Chapter #25

THE ROLE OF PREVOLITIONAL PROCESSES IN VIDEO GAME PLAYING
A Test of the Theory of Planned Behavior and the Extended Model of Goal-directed Behavior applied to video game playing

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ABSTRACT

The aim of the current study is to investigate the relationship between prevolitional processes and video game playing. In the study, models of attitude, the Theory of Planned Behavior (TPB) and the Extended Model of Goal-directed Behavior (EMGB) are tested with structural equation models to analyze the process that leads to video game playing. In addition, the role of the goal underlying video game playing within the EMGB is examined. The participants were 210 video game players who completed measures of Goal Desire, Attitude, Subjective Norms, Perceived Behavioral Control, Behavioral Desire, Anticipated Emotions, Intention to play and Playing Behavior (intensity of video game playing). The results showed that the TPB achieved a perfect fit although the predictive power of this model was weak. The EMGB demonstrated an unsatisfactory fit and the model had to be revised. Goal Desire was found to contribute to Behavioral Desire, but also to Playing Behavior. The consequence of this direct effect can be habitual or automatic processes which should not be omitted when considering prevolitional processes that lead to video game playing. The potential explanations for this are explored.

Keywords: video games, prevolitional processes, the theory of planned behavior, the extended model of goal-directed behavior.

1. INTRODUCTION

The aim of this study is to investigate the relationship between prevolitional processes and video game playing. Two models of attitude, the Theory of Planned Behavior (TPB, Ajzen, 1991; 2002) and the Extended Model of Goal-directed Behavior (EMGB, Perugini & Bagozzi, 2004) were tested with structural equation models to analyze the process that leads to playing behavior. The EMGB was used to specifically examine the role of the goal underlying video game playing.

2. BACKGROUND

Playing video games is a very popular activity among young people. In a survey conducted in Slovakia by Kováčová Holevová (2011), only 13% of respondents had never played video games. Furthermore, 26% of boys and 8% of girls indicated that they played video games every day. Therefore, it is important to examine the prevolitional processes that lead to video game playing. The aim of this study is therefore to examine which variables play a role in the process of developing and maintaining game behavior.

Playing video games may result from both deliberative and automatic processes. For example, habit strength (especially the automatic processes that are behind habitual past playing) and its direct effect on media use, is emphasized in the Model of Media Attendance proposed by LaRose and Eastin (2004). This study focuses on the deliberative path and examines video game playing as a planned behavior. This approach allows us to benefit from some of the insights from the models of attitude that consider behavior as planned and largely determined by the intention to perform it. The study tests two theoretical models in the context of playing behavior in order to identify which factors contribute to video game playing; The Extended Model of Goal - directed Behavior (EMGB) proposed by Perugini and Baggozzi (2004) and its predecessor; the Theory of Planned Behavior (TPB) proposed by Ajzen (1991; 2002).

2.1. The theory of planned behavior (TPB) and video game playing

The Theory of Planned Behavior (TPB) (Ajzen, 1991; 2002) is among the most known and widely adopted model of attitudes. Besides Intention, there are three fundamental constructs in the TPB: (1) the Attitude toward the behavior that corresponds to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question; (2) Subjective Norms (SN) which involve the perceived social pressure to perform or not to perform the behavior and (3) Perceived Behavioral Control (PBC), defined as the perceived ease or difficulty of performing the behavior. According to the TPB, people act in accordance with their intentions and perceptions of control over the behavior, whereas intentions in turn are influenced by attitudes toward the behavior, SN, and PBC. Armitage and Conner (2001) examined 185 empirical tests of the TPB and found that the TPB accounted for 39% of the variance in intention and 27% of the variance in behavior.

However, little research has been devoted to the application of this model to the attitude toward video games playing. Haagsma, King, Pieterse, & Peters (2012) tested the utility of the TPB model in gaming activity among Dutch young people. The results showed that the TPB variables only explained 9% of the variance in intention. While attitude and PBC emerged as predictors, SN was not found to account for any of the variance in intention. Despite the fact that the TPB model obtained statistical significance, the authors admitted that the total variance explained by this model was relatively low. Indeed, the TPB does not take into account some prevolitional processes and is one of the reasons why Perugini and Bagozzi (2001; 2004) proposed other models of attitude.

2.2. The extended model of goal-directed behavior (EMGB) – broadening and deepening the TPB

The Model of Goal-directed Behavior (MGB) and its extension, the Extended Model of Goal-directed Behavior (EMGB, Perugini & Bagozzi, 2001; 2004) expanded the TPB by incorporating affective, motivational and automatic processes. It also proposed a different flow among the constructs. In the EMGB, the intention to perform a behavior is primarily motivated by the desire to perform the behavior (Behavioral Desire, BD). This is defined as the personal motivation or wish to perform the action. For example, an individual could experience a strong desire to play but not really intend to engage in that behavior. BD relies on reasons that make the behavior desirable and is assumed to reflect the effects of attitude, SN, PBC, anticipated emotions (i.e., anticipated affective reactions to the failure and success of performing the action) and Goal Desire (GD) and mediates their influence on intention. The inclusion of GD in the EMGB is based on the assumption that the desire to

achieve a certain goal influences the desire to perform a certain behavior that is subjectively felt to be instrumental for goal attainment. As a result, BD will be the proximal determinant of the intention to perform the behavior in question while GD will have an indirect effect on intention through BD (Perugini & Bagozzi, 2004). These models (the MGB and the EMGB) also include past behavior in order to incorporate the influence of automatic and habitual processes in decision making. However, the role of past behavior will not be considered as a predictor of behavior in this contribution for two reasons. Firstly, the theoretical status of past behavior as a predictor of behavior has been the subject of much controversy (cf. Ajzen, 2004). Secondly, this study focuses on the deliberative processes involved in playing behavior.

Perugini and Bagozzi (2004) have confirmed that the MGB and in particular the EMGB has had better predictive power than the TPB. This better predictive power has also been demonstrated for different behaviors in various domains (e.g. Leone, Perugini, & Ercolani, 2004; Perugini & Bagozzi, 2001). Yet, there has been no research concerning the use of these models in explaining playing behavior.

Although the study is interested in applying the TPB and the EMGB to video games playing, it is not being suggested that the TPB or the EMGB provide a general model or theory of playing behavior. The TPB and the EMGB are general models that focus on decision making processes and can be applied to a variety of behaviors. These models provide much more detail about cognitive and emotional processes in deliberative action. The EMGB also incorporates the mechanisms and the processes through which the goal and the desire to achieve this goal influence behavior.

3. OBJECTIVES

The TPB and the EMGB were applied as a means of examining the relationship between prevolitional processes and video game playing. It was hypothesized that the EMGB would have better predictive power than the TPB (H1). It was also hypothesized that the goal underlying video game playing within the EMGB would not influence playing behavior directly. Rather it would influence it indirectly by increasing the desire toward the behavior that in turn influences the intention that determines the behavior. As a consequence, GD would not be a direct predictor of Behavior (H2) although in the EMGB, it would be a significant predictor of BD (H3).

4. PARTICIPANTS AND PROCEDURE

210 participants who were Slovak video game players aged from 14 to 35 years old (181 men, 29 women; Mean Age 20.1, Standard Deviation 5.7) completed measures of goal desire, attitude, subjective norms, perceived behavioral control, behavioral desire, anticipated emotions (PAE and NAE), intention to play and actual intensity of video games playing (playing behavior).

51% of the participants were secondary school students, 18.6% were university students and 30.5% were employees. Almost 32% of them were Counter Strike players, 19.5% were World of Warcraft players, 10.5% were League of Legends players, 6.2% were EVE online players and 4.3% were Overwatch players. The participants were obtained through occasional and snowball selection.

5. MEASURES

With the exception of playing behavior, all the responses were on 5-point scales with 5 indicating a higher score on the construct. The measures were adopted from other research which had investigated behavior within the TPB and the EMGB models (e.g., Leone et al., 2004, Richetin, Richardson, & Boykin , 2011, Perugini & Bagozzi, 2001; 2004).

Playing Behavior was measured by the question"Approximately how many hours over the week do you play video games?" Participants also completed the question about what kind of video game they played the most often.

Intention was assessed by three items (''I will play video games,'' ''How likely is it that you will play video games?'' and ''I intend to play video games''). The reliability of this measure was satisfactory. The Cronbach Alpha was .789.

Attitude. Participants were presented with the stem ''I think that for me video game playing is…'' followed by nine bipolar scales (bad-good, negative-positive, unpleasant-pleasant, punishing-rewarding, unenjoyable-enjoyable, unsatisfying-satisfying, uncool-cool, useless-useful, harmful-harmless). This achieved very good reliability. The Cronbach Alpha was .812.

Subjective Norms (SN) were assessed by three items (''People who are important to me think I should play video games,'' ''People who are important to me would approve of my video games playing,'' and ''People who are important to me would be very happy if I play video games''). The Cronbach Alpha was .829.

Perceived Behavioral Control (PBC) was assessed with five items (''How much control do you have over video games playing?,'' ''Whether I play video games or not is completely up to me,'' ''For me to play video games is easy,'' ''For me to play video games is difficult,'' (scored as reversed) and ''If I wanted to, it would be easy for me to play video games''). The reliability of this measure was not satisfactory (the Cronbach Alpha was .467). The last item in the above list was not related to the others and was subsequently eliminated. The Cronbach Alpha for the remaining items was 0.600. The reliability of the adjusted measure was at the edge of acceptability and therefore was not excluded from the measures tested in the models.

Behavioral Desire (BD) was measured by three items (''How strongly would you characterize your desire to play video games'' ''I desire to play video games,'' and ''Video games playing is something that I desire to do''). The reliability of this measure was high. The Cronbach Alpha was .855.

Anticipated Emotions. Positive Anticipated Emotions (PAE) were measured with five items. Participants indicated how delighted, proud, happy, pleased and satisfied they would feel if they succeeded in playing video games. Negative Anticipated Emotions (NAE) were also measured with five items. Participants indicated how disappointed, agitated, guilty, regretful and frustrated they would feel if they failed in playing video games. The reliabilities were high for both Negative (the Cronbach Alpha was .933) and Positive Anticipated Emotions (the Cronbach Alpha was .896).

Goal Desire. In order to measure GD, participants were first asked, ''What do you think would be the most likely reason why you would play a video game?'' The desire toward this goal was measured with three items (''How strongly would you characterize your desire to reason Y?,'' ''How likely is your desire to reason Y?'' and ''The intensity of your desire to reason Y can be described as?''). The Cronbach Alpha was 0.854.

Participants also completed questions about their gender, age as well as choosing whether they were secondary school students, university students or employed.

6. RESULTS

Age did not correlate with any measured variables (GD, NAE, PBC, Attitude, SN, BD, Intention or Behavior). Age only significantly correlated with PAE (r = -.146, p = .035). It means that the older the players are, the fewer the positive anticipated emotions they experience when they successfully play video games. Female and male players did not differ in any of the measured variables. The descriptive characteristics measuring the variables are listed in Table 1.

Table 1.

Means (on 5-point scales with 5 indicating higher score on the construct or in hours per week in Behavior) and Standard Deviations of the components of the TPB and the EMGB.

	All Players (N=210)	
	Mean (M)	Standard Deviation (SD)
Behavior (Actual Playing in hours per week)	18.00	12.68
Intention to Play	3.48	0.96
Attitude	3.91	0.59
Subjective Norms	2.76	0.88
Perceived Behavioral Control	4.10	0.65
Behavioral Desire to Play	2.96	0.99
Positive Anticipated Emotions	3.52	0.96
Negative Anticipated Emotions	2.14	0.95
Goal Desire	3.49	0.95

The correlation matrix for all variables included in the TPB and the EMGB models is presented in Table 2. Playing behavior correlated with intention, BD, attitude, PAE, NAE and GD. Intention and attitude correlated with all variables. PBC only correlated with intention, attitude and SN. GD was correlated with BD and intention as well as with playing behavior.

Table 2.
Correlation among the constructs of the TPB and the EMGB applied to video game playing.

	Playing	Intention	Attitude	SN	PBC	BD	PAE	NAE
Intention	0.32*							
Attitude	0.15*	0.5**						
SN		0.36**	0.26**					
PBC		0.25**	0.28**	0.18*				
BD	0.30*	0.67*	0.46**	0.25*				
PAE	0.21**	0.58**	0.5**	0.29**		0.71**		
NAE	0.29**	0.29**	0.14*	0.17*		0.46**	0.40**	
GD	0.32**	0.42**	0.36**	0.19**		0.49**	0.48**	0.32**

Note: GD = Goal desire, SN = Subjective Norms, PBC = Perceived Behavioral Control, PAE = Positive Anticipated Emotions, NAE = Negative Anticipated Emotions, BD = Behavioral Desire
N=210. * p<.05, **p<.01

The reasons for playing video games include the reasons (goals) participants listed for playing. The goals reported by the participants were: to have fun (31,4%), to avoid being bored (18,1%), to be with friends (15,2%), relax (10%), to escape from worry (10%), to win over other players (7,1%) and to advance in the game (6,2%).
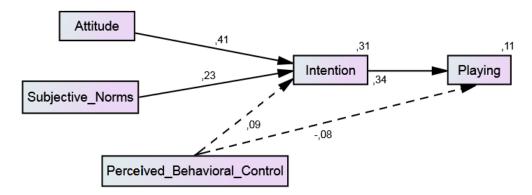
6.1. Tests of the TPB and the EMGB applied to video game playing

The TPB and the EMGB were formally tested with structural equation models using AMOS 20. Full structural equation models were used in order to investigate the goodness of fit for the TPB and the EMGB. The goodness of fit was ascertained by examining the chi square statistic which should be non-significant. The comparative fit index (CFI), the normed fit index (NFI), and the root mean square error of approximation (RMSEA) were also used as indicators of goodness of fit. Values above .95 for both the CFI and NFI and below .06 for the RMSEA can be considered satisfactory (Hu & Bentler, 1999).

6.1.1. Tests of the TPB applied to video game playing

Structural equation modeling was used to test the TPB. Attitude, SN and PBC were included as predictors of intention. Intention and PBC were included as predictors of playing behavior. The TPB obtained a perfect fit $\chi 2(N=210) = .166$, $p = .92$ (CFI = 1, NFI = .999, RMSEA = 0). The predictors accounted for 31% of the variance for intention and 11% for behavior. Intention was a function of attitude ($\gamma = .41$) and SN ($\gamma = .23$). PBC was a significant predictor of neither intention nor behavior. Finally, intention predicted playing behavior ($\beta = .34$). The standardized parameter estimates for the TPB are reported in Figure 1. The correlations among predictors are omitted for the sake of simplicity.
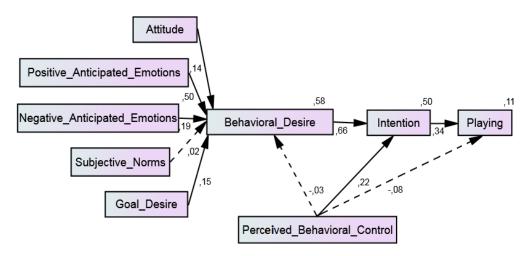
Figure 1.
Parameters estimates for the TPB applied to video game playing (N=210).

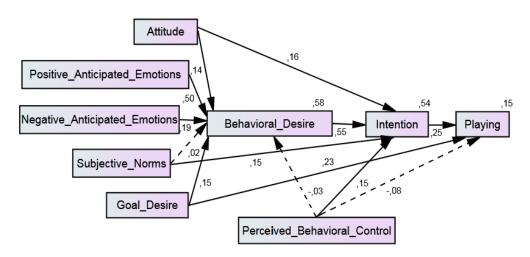### 6.1.2. Tests of the EMGB applied to video game playing

Structural equation modeling was used to test the EMGB. Attitude, SN, PAE, NAE, PBC and GD were included as predictors of BD. BD and PBC were included as predictors of Intention. Intention and PBC were included as predictors of playing behavior. The initial model obtained a poor fit $\chi2(N=210) = 41.66$, $p < .001$ (CFI = .947, NFI = .933, RMSEA = .115). Post hoc modification indices suggested an improved fit by the direct effect from attitude and SN to Intention and from GD to playing behavior. The standardized parameter estimates for the EMGB initial model is reported in Figure 2 and for the EMGB revised model in Figure 3. The correlations among predictors are omitted for the sake of simplicity.

Figure 2.
Parameters estimates for the EMGB (initial model) applied to video game playing (N=210).

The revised model obtained an acceptable fit χ2(N=210) = 12.581, *p* = .127 (CFI = .992, NFI = .98, RMSEA = .52). The predictors accounted for 58% of the variance in BD, for 54% of the variance in intention and for 11% of the variance in playing behavior. BD was a function of attitude (γ = .14), PAE (γ = .50), NAE (γ = .19) and GD (γ = .15). Intention was a function of BD (β = .55), but also attitude (γ = .16), SN (γ = .15) and PBC (γ = .15). Finally, playing behavior was predicted by intention (β = .25) as well as by GD (γ = .23). The hypothesis H2 was not supported and the hypothesis H3 was supported.

Figure 3.
Parameters estimates for the EMGB (revised model) applied to video game playing (N=210).

A comparison between the predictive power of the two models for intention and behavior shows that the EMGB accounted for more variance than the TPB. When applied to video game playing, the EMGB explained 54% and the TPB 31% of the variance for intention. The EMGB explained 15% and the TPB 11% of the variance for behavior. Therefore, hypothesis H1 was supported.

7. DISCUSSION

This study was designed to examine the prevolitional processes of video game playing within two models; the TPB and the EMGB. A further aim of this study was to investigate the goals underlying the behavior and the role of those goals in the determination of the desire to play (BD) and playing behavior within the EMGB. Using structural equation modeling, the goodness of fit of these models was tested.

The first aim of this study was to investigate the TPB applied to video game playing. The obtained fit was perfect but attitude and SN (predictors) only accounted for 31% of the variance in intention and intention only accounted for 11% of the variance in behavior. The results revealed better predictive power of the TPB applied to video game playing compared to those previously reported by Haagsma et al. (2012). Yet, despite the statistical significance, the total variance explained by this model was relatively low. A possible explanation for this is the fact that the TPB does not take into account motivational or

affective processes. This could potentially improve the predictive power of the model. In contrast to Haagsma et al. (2012), it was found that SN was a significant predictor of intention, while PBC was not. PBC also failed to predict playing behavior within the TPB model. A reason for this could be the procedure used to measure PBC or the relatively weaker reliability of this construct.

The second aim of this study was to investigate the motivational and affective processes within the EMGB that lead to video game playing. It was found that the initial model obtained an unsatisfactory fit. While intention was a significant predictor of behavior, the desire to play (BD) did not fully mediate the direct effect of SN, attitude and GD on intention. By direct effect from attitude and SN to intention and by direct effect from GD to behavior, the revised model obtained acceptable fit. The EMGB (Perugini & Bagozzi, 2004) proposes that desire mediates the effects of other predictors on intention. The full mediation hypothesis was confirmed by Perugini and Bagozzi (2001) and obtained support in the current data too. It was found that BD mediated the effect of PAE and NAE on intention but did not fully mediate the effect of attitude on intention. SN and PBC were not significant predictors of BD. Nevertheless, even when the aforementioned direct effects from attitude and SN to intention were included, BD was still the strongest predictor.

As is consistent with previous findings (Perugini & Bagozzi, 2001; Leone et al., 2004; Richetin et al., 2011), the significant predictors of BD were PAE and NAE. The anticipation of the positive feelings one would have if they succeeded in playing behavior and the anticipation of the negative feelings one would have if they failed in playing behavior are associated with the desire to play (BD). The greater variance explained by PAE compared to NAE in BD echoes the main reported goals underlying video game playing.

Although Perugini and Bagozzi (2001) assume in the EMGB that the effect of attitude on intention is mediated by BD, in some cases and for some behaviors, the mediation by BD may not be complete (e.g. Leone et al., 2004). Given that previous research has demonstrated that attitude influences intention, it is theoretically meaningful to allow a direct path from attitude to intention. It was found that the attitude to play was a significant predictor of BD although attitude also had a direct effect on the intention to play.

As mentioned, under some circumstances, the mediational power of BD might not mediate all the effects of the EMGB constructs on intention. Although what is desired is often intended, intention still might be directly based on the reasons and beliefs concerning the behavior. The results have revealed the direct effect from SN and PBC to intention. Playing game might be intended because players are believed to be normatively appropriate and therefore crucial for one's role identity (Carver, 1996). The development of an intention to play can be also facilitated if the player feels capable of enacting the behavior (Perugini & Conner, 2000). In such cases, the motivational input to intention comes from SN and PBC and can influence the intention directly without being completely mediated by BD.

A further aim of this research was to use the EMGB to determine whether the goal one wants to achieve when playing had an indirect rather than a direct relationship with behavior through BD and intention. The current results have confirmed that video game playing can be motivated by many different goals. The contribution of GD on BD was significant but the desire toward the goal one wants to achieve by playing (GD) also directly related to the emergence of the behavior. The results have also revealed that the desire toward the playing goals (GD) not only predicts the desire to play (BD) but has a more important role than more well established constructs. Indeed, SN and PBC did not

play a critical role, whereas PAE, NAE, attitude and GD were significant predictors of one's desire to play video game (BD).

Habitual or automatic processes included in video game playing may result in an association between GD and playing behavior occurred without considering intention or BD. As Perugini and Bagozzi (2004) mentioned, given the extent that the reasons for acting reflect non-deliberative processes, direct effects from reasons to intentions might be expected. This direct effect would reflect automatic activation of intentions. Although the study found direct effects between GDs and behaviors (not intentions), it can also be assumed that there is the effect of automatic or habitual processes in prevolitional processes that lead to video game playing. This direct association between GD and playing behavior should be stronger among heavy players than among casual players where the connection between goal desire (GD) and playing has not been created (or is not very strong) and deliberative processes are stronger determinants of behavior. For that reason, the moderating effects of playing experience should be taken into account in further research. It should also be emphasized that the contributions of the EMGB model only consider the deliberative path and treats video game playing as a planned behavior. Based on the findings, there is an assumption that habitual or automatic processes in prevolitional processes that lead to playing should not be omitted because they can play a role in playing behavior.

The limitations of this study need to be acknowledged. This study is correlational and therefore may shed light only indirectly on the causal mechanisms underlying decision-making processes. Nevertheless, the results have been consistent with the hypothesized theoretical framework. Future experimental studies could manipulate the key variables explicitly. It also needs to be acknowledged that the procedures used to measure some constructs could be improved. PBC was the construct that obtained weaker reliability. Although similar problems with reliability have been found in other studies (e.g. Richetin et al., 2011), items measuring this construct are used in a lot of research investigating behavior within the EMGB (e.g., Perugini & Bagozzi 2001; Leone et al. 2004; Richetin et al. 2011).

Practitioners may benefit from knowing the processes that lead to playing behavior. The determinants of the TPB or the EMGB have a different role in this process. The results have suggested that anticipated emotions, attitude and GD seem to be connected with more distal determinant of playing behavior; the desire to play. This construct does not necessarily imply that the player will intend to play. However, the desire to play was the strongest predictor of a more proximal determinant of playing behavior and together with perceived perception of control over playing (PBC), perceived social pressure to play (SN) and attitude, had a direct effect on the intention to play. The results have also suggested that players' goals played an important role in the prevolitional processes of video game playing and goal desire had an important role in the desire to play. The results have also suggested that it is necessary to know a player´s playing habits because automatic processes can play a role in the process of developing and maintaining playing behavior.

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KEY TERMS & DEFINITIONS

The Theory of Planned Behavior (TPB): is widely adopted model of attitudes. According to the TPB, people act in accordance with their intentions and perceptions of control over the behavior (PBC), whereas intentions in turn are influenced by attitudes toward the behavior, subjective norms (SN), and perceived behavioral control (PBC).

Intention: is assumed to be the most proximal determinant of the behavior.

Attitude toward the behavior: corresponds to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question.

Subjective Norms (SN): involve the perceived social pressure to perform or not to perform the behavior.

Perceived Behavioral Control (PBC): is defined as the perceived ease or difficulty of performing the behavior.

The Extended Model of Goal-directed Behavior (EMGB): expanded the TPB. In the EMGB, the intention to perform a behavior is primarily motivated by the desire to perform the behavior. This behavioral desire (BD) relies on reasons that make the behavior desirable and is assumed to reflect the effects of attitude, SN, PBC, anticipated emotions (AE) and Goal Desire (GD) and mediates their influence on intention.

Behavioral Desire (BD): is defined as the personal motivation or wish to perform the action.

Anticipated Emotions (AE): are anticipated affective reactions to the failure (negative anticipated emotions, NAE) and success (positive anticipated emotions, PAE) of performing the action.

Goal Desire (GD): the inclusion of GD in the EMGB is based on the assumption that the desire to achieve a certain goal influences the desire to perform a certain behavior that is subjectively felt to be instrumental for goal attainment.

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