Effectiveness of motivational regulation: Dependence on specific motivational problems☆

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1. Introduction

Conceptualized as the process of initiating, maintaining, and evaluating one's cognition and behavior towards a learning goal (Schunk, Pintrich, & Meece, 2008), learning motivation is considered to be an essential internal resource for effective self-regulated learning (SRL; Boekaerts, 1999; Boekaerts & Corno, 2005; Schunk et al., 2008; Wolters, 2003; Zimmerman, 2000). On the meta-level, regulating this internal resource – i.e. monitoring one's learning motivation and controlling it if necessary – can be conceptualized as a distinct and basic aspect of SRL that is just as essential for mastering complex learning tasks as learning motivation itself (Boekaerts, 1995, 1997; Garcia & Pintrich, 1994; Pintrich, 1999; Sansone & Thoman, 2006). Motivational regulation in this sense is in the focus of the present work.

Originating in fundamental work on motivational aspects of SRL, research on the question of how learners deal with motivational problems has intensified in recent decades (Dewitte & Lens, 1999; Garcia, 1999; Pintrich, 1999; Prudie & Hattie, 1996; Sansone, Weir, Harpster, & Morgan, 1992; Wolters, 1998, 1999; Zimmerman & Martinez-Pons, 1986). However, previous research on motivational regulation has widely ignored the distinction between qualitatively different motivational problems. For example, effective motivational regulation may differ between an insufficient learning motivation stemming from diminishing optimism to cope with the learning task and an insufficient learning motivation resulting from the failure to perceive that the learning content is of any value (see Wolters, 1998). This disregard of qualitatively different motivational problems is surprising since research literature regularly demands a situation-specific consideration of SRL (e.g., Winne, 2010; Wirth & Leutner, 2008).

Hence, the overall objective of the present study was to advance research on learners' motivational regulation by applying a situation-specific perspective on different types of motivational problems. For this purpose, we proposed a 2×3 model of different motivational problems in academic learning. To test the assumption that the resulting six motivational problems are separable from one another, an empirical study was conducted in which undergraduates were asked to report their effectivity in successfully regulating their own motivation when faced with them.

1.1. Motivational regulation

The theoretical assumptions and perspectives used in the field of motivational regulation are, to a large extent, rooted in the theoretical considerations and empirical studies published by Wolters (see Wolters, 2003, for a review). He conceptualized motivational regulation as deliberately influencing one's own motivation. In this sense, individuals are supposed to initiate, maintain or even enhance their level of motivation regarding a particular activity. For this purpose, learners can use motivational regulation strategies (Wolters, 2003). For instance, a university student can intentionally make herself aware of the

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significance of a given learning material in order to elevate her subjective valuing of the subject matter. This could help to prevent her from quitting a learning task that she may have experienced as boring. Studies based on a taxonomy of motivational regulation strategies presented by Wolters (1998, 1999) examined the wide range of motivational regulation strategies used by individuals to maintain sufficient, or improve insufficient, motivation while learning; they provided evidence that learners can effectively regulate their motivation using such strategies (e.g., Schwinger, Steinmayr, & Spinath, 2009, 2012; Schwinger, von der Laden, & Spinath, 2007; Wolters & Benzon, 2013). In any case, before learners will decide to manipulate their own motivation, they have to become aware that their learning motivation is inadequate to start or maintain the task at hand.

1.2. Situational specificity of motivational regulation

In their model of motivational regulation Schwinger and Stiensmeier-Pelster (2012) postulate that after detecting inadequate motivation and deciding to regulate it, learners analyze the quality of the motivational problem itself in the next step. This is supposed to build the basis upon which they can evaluate which motivational regulation strategy is best suited to address a given situation.

From a broader theoretical perspective on SRL, this cognitive sequence of detecting and evaluating a motivational problem is an inherent part of the regulation process. Particularly, Winne and Hadwin (2008), in reference to their four-phase model of SRL (Winne & Hadwin, 1998), argue that overcoming a motivational problem can be conceptualized as a regulation task. Although exhibiting some unique features, this regulation task is characterized by similar mechanisms (e.g., cognitive operations such as tactics and strategies, monitoring and evaluating progress against self-defined standards) as other learning tasks such as acquiring content knowledge. Winne and Hadwin (2008) locate appraisals of different motivational problems in the first phase of their model ("task definition"), in which self-regulated learners construct a personalized task profile with all essential information pertaining to the task at hand. Included are assumptions regarding the value of the task and self-assessments of how likely they are to successfully master the task. From this perspective, a task profile would provide information pertaining to different types of motivational problems (e.g., lack of motivation due to low expectancy of success) as well as appraisals of ability to deal with the specific kind of problem (e.g., expectations of getting a learning task started although it is evaluated as boring).

These appraisals of the effectiveness of motivational regulation should mirror the learners' individual experiences with specific demanding situations (Wolters, Benzon, & Arroyo-Giner, 2011). As such they should be assessable via self-reports, at least for adolescents and adult learners. Moreover, the appraisals should reflect the fact that motivational problems may place very different requirements on regulation and that engaging a motivational regulation strategy does not guarantee that it will be successful. From this theoretical point of view, learners' cognitive representations about the effectiveness of motivational regulation are supposed to depend on both their experiences with a specific motivational problem as well as on an overall person-specific self-efficacy on dealing with insufficient learning motivation (mirroring a person's basic capacity to regulate their own motivation).

Two approaches to empirically examine the situational specificity of motivational regulation are obvious. The first approach is to analyze what kind of strategies learners use in specific situations. Wolters (1998) provided 115 college students with specific learning situations (e.g., reading a chapter in a textbook), which were associated with either low expectancies of success (difficult learning material) or a low subjective value (boring or uninteresting learning material). The participants were asked to describe what they would do in the given situation in order to stay motivated. Wolters was able to show that, depending on the problem at hand, the students tended to report different strategies

with different frequencies. In a recent study conducted by Engelschalk, Steuer, and Dresel (2015), 54 college students were interviewed on their strategy use regarding various types of motivational problems. In addition to the differentiation between low expectancies of success and low subjective values, the learning phase in which motivation was compromised was subjected to variation. Again, a certain proportion of students reported different strategies for different situations. However, in both of the studies a substantial proportion of students reported using motivational regulation strategies independent from the specific motivational problems. Two theoretical explanations are possible for these findings: They either perceived no specific demands in the given situations or they chose a preferred strategy regardless of any specific demands. Neither of the two studies could clarify which explanation is more appropriate.

This leads to the second approach for examining the situational specificity of motivational regulation: Learners can be directly asked how they assess their effectiveness to regulate motivation when confronted with specific motivational problems. According to the aforementioned theoretical view, learners should be able to report their experiences in such situations. A corresponding (single) question was put to college students in the above-mentioned study by Engelschalk et al. (2015). They found first indications that students link different motivational problems with different assumptions regarding their effectiveness to cope with them. However, the findings solely rely on mean value differences and do not allow for conclusions on whether motivational regulation can be separated and therefore vary intra-individually with respect to different types of motivational problems.

1.3. Different motivational problems

To specify relevant and qualitatively different motivational problems which learners can react to with motivational regulation, we propose a set of 2×3 prototypical situations, each addressing specific regulation requirements (Fig. 1).
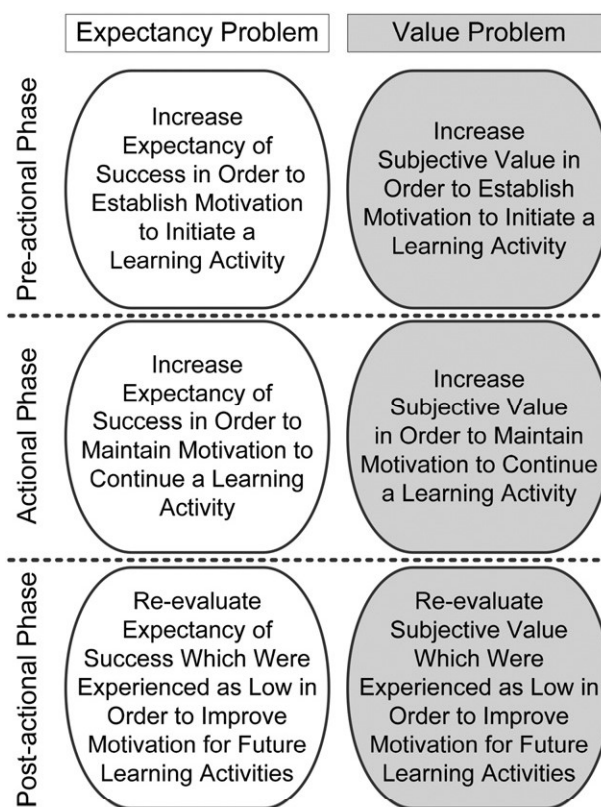

Fig. 1. A 2×3 model of motivational problems that can trigger motivational regulation.

First, we differentiate between expectancy and value problems. This is in line with the expectancy-value concept of motivation (e.g., Wigfield & Eccles, 2000) and was used by Wolters (1998) to fundamentally distinguish between different motivational problems. On the one hand, a low level of motivation in learners can be partially attributed to their perception of a low likelihood of being capable of successfully resolving the task at hand (low expectancy of success). On the other hand, a learner could be insufficiently valuing the learning activity itself or its anticipated consequences (low value).

Second, a differentiation is made among three phases of learning which are referred to as the pre-actional, actional and post-actional phases (Heckhausen & Kuhl, 1985; Schmitz & Wiese, 2006; Zimmerman, 2000). This perspective suggests that motivational problems can surface in different phases of learning and, dependent on the phase, can also place correspondingly different requirements on the subsequent regulation of motivation (Engelschalk et al., 2015; Lenzner & Dickhäuser, 2011; Wolters, 2003). The focus in the pre-actional phase is on selecting and committing to a specific learning goal as well as planning the learning action. Characteristic for this phase is the necessity to establish sufficient motivation to initiate appropriate learning activities. In the actional phase learning activities are executed – the specific demand for regulation in this phase is to maintain the current motivational state and protect it against conflicting goals which may be rivaling for attention. In the post-actional phase self-reflective processes stand to the fore. Above and beyond, the evaluation of the learning activities and their results, one's own learning motivation over the course of action, is evaluated. These evaluation processes can result in feelings of satisfaction or dissatisfaction and may also generate favorable or unfavorable attributions (Schunk, 1996). Here, the requirement for the regulation of one's own motivation can be seen in the adaptive management of errors and failure, as well as with experiences of low motivation in the previous learning phase – which has consequences for the subsequent learning motivation. Additionally, motivational regulation in the post-actional phase of learning can mean to build intentions that are directly focused on similar learning activities in the future. In both cases, motivational regulation would be directed towards safeguarding or increasing motivation in the future.

In combining these two lines of theoretical reasoning (differentiation between expectancy of success problems and subjective value problems in each of the three phases of learning), we fashion six qualitatively different types of motivational problems which raise specific requirements and potentially necessitate motivational regulation in a specific manner (see Fig. 1). Given the diversity inherent in these motivational problems, one can assume that learners may have encountered diverse experiences and (more or less) successfully come to terms with them. Consequently, we expect that learners will see their effectiveness in the regulation of learning motivation (in the sense of a full restoration of motivation) as specific to the particular requirements of the individual motivational problems.

1.4. Aims and hypotheses

From a theoretical perspective, it seems justified to assume that learners distinguish among different motivational problems. The literature review showed preliminary empirical evidence that learners are sensitive to certain situational characteristics that can stimulate motivational regulation (Engelschalk et al., 2015; Wolters, 1998). However, these findings do not provide a strict test of whether different types of motivational problems can be distinguished. Moreover, they do not allow for conclusions of whether and how specific types of motivational problems affect learners' subjective effectiveness in regulating their motivation. As a jumping-off point for generating conclusions on the situational specificity of motivational regulation, we proposed a set of 2×3 motivational problems, relevant in terms of both practice and theory. The present study aimed to assess the degree to which these specific requirements affect motivational regulation. Based on the aforementioned

theoretical assumption that learners usually have manifold experiences with motivationally demanding learning situations and unfavorable motivational states, we addressed this aim with an approach utilizing self-reports on the effectiveness of motivational regulation.

With regard to the six types of motivational problems (Fig. 1) and based on the theoretical considerations presented above, we set out to test three hypotheses. They all focus on separate but intertwined aspects of the assumed situational specificity of motivational regulation.

Hypothesis 1. The effectiveness of learners' motivational regulation can be separated in accord with types of motivational problems (differentiation between expectancy and value problems and among the phases of the learning process).

Hypothesis 2. A substantial amount of the differences found in the effectiveness of learners' motivational regulation can be attributed to the characteristics of the different types of motivational problems.

Hypothesis 3. Mean-level differences exist regarding the effectiveness of learners' motivational regulation for different types of motivational problems.

2. Method

2.1. Sample

The sample consisted of 283 students enrolled at a mid-sized German university who, on average, were in their third semester ($SD = 2.92$) of a teaching degree program. The average age of those questioned was 21.6 years ($SD = 3.08$). The proportion of female participants came to 75.6%, which reflects the typical female to male ratio in German teacher degree programs. By taking part in this study, the participants were awarded credits towards meeting a requirement associated with a psychology course they were enrolled in.

2.2. Presentation of the different motivational problems

An online questionnaire, which took about 20 min to complete, was presented to the participants.[1] The situations, which called for the participants to regulate their motivation, were presented in the form of descriptions of scenarios. First, preparing for an upcoming examination was depicted as a learning situation (based on expert ratings that this is particularly demanding in terms of self-regulating one's own learning, and is of particular relevance in higher education in the German context; Dresel et al., 2015). Students were asked to imagine being "unmotivated" in this learning situation. As a reason behind this lack of motivation, the issue of an imminent exam was described as being either difficult (expectancy problem) or boring (value problem). The localization of the motivational problem in one of the individual action phases was accomplished by combining it with one of these three statements, "You are thinking about preparing for an examination" (pre-actional phase), "You are in the process of preparing for an examination" (actional phase) or "You have finished preparing for an examination" (post-actional phase). In this manner, six situations were created, each describing one of the 2×3 types of motivational problems (see Fig. 1). For instance, the description of a value problem in the actional phase reads: "You are in the process of preparing for an examination. Therefore, you need to work through a large body of knowledge. Acquiring a deep understanding of the subject matter is essential. Picture yourself in the following situation: Faced with the boring (e.g., uninteresting, of little use, of little importance) but relevant content, you are unmotivated to continue studying". To give another example, the scenario for an expectancy problem in the post-actional phase reads:

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[1] This questionnaire was part of a larger battery of online assessements in the context of SRL which are not relevant for the present research question.

"You finished preparing for an exam. You had to work through a large body of knowledge. Acquiring a deep understanding of the subject matter was essential. Picture yourself in the following situation: Faced with the difficult (e.g., complex, demanding, hard to understand) but relevant content, you were unmotivated to study". Pre-actional and actional problems were formulated in present tense; post-actional problems were formulated in past tense and past perfect. Using a within-person approach, all participants judged all six scenarios, which were presented in an individually randomized order.

2.3. Measurement of effectiveness of motivational regulation

Below the descriptions of each of the situations, which were printed in large scale font, four items were used to assess the situation-specific effectiveness of motivation, which are listed in the Appendix (sample items: "In this situation, I am able to increase my motivation", "In this situation I am able to keep my motivation problem under control"). Agreement with the items was registered along a six point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Calculations of the internal consistencies of the four item scale came to Cronbach's α = 0.89–0.90 for the individual situations.

3. Results

3.1. Differentiating among different motivational problems

In order to test whether the effectiveness of learners' motivational regulation can be separated in accord with different types of motivational problems (Hypothesis 1), a series of confirmatory factor analyses were conducted with Mplus 7 (Muthén & Muthén, 2012), including the four items for regulatory effectiveness for each of the six motivational problems (4 × 6 items). Because identical items were used for all situations, correlated errors between these items were modeled. Covariance stemming from the specific wording of the single items could thus be corrected. Therefore, an overestimation of the relations between regulatory effectiveness in different situations was avoided.

In the first step, a global factor model was estimated in which all items loaded onto one factor – representing independence of the type of motivational problem. This did not result in an acceptable fit (Table 1). In the next step, a model with two factors was estimated, making a differentiation between expectancy and value problems. The resulting model fit was also unacceptable. Likewise, this was the case for Model 3 which considered three factors, differentiating between motivational problems in the three phases of the learning process. In the final step, a six factor model was estimated, differentiating between expectancy and value problems in three phases of learning process. This was the hypothesized model and it provided a very good fit to the data (see Table 1). The loadings of all items were in a satisfactory range (λ = 0.73–0.93). The six factors correlated in a quite homogeneous way in a moderate range (φ = 0.44–0.66; a complete matrix of the latent correlations is available as Supplementary material). Furthermore, χ^2-comparison tests confirmed that this model provided a significantly better fit to the data than the previously tested models. Thus, the six factors were used in the subsequent analyses.

3.2. Quantifying the situational specificity of motivational regulation

In order to quantify the extent of situational specificity that is inherent in the effectiveness of motivational regulation (Hypothesis 2), variance component analyses were conducted. Here, variance on the level of the six specific motivational problems (within person variance) was separated from variance on the level of the individual (between person variance). Subsequently, the variance within persons was set into a relationship with the variance between persons. It was found that this proportion was quite large (ICC = 0.49), indicating that about one half of the variance individuals reported for the effectiveness of their motivational regulation can be attributed to the specific characteristics of the different types of motivational problems (whereas the remaining variance can be attributed to global differences between persons, independent from the specific motivational problems). This result also remained intact under the assumption that measurement error is located exclusively on the level of the specific motivational problem (adjusted ICC = 0.43).

3.3. Mean-level differences in regulatory effectiveness

The mean-levels of regulatory effectiveness (Hypothesis 3) were analyzed with the help of a 2 (expectancy problem vs. value problem) × 3 (phase of learning process) factorial analysis with repeated measures on both factors. Descriptive values for each condition can be retrieved from Fig. 2.

This resulted in a significant and moderate main effect for the factor "expectancy problem vs. value problem" ($F(1282) = 17.73$, $p < 0.001$, $\eta^2 = 0.06$), which indicated that students report less effective regulation of their motivation in response to problems defined by a low subjective value of the material, in contrast to problems associated with low expectancies of being successful with the material at hand. The main effect for the factor "phase of learning process" was also statistically significant, but quite small ($F(2545) = 7.28$, $p = 0.001$, $\eta^2 = 0.03$). Post-hoc tests with Bonferroni corrections showed that students reported less effective regulation for motivational problems which occur in the pre-actional phase than for the regulation of motivation problems in the actional phase ($p = 0.001$) or the post-actional phase ($p = 0.004$). The interaction between the two factors was not significant ($F(2564) = 0.21$, $p = 0.81$, $\eta^2 < 0.001$).

4. Discussion

A flexible adaptation of one's learning behavior to the prevailing situational conditions is considered to be of central importance for successful self-regulated learning (e.g., Boekaerts, 1999; Hadwin, Winne, Stockley, Nesbit, & Woszczyna, 2001; Winne & Hadwin, 2008). The present study addressed the question of whether these conditions are also in place for the regulation of motivation – an important aspect of

Table 1
Results from confirmatory factor analyses for regulatory effectiveness: model fits and model comparisons.

Model	df or Δdf	χ^2 or $\Delta\chi^2$	RMSEA	CFI	TLI	SRMR
Model fits						
1. One global factor	192	2758.3[*]	0.217	0.562	0.370	0.104
2. Two factors, differentiating between expectancy and value problems	191	2238.9[*]	0.195	0.650	0.495	0.095
3. Three factors, differentiating between motivational problems in three different phases of learning process	189	1700.9[*]	0.168	0.742	0.623	0.075
4. Six factors, differentiating between expectancy and value problems in three different phases of learning process	177	287.1[*]	0.047	0.981	0.971	0.037
Model comparisons						
Model 4 vs. Model 3	12	1413.8[*]				
Model 4 vs. Model 2	14	1951.8[*]				
Model 4 vs. Model 1	15	2471.2[*]				

Note. N = 283 undergraduates. In all models correlated errors between identical items were specified.
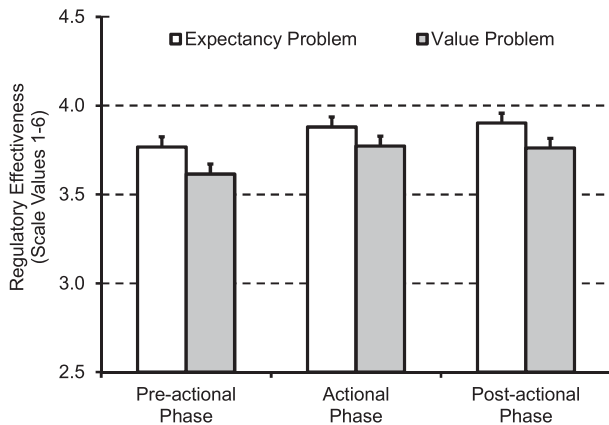 [*] $p < 0.001$.

Fig. 2. Mean values (with standard errors) for regulatory effectiveness in value and expectancy problems in the three phases of the learning process.

SRL which has been examined in the past mostly on the basis of global self-reports, i.e. without accounting for situational specifics (e.g., Schwinger et al., 2012; Wolters, 1999). As a framework for future research on the situational specificity of motivational regulation, a 2 × 3 model of qualitatively different motivational problems in academic learning is proposed in the present work. Thereby, a low expectancy for success or a poor subjective task value in one of three phases of the learning process served as specific triggers to stimulate the regulation of motivation. These assumptions were tested using students' appraisals of their effectiveness to deal with the described motivational obstacles. A strength of the present work is that the motivational problems were presented as detailed scenarios in order to improve validity (see Wirth & Leutner, 2008). Furthermore, previous preliminary findings on how motivational regulation is affected by different motivational problems (e.g., Engelschalk et al., 2015; Wolters, 1998) could be expanded and refined: In contrast to earlier studies, the present study allows for a strict test of whether different types of motivational problems can be separated (utilizing confirmatory factorial analyses). Additionally, the present data is the first to allow for a separation of the amount of variation in motivational regulation that can be attributed to the specific motivational problems on the one hand, and to global differences between learners on the other.

In accordance with Hypothesis 1, confirmatory factor analyses revealed that students' appraisals of being able to deal with motivational obstacles depend on expectancy vs. value problems as well as on the action phase in which these problems occur. Thus, the proposed 2 × 3 motivational problems each represent a specific motivational requirement for the regulation of motivation while learning. The finding that students' effectiveness of motivational regulation varied separately for the various types of motivational problems supports theoretical considerations that conceptualize motivational regulation as specific to previously apprehended problems for the regulation of motivation (e.g., Schwinger & Stiensmeier-Pelster, 2012). The similarities in the magnitudes of the latent correlations lead to the presumption that the expectancy-value differentiation is just as important as the differentiation among the different phases of the learning process.

The variance proportions in learners' regulatory effectiveness further support the assumption of a strong situational specificity of motivational regulation. In accordance with Hypothesis 2, we found that almost half of the variance in students' assessments has to be attributed to the characteristics of the different types of motivational problems. This can be seen as a strong argument that successful regulation of motivation is not dependent on the individual alone, but also on the specific demands instituted by the circumstances surrounding demotivating learning situations. The finding that the effectiveness of motivational regulation depends so clearly on the situation fuels the question of why even students who are avid learners suffer declines in motivation (see Wolters et al., 2011). Nevertheless, we also found evidence that – in addition to the specific requirements given rise by the different regulatory triggers – substantial personal differences also come into effect with regard to how well individuals are able to regulate their motivation to learn overall.

Finally, results across individuals demonstrate that different motivational problems were judged as being challenging to different degrees (Hypothesis 3). Learners appraise it, on average, as easier to overcome motivational difficulties which result from low expectancies of success than motivational difficulties stemming from low subjective values. In comparing the three action phases of a learning activity, motivational regulation in the pre-actional phase is seen as less effective than in the actional and post-actional phases. The comparatively low effectiveness of the self-regulation of one's motivation, particularly when it concerns the early stages of learning, indicates that the pre-actional phase seems to be most critical concerning influence by motivational regulation. Here, the large number of alternative courses of action available (Fries & Schmid, 2007) may play an important role. It is important to note that motivational regulation has to be seen as a task that is often anything but trivial – beyond any situational specificity. On the descriptive level, regulatory effectiveness in the present study had mean values scarcely any higher than the center of the answer scales. This indicates that learners are often not able to deal effectively with given motivational problems. One reason for this might be the fact that motivational problems can also be inherent to the entire learning context (e.g., compulsive or controlling context). It seems difficult to improve one's own motivation against strongly discouraging circumstances by means of motivational regulation strategies alone.

All in all, the findings are commensurate with the assumption of an, at the very least, moderate situational specificity of motivational regulation. Thus, it could be demonstrated that the approach currently taken in the research literature which promotes a situation-specific interpretation of self-regulated learning (e.g., Winne, 2010; Wirth & Leutner, 2008), must also be applied to the regulation of motivation. The results also correspond with the theoretical assumptions detailed by Winne and Hadwin (2008), which imply that learners hold a representation of the specific causes of a lack of motivation in a given situation. However, in the conventional method of ascertaining strategies to regulate motivation with the help of global self-reports (e.g., Schwinger et al., 2012; Wolters, 1999), participants were required to generalize over various types of situational specifications. This stands in contrast to the findings of the present study which rather suggest a situation-specific basis for the evaluation of strategies to regulate motivation. They point to the interpretation that the rather weak associations sometimes found between motivational regulation strategy use on the one hand, and effort and performance on the other hand, are actually closer and are in fact a methodological artefact of assessing strategy use in disregard of its situational specificity. Thus, the present findings also seem to be valuable with regard to improving the validity of future measuring instruments (see Leopold & Leutner, 2002; Wirth & Leutner, 2008). For subsequent investigations which propose to utilize a situation-specific assessment of strategy deployment, the 2 × 3 types of motivational problems proposed in the present work offer a viable foundation. For these problems it can be assumed that the selection and application of motivational regulation strategies might be tailored to manage the situation at hand. In this sense the situational specificity found on the level of reported regulatory effectiveness are in accordance with previous findings, on the level of problem-specific reports, about learners' use of motivational regulation strategies (see Engelschalk et al., 2015; Wolters, 1998).

Of course, the present study suffers from some limitations. First and foremost, one must take note that the situational specificity of motivational regulation found was derived from students' self-reports of their regulatory effectivity. Although it can be argued, as above, that learners have had manifold experiences with motivationally

demanding learning situations and, thus, are able to validly report their effectiveness in coping with these situations, a kind of self-efficacy belief may be also included in the measures. Since such measurement contamination leads rather to an underestimation than an overestimation of the relationships between variables, this underpins the found situational specificity all the more. Moreover, the embeddedness of the regulatory effectiveness items into realistic and specific descriptions of motivational problems is a strong argument for their validity. Due to their specificity, the items were easy for the respondents to process via the recall of relevant memories (cf. Karabenick et al., 2007). In contrast, for example, reporting incidences of strategy use has to be seen as much more problematic (Winne & Perry, 2000). Nevertheless, it would be desirable to test in the future, whether the situational specificity found also applies to the use of different motivational regulation strategies and other characteristics of learning processes. Behavior based assessments (e.g., experience-sampling, Goetz et al., 2014) would be an ideal supplement for the instrument in the present study.

As a further limitation, it should be mentioned that in the sample women are heavily over-represented. Additionally, the majority of the participants consisted of students in the early semesters of their studies. It is conceivable that students further along in their programs may have more differentiated regulatory responses to the problems described, taking into consideration their broader experience concerning the regulation of their motivation to learn (e.g., having already compiled and composed detailed academic theses).

4.1. Conclusions

Despite these limitations, the present study clearly indicates that motivational regulation has to be conceptualized in a strongly situation-specific manner. It could be shown that, for the effective regulation of one's motivation, it strongly matters if learning activities are appraised as too difficult or lacking in value. Additionally, it can be concluded that establishing the initial motivation to initiate a learning activity is different, and more difficult, than maintaining motivation while learning or evaluating preceding motivation in order to improve motivation for future learning activities. The proposed 2×3 types of motivational problems proved to be a valid basis for subsequent studies, particularly for the examination of the situation-specific use of strategies employed in the regulation of learning motivation.

Appendix A. Items to assess effectiveness of motivational regulation (original German items in parentheses)

1. In this situation I am able to motivate myself. (Mir gelingt es gut, mich in dieser Situation zu motivieren.)

2. In this situation I am able to keep my motivation problem under control. (Ich bekomme mein Motivationsproblem in dieser Situation in den Griff.)

3. In this situation I am able to increase my motivation. (Es gelingt mir in dieser Situation, meine Motivation zu steigern.)

4. In this situation I am able to overcome my lack of motivation. (Ich schaffe es in dieser Situation, meine Unmotiviertheit zu überwinden.)

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