ACADEMIC DISAPPOINTMENT: CONCEPTUALIZATION, SCALE DEVELOPMENT AND INITIAL VALIDATION1

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Abstract

Background and aims: Relationship between emotions and student engagement became a topic of scientific inquiry in the recent decades. In the literature, there are only a few research on academic disappointment despite its being acknowledged as a naturally occurring emotion in education life. This article aims to present a reconceptualization of disappointment, an instrument to measure academic disappointment and initial findings about psychometrics of this instrument.
Methods: An instrument with 3 different subsets was designed to assess academic disappointment with oneself (SD), with performance (PD) and with other person giving feedback (OD). Each subset included 16 items with 7-point Likert scale. Data was collected from 280 Hungarian undergraduate students.
Results: The SD and the PD subsets yielded similar factor structures with 4 factors. Although, the OD subset differed in terms of factor structure.

[1] The data collection for the current research was approved by the Ethics Committee of Psychology and Education Institute of Eötvös Loránd University/20151118.

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Discussion: The results show that students` experience of academic disappointment can vary. Some students tend to have a higher motivation and/or effort in response to this academic emotion while others tend to experience it as an emotion undermining motivation and/or effort. The direction of the emotion seems to cause difference in experience, particularly when the main trigger is the relational aspect of the situation.

Keywords: academic emotions, academic disappointment, student engagement, educational engagement, emotions, educational psychology.

Background and aims

Recent studies unveiled that emotional experiences are likely to affect students` education life. As a result of this acknowledgement, relationship between emotions and "educational engagement" (EE) (Fredricks et al., 2019) became one of the most extensively investigated topics in the field of education (King & Gaerlan, 2014; Pekrun & Linnenbrick-Garcia, 2012). The research findings demonstrated that the implications of the interactions between emotions and EE may differ depending upon the inquired academic emotion (AE). For example, experiencing academic enjoyment was shown to have favorable outcomes in terms of EE, such as students` making more effort towards their studies (Kahu et al., 2015; Pekrun, Goetz, Barchfeld, et al., 2011). Whereas academic boredom was reported to have an undermining effect (i.e., reduced effort) (Hanin & Van Nieuwenhoven, 2016; Sharp et al., 2017). On the other hand, the evidence from the literature points out that some of the negative AE (e.g., shame (Ganotice et al., 2016), disappointment (Kahu et al., 2015) may vary in their effects on students and may have a more complex dynamic. In light of these evidence, it is suggested that there is need for more studies that enlighten whether and why some negatively valenced AE led to differing emotional, cognitive or behavioral patterns. Further scientific findings may serve crucial purposes such as fostering new approaches in education to prevent students from reducing their EE (e.g., attrition).

Theoretically, "The Control-Value Theory" (Pekrun et al., 2007) offers a framework which serves to comprehend role of feelings in educational life. According to this theory, the term "academic emotions" refers to emotional experiences related to academic life or standing (Pekrun et al., 2009). The AE are assumed to be operating upon three fundamental dimensions. The first dimension put emphasis on whether an AE is elicited by "activities" (e.g., studying) or by "outcomes of the activities" (e.g., midterm grade) (Pekrun & Perry, 2014). The second dimension acquiesces "valence" (i.e., positive vs. negative) as a distinguishing feature. The third dimension differentiates AE depending upon their subsequent results in terms of engagement with academic life (i.e., activating vs. passivating) (Pekrun, 2006). In this regard, AE are postulated to exert their influence upon academic life based on these three dimensions. Their effects are suggested to be manifesting through various mechanisms including student engagement (Linnenbrick, 2007). In the literature, the EE (Fredricks, Blumenfeld, & Paris, 2004) is defined as

encompassing a wide range of investments devoted to academic work and activities. Briefly, the emotional aspect of EE encompasses almost all kinds of elements related to "affect", such as the significance of a certain grade etc. (Fredricks, Blumenfeld, & Friedel, 2005). The cognitive engagement covers the investment by means of personal cognitive resources (e.g., self-regulated learning), whereas the investment at behavioral level is identified through actions such as attendance to courses (Fredricks, 2011).

In the educational settings, certain emotions are likely to be more common among students as they are exposed to similar conditions in the surrounding environment. In this regard, disappointment was reported to be an emotion that is often encountered during the education process (Goebel & Maistry, 2019; Mahfoodh, 2017). These findings can be seized in depth if the definition of disappointment is considered. Existing definition of the disappointment stemmed from the field of economy (Bell, 1985). In this framework, disappointment was defined as a negative emotion which is triggered due to the discrepancy between what was expected and what was attained. Considering the field of education, educational settings offer a growth platform in which students are being trained in various ways. This growth process usually happens through assessments (e.g., exams etc.) which may not always have results in line with the students' expectations. In this respect, the variances between expectations and outcomes that give rise to disappointment, are a natural part of education life. Nevertheless, there is a scarcity of studies exploring academic disappointment (AD). The findings from these studies signal that AD is likely to be experienced with different patterns. More clearly, for some students it was reported to be perceived as an opportunity to learn and to enhance engagement with studies (Mahfood, 2017; Wright, 2012). While for others, it was noted to undermine their emotional (Goebel & Maistry, 2019) and behavioral EE (Meyer & Marx, 2014; Rowe et al., 2014). These findings seem to contradict with the classifications of Control Value-Theory. However, in an earlier work, Pekrun and colleagues (Pekrun, Goetz, Barchfeld et al., 2011) noted that some negative AE (e.g., shame) carry potential for a relatively complex phenomenology.

Based on these theoretical formulations and evidence, it is suggested that inspecting AD and its effects on EE may serve to improve our knowledge on AE. It may also provide valuable information to the field that may help to prevent lack of EE. Nonetheless, to our knowledge, there is only one attempt to design an instrument to assess AD (Harris et al., 2008). The researchers (Harris et al., 2008) created a 4-item questionnaire to collect data from students about the perceived (i.e., "How disappointed were you with this score?'') and objective intensity (i.e., "What was the actual score you received on that exam?") of their AD. However, the scope of this research was to investigate the associations between different forms of perfectionistic tendencies and their effects on perseverative thoughts. In addition, the researchers stated that they did not seek out any information about the psychometrics of this questionnaire. Other scientific efforts to measure disappointment had motives outside the scope of developing a tool for use in educational settings. These motives included differentiating between negative feelings (e.g., disappointment, anger, regret) (Marcatto & Ferrante, 2008; Van Dijk et al., 1999b) or working on appraisal patterns of

emotions (Van Dijk & Zeelenberg, 2002a) in the field of decision-making and assessing religious beliefs (Strelan et al., 2009). In this respect, there are not any reliable and standardized instruments to assess AD. Current study aims to fill this gap in the literature. More clearly, it aims to offer a new conceptualization of disappointment, to present a tool to measure AD and to present initial results on the psychometrics of this instrument. In parallel to this inquiry, it aims to scrutinize the relationship between AD and EE.

For this purpose, a comprehensive review of the literature was carried out on emotions, emotional experiences in academic life and disappointment as a first step. As the result of this inspection, it was noted that there are three constructs which should be acknowledged for a rigorous assessment of AD. As a second step, an assessment tool was designed by considering the identified constructs in the item construction process. A pilot and an actual data collection process were carried subsequently. Finally, the data analysis was conducted to acquire information about the psychometrics of the instrument. Before reporting the employed method and the results, we deem important to explain the constructs that were considered in item creation and their relevance for the development of Consequences of Academic Disappointment Inventory (CADI).

Elements of the Experience of Disappointment in Educational Setting

Direction of Disappointment

Theories and research which endeavored to illuminate the nature of emotions suggest that one of the constructs that requires attention is the direction. As an example, Thamm (2007, p. 24) suggested that target of emotions is an element among the fundamental rules which serve to comprehend emotional experiences. The author asserted that emotions may have multiple targets including the subject him(her) self, another person or a "third party". In this respect, the disappointment can be thought of as an emotion which may arise both due to issues in the inner world of the subject about oneself (e.g., disappointment with oneself) or in interaction with another person (e.g., disappointment with teacher). Moreover, the research findings showed that disappointment does not have to be necessarily a social emotion targeting an individual (Van Dijk & Zeelenberg, 2002b). Investigating evaluation styles of disappointment in decision-making field, researchers demonstrated that disappointment related to another individual and disappointment related to an attained "outcome" are appraised in distinct ways.

In fact, the definition of the disappointment gives clues to understanding how this emotion can be revealed in different ways. The definition puts essential emphasis on unattained expectations which indeed, may occur in life not only in relation to disappointing social interactions but also, in relation to expectations from oneself. For instance, receiving a lower grade than expected may consequently disappoint someone either with themselves (as person), with their performance or the person giving the grade (e.g., teacher). This theoretical frame is also supported by the work of Weiner (1979) who scrutinized appraisals of achievement in academic settings. According to Weiner (1979), when people evaluate their performance, they do consider both their own qualities and the qualities of the work at hand. Relying on these conceptualizations and the findings, it can be asserted that to provide reliable findings and accurate interpretations,

any work on the AD must take in to account the direction of the emotion.

Disappointment and Motivation

The literature shows that the relationship between feelings and motivation is interwoven (Roseman & Smith, 2001). Congruently, this interaction is acknowledged in the education field (Løvoll, Røysamb, & Vittersø, 2017; Schukajlow, Rakoczy, & Pekrun, 2017) and evidenced in the literature. For example, Pekrun and colleagues (2002) showed that certain positive feelings (i.e., hopefulness, pride, and enjoyment) were more likely to positively affect attitudes towards learning, including the motivation. On the other hand, the assessed negative feelings (i.e., boredom and hopelessness) were reported to undermine motivation (Pekrun, Goetz, Titz & Perry, 2002). The accumulation of evidence on the relationship between emotions and motivation was elaborated into a theoretical framework (Linnenbrick, 2007) which asserts that positive emotions are likely to enhance the motivation to engage in a particular task while negative emotions are likely to decrease the motivation.

In addition to this knowledge, we identified two more reasons for considering motivation as a crucial element in measurement of AD. First, in accordance with the fundamental assumptions of the Control Value Theory, the current research recognizes the EE to be at the interjunction between the students' AE and their success. The affective dimension of the EE, on the other hand, encompasses motivation along with other affective indicators (Christenson & Reschly, 2012). Secondly, although the research on disappointment is scarce, there are valuable studies from decision-making literature which point out to the existence of a dynamic interaction between disappointment, motivation, and engagement. As an example, in their work Zeelenberg and colleagues (1998) aimed to investigate feelings of regret and disappointment and they tried to determine the factors that can be important in differentiating the two emotions. The scope of their inquiry also comprised motives that accompany people's experiences of these two emotions. The findings unveiled that if a person feels regretful, (s)he is likely to have a motive to act so as to improve their situation (Zeelenberg, et al., 1998). On the other hand, it was shown that if a person is disappointed, (s)he is likely to have a motive to keep him/herself distanced from the feeling of disappointment or from the experience that resulted with disappointment. Therefore, we believe in the importance of investigating motivational aspect of AD.

Disappointment and Behavioral Investment

As the empirical research show, students' behaviors are oriented directly or indirectly by emotions (Pekrun & Stephens, 2010; Schutz, Hong, Cross, & Osbon, 2006). For instance, in a previous study, Senecal and colleagues (1995) demonstrated that "procrastination" (referred as a difficulty in terms of being motivated and being behaviorally engaged) have a significant association with students' affect. In respect of disappointment, an inverse association between disappointment and behavioral investment was reported by Van Dijk and colleagues (1999a). In this study, the researchers inspected how investment (or lack of it) affect the emotions triggered when people cannot obtain what they desire. The results indicated that the level of investment determines subsequent affective states of the person

and that if the person invests more (s)he is more likely to feel more disappointed when the obtained outcome is not the one that was hoped for (Van Dijk, et al., 1999a). A theory on the relations between AD and behavioral investment of students was interestingly formed in the field of economy by Anderberg and Cerrone (2017). The authors worked on causes of lack of behavioral engagement (i.e., dropouts) in academic life and offered an elaborated model of personal investment towards education. In their model, they suggested that avoidance of AD, could be an important factor that determines whether a student will or will not invest in education. In explaining their argument, they noted that students tend to adjust their investment and expectations about their academic life in accordance with their perception of their own academic capacities. In this way, for example, students who perceive themselves as having lower skills are postulated to be likely to invest minimally to avoid AD. This theory also corresponds with the definition of disappointment which emphasizes the role of expectations in occurrence of this unpleasant affect. Taking into account findings in the literature, it is proposed that AD is likely to be intertwined with behavioral investment to academic life. Hence, we assert that assessment of AD should comprehend the behavioral investment as a construct.

Method

Item construction

The former definition of disappointment was created in economics (Bell, 1985). We believed that revising this former definition may be adequate for a main reason. Although there are low number of studies on disappointment, these works revealed the existence of additional aspects of this emotional experience which are not encompassed by the former definition. These aspects include "desirability of outcome" (Van Dijk, et al., 2003; Van Dijk, et al., 1999a), "hopes for a desired outcome" (Ortony, et al., 1988; Van Dijk, et al., 1999b; Van Dıjk, 1999; Zeelenberg, et al., 2000) and "dissatisfaction" raised by attained outcome (Loomes & Sugden, 1986; Zeelenberg & Pieters, 2004). Therefore, it was assumed that an operational definition that embraces such valuable elements may serve better as framework in terms of its' construct validity. In collaboration with experts, we identified the parameters to be used in this revision. According to this revised definition, "disappointment is a negative feeling that appears when one expects to attain a hoped for or desired thing and the outcome is not satisfying." This conceptualization became the departure point of the current research.

As a second step, 3 researchers (A. S. Ç., G. O. and I. T. K.) designed a recall task by which students were instructed to remember a situation in which they received negative feedback from a professor or a well-respected authority and felt disappointed in the last months in their academic life. The items (Table A1) to be rated in response to the recall task were created by considering the identified parameters and the revised definition of disappointment. An inventory with 3 subsets was designed. The item subsets aimed to measure the direction (i.e., AD with oneself (SD), with performance (PD) and with other person giving the feedback (OD)) as well as the motivational and the behavioral components of the AD. All the items were designed to be rated on 7-point Likert scale (1 = Not true of me at all, 2 = Not true of me, 3 = Rath-

er not true of me, 4 = Somewhat true of me, 5 = Rather true of me, 6 = True of me and 7 = Absolutely true of me). In the following step, 2 experts from the field of clinical psychology (G. K. and B. B.) were asked to review the items. In accordance with the experts` feedback, some of the items were revised to improve content validity. After these revisions, the inventory was transferred to Qualtrics to convey online access to participants.

Before starting the data collection, a pilot study was conducted with 4 subjects. These volunteering subjects were Hungarian B.A. students. In compliance with cognitive interviewing techniques, a thinking aloud procedure was performed. The subjects were asked to think aloud while reading and rating the inventory items. The feedback received during this pilot indicated that the items were appropriate in terms of their face and content validity.

Participants and procedure

The sample consisted of 280 Hungarian B.A. students across different majors and universities in Hungary. The age of participants ranged from 19 to 48 years (M = 21.74, SD = 3.51) (See Table 1). Most of the sample consisted of the students who were either in their 1st (32.9) or 2nd (33.6) year of their education.

The participation to the current research was voluntary, and convenience sampling was employed. The data collection was performed via Qualtrics. Recruitment announcements were made through various channels including social media, classes etc. In this way, the participants were recruited both via online platforms and through compensation with course credits. Volunteering subjects were asked to read and approve the informed consent form. Then, they were asked to respond to the survey which took approximately 20 minutes to complete. The data collection was approved by the Ethics Committee of Psychology and Education Institute of Eötvös Loránd University and was carried out accordance with Helsinki Declaration.

Table 1. Descriptive Statistics (N=280)

	Characteristic	**Frequency**	**Percentage (%)**
Gender	Male	64	22.9
	Female	216	77.1
Age	18-19	446	16.4
	20-29	227	81
	30-39	4	1.4
	40-	3	1
Years in university education	1	92	32.9
	2	94	33.6
	3	50	17.9
	4	16	5.7
	5	18	6.4
	Others	10	3.5

Statistical analysis

The analysis was ran on SPSS 20 and Mplus 8 (Muthén & Muthén, 1998-2017). The recommended criteria from the previous studies (Orosz, et al., 2018) and the guidelines (Boateng, et al., 2018) were applied to evaluate the items. The items were inspected in terms of their content validity (Haynes, et al., 1995; Zamanzadeh, et al., 2014), item-total correlations (Clark & Watson, 1995; Nunnally & Bernstein, 1978) and Skewness-Kurtosis values (Curran, et al., 1996).

Exploratory factor analysis (EFA) was performed to reveal the psychometric properties of the subsets. The robust maximum likelihood estimator (MLR) was used in the data analysis as it is known for its strength in generating reliable results (Lei & Shiverdecker, 2019). In addition, CF-varimax rotation was applied as it is known to enhance a harmonious distribution of variances among factors (Schmitt & Sass, 2011). The factor structure was tested by use of goodness of fit indices such as Chi-square ($\chi 2$) values, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) in accordance with the guidelines (Brown, 2015). TLI and CFI values are deemed in acceptable range if they are approximate to or greater than 0.90. The RMSEA value is suggested to be acceptable if it is equal or less than 0.08. To acquire information about the internal reliability, the Cronbach's alpha (α) and the composite reliability (CR) scores were examined.

Results

Item discrimination, normality, and content validity

The items were detected to be in the acceptable range in line with the criteria for item-total correlations (≥ 0.70) and Skewness-Kurtosis (± 2). Also, they were determined to be adequate in terms of content validity.

Exploratory factor analysis (EFA)

Disappointment with Self (SD) Subscale

To examine the factor structure and to obtain information about initial validity, EFA was performed. A 4-factor solution was revealed to give the best fit for the SD subset ($\chi 2 = 112.369$, df = 62, p = 0.000; CFI = 0.973, TLI = 0.948; RMSEA = 0.061 [90% CI 0.043-0.079]; SRMR = 0.017; AIC = 10704,32) (See Table A2). The factor loadings in this initial model ranged from 0.34 to 0.86. Although, the items 2, 3, 10 and 12 had cross loadings exceeding 0.2. The elimination of the items 2 and 10 was remarked to be appropriate for the following reasons. Item 2 was loaded on two factors with modest factor loadings on each (i.e., 0.48 on the 1st factor and 0.34 on the 3rd factor). In a similar way, the item 10 was loaded on two factors with modest factor loadings (i.e., 0.48 on the 1st factor and 0.34 on the 3rd factor). Hence, we repeated the analysis by eliminating the items 2 and 10. The results yielded again a 4-factor solution with adequate fit for the SD subset ($\chi 2 = 66.186$, df = 41, p = 0.000; CFI = 0.984, TLI = 0.964; RMSEA = 0.053 [90% CI 0.028-0.076]; SRMR = 0.015; AIC = 9486,93) (See Table A2). The factor loadings in this solution ranged from 0.42 to 0.89 (See Table 2).

In this revised model, 2 items were noted to have loaded on two factors. To be more precise, the item 3 was loaded on the 1st factor with 0.53 factor loading and on the 3rd factor with 0.30 factor loading. The item 12 was loaded on the 1st factor with 0.22 factor loading and on the 3rd factor with 0.42 factor loading. However, these cross-loadings were noted to be within acceptable range and not to pose any problem in identifying factors (Asparouhov & Muthén, 2009; Tóth-Király, et al., 2017).

Table 2. Results for the Revised 4-Factor Solution of SD Subset

	Self-Disappointment Subset			
Item no	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**
1	**0.601**	–0.057	0.270	–0.052
3	**0.537**	–0.144	0.308	–0.003
4	**0.895**	–0.020	–0.017	–0.032
5	–0.189	**0.661**	–0.061	0.079
6	0.064	**0.863**	–0.086	–0.008
7	–0.167	**0.696**	0.088	0.069
8	–0.188	**0.631**	–0.041	0.092
9	0.177	–0.063	**0.667**	–0.139
11	0.066	0.025	**0.743**	0.012
12	0.227	–0.049	**0.426**	–0.309
13	–0.037	0.119	–0.264	**0.487**
14	–0.020	0.143	–0.252	**0.553**
15	–0.060	–0.040	0.049	**0.833**
16	–0.025	0.070	–0.114	0.712
Factor Correlations				
Factor 1	-			
Factor 2	-0.53	-		
Factor 3	0.62	-0.36	-	
Factor 4	-0.44	0.38	-0.57	-
Reliability				
Cronbach alpha	0.89	0.89	0.84	0.86
Composite reliability	0.72	0.80	0.64	0.74

p = 0.000.

Disappointment with Performance (PD) Subscale

Similarly, a 4-factor solution yielded the most adequate fit for the PD subset ($\chi 2$ = 101.025, df = 62, p = 0.000; CFI = 0.981, TLI = 0.964; RMSEA = 0.053 [90% CI 0.033-0.071]; SRMR = 0.019; AIC = 10766,980) (See Table A2). In this model, the factor loadings ranged from 0.35 to 0.91. Items 4, 7, 9, 11, 12, 14 and 16 were detected to

have cross loadings exceeding 0.2. Items 7, 9 and 14 were evaluated for elimination for the following reasons. Item 7 was loaded on two factors with very close factor loadings (i.e., 0.40 on the 2nd factor and 0.42 on the 4th factor). Item 9 was also loaded on two factors with close factor loadings (i.e., 0.23 on the 1st factor and 0.35 on the 3rd factor). Item 14 was loaded with a negative factor loading on the 3rd factor (–0.45) exceeding the factor loading with the 4th factor (0.37). The analysis was repeated after the elimination of these items. The results revealed again a 4-factor solution with adequate fit to the data ($\chi 2$ = 35.620, df = 32, p = 0.000; CFI = 0.998, TLI = 0.995; RMSEA = 0.023 [90% CI 0.000-0.056]; SRMR = 0.013; AIC = 8808.830) (See Table A2). The factor loadings in this solution ranged from 0.48 to 0.93 (See Table 3). In this new model, the items 2, 4, 11, 12 and 13 were remarked to have minor cross-loadings. In evaluating these cross-loadings, we referred to the recommendations of Asparouhov and Muthén (2009). The authors suggest that to avoid inadequate rejections of fit models and to avoid disruptions in estimations, minor cross-loadings should be kept. Hence, we refrained from engaging in further eliminations for this subset.

Table 3. Results for the Revised 4-Factor Solution of the PD Subset

Item no	Performance Disappointment Subset			
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**
1	**0.567**	–0.240	0.157	–0.054
2	**0.551**	–0.240	0.274	0.061
3	**0.730**	–0.062	0.048	–0.217
4	0.599	–0.140	0.239	0.085
5	–0.145	**0.759**	0.004	0.022
6	–0.042	**0.650**	0.002	0.179
8	–0.149	**0.647**	–0.073	0.075
10	0.002	–0.017	**0.937**	–0.048
11	0.241	0.022	**0.585**	–0.206
12	0.241	–0.013	**0.480**	–0.198
13	0.049	**0.524**	–0.186	0.205
15	–0.164	–0.063	0.026	**0.789**
16	0.131	0.184	–0.179	0.736
Factor Correlations				
Factor 1	-			
Factor 2	-0.53	-		
Factor 3	0.62	-0.45	-	
Factor 4	-0.43	0.48	-0.63	-
Reliability				
Cronbach alpha	0.93	0.86	0.90	0.83
Composite reliability	0.70	0.74	0.72	0.73

p = 0.000.

Disappointment with the Other Person (OD) Subscale

For the OD subset, the analysis yielded a solution diverging from the models attained for the SD and the PD subset. The 3 and 4-factor solutions yielded more adequate fit indices compared to 1 and 2 factor solutions (See A3). Although, both 3 and 4 factor solutions resulted each with 8 items with factor loadings exceeding 1. On the other hand, the elimination of these detected items, on the other hand, did not provide meaningful factor structures for neither of the two models. Hence, a 2-factor solution ($\chi 2$ = 242.560, df = 89, p = 0.000; CFI = 0.902, TLI = 0.868; RMSEA = 0.089 [90% CI 0.076-0.103]; SRMR = 0.049; AIC = 12195,374) (See Table A2) was identified to yield better results when considering the fit indices, the factor loadings, and the factor structures. The modification indices for the 2-factor solution revealed a high correlation between the 4th and 12th items. These indicators pointed out to a need for specification of the model. The model was specified by using WITH statement between these items. The 16th item was detected to have a poor factor loading (i.e., 0.165). So, we decided to eliminate this item and the analysis were rerun with the remaining 15 items. The goodness of fit indices were indicated to be adequate for this solution ($\chi 2$ = 155.725, df = 75, p = 0.000; CFI = 0.946, TLI = 0.924; RMSEA = 0.070 [90% CI 0.055-0.086]; SRMR = 0.039; AIC = 11252,636) (See Table A2). In this solution, the factor loadings ranged from 0. 44 to 0. 94 (See Table 4) and there were not any cross-loads. The analysis for the OD subset demonstrated that it did not replicate the same factor structure with the SD and the PD subsets. The potential reasons for this difference are to be elaborated in the discussion section. The fit indices for the eliminated models for all three subsets are presented in appendix (Table A3).

Table 4. Results for the Revised 2-Factor Solution of the OD Subset

Items	Disappointment with the other subset	
	Factor 1	**Factor 2**
1	**0.712**	–0.251
2	**0.864**	–0.035
3	**0.703**	–0.080
4	0.489	–0.287
5	0.011	**0.946**
6	–0.121	**0.446**
7	–0.265	**0.510**
8	–0.144	**0.548**
9	**0.539**	-0.368
10	**0.618**	–0.056
11	**0.774**	–0.037
12	0.510	–0.171
13	–0.077	**0.822**
14	–0.266	**0.518**
15	–0.050	**0.727**

Items	Disappointment with the other subset	
	Factor 1	**Factor 2**
Factor Correlations		
Factor 1	-	
Factor 2	-0.59	-
Reliability		
Cronach alpha	0.91	0.89
Composite reliability	0.85	0.84

p = 0.000.

Reliability

In analyzing the internal reliability of the subsets, we considered the items which were identified to strongly load on a particular factor as forming different subgroups. Revealed information about the internal reliability indicators are presented in tables 4, 5 and 6. We assessed Cronbach's alpha (α) (Cronbach, 1951) as this measure is a commonly referred indice of internal reliability. In addition, we examined the composite reliability (CR). The inspection of the CR scores are deemed to provide a relatively better estimate because they are extracted from a calculation based on factor weights and error variances (Raykov, 1997).

In terms of Cronbach alpha, the internal reliability for all the subgroups belonging to the SD and the PD subsets were good when considering the recommendations from the guidelines (Tavakol & Dennick, 2011; Bland & Altman, 1997). Despite its defiance from our initial theoretical formulations, we also conducted reliability analysis for the OD subset to better understand the relations between the items of this subset (See Table 6). In regards of the CR scores, the values equal or greater than 0.60 are suggested to be within acceptable range in terms of reliability (Hamid et al., 2017; Hair et al., 2014). The CR scores for all of the subgroups of the 3 subscales were larger than 0.60 and thus, indicated a good internal reliability.

Factor labelling

As the SD and the PD subscales demonstrated similarities in their factor structure, the factor labels employed for these subsets were similar. The 1st factor was labelled "Motivation" which is conceptualized in the literature as "The hypothetical construct used to describe the internal and/or external forces that produce the initiation, direction, intensity, and persistence of behavior." (Vallerand, 2012). In accordance with the theoretical frame of the current study, motivation is deemed to be a manifestation of affective dimension of the EE. As the 2nd factor for both the SD and the PD subsets were mainly comprised of the items indicating a lack of motivation, this factor was named "Lack of Motivation". The 3rd factor of these subsets is labelled as "Behavioral Investment" (BI). This factor can be said to be in line with the behavioral engagement defined by Fredricks and colleagues (Fredricks, et al., 2019). However, we preferred to use the label BI as the items of the 3rd factor were designed by use of specific indicators such as devoted time and effort in academic tasks. The 4th factor consisted of the items designating a lack of

BI. Hence, this factor was labelled "Lack of Behavioral Investment".

The OD subset was determined to be diversified from the SD and the PD subsets in terms of its overall composition. The extracted factor structure revealed that the 1st factor was comprised of the "positively worded items" in this subset. More specifically, it included the items covering both the motivational and the behavioral aspects of the AD with another person giving the feedback. The 2nd factor consisted of the "negatively worded items". It encompassed all the items which refer to a lack of motivation and lack of behavioral investment.

Discussion

The evidence from the literature brought about the recognition that AE have a potential to affect education life. The AE are suggested to manifest their effects through different ways including EE. Despite the interest in research on AE, only a handful of studies investigated AD. We believe that research on AD may provide both scientists and educators with valuable knowledge to be used for crucial purposes (e.g., prevention of dropouts etc.). Nevertheless, to examine the AD, a need for a reliable and valid assessment tool was evident in the literature. To fill this gap, the current research aimed to create an instrument to assess how students experience disappointment in educational settings. The findings showed that a 4-factor solution gives the most adequate fit for the SD and the PD subsets. However, in both subsets, minor cross-loadings were noted even after the elimination of the selected items. This result can be interpreted as a natural consequence of difficulty of measuring human emotions. Indeed, it is recognized to be challenging to create items which indicate directly and only a single construct in the field (Orosz, et al, 2018; Rodriguez, et al., 2016). Additionally, it is known that the existence of minor crossovers does not necessarily pose a threat for conceptualization of the factors (Tóth-Király, Bőthe, & Rigó, et al., 2017). On the other hand, it is important to remark that assessments with larger samples may serve to obtain more information about the inspected constructs and the factorial structure of the inventory. Therefore, we believe that it can be incautious to indicate these reported statistical solutions and item subsets as the final models of the inventory.

An interesting finding revealed by the current research concerned the similarities and the divergences between different experiences of AD in relation to the direction of the emotion. According to the results, it seems that students experience their AD with themselves and their performance in a similar manner. In line with this similarity, for the SD and the PD subsets, the analysis elicited 4 factors referred as motivation, lack of motivation, BI, and lack of BI. Surprisingly, the results showed that students experience their AD with the person giving the feedback in a different manner. This result for the OD subset signals a sharper distinction between positive and negative ways of experiencing when a student becomes academically disappointed due to unfulfilled expectations from a respected authority. In this respect, these findings may be pointing out to a phenomenological nuance raised by the direction of AD. Indeed, these results are in line with the findings from Van Dijk & Zeelenberg (2002b) who reported divergences between experiences of disappoint-

ment caused by an "outcome" and caused by a "person". According to the authors, people are perceiving disappointment with another person as a situation that is relatively beyond control and in which they may feel distanced in terms of social interactions with the other person. These findings can be thought to be hinting a variant impact of social context and sense of control over other people. In that sense, it might be suggested that underlying causes (i.e., issues in inner world vs. issues pertaining to social relations) may trigger the same feeling with a certain difference in the manner it is experienced. This suggestion is consistent with the former formulations of Frijda (1993) who explains that some emotions may be associated with a rather complicated phenomenology. Frijda (1993) mentions, for instance, two kinds of "experience of shame". The first type is suggested to appear due to a distinction between the actual and ideal state of the person. Whereas the second is suggested to arise because of an occasion in which the person becomes unable to correspond to people`s expectations. The second experience is postulated to differ as it is likely to be intertwined with elements such as "social ridicule" and "rejection". Disappointment appears to constitute an experience with a similar complexity. People`s experience of disappointment seem to be highlighted either by the self-evaluative or by the social aspect of the issue that triggers the emotion. Future studies may help to grasp this variance in depth.

Alongside the creation of the instrument, our findings unfolded double sided nature of AD (activating vs. deactivating). This result appears to be in contrast with Control-Value Theory which classifies disappointment as a "negative-deactivating" emotion (Pekrun & Perry, 2014). Although it is possible to find clues for a similar complexity for other negative AE as well. For instance, Pekrun and colleagues (2002) stated that the "negative activating" emotions (i.e., anger, anxiety, and shame) are likely to have complex patterns. These emotions were found to have negative associations with the affective (e.g., intrinsic, and extrinsic motivation) and the behavioral (e.g., self-reported effort) components of EE, yet the authors noted that these associations were relatively weak. A similar potential of two-sidedness was reported for "academic shame" by Turner & Schallert (2001). The authors examined the nature of shame by assessing responses of students to received midterm feedback. It was revealed that while "half" of the students had increased EE (i.e., motivation and effort) with their studies, the rest showed decreased engagement. In terms of causality, the authors stated that the variance between student responses to shame was associated with "student resiliency". This characteristic, in turn, was suggested to be defined by a combination of three academic aspects: Student`s confidence in one`s abilities, academic aspirations (i.e., extrinsic motivation) and attributed value to the feedback. Relying on these findings, it can be concluded that negative AE need to be researched with caution to their potential for a two-sided nature.

We believe that the design of a valid and reliable instrument is important for understanding the AD. However, the current study has certain limitations. The first limitation concerns the generalizability of these findings to the larger populations. The target population in this study consisted of Hungarian B.A. students and, in this regard, we cannot generalize our findings to other student populations. We acknowledge that factors such as cultural background may be

an important determinator in experience of an emotion. Further studies with other populations would enhance generalizability. The second limitation concerns use of recall tasks. Despite our care in creating a clear instruction for the employed recall task, it is not viable to ascertain whether it solely triggered AD. Indeed, targeting a specific emotion is a well-known difficulty in this area of research. The third limitation concerns the information about variances related to age and experience duration in educational setting. As the current study sample was mostly consisted of participants from the same age group, we did not have sufficient data to inspect age or experience related differences. Further studies may help to clarify this aspect of the issue. The final limitation of this study was our inability to assess the relationship of AD with other constructs. One reason for this limitation is the lack of similar tools for measurement of AD. Further examinations of factor structure, convergent and divergent validity by using of instruments measuring other relevant constructs may enhance validation.

Conclusion

Based on our findings, our previously formulated model was validated in the SD and the PD subsets of the CADI. The current data showed that a different formulation for the OD subset may be needed. The present study provides both theoretical and practical contributions to the field. First, we believe that these findings may serve to approach AE from a different perspective. Secondly, this study offers a new and validated definition of disappointment and, offers evidence for the double-sided nature of AD. In practical terms, this study provides reliable and valid item subsets which can be utilized in educational settings. The inventory can serve as a tool to identify learners who are likely to become demotivated or decrease their BI (e.g., dropping out of education life) in face of AD. The gathered information may serve for the development of techniques to enhance EE. More information can be gathered about the psychometrics of the inventory by applying it to larger samples. A prospective research goal may be to examine the convergent and divergent validity of the inventory. Finally, making reformulations for the OD subset is among our aspirations for further studies.

Conflict of interest

There is no conflict of interest between the authors to declare.

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Összefoglaló

Tanulással kapcsolatos csalódottság: konceptualizáció, kérdőív fejlesztés és validáció

Háttér és célkitűzések: Az érzelmek és a tanulók elkötelezettsége közötti kapcsolat az elmúlt évtizedekben vált a tudományos kutatás témájává. A szakirodalomban azonban csak kevés kutatás foglalkozik az iskolai közegben átélt tanulással/teljesítménnyel kapcsolatos csalódással/csalódottsággal, annak ellenére, hogy azt az oktatás során a tanulók természetesen előforduló érzelemként azonosítják. Jelen tanulmány célja, hogy bemutassa a csalódás/csalódottság újragondolását, egy, az akadémiai csalódottság mérésére szolgáló eszközt és az eszköz pszichometriai jellemzőire vonatkozó első eredményeket.
Módszer: Egy olyan kérdőív kialakítását tűztük ki célul, amely három alskálát tartalmaz, és az önmagunkkal, a teljesítményünkkel és a visszajelzést adó másik személlyel kapcsolatos, iskolai tanulmányokkal összefüggő csalódottság felmérésére szolgál. Mindegyik alskála 16 tételt tartalmaz, amelyekre 7 pontos Likert-skála segítségével lehet válaszolni. A vizsgálatban 280 magyar egyetemi hallgató vett részt.
Eredmények: Az önmagunkkal, a teljesítményünkkel kapcsolatos csalódottságra vonatkozó alskálák hasonló faktorstruktúrát eredményeztek, négy faktorral, azonban a visszajelzést adó másik személyben való csalódottságra vonatkozó kérdések faktoranalízise ettől eltérő eredményt adott.
Megbeszélés: Az eredmények arra utalnak, hogy a hallgatók iskolai tanulmányokkal kapcsolatos tapasztalatai, így a csalódottság is, motiváló erővel bírhatnak és az erőfeszítéseket is növelhetik, de ugyanakkor alá is áshatják ezeket. Úgy tűnik, hogy a csalódottság tárgya is fontos lehet ebben, különösen, ha az a másik személlyel kapcsolatos.

Kulcsszavak: tanulással kapcsolatos érzelmek, iskolai csalódottság, tanulói elkötelezettség, iskolai elkötelezettség, érzelmek, pedagógiai pszichológia.

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Appendices

Table A1. Preliminary Items for Consequences of Academic Disappointment Inventory (CADI)

Item	Item content	
SD1	After this event, I was disappointed in myself, but..	..I felt motivated to improve.
SD2		..this experience boosted my energy to work.
SD3		..it strengthened my drive to make further efforts.
SD4		..this experience enhanced my motivations.

Item	Item content	
SD5	After this event, I was disappointed in myself, and..	..I felt demotivated.
SD6		..I felt that I have no energy
SD7		..I lost my drive.
SD8		..this experience consumed all my motivations.
SD9	After this event, I was disappointed in myself, but..	..I worked harder to be better.
SD10		..I devoted more time to improve myself.
SD11		..I put a lot of effort into becoming a successful person.
SD12		..I followed various opportunities to develop my skills.
SD13	After this event, I was disappointed in myself, and..	..I did not do anything about it
SD14		..I did not devote any energy to improve myself.
SD15		..I put no effort into becoming better.
SD16		..I stopped looking for opportunities to develop my skills.
PD1	After this event, I was disappointed with my performance, but..	..it motivated me to pursue the task.
PD2		..it boosted my energy to invest in the task.
PD3		..it strengthened my drive to make further efforts on this task.
PD4		..it motivated me to work harder on this task.
PD5	After this event, I was disappointed with my performance, and..	..I did not feel like pursuing this task.
PD6		..I felt that I have no energy to devote on this task.
PD7		..I lost my drive to make further efforts on this task.
PD8		..and this experience reduced my motivation to work on this task.
PD9	After this event, I was disappointed with my performance, but..	..I planned the necessary steps ahead to achieve my goal in this task.
PD10		..I put a lot of effort into improving my performance.
PD11		..I prepared even more to be successful on this task.
PD12		..I did everything I could to develop my skills on this task.
PD13	After this event, I was disappointed with my performance, and..	..I was not invested in becoming successful on this task.
PD14		..I did not put any effort into improving my performance.
PD15		..I stopped practicing for the task
PD16		..I did not devote any time to develop my skills on this task.
OD1	After this event, I was disappointed in the person who gave me the feedback, but..	..it motivated me to learn further from him/her.
OD2		..it boosted in me a drive to pursue opportunities for benefiting from his/her knowledge.
OD3		..it enhanced my motivation to work harder so as to receive positive feedback from her/him.
OD4		..it motivated me to devote my energy to change his/her view of me.
OD5	After this event, I was disappointed in the person who gave me the feedback, and..	..I lost my drive to learn from him/her.
OD6		..I felt that I have no energy to change his/her view of me.
OD7		..it reduced my motivation to benefit from his/her knowledge.
OD8		..I felt like I did not have any motivation to receive positive feedback from him/her.

Item	Item content	
OD9	After this event, I was disappointed in the person who gave me the feedback, and..	..I pursued opportunities to learn from him/her more.
OD10		..I worked harder so as to gather knowledge by seriously considering his/her opinion.
OD11		..I devoted time and energy to benefit from his/her knowledge.
OD12		..I put a lot of efforts to change his/her view of me.
OD13	After this event, I was disappointed in the person who gave me the feedback, and..	..I completely stopped looking for opportunities to learn from him/her.
OD14		..I did not make any effort to benefit from his/her knowledge.
OD15		..I avoided potential interactions with this person.
OD16		..I did not devote energy in gathering information about why (s)he gave this negative feedback.

Table A2. Goodness of Fit Information for All Subsets

Model	χ2 (df)	CFI	TLI	RMSEA	90 % CI
SD subset EFA 4-factor model	112.369 (62)	0.973	0.948	0.061	0.043 – 0.079
SD subset EFA 4-factor model revised	66.186 (41)	0.984	0.964	0.053	0.028 – 0.076
PD subset EFA 4-factor model	101.025 (62)	0.981	0.964	0.053	0.033 – 0.071
PD subset EFA 4-factor model revised	35.620 (32)	0.998	0.995	0.023	0.000 – 0.056
OD subset EFA 2-factor	242.560 (89)	0.902	0.868	0.089	0.076 – 0.103
OD subset EFA 2-factor revised	155.725 (75)	0.946	0.924	0.070	0.055 – 0.086

Note: SD: Self-disappointment subscale, PD: Performance disappointment subscale, OD: Disappointment with the other person subscale, EFA: Exploratory factor analysis, CFI: Comparative fit index, TLI: Tucker-Lewis Index, RMSEA: Root mean square of approximation, CI: Confidence interval.

Table A3. Goodness of Fit Information for the Eliminated Models

Model	χ2 (df)	CFI	TLI	RMSEA	90 % CI
SD subset EFA 1-factor model	505.987 (104)	0.788	0.755	0.133	0.122 – 0.145
SD subset EFA 2-factor model	303.410 (89)	0.887	0.847	0.105	0.092 – 0.118
SD subset EFA 3-factor model	125.404 (75)	0.973	0.957	0.056	0.038 – 0.072
PD subset EFA 1-factor model	461.041 (104)	0.829	0.802	0.124	0.113 – 0.136
PD subset EFA 2-factor model	316.557 (89)	0.891	0.853	0.107	0.094 – 0.120
PD subset EFA 3-factor model	141.347 (75)	0.968	0.949	0.063	0.047 – 0.079
OD subset EFA 1-factor model	421.563 (104)	0.798	0.767	0.119	0.107 – 0.131
OD subset EFA 3-factor model	162.965 (75)	0.944	0.910	0.074	0.058 – 0.089
OD subset EFA 4-factor model	106.413 (62)	0.972	0.945	0.057	0.038 – 0.076

Note: SD: Self-disappointment subscale, PD: Performance disappointment subscale, OD: Disappointment with the other person subscale, EFA: Exploratory factor analysis, CFI: Comparative fit index, TLI: Tucker-Lewis Index, RMSEA: Root mean square of approximation, CI: Confidence interval.

Table A4. Descriptives for the Subsets of SD Subscale

	Mean	SD	Minimum	Maximum
Motivation	4,16	1,48	1	7
Lack of motivation	3,57	1,48	1	6,75
BI	4,67	1,28	1	7
Lack of BI	2,66	1,29	1	6

Note: N = 217, Missing = 63, BI = Behavioral Investment

Table A5. Descriptives for the Subsets of PD Subscale

	Mean	SD	Minimum	Maximum
Motivation	4,18	1,51	1	7
Lack of motivation	3,67	1,48	1	7
BI	4,59	1,39	1	7
Lack of BI	2,95	1,35	1	7

Note: N = 223, Missing = 57, BI = Behavioral Investment

Table A6. Descriptives for the Subsets of OD Subscale

	Mean	SD	Minimum	Maximum
Positively worded items	3,48	1,43	1	7
Negatively worded items	3,96	1,43	1	7

Note: N = 217, Missing = 63.