The role of explicit need strength for emotions during learning ☆

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ABSTRACT

According to self-determination theory, the satisfaction of the basic needs for autonomy, competence, and relatedness influences achievement emotions and situational interest. The present study investigated whether domain-specific explicit need strength moderated the impact of need satisfaction/dissatisfaction on the outcomes achievement emotions and situational interest. Self-report measures of domain specific need strength, perceived need satisfaction/dissatisfaction, achievement emotions (joy and boredom), and situational interest (catch-SI and hold-SI) were completed by 220 students attending 8th and 9th grade. Explicit need strength moderated the impact of perceived need satisfaction on hold-SI. Additionally, need strength moderated the impact of perceived need dissatisfaction on joy, boredom, and hold-SI. Nevertheless, need satisfaction had greater predictive power than need strength and the interaction effects appeared more consistently with the predictor perceived need dissatisfaction. Thus, need satisfaction seems to be the main explanatory variable for the outcomes. Conclusions are discussed.

1. Introduction

Self-determination theory (SDT) suggests that autonomy, competence, and relatedness are universal needs for every human being (Deci & Ryan, 1985). Autonomy is defined as the perception of being the "origin or source of one's behavior" (Deci & Ryan, 2004, p. 8). The need for competence is understood as the need for "feeling effective in one's ongoing interactions with the social environment" (Deci & Ryan, 2004, p. 7). The need for relatedness is defined as the necessity of "feeling connected with others" (Deci & Ryan, 2004, p. 7).

Need satisfaction has been shown to lead to positive consequences in various achievement-related domains (e.g., Assor, Kaplan, & Roth, 2002; Patrick, Skinner, & Connell, 1993). When needs are thwarted, negative effects on outcomes can be expected (Deci & Ryan, 1987).

The question of whether the impact of need satisfaction/dissatisfaction on outcomes is influenced by individual differences in needs has been discussed conceptually (Deci & Ryan, 2000; Vallerand, 2000), but very few empirical studies have addressed this issue.

Therefore, the present study tests the moderating effect of explicit need strength on the relation between need satisfaction/dissatisfaction and the two outcomes achievement emotions and situational interest in the domain of physics classes.

1.1. Need satisfaction in the classroom context

Which factors in the classroom contribute to students' need satisfaction? Autonomy in the classroom is supposed to result from two components (Lewalter, 2005; Roth, Assor, Kanat-Maymon, & Kaplan, 2007): perceived fit with one's own wishes and goals and perceived self-determination. Perceived fit with one's own wishes and goals results from viewing activities as interesting (Assor et al., 2002) or when the personal relevance of activities is clear (Reeve, 1996). Self-determination refers to activities in which students are granted choices (e.g., Reeve, 1996). Competence results from the experiences that own abilities match the requirements of the lesson (e.g., Katz, Kaplan, & Gueta, 2010). Social relatedness in the classroom context may result from feeling accepted by the teacher (e.g., Katz et al., 2010) or classmates (e.g., Willems, 2011).

What are the consequences of need satisfaction in the classroom context? First, a direct outcome of satisfaction/dissatisfaction of needs in all domains is an emotional response (Baumeister & Leary, 1995; Ryan, Connell, & Deci, 1985). The positive effect of need satisfaction on positive/negative emotions (e.g., happiness, joy, interest/boredom, distress, and anger) and the negative effect of need dissatisfaction on emotions have also been shown in the classroom context (Patrick et al., 1993).

Second, need satisfaction can lead to an increase in interest (Krapp, 2005; Minnaert, Boekaerts, & deBrabander, 2007; Mouratidis, Vansteenkiste, Sideridis, & Lens, 2011). More specifically, Tsai, Kunter,

Lüdtke, Trautwein, and Ryan (2008) showed that autonomy was associated with higher interest in three different subjects.

Interest is conceptualized both as an individual interest, in terms of an enduring disposition consistent across situations, and situational interest, evoked by situational cues (Krapp, 2002; Schiefele, 2001). Hidi and Renninger (2006) distinguish between four phases of interest: triggered situational, maintained situational, emerging individual, and well-developed individual interest.

Recently, Renninger and Hidi (2011) have claimed the necessity to study the relation between psychological needs and interest as conceptualized in the four-phase model as this connection has not been studied so far (but see Lewalter & Willems, 2009). Thus, our study is one of the first to focus on the effects of psychological needs on situational interest with the two components: triggered-SI (i.e., catch-SI; Mitchell, 1993) and maintained-SI (i.e., hold-SI; Mitchell, 1993). An initiation of interest by experiencing actual enjoyment is conceptualized by the catch component (e.g., Hidi & Renninger, 2006), whereas the maintenance of interest after it was triggered in a lesson is defined by the hold component (e.g., Renninger & Hidi, 2011). According to SDT, autonomy-supportive strategies, such as challenging or acknowledging the students' point of view (Deci & Ryan, 1987; Reeve, 1996) promote situational interest (e.g., Deci, 1992). The effects of these strategies on achievement emotions and situational interest cannot be reduced to only the satisfaction of autonomy. For example, Wild (2000) found significant effects of all three needs on the development of interest orientation.

Therefore, effects on outcomes were considered for each need. With regard to achievement emotions and situational interest, all three needs—when satisfied—were expected to contribute to higher positive achievement emotions, greater situational interest, and lower negative achievement emotions. Second-order factors were expected to underpin the scales of satisfied/dissatisfied autonomy, competence, and relatedness and need for autonomy, competence, and relatedness.

1.2. Why study need dissatisfaction alongside need satisfaction?

In the present research, the effects of both need satisfaction and need dissatisfaction on outcomes were studied. Need satisfaction is supposed to be linked to adaptive human functioning, and need dissatisfaction is supposed to lead to psychological dysfunctions (see Ryan, Deci, Grolnick, & La Guardia, 2006). Sheldon and Gunz (2009) tested whether differentiating need satisfaction/dissatisfaction in two separate components yields different effects for need-relevant motivations. They found that only need dissatisfaction predicted corresponding motivations. Consequently, Sheldon (2011) claimed that need satisfaction and need dissatisfaction should be considered as two separate variables as they might have different consequences for outcomes.

Over the course of a school year, students can be supposed to have made need-satisfying experiences and also experiences when their needs were not met, between which they should be able to consciously distinguish.

In order to consider the two variables as distinct constructs, a confirmatory factor analysis (CFA) model specifying need satisfaction and dissatisfaction as two factors should show better model fit than a model in which need satisfaction and dissatisfaction are assumed to be one factor.

1.3. Individual differences in needs according to SDT

The question of whether individual differences in needs should be considered in research on basic psychological needs has been discussed controversially.

Vallerand (2000) argues that individual differences in needs might play a role in motivational processes.

Deci and Ryan (2000) emphasize that the positive consequences of need satisfaction for outcomes should be the main focus of attention, assigning individual differences in needs only a minor role in predicting outcomes. Furthermore, from their point of view, self-report measures capture only explicit motives that do not reflect the concept of needs (Ryan & Deci, 2000).

Nevertheless, it has also been claimed that people are able to express the levels of their psychological needs in different domains (Katz et al., 2010). Schüler, Sheldon, and Fröhlich (2010) found that competence had stronger effects on successive flow, intrinsic motivation, and goal attainment for individuals with a high implicit need for achievement than for individuals with a low implicit need for achievement. The explicitly measured motive for achievement had no significant relations with the outcome variables. Hofer and Busch (2011) found that the implicit motives for achievement and affiliation moderated the relation between competence and job satisfaction, and between relatedness and partnership satisfaction, respectively.

These studies have some limitations. The need for autonomy could not be included in the studies, because, until now, there has been no implicit measure of the need for autonomy. Second, the explicit measures used by Schüler et al. (2010) were scales from the Personality Research Form (PRF; Jackson, 1984), a method that was not developed with the intention to match the implemented implicit measures.

Focusing on one domain, Katz et al. (2010) found that the level of expressed needs of students can influence how teachers' need support is perceived and that the relation between teachers' need support and students' autonomous motivation might be moderated by students' level of expressed needs. That is, there is a necessity for the testing of domain-specific explicit measures.

In the present study, need strength was assessed to test individual differences in needs. SDT proposes that human beings are born with an evolutionary predisposition to experience positive consequences when perceiving autonomy, competence, and relatedness (Sheldon & Schüler, 2011). Individuals can develop different preferences for one or more of the three needs, because the contexts in which humans grow up are different and may not always be sufficient for experiencing autonomy, competence, and relatedness to the same degree. Thus, individuals may not have the same opportunities to learn about the linkage between need satisfaction and positive outcomes. Individuals are supposed to be "sensitized" (Sheldon & Gunz, 2009, p.1472) to particular needs by prior need satisfaction experiences and to value a specific need more when they experience more satisfaction from this specific need (Moller, Deci, & Elliott, 2010). Need strength should thus differ between domains because people can have distinct experiences of need satisfaction/dissatisfaction in specific contexts.

1.4. The present research

The present research investigated whether explicitly assessed domain-specific need strength moderated the effect of need satisfaction/dissatisfaction on achievement emotions and on two subcomponents of situational interest: catch-SI and hold-SI (Hidi & Renninger, 2006; Mitchell, 1993). A positive relation between need satisfaction and joy, catch-SI, and hold-SI and a negative relation between need satisfaction and boredom were expected. Additionally, a negative relation between need dissatisfaction and joy, catch-SI, and hold-SI and a positive relation between need dissatisfaction and boredom were assumed. Moreover, it was assumed that explicit need strength would moderate the effect of need satisfaction/dissatisfaction on outcomes.

The assumptions were investigated in two ways. First, the moderating effects of the strength of each separate need on the relation between the satisfaction/dissatisfaction of the specific need and outcomes were explored. Thereby, the distinct impact of the strength of the separate needs on the relation between the satisfaction/dissatisfaction of the specific needs and outcomes was investigated.