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## Is Reward A Punishment? from Reward Addiction to Sensitivity to Punishment

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### ABSTRACT

This study introduces the topics of reward addiction and sensitivity to punishment in academic contexts to the literature. This study was designed firstly to develop reliable and valid measurement tools that can measure high school students' reward addiction and sensitivity to punishment in academic contexts, and secondly to test the structural equation model formed to identify the relationships between reward addiction and sensitivity to punishment. The participants of the study were a total of 506 high school students. Exploratory and confirmatory factor analyses showed that the developed measurement tools were valid and reliable. According to the structural equation model formed between the variables of reward addiction and sensitivity to punishment, the reward addiction variable significantly and positively affected sensitivity to punishment. The findings of this study inform both parents and educators with a new perspective about the possible negative results of using punishment and rewards in academic context.

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#### Keywords:

Reward Addiction, Punishment Sensitivity, Academic Context, Student

### 1. Introduction

Reward and punishment have, more or less, always been in educational environments. They are sometimes believed to be a facilitator, or sometimes an inhibitor, and indispensable practices of education systems. Reward and punishment are means of external intervention to behaviour and can be used for different purposes. Although they are used for different purposes, it is thought that reward and punishment that intervene the behaviour from external world are in fact processed through individuals' filter of perception and interpretation, and weakens their locus of control by negatively affecting it in a similar way. Despite being used for different purposes, it is thought that as a result of the common meaning attached to reward and punishment in internal perception processes, an increase in the sensitivity to one of these practices would cause an increase in the other as well. In this study, this hypothesis was tested in the academic context where reward and punishment widely exist.

In the literature, only one study, which was conducted by Aypay (2015), examined the sensitivity to punishment in the academic context on middle school students. In other studies, sensitivities to reward and punishment were investigated without being specific to a certain context, but based on different variables by regarding them as general tendencies. Some of these studies include Morgan, Bowen, Moore and van Goozen (2014), Hundt, et al. (2013), Cavanagh, Frank and Allen (2011), Guimón, Las Hayas, Guillén, Boyra and González-Pinto (2007), Van der Linden, Taris, Beckers and Kindt (2007).

The concepts of reward sensitivity and punishment sensitivity emerged from Gray and McNaughton's (2000) Reinforcement Sensitivity Theory (RST). Reward sensitivity can be defined as one's learning that feeling

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situations and behaviours are strongly reinforced by positive encouragers (Van Der Linden, Beckers & Taris, 2007). In this case much effort is made to obtain the positive results of behaviours. This is because there are feeling situations that lead to both motivation to gain rewards and reward-seeking behaviours (Gray, 1991). Individuals' insisting on achieving the goal to get a reward and the increase of energy they need to do this are a result that is revealed by the feelings of expectation, happiness, pleasure and anger together (Carver, 2004). In the case of reward sensitivity, individuals react with behaviours of approaching or active avoiding (Van Der Linden, Beckers, et al., 2007).

New exciting findings on reward practices have started to be revealed through a detailed examination of brain mechanism with technological tools. The works of researchers such as Delgado, Locke, Stenger and Fiez (2003), and Knutson, Adams, Fong and Hommer (2001) showed that rewards, about which individuals are informed at the beginning or conditioned, have an addictive characteristic. It was revealed that the reactions of human brain to reward stimuli are largely similar to its reactions to situation of addictive stimuli. Individuals feel relieved for a short period due to both reward stimuli and addictive stimuli, and then this effect disappears, leading to the need for a new dose (Pink, 2009). Addictive effect of rewards can be an extended version of "Sensitivity to Reward" in Gray and McNaughton's (2000) Reinforcement Sensitivity Theory (RST). Reward addiction may emerge when one's feelings and behaviours are controlled by positive encouragers (Aypay, 2016).

Sensitivity to punishment can be defined as the sensitivity that results in being over sensitive to punishment and punishment stimuli, and fear, anxiety, inhibition and reactivity that is not functional. Sensitivity to punishment, hinders individuals from achieving their goals and finalises the approach-hindrane tension mostly with an avoidance reaction, is responsible for feelings such as anxiety, fear, sadness and inhibition due to punishment, unrewardedness and innovation clues (Gray, 1990). Reward and punishment sensitivities are argued to be the characteristics of the brain that are controlled by feeling systems that work independently from each other (Gray & McNaughton, 2000). However, as getting reward is pleasing for an individual with high reward sensitivity, being unrewarded or lack of a reward would be unpleasant in the same extent (Carver, 2004; Corr, 2002; Harmon-Jones, 2003). However, as being punished is unpleasant for an individual with high punishment sensitivity, lack of punishment would be pleasing in the same extent. One of the most important common reasons for similar effects of external rewards and punishment is the feeling that behaviour is controlled from outside. Individuals' ways of reaction to environmental effects are largely influenced by their ways of interpreting their experiences (Patterson, 1973). For this reason, even in an activity such as rewarding that is performed for pleasure and hoping that it will have a positive effect, when individuals attribute it a meaning like "*I am controlled externally*", then it will have a destructive effect, not remedial or healer. They emotionally become distant to that activity with such a meaning, and at the same time, start demanding short-term relief from outside. In other words, they can develop addiction to external rewards. This addiction can make them more sensitive to negative effects like punishment.

Based on these explanations, it can be argued that as students' reward addiction in the academic context increase, their sensitivity to punishment in the academic context would also increase. To test this argument, this study firstly aimed to develop valid and reliable measurement tools to measure high school students' reward addiction and sensitivity to punishment in academic contexts. Then, the study aimed to test the structural equation model formed to identify the relationships between reward addiction and sensitivity to punishment. Because little or no studies have focused on students' reward addiction and sensitivity to punishment in the academic contexts in the literature, this study is considered to provide a new and different perspective to reward and punishment practices.

## **2. Method**

This study was conducted in the context of scale development by employing cross-sectional design and relational survey model. Convenience sampling method was used in the study.

## 2.1. Participants

The participants of the study were a total of 506 9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> graders studying at three state high schools in the city of Eskisehir. 300 of the students were female (59.3%), and 206 were male (40.7%). The distribution of the students based on schools are 89 (17.6%), 295 (58.3%) and 122 (24.1%). 134 of the students (26.5%) were 9<sup>th</sup> graders, 244 (48.2%) were 10<sup>th</sup> graders and 128 (25.3%) were 11<sup>th</sup> graders.

## 2.2. Data Gathering Tools

The measurement tools, High School Students' Reward Addiction Scale (HSSRAS) and High School Students' Sensitivity to Punishment Scale (HSSSPS) that were used to identify the relationships between reward dependence and sensitivity to punishment, were developed within the scope of this study.

## 2.3. Procedure

Written data gathered from 65 high school students was used to form the items in the scales. Additionally, theory and research findings in the literature on the effects of rewards and punishment were also utilized. An item pool of 26 items was formed for the reward dependence scale, whereas that of 21 items was formed for the sensitivity to punishment scale. Based on the views of experts in the fields of educational psychology, and guidance and psychological counselling, it was decided that the scale forms were suitable for measuring the characteristics that were aimed to be measured. The scale items were prepared on a four-point Likert scale as "Strongly agree", "Agree", "Somewhat agree" and "Strongly disagree". Pilot forms were administered to 30 high school students and their intelligibility was tested. The final forms were administered to 550 students. However, only those of 506 students were accepted as valid and included in the analyses.

## 2.4. Data Analysis

The data were analysed using descriptive statistics, Exploratory (EFA) and Confirmatory Factor Analyses (CFA), reliability analyses, correlation analysis and path analysis. For factor analyses, the dataset obtained from 506 individuals were split into two groups. EFA was conducted on the first dataset and Varimax Rotation Technique was employed. CFA was then applied to the second group of data and it was examined whether the structures revealed in EFA were confirmed. CFA is used to test the relationships between the set of variables observed in the model and the set of implicit (latent) variables (Muthén & Muthén, 1998-2010). Then, it is aimed to predict and explain the implicit variables (dimensions of the scale) by means of the observed variables (scale items). The reliability of scales was measured using Cronbach alpha coefficient and item discrimination indices. For this aim, both item-total correlations were used and the differences between the item mean scores of the bottom and the top 27% groups formed based on the total scores in the scale was tested using T-test. The significance level was taken as  $\alpha=.001$ . The anti-image correlations were also calculated for the scale items. Then, the structural equation model formed to identify the relationships between reward dependence and sensitivity to punishment was analysed through path analysis.

## 3. Findings

### 3.1. Findings for the Validity and Reliability of the High School Students' Reward Addiction Scale (HSSRAS)

The KMO value of HSSRAS was found as 0.95, and the Bartlett's test result was significant ( $\chi^2_{(153)}=5321,719$ ,  $p<.001$ ). The results of EFA in which varimax rotation technique was used are presented in Table 1. As a result of EFA, three factors having an eigenvalue higher than 1 and explaining 64% of the total variance was revealed. Eigenvalues of the basic elements were 5.83, 3.17 and 2.55, respectively. The common variances of the three factors defined related to the items ranged from .44 to .77. The variances that the factors explain were 32.42%, 17.62% and 14.18%, respectively. The scale factors consisted of nine, five and four items, respectively. Since the items in the first factor included statements emphasizing that students' high reward expectations for studying should be met, this factor was named as "Conditional Performance Related to Reward Expectation" (CPRRE). As the items in the second factor included items emphasizing the reinforcing

effects of students' rewards in the school context, this factor was named as "Reinforcement Effect of Reward at School" (RERS).

**Table 1.** Results of Explanatory Factor Analysis Related to HSSRAS

Factor Name	Item Number	Rotated Factor Loadings			
		Factor-1	Factor-2	Factor-3	Communalities
Conditional Performance Related to Reward Expectation (CPRRE)	12	.80	.23	.17	.72
	14	.79	.20	.11	.69
	8	.78	.15	.05	.64
	7	.76	.19	.16	.66
	15	.73	.27	.20	.65
	13	.73	.16	.09	.56
	9	.71	.23	.19	.60
	16	.69	.19	.17	.55
Reinforcement Effect of Reward at School (RERS)	6	.69	.15	.26	.57
	19	.14	.78	.28	.71
	20	.10	.78	.39	.77
	23	.38	.71	.16	.68
	21	.37	.68	.26	.67
Reinforcement Effect of Reward at Home (RERH)	24	.46	.63	.05	.62
	5	.08	.14	.82	.70
	17	.18	.31	.75	.69
	11	.47	.20	.61	.64
Cronbach Alpha	1	.17	.20	.60	.44
Explained Variance		.92	.86	.79	Total .93
		% 32.42	% 17.62	% 14.18	Total % 64.22

The items in the third factor included items emphasizing the reinforcing effects of students' rewards for their academic work at home, and this factor was named as "Reinforcement Effect of Reward at Home" (RERH). The correlations of the sub-dimensions of HSSRAS with the total score and between each other are presented in Table 2. As is seen in Table 2, all the factors were strongly related to the total score, moderately related to each other.

**Table 2.** Correlation Coefficients Among HSSRAS Factors

	CPRRE	RERS	RERH
CPRRE			
RERS	.62**		
RERH	.55**	.65**	
HSSRAS TOTAL	.91**	.85**	.79**

\*\*p<.01

To confirm the structure of HSSRAS determined by EFA, CFA was applied to the second half of the dataset. When first-order relational confirmatory factor analysis was conductor for the reward dependence scale, it was found that there was a relationship at the level of .95 between the second and third dimensions of the scale. A relationship at such a level causes a multicollinearity problem in the path analysis established between reward dependence and sensitivity to punishment (Licht, 1998). For this reason, it was found that the confirmatory factor analysis model established for the reward dependence scale showed the most suitable fit values in the second-order. The initial fit values of the second-order confirmatory factor analysis were below the criteria [CMIN=338.973, df=132, p=.000, CMIN/df=2,568, GFI=.87, IFI=.92, CFI=.92,

RMSEA=.07]. Therefore, modifications were needed to improve the model fit of the scale on the condition of keeping the theoretical relationships (Bayram, 2010). The fit indices of the model following the modifications [CMIN=220,786, df=122, p=.000, CMIN/df=1,810, GFI=.92, IFI=.96, CFI=.96, RMSEA=.057] showed that the model had a better fit (Arbuckle, 1995-2008; Kline, 2011).

The Cronbach alpha coefficients for the HSSRAS factors and the total score are, respectively, as in the following: .93, .92, .86. and .79. The item-total correlations for all the items in HSSRAS ranged between .43-.75. 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 found to be significant ( $p<.001$ ). The anti-image correlations were also calculated for the HSSRAS items. All items, except Item 20 (.87), had correlation values between .92-.96. According to these values, the items in the scale had high reliability and were towards measuring the same behaviour.

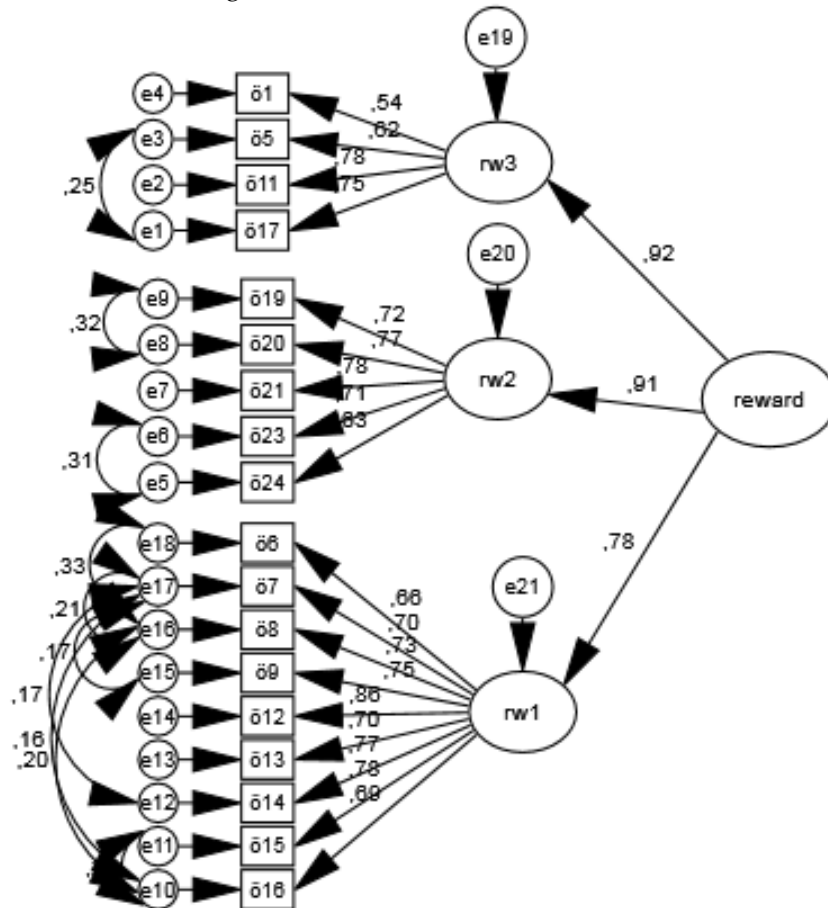


Figure 1. Second-order confirmatory factor analysis for the reward addiction scale

### 3.2. Findings on the Validity and Reliability of High School Students' Sensitivity to Punishment Scale (HSSSPS)

The KMO value of HSSSPS was found as 0.90, and the Bartlett's test result was significant ( $\chi^2_{(153)}=2260,070$ ,  $p<.001$ ). EFA results of HSSSPS are presented in Table 3. As a result of EFA, four factors having an eigenvalue higher than 1 and explaining 64% of the total variance was revealed. Eigenvalues of the basic elements were 4.06, 2.79, 2.53 and 2.19, respectively. The common variance of the four factors defined related to the items ranged from .49 to .79. The variances that the factors explain were 22.55%, 15.54%, 14.08%, and 12.17%, respectively. After rotation, the factors included seven items, four items, four items and three items, respectively. Since the items in the first factor emphasized the students' fear of being punished at home or at school related to the academic context, it was named as "Fear of Being Punished" (FBP). As the second factor emphasized the negative feelings that the students developed towards school, teachers and courses due to being punished in the academic context, this factor was named as "Negative Attitudes towards Punishment Contexts" (NATPC). As the third factor emphasized the negative feelings that the students developed towards school, teachers and courses due to being punished in the academic context, this factor was named

as “Negative Self-Feelings Due to Punishment” (NSFDP). The items in the fourth factor emphasized that students stay passive or do not participate in lessons when they are in expectation of a result for which they can be punished in the academic context, and thus, this factor was named as “Inhibition Due to Punishment” (IDP).

**Table 3.** Results of Explanatory Factor Analysis Related to HSSSPS

		Rotated Factor Loadings					
Factor Name	Item Number	Factor-1	Factor-2	Factor-3	Factor-4	Communality	
Fear of Being Punished (FBP)	12	<b>.80</b>	.07	.12	.01	.68	
	13	<b>.74</b>	.02	.24	.08	.59	
	4	<b>.71</b>	.21	.19	.27	.66	
	5	<b>.70</b>	.21	.10	.15	.58	
	9	<b>.67</b>	.17	.20	.20	.59	
	10	<b>.64</b>	.29	.20	.25	.64	
Negative Attitudes Towards Punishment Contexts (NATPC)	15	<b>.55</b>	.26	.25	.16	.53	
	7	.05	<b>.78</b>	.25	.11	.74	
	6	.14	<b>.77</b>	.20	.17	.68	
	8	.40	<b>.68</b>	.03	.16	.63	
Negative Self-Feelings Due to Punishment (NSFDP)	11	.24	<b>.65</b>	.16	.05	.54	
	20	.28	.26	<b>.77</b>	.20	.76	
	21	.28	.12	<b>.73</b>	.26	.69	
	19	.27	.08	<b>.63</b>	.05	.49	
Inhibition Due to Punishment (IDP)	17	.07	.32	<b>.59</b>	.15	.61	
	2	.22	.13	.24	<b>.81</b>	.79	
	1	.10	.21	.09	<b>.79</b>	.70	
	3	.42	.07	.32	<b>.64</b>	.70	
Cronbach Alpha		.88	.80	.80	.79	Total .92	
Explained Variance		% 22.55	% 15.54	% 14.08	% 12.17	Total % 64.35	

To determine whether HSSSPS was prepared in the form of an additive scale, Tukey’s Additivity Test was conducted. The results showed that the nonadditivity value of the scale was not significant, (F=06, P>.05). This means that the scale had an additive form characteristic. For this reason, HSSSPS can be used either as four factors or as a total score. The correlations of the sub-dimensions of HSSSPS with the total score and between each other are presented in Table 4. All the factors were strongly related to the total score, moderately related to each other.

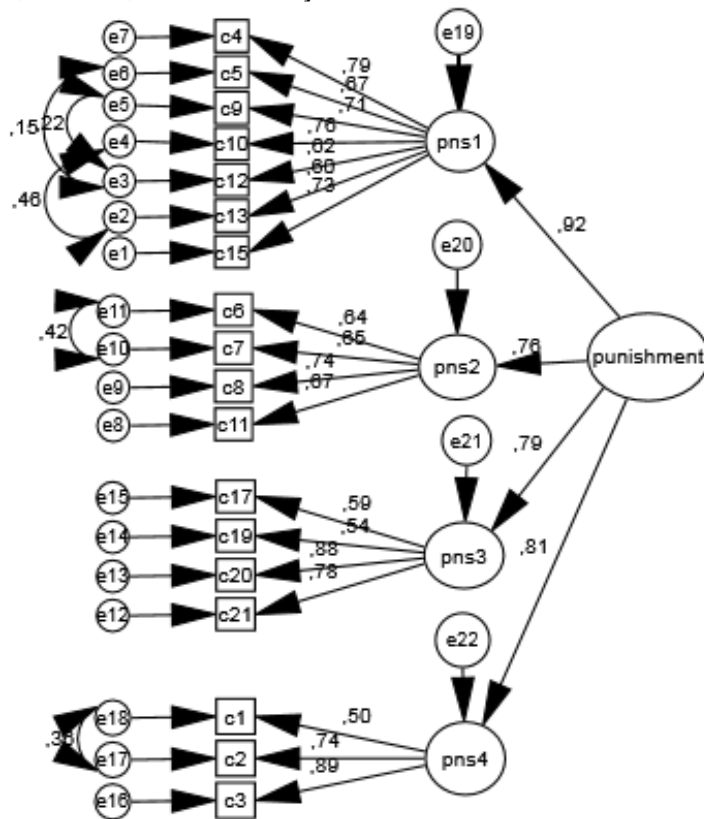
**Table 4.** Correlation Coefficients Among HSSSPS Factors

	FBP	NATPC	NSFDP	IDP
FBP				
NATPC	.53**			
NSFDP	.60**	.56**		
IDP	.57**	.46**	.57**	
HSSSPS TOTAL	.88**	.77**	.83**	.76**

\*\*p<01

To confirm the structure of HSSSPS determined by EFA, CFA was applied to the second half of the dataset. According to the CFA results, the scale showed a better fit in the second-order. The initial fit values of the

second-order confirmatory factor analysis were below the criteria [CMIN=369.984, df=131, p=.000, CMIN/df=2,824, GFI=.86, IFI=.89, CFI=.89, RMSEA=.085]. Therefore, modifications were needed to improve the model fit of the scale on the condition of keeping the theoretical relationships (Bayram, 2010). The fit indices of the model following the modifications [CMIN=263,367, df=127, p=.000, CMIN/df=2,074, GFI=.90, IFI=.94, CFI=.94, RMSEA=.065] showed that the model had a better fit (Arbuckle, 1995-2008; Kline, 2011).

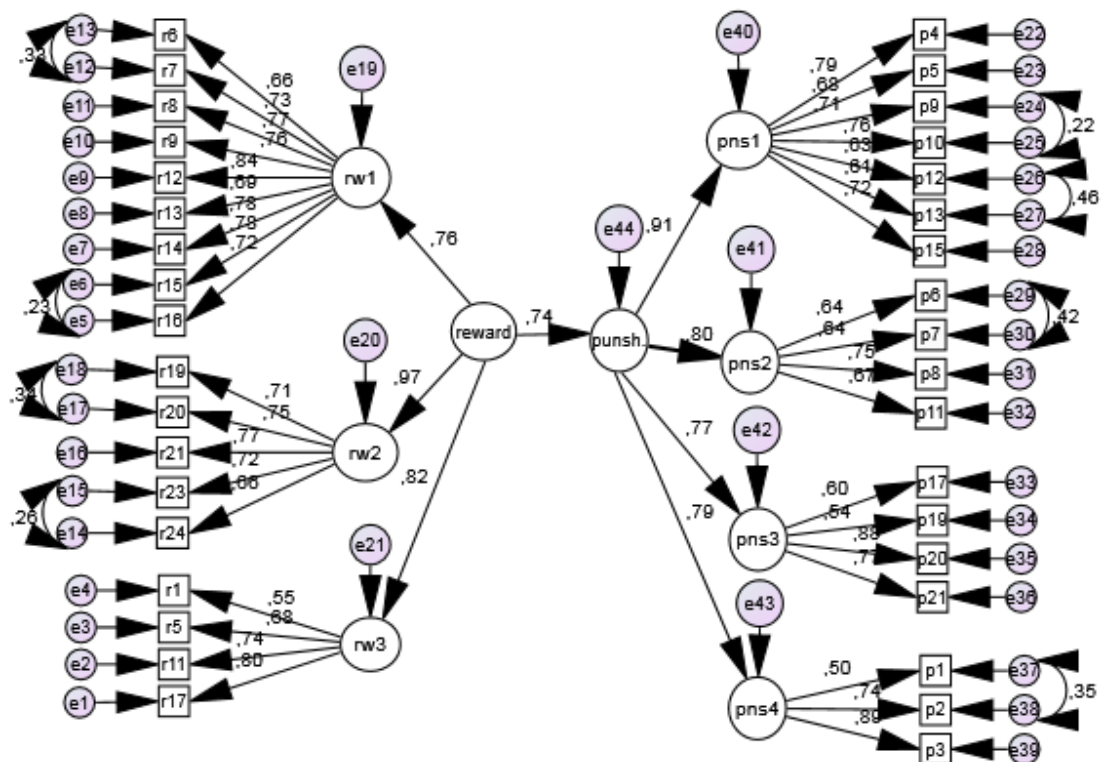


**Figure 2.** Second-order confirmatory factor analysis for the sensitivity to punishment scale

The Cronbach alpha coefficients for the HSSSPS factors and the total score are, respectively, as in the following: .92, .88, .80, .80 and .79. The item-total correlations for all the items in HSSSPS ranged between .48-.70. 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 found to be significant ( $p < .001$ ). In addition, the anti-image correlations of the HSSSPS items ranged between .84-.95. According to these values, the items in the scale had high reliability and were towards measuring the same behaviour.

### 3.3. Findings for the Structural Equation Model Established Between High School Students' Reward Addiction and Sensitivity to Punishment in the Academic Contexts

Then, the structural equation model formed to identify the relationships between reward addiction and sensitivity to punishment was analysed through path analysis. According to the structural equation model in Figure 3 formed between the variables of reward addiction and sensitivity to punishment, the reward addiction variable significantly and positively affected sensitivity to punishment ( $p < .05$ ). The standardised regression coefficient results related to the path analysis revealed that reward addiction affected sensitivity to punishment at the level of ( $\beta = .74$ ).



**Figure 3.** Structural equation model for the relationship between reward addiction and sensitivity to punishment

Consequently, as the high school students' reward addiction increased, their sensitivity to punishment also increased. On the other hand, reward addiction, as an independent variable, explained 54.8% of the variation in the sensitivity to punishment variable. The fit values prior to the modification related to the structural equation model established between reward addiction and sensitivity to punishment in the academic contexts were below the criteria [CMIN=1274.701, df=586, p=.000, CMIN/df=2.175, GFI=.78, IFI=.87, CFI=.86, RMSEA=.068]. The fit indices of the model following the modifications [CMIN=1087.185, df=578, p=.000, CMIN/df=1.880, GFI=.81, IFI=.90, CFI=.90, RMSEA: .059] showed that the model showed a substantially good fit.

**4. Discussion, Conclusions and Recommendations**

HSSRAS revealed a three-factor structure. The factors revealed that performing or acting in the case of reward addiction in the academic context was conditioned on a high level of reward expectation, and the students performed behaviours in accordance with short-term goals due to rewards taken at home and at school. Based on the works of Gray (1991), Gray and McNaughton (2000) and Carver (2004), it is argued that HSSRAS was suitable for measuring reward addiction. This is because these works mentioned that individuals with high level of reward expectation had high motivation for winning and the feeling states to enable them perform the necessary behaviours to win a reward, and they react by approaching the reward or actively avoiding the situations without any rewards.

HSSSPS revealed a four-factor structure. The factors showed that the students felt fear in the case of sensitivity to punishment in the academic context (fear of being punished), developed negative feelings and attitudes towards contexts in which they exposed to punishment practices, their sense of self and self-value were damaged due to being punished, and inhibition that made students passive was experienced. Based on the works of Farmer (2005), Segarra, et al. (2007) and Van Der Linden, Beckers, et al. (2007), it seems that HSSSPS properly represented the phenomenon of punishment sensitivity. The reason is that these works mentioned hesitance in the activation of BIS, a state of inhibition as actively avoiding stimuli that stir fear or being unwilling to enter certain environmental contexts, social anxiety or generalised anxiety disorders, and repression of participation.



Another aim of this study was to test the prediction that reward addiction developed in students would increase their sensitivity to punishment. According to the results of the path analysis in which the structural equation model formed between the variables of reward addiction and sensitivity to punishment was tested, the reward addiction variable significantly and positively affected sensitivity to punishment ( $p < .05$ ). The standardised regression coefficient results related to the path analysis revealed that reward addiction affected sensitivity to punishment at the level of ( $\beta = .74$ ). According to this finding, as the high school students' reward addiction increased, their sensitivity to punishment also increased. Reward addiction, as an independent variable, explained 54,8% of the variation in the sensitivity to punishment variable.

In Reinforcement Sensitivity Theory, BAS and BIS are controlled by sense systems of the brain that work independently from each other (Gray & McNaughton, 2000). However, the findings obtained in this study showed that reward and punishment sensitivities that are argued to be controlled by sense systems that work independently from each other in the brain are in fact closely related to each other. This can be related to that the sensitivity developed for rewards and punishment actually cause developing sensitivity to unrewardedness and unpunishedness (Van Der Linden, Beckers, et al., 2007)

Another explanation for this finding could be that reward addiction make students lose control or become open to being controlled from outside. According to Cognitive Evaluation Theory, individuals perceive external rewards as their behaviours being controlled (Deci & Ryan, 1985). With external rewarding practices, individuals who have reward addiction become more dependent to rewards, and they can be losing their feeling of control gradually in return for the temporary and short-term feeling of pleasure that rewards create in them. Individuals who get used to the temporary pleasure that come from outside lose their ability to please themselves or forget this capacity of theirs in this regard. The reason is that the pleasure they feel is not what is created with their own will. In this way, they may start to pin their hope upon external powers rather than internal motivators as their pleasing experiences increase due to external intervention. When considered from this perspective, rewarding is in fact the process of making individuals lose control. Addiction can develop easily in this context. As individuals who lose their control through the rewarding process hope for pleasure from outside, they might be attributing the negative events they experience mostly to external sources by generalising the weakening in their feeling of control. Therefore, as rewarding makes individuals be dependent on itself, it can increase their sensitivity to punishment to the highest point.

It is thought to be of significance to develop tools that can measure reward addiction and sensitivity to punishment. The exploratory and confirmatory factor analysis and the reliability analyses showed that HSSRAS and HSSSPS were valid and reliable tools. As the high school students' reward addiction increased, their sensitivity to punishment also increased.

The findings of this study are of significance in the sense of informing both parents and educators once again and with a different perspective about the possible negative results of using punishment and rewards. Parents and educators should not refer to external rewards and punishment practices by being deceived by the outcomes that seem like quick and useful. At least, they should use these only when they need such an intervention after analysing the situation carefully. Further studies should focus on identifying other related variables that can help explain reward and punishment sensitivities and reward addiction.

## References

- Arbuckle, J. L. (1995–2008). *Amos 17.0 user's guide*. Crawfordville, FL: Amos Development Corporation.
- Aypay, A. (2016). *Akademik Bağlamda Ödül Bağımlılığının Ebeveynlik Tarzı ve Cinsiyet ile İlişkileri*. VIII. International Congress of Educational Research. "Quality Assurance in Higher Education and Accreditation of Faculties of Education". 5-8 May, Çanakkale Onsekiz Mart University, Çanakkale, Turkey.
- Aypay, A. (2015). Sensitivity to punishment in the academic context: it's relationship with locus of control, gender and grade level. *Eğitimde Kuram ve Uygulama - Journal of Theory and Practice in Education*, 11(4), 1475-1495.

- Bayram, N. (2010). *Yapısal eşitlik modellemesine giriş: Amos uygulamaları*. Bursa: Ezgi Kitabevi.
- Cavanagh, J. F., Frank, M. J., & Allen, J. J. B. (2011). Social stress reactivity alters reward and punishment learning. *SCAN*, 6, 311-320. doi: 10.1093/scan/nsq041
- Carver, C. S. (2004). Negative affects deriving from the behavioral approach system. *Emotion*, 41, 3-22. doi: 10.1037/1528-3542.4.1.3
- Corr, P. J. (2002). J.A. Gray's reinforcement sensitivity theory and frustrative nonreward: A theoretical note on expectancies in reactions to rewarding stimuli. *Personality and Individual Differences*, 32, 1247-53. doi:10.1016/S0191-8869(01)00115-5
- Corr, P. J., Pickering, A. D., & Gray, J. A. (1997). Personality, punishment, and procedural learning: A test of J. A. Gray's anxiety theory. *Journal of Personality and Social Psychology*, 73, 337-344.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Delgado, M. R., Locke, H. M., Stenger, V. A., & Fiez, J. A. (2003). Dorsal striatum responses to reward and punishment: Effects of valence and magnitude manipulations. *Cognitive, Affective, & Behavioral Neuroscience*, 3(1), 27-38.
- Farmer, R. F. (2005). Temperament, reward and punishment sensitivity, and clinical disorders: Implications for behavioral case formulation and therapy. *International Journal of Behavioral Consultation and Therapy*, 1(1), 56-76.
- Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion*, 4, 269-288.
- Gray, J. A. (1991). The neuropsychology of temperament. In J. Strelau & A. Angleitner (Eds.), *Explorations in temperament: International perspectives on theory and measurement* (pp. 105-128). New York, NY: Plenum Press.
- Gray, J. A., & McNaughton, N. (2000). *The neuropsychology of anxiety* (2nd ed.) London: Oxford University Press.
- Guimón, J., Las Hayas, C., Guillén, V., Boyra, A., & González-Pinto, A. (2007). Shame, sensitivity to punishment and psychiatric disorders. *The European Journal of Psychiatry*, 21 (2), 124-133.
- Harmon-Jones, E. (2003). Anger and the behavioral approach system. *Personality and Individual Differences*, 35, 995-1005. doi:10.1016/S0191-8869(02)00313-6
- Hundt, N. E., Brown, L. H., Kimbrel, N. A., Walsh, M. A., Nelson-Gray, R., & Kwapil, T. R. (2013). Reinforcement sensitivity theory predicts positive and negative affect in daily life. *Personality and Individual Differences*, 54, 350-354. doi:10.1016/j.paid.2012.09.021
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (Third Edition). New York/ London: The Guilford Press.
- Knutson, B., Adams, C. M., Fong, G. W., & Hommer, D. (2001). Anticipation of increasing monetary reward selectively recruits nucleus accumbens. *Journal of Neuroscience*, 21, RC159. [Available at: <http://www-psych.stanford.edu/~span/Publications/bk01jn.pdf>], Retrieved on January 1, 2015.
- Masitsa, G. (2008). Discipline and disciplinary measures in the Free State township schools: Unresolved problems. *Acta Academica*, 40(3), 234-270.
- Morgan, J. E., Bowen, K. L., Moore, S. C., & van Goozen, S. H. M. (2014). The relationship between reward and punishment sensitivity and antisocial behavior in male adolescents. *Personality and Individual Differences*, 63, 122-127. doi: 10.1016/j.paid.2014.01.054
- Muthén, L. K., & Muthén, B. O. (1998-2010). *Mplus user's guide* (Sixth Edition). Los Angeles, CA: Muthén & Muthén.
- Patterson, C. H. (1973). *Humanistic education*. Englewood Cliffs, NJ: Prentice-Hall.
- Pink, D. H. (2009). *Drive: The surprising truth about what motivates us*. New York, NY: Riverhead Books.
- Shaikhmag, N., & Assan, T.E.B. (2014). The effects of abolishing corporal punishment on learner behaviour in South African high schools. *Mediterranean Journal of Social Science*, 5(7), 435-442. doi: 10.5901/mjss.2014.v5n7p435
- Segarra, P., Ross, S. R., Pastor, M. C., Montañés, S., Poy, R., & Molto, J. (2007). MMPI-2 predictors of Gray's two-factor reinforcement sensitivity theory. *Personality and Individual Differences* 43, 437-448. doi: 10.1016/j.paid.2006.12.013

- Van Der Linden, D., Beckers, D. G. J., & Taris, T. W. (2007). Reinforcement sensitivity theory at work: Punishment sensitivity as a dispositional source of job-related stress. *European Journal of Personality*, 21, 889–909. doi: 10.1002/per.660
- Van der Linden, D., Taris, T.W., Beckers, D.G.J., & Kindt, K.B. (2007). Reinforcement sensitivity theory and occupational health: BAS and BIS on the job. *Personality and Individual Differences*, 42, 1127–1138. doi: 10.1016/j.paid.2006.07.029