2017; Naz et al., 2011). Based on and in addition to these negative effects of punishment, students' becoming individuals with high sensitivity to punishment (i.e. fear of getting punished and trying to avoid punishment) is argued to be one of the negative consequence of punishment on students (Aypay, 2015a).

The findings on the addictive characteristic of reward, and punishment causing sensitivity to getting punished bring to mind the concepts of reward and punishment sensitivities in Gray and McNaughton's (2000) Reinforcement Sensitivity Theory. While reward sensitivity is defined as individuals' learning that their emotional states and behaviours are strongly reinforced by positive incentives (Van Der Linden, Beckers, & Taris, 2007); reward addiction may emerge when one's feelings and behaviours are controlled by positive incentives (Aypay, 2016a, 2016b). On the other hand, sensitivity to punishment is defined as "the sensitivity that results in being over sensitive to punishment and punishment stimuli, fear, anxiety, inhibition, and reactivity that is not functional" (Aypay, 2015a).

Reinforcement Sensitivity Theory proposes that reward and punishment sensitivities are functions of faculties that operate independently in human brain (Gray & McNaughton, 2000). As a matter of fact, reward and punishment are used for opposite purposes in education systems. However, it is assumed that individuals with reward addiction would be the first ones noticing a reward having lower value than expected, and this would make them disappointed (Carver, 2004; Corr, 2002; Harmon-Jones, 2003).

Aypay (2015b) argues that the effects of practices related to reward and punishment on individuals would yield results that are related to each other. In other words, just as much contented an individual whose reward addiction has reached to the level of addiction is when he/she gets a reward, he/she would experience as much disturbance in the absence of a reward or when the rewarding stops. This situation forms a perception of punishment in the individual. On the other side, just as much disturbing getting punished is for an individual in the case of high sensitivity developed against punishment, a situation without punishment would be that pleasing for him/her. This forms a perception of reward in the individual. According to the researcher, another possible explanation for the reward-punishment relationship is the view that both practices are external interventions to behaviour and external interventions cause weakening in individuals' perception of control. In this way, for example, the addiction developed to outside world in experiencing the feeling of pleasure by individuals whose behaviours are tried to be frequently controlled with reward would lead them to the belief that encountering unpleasant results are also out of their own control. The researcher hypothesises that the effects of reward and punishment practices on each other emerge more clearly particularly in the case of an increase in the level of reward addiction. Aypay (2015b) tested this hypothesis on high school students and revealed that reward addiction as the independent variable explained over half of of the variation in the sensitivity to punishment.

Schools where rewarding and punishment is often applied are also a source of burnout syndrome resulting from school in individuals. School burnout is a syndrome caused by excessive demands that students have difficulty in meeting in academic life and perceived as a long term stress factor (Aypay, 2011). In other words, stress cause school burnout. In this regard, it was found that school burnout could also develop in middle school students (Aypay, 2011; Baş, 2012; Zhang, Klassen, & Wang, 2013). School burnout can cause certain undesired behaviours in students. For instance, students who develop school burnout syndrome attend the school less frequently (Tuominen-Soini & Salmela-Aro, 2014), delay their academic responsibilities more often (Çakır, Akça, Kodaz, & Tulgarer, 2014), make more absences, are more likely to drop out of school and become less motivated (Bask & Salmelo-Aro, 2012), and their tendency to enter depression (Salmela-Aro, Savolainen, & Holopainen, 2009) and develop suicidal thoughts increases (Dyrbye et al., 2008). In order to eliminate the negative results caused by school burnout, the factors that lead to burnout in students or the variables that are related to burnout should be determined.

The phenomena of reward addiction and sensitivity to punishment in academic contexts, and school burnout, each of which refers to a negative state, are consequences of misapplications in academic experiences. It is not likely that these negative consequences that stem from the misapplications in academic life develop independently from each other. It seems reasonable to think that they are related, and even have a cause-effect relationship between them, or facilitate the emergence

of another negative consequence. The findings of recent studies also confirm this view. For example, it was found that high school students' levels of reward addiction explained more than half of the change in their sensitivity to punishment (Aypay, 2015b), high school students' reward addiction in the academic context was a predictor of their school burnout (Aypay, 2016a), and middle school students' sensitivity to punishment in the academic context significantly explained their school burnout (Aypay, 2015b).

Although middle and high school years are called the adolescence years, the middle school period is called the early adolescence and the high school period is called the mid-adolescence (Çok, 2007). Certain research findings that examined the same phenomenon separately for students at middle and high school levels show how the differences between students' developmental characteristics cause differences in their experiences of the same phenomenon. For instance, while school burnout syndrome revealed a four-dimension structure (i.e. burnout due to school activities, burnout due to family, incompetence at school, lack of interest in the school) for middle school students (Aypay, 2011), the same syndrome had a seven-dimension structure (i.e. losing interest in school, burnout from studying, burnout due to family, burnout from doing homework, being bored and tired of teacher attitudes, the need to rest and have fun, and incompetence at school) for high school students (Aypay, 2012). Similarly, the phenomenon of sensitivity to punishment in the academic context showed a three-dimensional structure (i.e. inhibition due to punishment, negative attitudes towards punishment contexts, and regulatory effect of punishment) for middle school students (Aypay, 2015a), whereas in a study with high school students it revealed a four-dimensional structure (i.e. fear of punishment, negative attitudes towards punishment contexts, negative self-feelings due to punishment, and inhibition due to punishment) for high school students (Aypay, 2015b). This variation among students at different levels is affected by both the differences between students' cognitive and psychological characteristics depending on increasing age, and experiential differences due to having less or more learning experience.

Considering the arguments provided above, it seems significant to determine what kind of a pattern the relationship between reward addiction and sensitivity to punishment in the academic context revealed in the analyses conducted within data gathered through measurement tools developed for high school students would be yielded within data gathered by using measurement tools developed for middle school students. Similarly, it is also important to determine whether reward addiction in the academic context as a variable predicting high school students' school burnout would also be valid for middle school students. Accordingly, this study aimed to answer two basic questions for middle school students.

I. Is middle school students' reward addiction in the academic context related to their sensitivity to punishment?
II. Is middle school students' reward addiction in the academic context a significant predictor of their levels of school burnout?

Since no measurement instrument was found to identify middle school students' levels of reward addiction unique to the academic context in the literature, a measurement instrument was primarily developed. This was a secondary aim of this study in order to respond these questions. Although reward and punishment are used for opposite purposes in education systems, such a study that can help determine how reward and punishment work for middle school students in practice can enable parents and teachers to gain awareness regarding the proper and purposive use of these tools. Additionally, determining whether rewarding practices for yielding positive effects in students leads to a potential danger such as school burnout can raise individuals' awareness on the use of rewards more appropriately.

Method

Research Design and Participants

This study adopted the relational screening model. The research data were gathered simultaneously from different age groups. The population of the study consisted of 32,688 students attending the fifth, sixth, seventh and eighth grades of middle schools located in the central districts of Eskisehir province, i.e. Odunpazari and Tepebasi. In the study, a sample group of 380 students were found to be sufficient in sample selection at the level of 0.05 confidence interval. Through simple random sampling, five of the 76 middle schools in the Odunpazari and Tepebasi districts were selected by using the web site "random.org". The study was conducted with 763 participants who were the voluntary students in the classrooms for which the schools granted permission. Twenty-two of the filled formed were excluded from the data set due to missing answers, which left 741 valid forms. The distribution of the students based on schools are 219 (29.55%), 91 (12.28%), 188 (25.37%), 137 (18.48%) and 106 (14.30%), respectively. Thirty-two of the students did not state their gender. Among 709 students who did, 353 were female (49.78%) and 356 were male (50.21%). The distribution of the students based on grade levels is as follows: 123 (16.59%) 5th graders, 133 (17.94%) 6th graders, 237 (31.98%) 7th graders and 248 (33.46%) 8th graders.

Data Gathering Tools

Personal Information Form: In this form developed by the researcher, the students were asked to state the name of their school, their grade level and gender.

Scale of Punishment Sensitivity in The Academic Context (SPSAC) for Middle School Students: This scale was developed by Aypay (2015a) for middle school students. The scale was rated as Strongly Agree (4), Agree (3), Somewhat Agree (2) and Strongly Disagree (1), and high scores indicated higher the level of sensitivity to punishment. The scale demonstrated a three-factor structure, each of which included three items, that explained 66% of the total variation in the students' sensitivity to punishment in the academic context. The factors were named as Inhibition Due to Punishment (IDP), Negative Attitudes Towards Punishment Contexts (NATPC) and Regulatory Effect of Punishment (REP). Sample items for each factor are as follows: [“"If I think I will get reaction, I don't answer to a question in a class even though I know the answer.”, ““I don't like the school since it is a place where you get punished.”, “I get angry with myself when I perform a behaviour for which I get punished because of my courses.”]. Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted on the scale data. The CFA fit indices for the model were as follows: [(χ^2/sd=1.75), *GFI*=0.96, *AGFI*=0.93, *NFI*=0.95, *NNFI*=0.97, *SRMR*=0.05, *RMSEA*=0.05, *CFI*=0.98]. The test-retest reliability of SPSAC was .80, and the Cronbach's Alpha coefficients for the whole scale and the factors were .80, .80, .75, and .61, respectively.

Elementary School Student Burnout Scale for Grades 6-8 (ESSBS): This scale was developed by Aypay (2011) for middle school students. The scale was rated as Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1), and high scores indicated higher the level of school burnout. The scale demonstrated a four-factor structure, that explained 59% of the total variation in the students' school burnout. The factors were named as Burnout Due to School Activities (BDSA), Burnout Due to Family (BDF), Incompetence at School (IS) and Lack of Interest in the School (LIS). The factors contained 12, 5, 4 and 5 items, respectively, and six items were reversed in response. Sample items for each factor are as follows: ["I'm tired of studying.", "I'm bored with my family asking more than I can do in my courses.", "I often feel myself incompetent at school.", "I don't want to go to school."]. Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted on the scale data. The CFA fit indices for the model were as follows: [(χ^2/sd=2.68), *GFI*=0.94, *AGFI*=0.91, *PGFI*=0.89, *RMSEA*=0.07, *CFI*=0.91]. The Cronbach alpha internal reliability coefficients calculated for the factors of ESSBS were .92, .83, .76 and .81, respectively.

Reward Addiction Scale in the Academic Context (RASAC) for Middle School Students: The scale was developed by the researcher within the scope of this study. The scale was rated as Strongly

Agree (4), Agree (3), Somewhat Agree (2) and Strongly Disagree (1), and high scores indicated higher the level of reward addiction. The scale demonstrated a two-factor structure, each of which included five items, that explained 62% of the total variation in the students' reward addiction. The factors were named as "High Expectation of Reward (HER)" and "Reinforcement Effect of Reward (RER)", respectively. Sample items for each factor are as follows: [“After every one of my school achievements, I expect to receive rewards bigger from the ones my parents have given me before.”, “I study for my classes at once, if I know that I will be rewarded for it.”]. EFA and CFA were performed on the scale data. The CFA fit indices were as follows: [(χ^2/sd=2.05), *CFI*=0.97, *NFI*=0.95, *NNFI*=0.97, *RMSEA*=0.06, *SRMR*=0.5]. The Cronbach alpha coefficients for the RASAC factors and the total score are .86, .82 and .89, respectively. In order to develop the Reward Addiction Scale in the Academic Context (RASAC) for Middle School Students within the scope of this study, 50 middle school students were asked to write their feelings, thoughts and behaviours related to being rewarded in the academic context in an open-ended way. In addition to the data gathered from the students, a draft form containing a total of 24 items was formed using the theoretical base and research findings towards the effects of punishment in the literature. After two experts in educational psychology confirmed the suitability of the items, their understandability was checked in a pilot application with 25 middle school students. Of the 741 students who participated in the study, the data gathered from 250 were used for EFA, and those from 243 were used for CFA. For the construct validity of RASAC developed in this study, Direct Oblimin Rotation Technique in EFA was applied to half of the dataset, and the resulting structure was tested with CFA in the other half of the dataset. The reason why Direct Oblimin Rotation Technique was employed in EFA (Büyüköztür, 2002) was related to the assumption that the factors constituting reward addiction would be related to each other. In order to have a purer test in EFA, the items with factor loading values of .50 and above were selected, and others were excluded. Additionally, the items that were loaded on two factors with a difference of .10 and below were also excluded. The reliability of the scale was analysed by calculating the Cronbach's Alpha coefficient, test-retest reliability with the data gathered from a group of 60 students for the second time in a 20-day interval, and item discrimination index for the whole scale and its sub-factors. While calculating the item discrimination index, the item-total correlations were considered, the differences between the item mean scores of the bottom and top 27% groups determined according to the total scale scores were tested with t-test, and α=.001 was selected as the significance level. In addition, the anti-image correlations were calculated for the items.

Procedure

The data gathered from 493 participants within the whole data from 741 individuals in the study were used in the validity and reliability analyses of the RASAC. The data gathered from 250 participants were used for EFA, and those from 243 were used for CFA. Then, the structural model test established between the variables of reward addiction and sensitivity to punishment in the academic context, and the regression analysis for the relationship between these variables were conducted on the data gathered from 248 individuals. Prior to the analysis of the structural model established towards the relationship between middle school students' reward addiction and sensitivity to punishment, whether the measurement model as the first step of the structural equation modelling was established was examined through CFA. The structural equation modelling was then established with the latent variables and tested with path analysis. Afterwards, the structural model towards the relationship between the sub-dimensions of reward addiction and the sensitivity to punishment was tested.

Data Analysis

One of the two aims of this study is to test the model developed for the relationship between reward addiction and sensitivity to punishment in the academic contexts. For this aim, confirmatory factor analysis and path analysis techniques were employed. By means of the confirmatory factor analysis, it was examined whether the measurement model as the first step of structural equation modelling was established. The structural equation modelling was then established with the latent variables and tested with path analysis. With regard to the second primary aim of the study, which was to determine whether levels of reward addiction in the academic context predicted students' school burnout, multiple linear regression analysis was conducted. The outlier values were firstly excluded

from the data set for the analyses. In this respect, Mahalanobis distance was calculated, and then, the significant values at the level of p = .001 were accepted as outlier values and excluded from the data set (Mertler & Reinhart, 2016). In order to determine whether the sample size was suitable for factor analysis, Kaiser-Meyer-Olkin coefficient was calculated and found to be .90. The results of the Bartlett's test that provides information about multiple linearity and multiple normality (Çokluk, Şekercioğlu, & Büyüköztürk, 2010) were examined, and the χ^2 value obtained in this test was found to be significant ($\chi^2_{(45)}$=945,880, p<.001). Besides, to determine whether there was a multicollinearity problem among the items, correlation coefficients were calculated, and the highest coefficient was found to be .71. Since this value was below .85 (Field, 2009), it was decided that there was no multicollinearity problem.

Results

Findings Related to The Validity And Reliability of Reward Addiction Scale in The Academic Context (Rasac) for Middle School Students

Direct Oblimin Rotation Technique was used in EFA conducted for the construct validity of RASAC. The brains reacts to addictive drugs is in the form of short-term relief after taking the drug, and then, a desire for a new dose. It is known that tolerance is developed to higher doses in time (Pink, 2009). In other words, addiction includes both the state of an increased sensitivity to a drug, and the behaviours that start to be controlled by the same drug. Consequently, these characteristics that form the state of addiction are thought to be related to each other. Because the brain's reactions to conditional rewards are similar to those reactions to addictive substances (Pink, 2009), it is assumed that the factors that constitute reward addiction would be related to each other. In cases where it is assumed that factors are related to each other, the use of the Direct Oblimin Rotating Technique is more suitable (Büyüköztürk, 2002). The KMO value of RASAC was 0.90, and the Bartlett's test result was significant ($\chi^2_{(45)}$=945,880, p<.001). EFA results of RASAC are presented in Table 1. As a result of the EFA, the eigenvalues of the two factors having values higher than 1 and explaining 62% of the total variance were 5.05 and 1.17, respectively. The common variances of the two factors defined related to the items ranged from .47 to .69. The variances that the factors explain were 50.49% and 11.69%, respectively. After the rotation, each scale factor consisted of five items. Since the items in the first factor emphasised that students have a high expectation of reward as a condition for fulfilling academic duties, this factor was named as High Expectation of Reward (HER). As the items in the second factor featured an exaggerated positive effect in students' emotional states and motivation, this factor was named as Reinforcement Effect of Reward (RER).

Table 1. Explanatory Factor Analysis Results of RASAC

Factor Loading After Rotation				
Factor Name	**Items**	**Factor-1**	**Factor-2**	**Common Variance**
High expectation of reward (HER)	13	**.88**	.09	.67
	9	**.84**	.23	.69
	15	**.78**	.16	.62
	12	**.76**	.23	.69
	16	**.58**	.30	.56
Reinforcement effect of reward (RER)	5	.08	**.85**	.64
	17	.19	**.82**	.68
	1	.16	**.71**	.47
	19	.30	**.65**	.57
	11	.33	**.57**	.63
Cronbach's Alpha		.86	.82	.89 (Total)
Explained Variance Total: % 62.18		% 50.49	% 11.69	

Based on the eigenvalue criterion, the number of important factors in the scale was defined as two. Besides, examining the component matrix table, it was observed that the factor loadings of all the 10 items in the first factor were .59 and over. This finding shows that the scale has also a general factor. The variance explained by the first factor prior to rotation being 50%, and a steep decline being observed after the first factor in the scree plot are the proofs of the existence of this general factor. To determine whether the scale was prepared in the form of an additive scale, Tukey's Additivity Test (Özdamar, 2013, p. 560) was conducted. The results showed that the nonadditivity value of the scale was not significant, (F=2.12, P>.05). This is another proof for the view that the scale had an additive form characteristic. For this reason, the use of RASAC with one factor as well as two factors is also suitable. The sub-factors of RASAC showed strong correlations with the whole scale (r=.80 and r=.88, p<.01) and moderate correlations with each other (r=.42, p<.01).

The two-factor structure of RASAC identified in EFA was subjected to CFA in the second dataset with 243 individuals. The chi-square value calculated for data fit was revealed as [$\chi^2_{(34)}$=69.87, p<.01]. The goodness-of-fit indices for the model are presented in Table 2.

Table 2. Fit Indices of the Confirmatory Factor Analysis for RASAC

Fit Index	Value	Interpretation
χ^2	69.87	(p < .05)
sd	34	
χ^2 / sd	2.05	Good fit (Kline, 2005)
RMSEA	.06	Acceptable (Jöreskog & Sörbom, 1993)
SRMR	.05	Acceptable (Anderson & Gerbing, 1984)
CFI	.97	Perfect fit (Tabachnick & Fidell, 2011)
NFI	.95	Perfect fit (Kline, 2005)
NNFI	.97	Perfect fit (Kline, 2005)

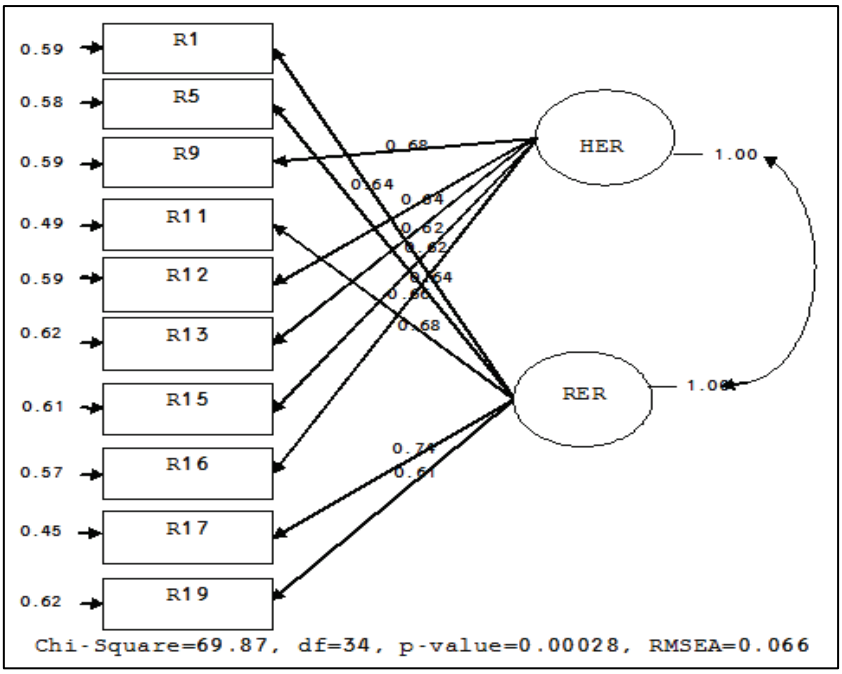

Figure 1. Path Diagram for RASAC

The Cronbach alpha coefficients for the RASAC factors and the total score are .86, .82 and .89, respectively. The test-retest correlations were .78, .80 and .78 for RASAC factors and the whole scale, respectively. The item-total correlations for all the items ranged between .49-.71. The t-test result showing the difference between the item mean scores of the bottom and top 27% achieving groups that were formed based on the scale total scores was significant (p<.001).

Findings Related to The Predictive Relationships among Middle School Students' Reward Addiction - Sensitivity to Punishment in The Academic Context and Reward Addiction - School Burnout

The correlations between reward addiction and sensitivity to punishment in academic contexts are presented in Table 3.

Table 3. Correlations of SPSAC and RASAC Factors with Each Other and Total Scores

	IDP	**NATPC**	**REP**	**SPSAC**	**HER**	**RER**
IDP						
NATPC	,385**					
REP	,426**	,340**				
SPSAC	,806**	,747**	,748**			
HER	,322**	,509**	,414**	,536**		
RER	,293**	,390**	,365**	,451**	,542**	
RASAC	,349**	,511**	,443**	,561**	,871**	,885**

(IDP: Inhibition Due to Punishment; NATPC: Negative Attitudes Towards Punishment Contexts; REP: Regulatory Effect of Punishment; SPSAC: Scale of punishment sensitivity in the academic context for middle school students; HER: High Expectation of Reward; RER: Reinforcement Effect of Reward; RASAC: reward addiction scale in the academic context for middle school students)

As is seen in Table 3, the dimensions of reward addiction and sensitivity to punishment showed moderate correlations between teach other, whereas the factors of both scales were strongly correlated to total scores in the scales. The factors of both scales were positively correlated to each other, and the correlation coefficients ranged from .29 to .50. Moreover, the results of Tukey's Additivity Test for both scales showed that these scales could be used with a unidimensional structure as well as with sub-dimensions. Considering the correlations in Table 3 and that both scales can be used as a unidimensional structure, it would be suitable to use path analysis in testing the hypothesis regarding the positive relationship between reward addiction and sensitivity to punishment in academic contexts.

Prior to the analysis of the structural model established towards the relationship between middle school students' reward addiction and sensitivity to punishment, whether the measurement model as the first step of the structural equation modelling was established was examined through CFA. The analysis revealed that the measurement model was established. The path diagram for the model obtained in CFA is shown in Figure 2. The structural equation modelling was then established with the latent variables and tested with path analysis. The model obtained as a result of the path analysis is presented in Figure 3, and the goodness-of-fit indices are given in Table 4

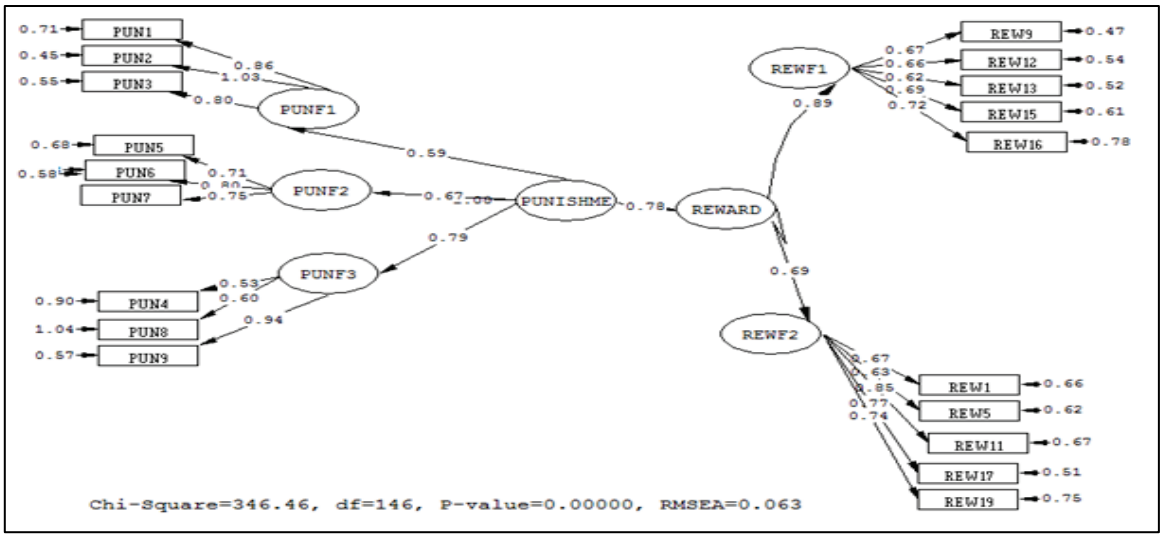

Figure 2. Yapısal Eşitlik Modellemesi: Ölçme Modeli

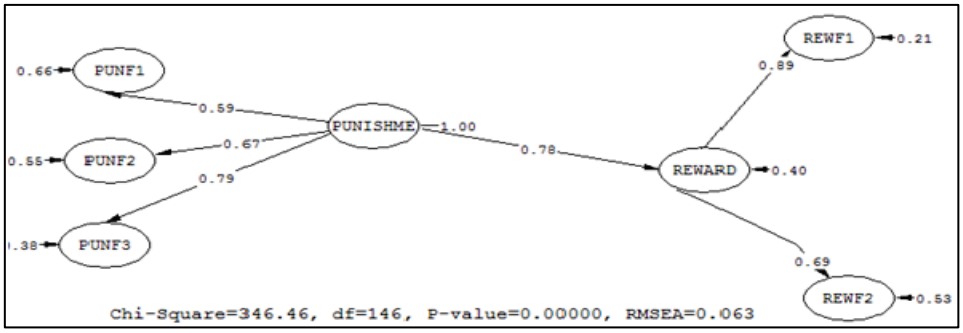

Figure 3. Structural Equation Modelling: Structural Model

Table 4. Fit Indices of The Structural Equation Modelling

Fit Index	Value	Interpretation
χ^2	346.46	($p < .05$)
sd	146	
χ^2 / sd	2.37	Good fit (Kline, 2005)
RMSEA	.063	Acceptable (Jöreskog & Sörbom, 1993)
SRMR	.06	Acceptable (Anderson & Gerbing, 1984)
CFI	.96	Perfect fit (Tabachnick & Fidell, 2011)
NFI	.93	Good fit (Kline, 2005)
NNFI	.95	Good fit (Kline, 2005)

With respect to reward addiction as a predictor of sensitivity to punishment in academic contexts, it is hypothesised that the effect of reward addiction in causing sensitivity to punishment would be mostly related to high expectation of reward. While the content that students feel due to the rewards they receive enhances their willingness to repeat the reward-winning behaviour, it also raises the expectation of being rewarded not just for that behaviour and similar performances in the past, but also for performances in many different situations in the future. As the number of such experiences increase, the intensity of this expectation also gets stronger. In this way, despite the increasing reward expectation for all performances, it would be inevitable that any unrewarded performance is perceived as a kind of punishment by students. From this perspective, it seems more reasonable to argue that reward addiction in the academic context causes sensitivity to punishment not actually due to the reinforcement effect of rewards, but by the high expectation of reward. In order to test the accuracy of this hypothesis,

the structural model towards the relationship between the sub-dimensions of reward addiction and the sub-dimensions of the sensitivity to punishment was tested. The analysis revealed that the measurement model was established. The model is presented in Figure 4, and the fit indices of the model are given in Table 5.

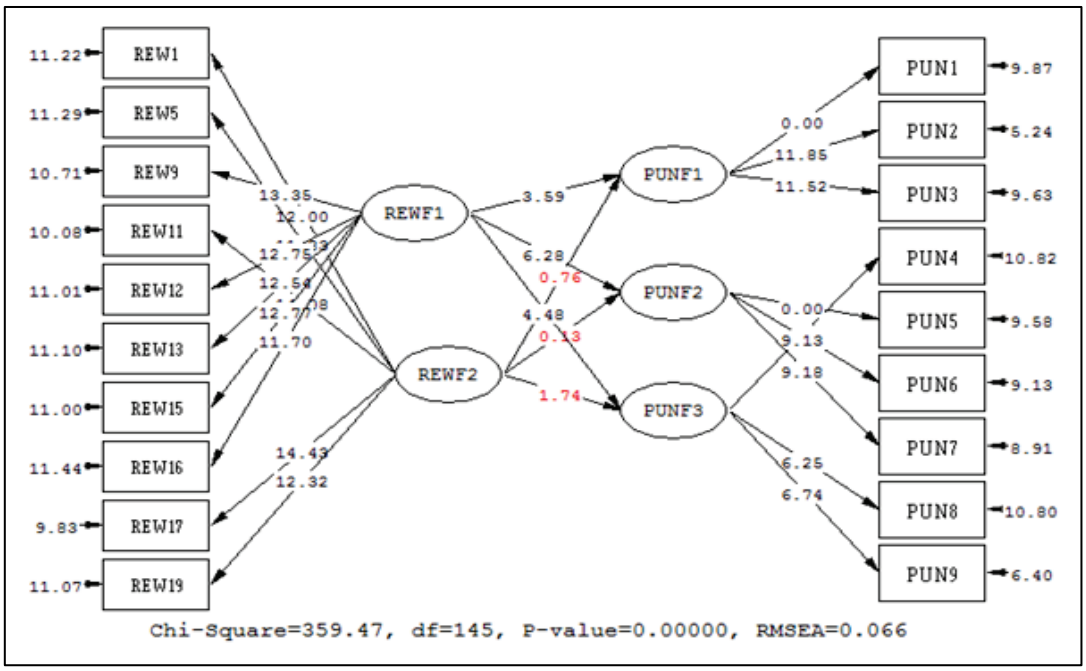

Figure 4. Structural Equation Modelling: Scale Model

Table 5. Fit Indices of The Structural Equation Modelling

Fit Index	Value	Interpretation
χ^2	359.47	($p < .05$)
sd	145	
χ^2 / sd	2.47	Good fit (Kline, 2005)
RMSEA	.066	Acceptable (Jöreskog & Sörbom, 1993)
SRMR	.07	Acceptable (Anderson & Gerbing, 1984)
CFI	.95	Perfect fit (Tabachnick & Fidell, 2011)
NFI	.92	Good fit (Kline, 2005)
NNFI	.94	Good fit (Kline, 2005)

The model confirmed the hypothesis that the effect of reward addiction in causing sensitivity to punishment would be mostly related to high expectation of reward. According to the model, while the reinforcement effect of rewards is not a significant predictor of any of the dimensions in sensitivity to punishment, the high expectation of reward is a significant predictor of all dimensions of the sensitivity to punishment.

To determine whether middle school students' reward addiction in the academic context is a variable that predicts their school burnout, Multiple Linear Regression Analysis was employed. For this purpose, the sub-factor scores in RASAC [High Expectation of Reward (HER); Reinforcement Effect of Reward (RER)] and the total scores in ESSBS were included in the analysis. The results of the regression analysis regarding the prediction of the students' school burnout based on their reward addiction are presented in Table 6.

Table 6. Multiple Regression Analysis Results Related to The Prediction of School Burnout Based on Reward Addiction in The Academic Context

Variable	B	Standard Error β	β	t	p	Pairwise r	Partial r
Constant	41.36	3.18	_	12.97	.000		
High expectation of reward	0.83	0.25	0.19	3.23	.001	0.24	0.17
Reinforcement effect of reward	0.44	0.24	0.11	1.85	.065	0.20	0.09
$R = 0.27$ $R^2 = 0.07$							
$F_{(2-344)} = 13.07$ P = .000							

In the regression analysis, the variables of high expectation of reward and reinforcement effect of reward together were low and significantly related to the burnout scores ($R=0.266$, $R^2=0.071$, $p<.01$). These three variables together explained 7% of the total variance in the students' school burnout. According to the standardized regression coefficient (β), the relative order of importance of these three predicting variables on school burnout was; high expectation of reward and reinforcement effect of reward. The t-test results regarding the significance of regression coefficients showed that between the two variables, the variable of high expectation of reward significantly predicted school burnout, whereas reinforcement effect of reward was not a significant predictor.

Discussion, Conclusion and Suggestions

The validity and reliability analyses of the RASAC shows that this scale has the characteristics of measuring reward addiction in middle school students in a valid and reliable way. When the items in the factors *"high expectation of reward"* and *"reinforcement effect of reward"* are examined, it is clearly seen that the reward addiction scale in the academic context has a structure that overlaps with the definitions related to the characteristic of sensitivity to punishment (Carver, 2004; Gray, 1991; Gray & McNaughton, 2000; Van Der Linden et al., 2007) and the explanations related to the addictive effect of reward (Pink, 2009) in the literature. The items of RASAC covers high sensitivity developed against a stimulus to which one is addicted, and emotional and behavioural characteristics shown when one is an addict.

According to the results of the path analysis related to the structural model towards the relationship between reward addiction and sensitivity to punishment in the academic contexts, as the middle school students' reward addiction increased, their sensitivity to punishment also increased. The path analysis revealed that there was a strong positive relationship between the students' reward addiction and sensitivity to punishment in the academic contexts ($r=0.78$). The regression equation revealed that reward addiction explained 60% of the variation in sensitivity to punishment. In other words, when middle school students become dependent on receiving rewards related to their academic life, this addiction also causes them to be oversensitive to getting punished in similar contexts. In this sense, it would not be wrong to say that rewards that are redundantly given to students do as twice more harm to them. This is because students would be dragged away from the opportunities of performing their academic activities with intrinsic motivation and pleasure. Besides, due to the oversensitivity caused by this addiction, students would experience inhibition in courses, develop negative attitudes towards academic contexts, and lastly, have negative feelings about themselves, which would reveal the potential of having a significant harm to their academic future.

According to Reinforcement Sensitivity Theory, reward and punishment sensitivities are functions of the brain that operate independently and are controlled by affective systems (Gray & McNaughton, 2000). In this case, these sensitivities are expected to develop independently. However, studies suggesting that reward dependent individuals realise a situation with a reward smaller than expected earlier than other individuals and have disappointment because of this (Carver, 2004; Corr, 2002; Harmon-Jones, 2003) and Aypay's hypothesis that the effects of reward and punishment practices

on individuals would reveal results that are related to each other (2015b) require to re-interpret the significant relationship (60%) found in this study with a different perspective.

In order to understand and interpret the relationship between reward addiction and sensitivity to punishment in academic contexts, it would be necessary to examine the analyses related to the model that shows the relationship between the dimensions of reward addiction and those of sensitivity to punishment. The analysis showed that the dimension "reinforcement effect of rewards" within reward addiction in the academic context do not have significant relationships with the dimensions of sensitivity to punishment, but the dimension "high expectation of reward" is significantly related to all dimensions of sensitivity to punishment. While the "reinforcement effect of rewards" refers to positive feelings that rewards create in individuals and the conditioned increase in their performance, the "high expectation of reward" indicates that individuals' performance depends on whether they would be rewarded, and their expectation that the amount of future rewards would be more than those in the past. In other words, the "reinforcement effect of rewards" mostly related to the increasing sensitivity to getting rewarded, whereas the "high expectation of reward" denotes to the actual addiction to rewards. In that case, this significant relationship between reward addiction and sensitivity to punishment in the academic contexts may perhaps have an explanation. A person whose reward addiction has reached to the level of addiction would not have feelings and thoughts only related to reward situations. Such an addiction would also activate other feelings and thoughts in individuals that are interpreted as a kind of punishment from the perspective of the addicted person such as not having the reward, discontinuation of rewarding, and being deprived of reward. These feelings and thoughts may prompt the brain system that is activated in environments with punishment and punishment stimuli as proposed by the Reinforcement Sensitivity Theory. As addiction to reward increases due to reminder ties (connotation ties) that are formed between two independent systems of different feelings and gets strengthened constantly as a result of repeated similar experiences, another meaning of this can be an increase in sensitivity to punishment.

According to the results of the Multiple Regression Analysis, reward addiction was a significant predictor of school burnout ($R=0.266$, $R^2=0.071$, $p<.01$). Reward addiction in the academic context explained 7% of the variation in school burnout. In other words, as middle school students' reward addiction increase, they are more inclined to develop school burnout syndrome. This is thought to be due to two reasons. First, although conditional rewards seem to be pleasing stimuli from the individual's perspective who is exposed to them, they may also be triggering concerns such as not being able to receive a reward, or losing the right to have a reward. Second, due to long-term exposure to experiences in which the expectation of reward is not met, individuals may have disappointments or decreasing internal motivation over time. Such a mood may cause feeling psychologically distant to academic duties. When the ratio at which reward addiction in middle school students explains school burnout is compared to the findings in the study with high school students (Aypay, 2016a), it draws attention that reward addiction in the academic context predicts school burnout at a higher level (14%) in high school students. This is thought to be related to both the increasing power of reward addiction over time and students' experiences of being rewarded by their parents or teachers in academic tasks for a longer time period. It appears that reward addiction predicts school burnout in higher school students in a stronger way than it does for middle school students.

Although the fact that the sample of this study consisted of students from a single city stands out as a limitation for the generalisability of the findings, these findings are thought to contribute to the literature in terms of providing data about the relationship patterns that the variables of reward addiction, sensitivity to punishment and school burnout in academic contexts that middle school students experience have with each other. The findings of this study reveal practical information for

parents, educators and guidance teachers. This is because they present practical reasons why reward and punishment related to academic activities should be analysed very carefully and be applied as rare as possible. The scale developed for middle school students' reward addiction in the academic context is another contribution to the literature. It is suggested that further studies can examine parents' attitudes that cause students to develop sensitivity to punishment and reward addiction, and programs to reduce the level of stress perceived by students experiencing school burnout can be developed and tested.

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