Chapter 14
Occupational Self-Regulation

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14.1 Introduction

Alongside teachers' professional knowledge, beliefs, and work-related motivation, occupational self-regulation represents the fourth aspect of teacher competence in the COACTIV model (see Chap. 2). The model defines self-regulation as teachers' ability to budget personal resources in the professional context. People with strong self-regulatory skills demonstrate a level of occupational engagement that is commensurate with the challenges of the teaching profession while at the same time maintaining a healthy distance from work concerns and conserving their personal resources. The underlying assumption is that only teachers who are able to adaptively regulate the use of their own resources can successfully cope with the demands placed on them as teachers. The COACTIV model thus includes not only subject-specific cognitive and motivational aspects of teachers' professional competence (knowledge and beliefs, motivation) but also a cross-curricular aspect that probably concerns all psychological levels (cognition, motivation, and emotion) and that has rarely been considered in previous models of competence. In this respect, the COACTIV model is based on a broader understanding of professional competence that reaches beyond purely cognitive and subject-specific aspects (Baumert and Kunter 2006; Weinert 2001).

With its consideration of cognitive, motivational, and emotional aspects, the COACTIV model reflects the multiple demands of the teaching profession (Doyle 1986; Lortie 1975). Teachers play the central role in shaping the teaching–learning situation; they are called upon to support, encourage, and monitor students in their processes of active learning. In performing these functions, teachers face disparate expectations—from the public, the school administration, parents, fellow teachers,

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and the students themselves. In particular, the social nature of the classroom confronts teachers with a wide variety of needs, interests, and motivations simultaneously. To respond to these complex situations, teachers have to be highly adaptable, which presumably requires them to draw on all areas of psychological functioning.

The COACTIV competence model postulates that the ability to successfully manage personal resources—which we refer to as adaptive self-regulation—should be considered part of teachers' professional competence. It follows from this that the ability to self-regulate should help teachers to meet the demands of the teaching profession and should therefore be reflected in successful teaching. Two criteria of successful teaching practice are considered in this context. The first is the provision of high-quality instruction, the core task of the teaching profession. The second criterion expands the perspective on teachers' classroom behavior to include their occupational well-being, a key criterion in the field of occupational and organizational psychology. Occupational well-being, expressed in job satisfaction and the absence of stress and psychological strain, seems likely to be a critical factor in teacher retention as well as in long-term teacher performance and psychological and physical health (Guglielmi 2001; Hobfoll and Shirom 1993; Judge et al. 2001; Melamed et al. 2006; Ostroff 1992; Sonnentag 2001; Wright and Cropanzano 1998).

This chapter first defines the concept of self-regulation, situates this concept theoretically in the framework of conservation of resources (COR) theory (Hobfoll 1989, 2001), and introduces a typological approach that posits four types of self-regulation, each of them adaptive in different ways (Kieschke and Schaarschmidt 2008). It then summarizes previous findings from COACTIV on the importance of self-regulation for successful professional practice, all of which relate to the effect of self-regulation alone, in isolation from other aspects. As such, it remains unclear to what extent the previous findings on the role of self-regulation are substantiated when all aspects of professional competence distinguished in the COACTIV model are examined simultaneously. This question is explored in the empirical section of this chapter, which presents new analyses on the individual and combined effects of these different aspects of competence on teaching practice.

14.2 Self-Regulation as an Aspect of Professional Competence

As the term (self-) regulation is employed in diverse fields of psychological research, we first need to consider the various conceptualizations and to draw some distinctions. In basic psychological research, the concept of regulation is usually associated with action models (Gollwitzer 1996) or with emotion regulation (Gross 1999, 2007). In action models, self-regulation refers to the achievement of a desired objective through planning, volitional processes, and the evaluation of actions taken. In the context of emotion regulation, it relates to how people try to regulate their reception and expression of emotions. In the educational psychology literature, the concept of self-regulation is closely associated with self-regulated or self-directed

learning (Boekaerts et al. 2000). Self-regulation in this context means effective and independent learning and includes cognitive, motivational, and metacognitive components; successful self-regulation describes—based on general action models—the autonomous initiation, maintenance, and evaluation of learning processes.

By contrast, self-regulation in the context of professional competence refers to how teachers manage their own resources in a professional setting. In line with COR theory (Hobfoll 1989), resources are understood to include objects (e.g., material goods), personal characteristics (e.g., self-efficacy, hardiness, locus of control), conditions (e.g., occupational status, family status), and energies (e.g., time, knowledge) that are valuable to the individual. Expanding on this definition of resources, Freund and Riediger (2001) have differentiated between (a) resources that are available in limited quantities, that is, those that are reduced by consumption (e.g., money and time), and (b) resources that make it possible to successfully manage the other "finite" resources (e.g., personality characteristics and motivational processes). Occupational self-regulation can, according to this definition, be understood as a strategy for managing finite resources such as time and energy.

What is common to all the concepts of (self-)regulation discussed here is that they always involve the self-referential processing of the individual's cognitive, motivational, or emotional experience and always emphasize the individual as the primary actor. The following section briefly outlines the theoretical framework for the understanding of adaptive resource management that was applied in COACTIV.

14.2.1 Hobfoll's Conservation of Resources Theory

The concept of self-regulation used in COACTIV has its theoretical foundations in Hobfoll's conservation of resources (COR) theory (1989), a resource-oriented metatheory of human motivation that is also held to have validity for experience and behavior in occupational contexts. It offers an understanding of what the adaptive management of personal resources means and what consequences it can be expected to have (Hobfoll and Freedy 1993; Hobfoll and Shirom 1993). The basic tenet of COR theory is that all people strive to protect, conserve, and expand their resources. When resources are threatened, or an investment of personal resources leads to a loss or failure to obtain the desired gratification, the person experiences psychological stress (Hobfoll 2001). This basic tenet is specified in two ways: first, a loss of resources is assumed to have a stronger impact on the individual's stress experience than the reverse effect of a resource gain. Second, the investment of resources is seen as a necessary precondition for their maintenance, protection, and growth.

Applied to the work setting, COR theory emphasizes that the chronic loss of resources and the lack of resource gain following significant resource investment—for example, an investment of time, energy, or personal ability—represent the leading causes of stress and burnout (Hobfoll 2001). Emotional exhaustion and reduced productivity in this context are viewed as the result of a "loss spiral" in which high amounts of resources are invested without the individual experiencing sufficient

gratification. Accordingly, those who budget their personal resources best distinguish themselves by their ability to protect and conserve their resources and, at the same time, to successfully invest them. In COACTIV, we refer to this strategy of balancing resource investment with resource conservation and recovery as adaptive self-regulation. Drawing directly on COR theory, we can thus hypothesize that adaptive self-regulation is manifested in the absence of stress and strain and thus in occupational well-being, as well as in the maintenance of performance levels over the long term.

14.2.2 Self-Regulatory Skills as a Component of Professional Competence

When self-regulation is situated in a model of competence, the broader definition of competence clearly also applies to this specific aspect. Competence is defined as the personal capacity to successfully cope with specific demands (see Sternberg and Grigorenko 2003; Weinert 2001). Specifically, previous research on teacher competence has focused on the quality of instruction provided and its impact on student learning outcomes and motivation. In this context, successful instruction can be described with reference to the "classic" dimensions of instructional quality (see Chap. 6). Alongside classroom management, the critical cross-curricular dimensions identified are maintaining an appropriate instructional tempo that allows students time to reflect, setting cognitively activating tasks that promote independent learning, and providing emotional and motivational support to students. From this perspective, effective classroom management is ideally combined with an appropriate pace, a high level of cognitive challenge, and the provision of individual learning support.

In addition to instructional quality, research on self-regulation has established occupational well-being—an indicator that represents a central "measure of success" in occupational and organizational psychology—as a second criterion of successful teaching practice (Hobfoll and Shirom 1993; Judge et al. 2001; Melamed et al. 2006; Sonnentag 2001; Wright and Cropanzano 1998). Occupational well-being can be understood as resulting from the successful handling of occupational pressures and is expressed in satisfaction with one's job situation and the absence of symptoms of strain. It seems particularly important to consider occupational well-being as a criterion for occupational success in teachers, as research on teacher health has shown that far from all teachers manage to cope successfully with the demands of their profession. Teachers are considered particularly vulnerable to stress and burnout, and the profession is characterized by high rates of early retirement due to adverse mental health effects (Huberman and Vandenberghe 1999; Schaufeli and Enzmann 1998). In addition, a higher level of strain is likely to be reflected in teachers' classroom practice. It therefore seems imperative that a comprehensive model of competence includes an aspect that can be regarded as a crucial personal prerequisite for successfully coping with the pressures of the teaching profession.

14.2.3 Individual Differences in Self-Regulation: A Typological Approach

Based on the idea that individuals differ in their patterns of self-regulation, and drawing on the work of Schaarschmidt (e.g., Kieschke and Schaarschmidt 2008), four different types of self-regulation that can also referred to as behavioral or self-regulatory styles have been proposed in COACTIV (Klusmann et al. 2008). Within this typological approach, the emphasis was not on the isolated effects of single characteristics, but rather on the intraindividual interplay of two characteristics: work engagement and resilience. Work engagement is seen as a fundamental willingness to invest effort and energy in one's work, which is reflected in the importance placed on the work, professional ambition, and the willingness to exert oneself. Work-related resilience describes the extent to which individuals are able to maintain a healthy distance from work concerns and to deal with failure. A high level of work engagement can be understood as a process of investing resources, and a high level of resilience can be understood as a process of conserving resources. According to COR theory, this combination of characteristics describes the most adaptive response, which should therefore be reflected in the successful fulfillment of work-related demands.

Drawing from COR theory (Hobfoll 1989) and the work of Schaarschmidt (Kieschke and Schaarschmidt 2008), we proposed four self-regulatory types, each with distinctive patterns of work engagement and resilience and each associated with different levels of self-regulatory ability[1] (see Fig. 14.1). The *healthy–ambitious* type, with high scores on both occupational engagement and resilience, should be best equipped to manage personal resources and be able to draw on abundant resources to meet work-related demands. The *unambitious* type combines a low level of engagement with high resilience and should thus be good at conserving personal resources, but show low levels of work engagement and thus fail to make the investment of resources considered necessary according to COR theory. Teachers of this self-regulatory type can therefore be expected to experience little stress, but not to have high levels of occupational well-being. The quality of their teaching is also likely to be problematic. Two further types are seen as particularly vulnerable to the experience of occupational stress and low levels of well-being and are thus regarded as "at-risk" types. The first is the *excessively ambitious* type, which combines high work engagement with low resilience. Teachers of this type invest copious personal resources in their work, but do not manage to conserve and replenish those resources; in the long term, this can be expected to lead to a loss of resources (i.e., a resource loss spiral; Buchwald and Hobfoll 2004). With their high levels of engagement, they can probably ensure the quality of their instruction for a certain period of time, but only with elevated levels of stress and at the expense of their occupational well-being. The

[1] In Schaarschmidt's work, the aspect of "work-related emotions" (i.e., the experience of occupational success and life satisfaction) is used alongside engagement and resilience as a third dimension in the identification of the four types. In the present approach, in contrast, this aspect is not integrated into the configuration of self-regulatory types in order to increase the conceptual precision and to minimize the probability of confounding resources as predictors with stress indicators or well-being as a criterion (Coyne and Whiffen 1995).

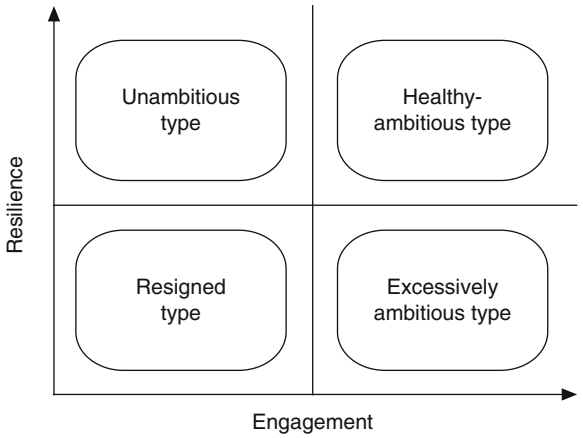

Fig. 14.1 The four self-regulatory types based on levels of occupational engagement and resilience

fourth self-regulatory style, the *resigned* type, shows both low engagement and low resilience, which can be expected to lead to a loss of personal resources. Consequently, such individuals are probably not capable of meeting the demands of the profession and thus cannot be expected to experience positive well-being.

14.3 The Investigation of Self-Regulation in COACTIV: A Summary of Findings to Date

The focus of our empirical research on self-regulation as an aspect of professional competence has been on empirically identifying the postulated types of self-regulation and on investigating their relationship to two central criteria of successful teaching: quality of instruction and occupational well-being. This section presents the empirical findings to date; the next section reports new analyses testing the specific effects of self-regulation, above and beyond the other aspects of teacher competence, on occupational practice.

14.3.1 The Empirical Operationalization and Assessment of Self-Regulation in COACTIV

Self-regulation was assessed in both 2003 and 2004 in COACTIV, using a short version of the Occupational Stress and Coping Inventory (AVEM) by Schaarschmidt and Fischer (1997).[2] This measure uses eight subscales to assess the dimensions of work engagement (example item: "I spare no effort at work") and resilience (example item: "I can switch off easily after work"). In previous research within the COACTIV framework (see Klusmann et al. 2006; Klusmann et al. 2008), the pos-

[2]We would like to thank A. Fischer and U. Schaarschmidt for providing this short version of the measure.

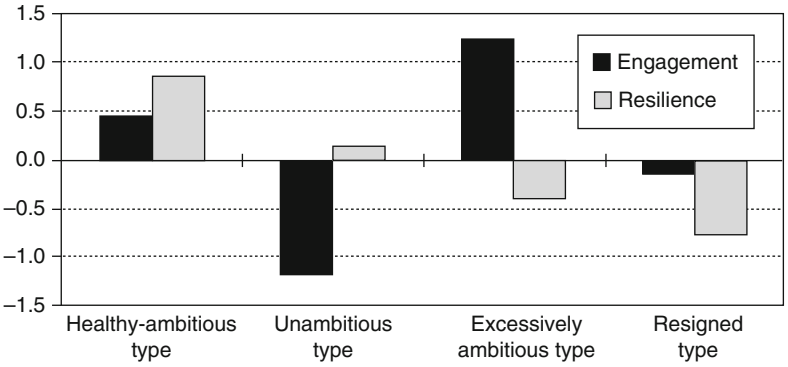

Fig. 14.2 Findings of latent profile analyses: *z*-standardized means of work engagement and resilience by the four self-regulatory types

tulated occupational behavioral styles have been replicated across various subsamples of COACTIV teachers using different person-centered methods, including cluster analysis and latent profile analysis (Vermunt and Magidson 2002). The results of the latent profile analysis, which aimed to identify subpopulations sharing specific patterns of the characteristics under investigation, are presented in simplified form in Fig. 14.2. The figure shows the *z*-standardized means on the dimensions of work engagement and resilience by the four self-regulatory types identified. The database used for these analyses was the extended teacher sample of the PISA-I-Plus assessment, in which mathematics teachers and up to 10 additional teachers in each school were surveyed on topics including their emotional experience of the teaching profession (see Chap. 5). The data used in these analyses were obtained from 1,789 teachers in the 197 PISA schools. Respondents were the mathematics teachers in the PISA classes as well as up to 10 additional mathematics and science teachers in each of the schools (Klusmann et al. 2008). As expected, the analysis yielded four distinct self-regulatory types (healthy–ambitious, unambitious, excessively ambitious, and resigned) showing the anticipated prototypical profiles on the scales of work engagement and resilience (see also Klusmann et al. 2008).

Whereas the mean profiles of the four self-regulatory types remained stable across different COACTIV subsamples and different cluster analytic procedures, the frequency distributions have varied slightly across the studies carried out thus far, with 24–31% of teachers belonging to the healthy–ambitious type, 23–28% to the unambitious type, 15–19% to the excessively ambitious type, and 26–30% to the resigned type. Only small effects of school type, teacher age, and sex were found for occupational self-regulation, and these effects differed slightly across samples and methodological approaches. With regard to school type, marginally more teachers in academic-track schools were of the excessively ambitious type, and marginally more teachers in non-academic-track schools were of the resigned type. Furthermore, more of the teachers of the healthy–ambitious type and the unambitious type were men, whereas more of the teachers of the two at-risk groups were women. Additionally, teachers of the unambitious and the resigned types tended to be older than teachers of the healthy–ambitious and the excessively ambitious types (see Klusmann et al. 2006, 2008).

14.3.2 Self-Regulation and Successful Teaching Practice

In our research on self-regulation to date, we have focused on two aspects of teaching practice: the provision of high-quality instruction as the core task of the teaching profession and teachers' occupational well-being as the result of their successful management of work-related demands. The following section summarizes the related findings from COACTIV to date.

14.3.2.1 Self-Regulatory Skills and Instructional Quality

Expanding the concept of professional competence to include self-regulatory skills appears justified only if an empirical association can be shown to exist between this aspect of competence and teachers' professional behavior, particularly the quality of instruction. The key question to be addressed was therefore to what extent teachers exhibiting different styles of self-regulation—as identified by applying cluster analytic methods to teacher self-report data—actually differ with regard to their instructional behavior. One major strength of the COACTIV study is that not only teacher self-reports but also student data can be used to evaluate the instructional process. Table 14.1 reports the student data, presenting class-mean ratings of the central dimensions of instructional quality for the four self-regulatory types, along with the results of variance analysis (see also Klusmann et al. 2008). These results are based on data from 318 teachers for whom both self-reports on self-regulation and student ratings were available.

The findings showed that teachers differed in their instructional behavior depending on their self-regulatory style. The teachers classified as belonging to the healthy–ambitious type received the most favorable ratings: their students reported higher levels of cognitive activation in class, an appropriate tempo, and more constructive support than did the students of teachers classified as belonging to one of the other three self-regulatory types. Teachers of the excessively ambitious type—who are highly engaged but not very resilient—were at least rated favorably with regard to the level of cognitive activation in the classroom. Teachers of the unambitious and resigned types, however, were rated lower across the board. The only dimension in which the four self-regulatory types did not differ was classroom management. We interpreted these findings as indicating that teachers with lower self-regulatory skills—as attributed to the unambitious type, the excessively ambitious type, and the resigned type—have particular difficulties in adapting to the needs of their students, whether on a cognitive or a socioemotional level, as a result of which they receive lower ratings than do teachers with high self-regulatory abilities (the healthy–ambitious type) on all work-related demands beyond establishing basic order in the classroom. These findings remained stable when school type as well as teacher sex and age were controlled.

Of particular interest, Klusmann et al. (2008) showed that—mediated by quality of instruction—teacher self-regulation affected student motivation in mathematics.

Table 14.1 Quality of instruction and teacher well-being as a function of self-regulatory type: means and standard deviations

	H	U	A	R	*F*
Quality of instruction					*F*(3, 312)
Classroom management	2.41	2.44	2.53	2.49	0.65
	(0.44)	(0.55)	(0.62)	(0.55)	
Tempo	2.25[a]	2.48[b]	2.40[b]	2.42[b]	6.37*
	(0.35)	(0.39)	(0.35)	(0.37)	
Cognitive activation	2.83[a]	2.75[b]	2.82[a]	2.74[b]	3.19*
	(0.20)	(0.27)	(0.22)	(0.24)	
Social support	2.94[a]	2.62[b]	2.79[b]	2.70[b]	8.57*
	(0.37)	(0.49)	(0.44)	(0.41)	
Well-being					*F*(3, 1785)
Emotional exhaustion	1.80[a]	1.97[b]	2.36[c]	2.41[c]	116,51*
	0.49	0.58	0.68	0.58	
Job satisfaction	3.24[a]	3.01[b]	2.76[c]	2.72[c]	59,19*
	0.59	0.69	0.78	0.70	

Note: The findings remained stable when teacher age, teacher sex, and school type were controlled
*$p < 0.05$
H = Healthy-ambitious type; U = Unambitious type; A = Excessively ambitious type; R = Resigned type. Means with different subscripts differ statstically significantly in Student-Newman-Keuls post hoc test

Students of teachers belonging to the healthy–ambitious type reported higher motivation than did students of the other teacher types, an effect that can probably be attributed to higher cognitive activation and better social support in the respective classrooms.

14.3.2.2 Self-Regulatory Skills and Occupational Well-Being

The consideration of occupational well-being added a new dimension to the understanding of successful teaching practice. Based on the teacher sample described above, we tested the extent to which differences in self-regulation were also associated with teachers' occupational well-being. Table 14.1 displays the means of our two indicators of occupational well-being: teachers' emotional exhaustion as the core symptom of burnout (Maslach et al. 2001) and job satisfaction as a cognitive–evaluative assessment of one's work situation. The findings showed that the teachers' emotional functioning and stress levels, as hypothesized, differed substantially depending on their self-regulatory type. Teachers of the healthy–ambitious type, who are able to achieve a balance between the process of investing resources (engagement) and that of conserving resources (resilience), scored the most favorably on both emotional exhaustion and job satisfaction: they suffered significantly less emotional exhaustion and were more satisfied than other teachers. Even teachers of the unambitious type, who show high resilience and low engagement, did not

exhibit as high a level of well-being as did teachers of the healthy–ambitious type. Although individuals of the unambitious type attempt to maintain and conserve their resources, they do not make the investment of resources considered necessary according to COR theory. Consequently, they have fewer resources at their disposal and lower well-being than do individuals of the healthy–ambitious type. As expected, teachers of the two at-risk types scored least favorably, showing substantially higher levels of exhaustion and lower satisfaction than the other teachers.

14.4 Occupational Self-Regulation in the Context of the Other Aspects of Teacher Competence: Investigating Independent and Combined Effects

The above findings revealed an association between teacher self-regulation and two central criteria of successful teaching practice. Specifically, teachers with adaptive self-regulation showed higher occupational well-being and higher instructional quality than did teachers with less adaptive types of self-regulation. However, these findings were based on the study of self-regulation in isolation; the other aspects of teacher competence were not taken into account. Given that self-regulation is theoretically conceptualized to be one of four aspects of teachers' professional competence, it seems worth examining the specific power of self-regulation to explain teachers' instructional behavior and occupational well-being. Indeed, if self-regulation is to be established as an aspect of competence that is equal in importance to professional knowledge, beliefs, and occupational motivation, it has to be demonstrated (1) that self-regulation can be empirically distinguished from professional knowledge, beliefs, and activity-specific motivation and (2) that self-regulation has explanatory value for successful teaching practice, above and beyond that of the other aspects of teacher competence.

In the first comprehensive analysis taking all aspects of professional competence into account, Kunter et al. (2007) showed by means of factor analysis that self-regulation was empirically distinguishable from the other three aspects of teacher competence. In a further step in their analyses, latent structural equation models were used to examine the independent and combined power of the four aspects of competence to explain quality of instruction. The results showed that when professional knowledge, beliefs, and motivation were controlled, the ability for adaptive self-regulation—as expressed in allocation to the healthy–ambitious group—affected instructional behavior in terms of the individual learning support provided by teachers. This means that even with the same levels of professional knowledge, the same beliefs, and the same levels of motivation, those teachers who show high engagement and high resilience are perceived by their students as more supportive of learning processes.

With regard to the occupational well-being of teachers as a criterion for successful teaching, no study has yet examined the independent and combined effects of the

aspects of teacher competence. The question arises how occupational self-regulation and well-being interact when the other aspects of competence are taken into account. Teachers' content knowledge and pedagogical content knowledge, in particular, themselves represent important resources for instructional practice. The data show that especially knowledge of how to convey specific curricular content to learners—that is, pedagogical content knowledge—leads to higher-quality teaching and evidently equips teachers to adapt to different teaching situations and to their students' diverse needs and abilities. It thus seems plausible that professional knowledge constitutes a personal resource for handling difficult teaching situations and hence reduces the experience of psychological stress. This relationship has not, however, been studied empirically to date. High activity-specific motivation in the form of enjoyment of teaching and interest in the teaching subject can "buffer" the experience of occupational stress (see Chap. 13). A constructivist view of the teaching–learning situation (see Chap. 12) may also serve to reduce some of the pressure on teachers, as this perspective does not view teachers as solely responsible for student progress, but emphasizes the students' own active role in their learning. The key research question addressed in the following section is therefore whether emotional and motivational self-regulation still has an effect on occupational well-being when differences in teachers' professional knowledge, learning theory beliefs, and activity-specific motivation are controlled.

14.4.1 Method

Sample: The data used in the present study were collected from the COACTIV teacher sample at the first point of measurement in 2003. The present analyses began with the 314 teachers who provided complete data on the AVEM scales and were included in the cluster analysis identifying self-regulatory types (Klusmann et al. 2006). Because data on teachers' professional knowledge were not collected until the second point of measurement, the sample size in the further analyses was somewhat reduced. This approach seemed justified, given that teachers' professional knowledge can be expected to remain stable over the course of a school year. The 125 teachers for whom complete data on all relevant characteristics were available did not differ statistically significantly on the indicators of occupational well-being from the 189 teachers for whom complete data were not available.

Measures: Occupational well-being was assessed using the indicators emotional exhaustion and job satisfaction. Emotional exhaustion was measured with four items of the German version (Enzmann and Kleiber 1989) of the Burnout Inventory (Maslach et al. 1996). Job satisfaction was measured on the basis of the Job Diagnostic Survey (Hackman and Oldham 1975), with six items asking teachers for a broad assessment of their occupational situation (see Merz 1979). As discussed above, the capacity for self-regulation was measured using a short version of the Occupational Stress and Coping Inventory (AVEM) developed by Schaarschmidt and Fischer (1997), which comprised eight subscales on the dimensions of work

engagement and resilience. Cluster analytic procedures (for a detailed description, see Klusmann et al. 2006) were used to assign each of the teachers to one of the four self-regulatory styles (healthy–ambitious, unambitious, excessively ambitious, and resigned).

Professional knowledge was assessed using the tests of content knowledge (CK) and pedagogical content knowledge (PCK) described in Chap. 8. Learning theory beliefs were measured with the COACTIV global constructivist beliefs scale (see Chap. 12; Dubberke et al. 2008), and teacher motivation was assessed using the COACTIV scales of enthusiasm for teaching and for the subject taught (see Chap. 13; Kunter et al. 2008).

14.4.2 Results

To examine the independent and combined effects of the four aspects of teacher competence on occupational well-being, we first conducted bivariate correlation analyses; we then performed two linear regression analyses for the criteria of emotional exhaustion and job satisfaction (see Table 14.2). The first two regression models (M_{11}, M_{21}) were estimated with age, sex, and school type as control variables, and membership of the healthy–ambitious type as well as membership of the unambitious type as dummy variables. Because teachers belonging to the two at-risk types exhibited substantial deficits in their capacity for self-regulation and in well-being, as shown above, they were chosen as the reference category. In other words, the regression coefficients for the healthy–ambitious type and the unambitious type have to be interpreted relative to the reference group of the other two at risk types. In the second step of the analysis, the other aspects of teacher competence were included in the models (M_{12}, M_{22}): mathematical content knowledge and pedagogical content knowledge as facets of professional knowledge (see Chaps. 8 and 9), constructivist beliefs as characteristic of desirable beliefs about teaching and learning (see Chap. 12), and enthusiasm for the subject or for teaching as facets of activity-specific motivation (see Chap. 13).

The results of the bivariate correlations showed the expected negative association between emotional exhaustion and membership of the healthy–ambitious or unambitious types. As shown by the comparison of means in the previous section, adaptive self-regulation (healthy–ambitious type) is associated with less emotional exhaustion; the same holds, although to a lesser extent, for teachers of the unambitious type. The other aspects of teacher competence—constructivist beliefs and enthusiasm for the subject taught and for teaching—also showed negative correlations with emotional exhaustion. Only the two knowledge aspects were not associated with teachers' emotional functioning.

The first regression model (M_{11}) predicting emotional exhaustion confirmed the correlational findings when age, sex, and school type were controlled. Again, teachers of the healthy–ambitious and unambitious types reported lower rates of emotional exhaustion than did teachers of the reference category (excessively ambitious

Table 14.2 Predicting well-being by self-regulation, constructivist beliefs, enthusiasm, and professional knowledge: results of regression models

	Emotional exhaustion			Job satisfaction		
		M_{11}	M_{12}		M_{21}	M_{22}
	r	β	β	*r*	β	β
Age		0.00	0.05		0.00	0.03
Sex		0.07	0.08		–0.11	–0.15
School type		–0.07	–0.10		0.07	0.17
Adaptive self-regulation						
Healthy–ambitious type	**–0.29**	**–0.41**	**–0.35**	**0.30**	**0.40**	**0.37**
Unambitious type	**–0.18**	**–0.35**	**–0.49**	0.11	**0.27**	**0.31**
Constructivist beliefs	**–0.19**		–0.05	**0.18**		0.09
Enthusiasm for the subject	**–0.16**		0.08	**0.19**		–0.08
Enthusiasm for teaching	**–0.30**		**–0.28**	**0.23**		0.16
Content knowledge	0.01		0.13	0.02		–0.12
Pedagogical content knowledge	0.02		0.02	0.01		–0.02
R^2		0.19	0.30		0.16	0.18

Note: Table shows bivariate correlations (*r*) and standardized regression coefficients (β); correlation and regression coefficients significant at $p < 0.05$ are shown in bold; teachers of the healthy–ambitious type and the unambitious type were dummy-coded for use in the analyses; teachers of the two at-risk types formed the reference group; sex 0 = male, 1 = female; school track is dummy-coded: 1 = academic track, 0 = non-academic track

and resigned types). The second regression model (M_{12}) in this set included the other aspects of teacher competence. In this model, the results showed a statistically significant regression coefficient not only for membership of the healthy–ambitious and unambitious types but also for teachers' enthusiasm for teaching. This means that, above and beyond their self-regulatory skills, teachers who reported higher enjoyment of teaching scored lower on emotional exhaustion than did teachers who reported lower enjoyment of teaching. None of the other aspects of teacher competence explained any further variance in emotional exhaustion.

The bivariate correlations for teachers' job satisfaction showed a similar pattern as those for emotional exhaustion. Membership of the healthy–ambitious type, stronger constructivist beliefs, and enthusiasm for the subject taught and for teaching were correlated with higher job satisfaction. No statistically significant correlations were found for membership of the unambitious type or for the two facets of teacher knowledge. Results of the first regression model (M_{21}), controlling for teacher age, sex, and school type, showed a statistically significant regression coefficient for both self-regulatory types; that is, teachers of the healthy–ambitious type and of the unambitious type showed significantly higher job satisfaction than did teachers of the excessively ambitious and unambitious types. In the second regression model (M_{22}), none of the other aspects of teacher competence made a significant contribution to predicting job satisfaction.

Overall, these findings show that the effects of self-regulation on occupational well-being are specific and cannot be explained by the other aspects of teacher competence (Kunter et al. 2007). Teachers of the healthy–ambitious type, who are capable

of managing their own resources effectively and who have high self-regulation skills, report substantially less emotional exhaustion and higher job satisfaction than do teachers of the excessively ambitious and resigned types. However, teachers of the unambitious type also display higher well-being than do those of the at-risk types. Findings on the other aspects of competence indicate that teachers' work-related enthusiasm plays a supportive role, although the causal status of this relationship remains uncertain. Interestingly, teachers' professional knowledge showed no association either with the experience of emotional exhaustion or with job satisfaction.

14.5 General Discussion and Outlook

The purpose of this chapter was to provide a theoretical context for the concept of occupational self-regulation as an aspect of teachers' professional competence and to present empirical support for this approach—first, by summarizing previous findings on its validity and, second, by conducting new analyses on the interplay among the aspects of teachers' professional competence. Self-regulation was defined as a person's ability to budget personal resources adaptively in a professional context, which should manifest itself in a balance between work engagement as an investment of resources and resilience as the conservation of resources (see COR; Hobfoll 1989). Our findings showed, first, that four different self-regulatory types are empirically identifiable: the healthy–ambitious type, the unambitious type, the excessively ambitious type, and the resigned type. Second, the findings revealed that the type of occupational self-regulation was significantly related to both occupational well-being and quality of instruction. Third, the new analyses clearly showed that occupational self-regulation has specific effects on instructional behavior and occupational well-being, even when the other aspects of teacher competence are taken into account. In line with our theoretical expectations, an adaptive self-regulatory style (healthy–ambitious type), which achieves a balance between investing and conserving resources, proved superior to all other types of self-regulation—as reflected in positive effects on both instructional behavior and occupational well-being. Self-regulation based primarily on the conservation of resources, as observed in teachers of the unambitious type, was positively associated with occupational well-being, but students rated the instructional quality of these teachers to be lower. These teachers' strategy of primarily conserving their resources also appears problematic given that continuing professional development, which can be understood as an ongoing investment of resources, is considered a requirement of the profession—as formulated, for example, in the standards for teacher training recently released by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder (KMK 2004). The least favorable results, particularly in terms of well-being, were found for teachers identified as belonging to the two at-risk types. Teachers of the excessively ambitious type received good ratings from students on some aspects of their teaching practice, but it seems unlikely that they

will be able to maintain their "excessive engagement"—investing resources without having measures in place to replenish those resources—in the long term without sacrificing their psychological and physical well-being.

Overall, the empirical findings underscore the importance of supplementing the "classic," purely cognitive aspects of teacher competence within the COACTIV model of teachers' professional competence. Activity-specific motivation (see Chap. 13) was the first such addition. With self-regulation, we now extend the spectrum of teacher competence to include a broader, overarching aspect that can be expected to concern all psychological functional levels (e.g., cognition, motivation, and emotion) and that is distinct from the aspects of teacher competence considered previously, in that it involves teachers' self-referential processing of their professional experience. The social orientation of the teaching profession appears to pose a particular challenge for teachers, requiring an adaptive means of dealing with work-related stress. Teachers frequently mention problems in the teacher–student relationship, as well as a lack of student motivation and discipline problems, as main reasons for their experience of work-related stress, leading many teachers to leave the profession long before retirement (Blase 1986; Evers et al. 2004; Friedman 1995; Geving 2007). The difficulties that can accompany the social nature of teaching are further reflected in the fact that the phenomenon of burnout was first observed and investigated in the social professions. These difficulties further underscore the importance of being able to manage personal resources effectively (Enzmann and Kleiber 1989; Maslach and Leiter 1999; Schaufeli and Enzmann 1998).

Although the investigation of teachers' professional competence has in recent years focused primarily on teachers' content knowledge, pedagogical content knowledge, and pedagogical knowledge, there is a long history of research on teachers' more general personality characteristics (Helmke and Weinert 1997). The "personality paradigm," for example, focused on identifying the "good teacher" based on characteristics such as emotional stability, agreeableness, and openness (Austad 1972). The findings showed only weak associations with instructional behavior, however, and these were only relevant for extreme personality characteristics. One point of criticism was also that the very abstract characteristics that seemed to be associated with specific behaviors in various contexts were too distant from the classroom context and difficult to modify. Self-regulation, in contrast, relates explicitly to teacher experience and behavior in the professional context. However, conclusive evidence of the malleability and modifiability of this construct, which constitutes an important criterion for all aspects of competence, has yet to be presented.

In addition to raising theoretical and conceptual questions, our findings highlight the question of malleability: only a small proportion of the teachers investigated showed a sufficient capacity for adaptive self-regulation. That is, only some of the teachers appeared capable of budgeting their resources in such a way that they could provide an appropriate level of instructional quality while experiencing low exhaustion and high job satisfaction. Future research should therefore address the conditions and preconditions for adaptive self-regulation and the stability of the self-regulatory types identified in the present research. It also seems important to

study how self-regulation can be modified in the context of teacher education and in-service training, so that strategies for the adaptive response to professional challenges and management of personal resources can be given more focused attention in the training of future teachers.

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