



Flow among music teachers and their students: The crossover of peak experiences[☆]

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Abstract

This study among 178 music teachers and 605 students from 16 different music schools examined the peak experience of flow (Csikszentmihalyi, 1990). On the basis of the literature, it is hypothesized that job resources, including autonomy, performance feedback, social support, and supervisory coaching have a positive influence on the balance between teachers' challenges and skills, which, in turn, contributes to their experience of flow (absorption, work enjoyment, and intrinsic work motivation). In addition, using emotional contagion theory, it is hypothesized that flow may crossover from teachers to their students. The results of structural equation modeling analyses offer support for both hypotheses. These findings are discussed in light of theories about crossover and emotional contagion.

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1. Introduction

Flow is a state of consciousness where people become totally immersed in an activity, and enjoy it intensely. According to Csikszentmihalyi (1997), such a peak experience can emerge in any situation in which there is activity, and researchers have

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indeed found evidence for flow during the execution of a large number of different activities, including sports, work, and playing music (Catley & Duda, 1997; Csikszentmihalyi & Csikszentmihalyi, 1988; Csikszentmihalyi & LeFevre, 1989; Jackson & Marsh, 1996; Kowal & Fortier, 1999). In the present study, the phenomenon of flow is investigated among music teachers and their students. The main research questions addressed whether job resources facilitate flow at work, and whether this experience may crossover from music teachers to their students.

2. Flow at work

What is flow? The literature reveals a laundry list of definitions of the concept. Csikszentmihalyi (1990), who coined the term flow, describes the concept as: “The state in which people are so intensely involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it.” In addition to the pleasure in the activity and the intrinsic motivation to continue doing it, the total immersion in an activity seems to be a central aspect of the flow-experience. For example, Lutz and Guiry (1994) describe flow as: “. . . a state of mind sometimes experienced by people who are deeply involved in some event, object, or activity. . . they are completely and totally immersed in it. . . Indeed, time may seem to stand still and nothing else seems to matter while engaged in the consumption event.” These scholars emphasize the idea that time flies during a flow experience. Ellis, Voelkl, and Morris (1994) define flow as an optimal experience that is the consequence of a situation in which challenges and skills are equal. According to these researchers, such a situation facilitates the occurrence of flow-related phenomena, such as positive affect, arousal, and intrinsic motivation (p. 337). Furthermore, Ghani and Deshpande (1994) particularly emphasize the total concentration and the enjoyment people experience when in flow: “The two key characteristics of flow are (a) total concentration in an activity and (b) the enjoyment which one derives from an activity. . . There is an optimum level of challenge relative to a certain skill level.” (p. 383).

The most prominent definitions of flow seem to have three elements in common, namely absorption (“the total immersion in an activity”), enjoyment, and intrinsic motivation. These three elements are indeed the core components that are usually included in studies by many flow-researchers (e.g., Csikszentmihalyi, 1997; Csikszentmihalyi & Csikszentmihalyi, 1988; Csikszentmihalyi, Rathunde, & Whalen, 1993; Larson & Richards, 1994). Accordingly, when flow is applied to the work situation, it can be defined as a short-term peak experience at work that is characterized by absorption, work enjoyment, and intrinsic work motivation. *Absorption* refers to a state of total concentration, whereby employees are totally immersed in their work. Time flies, and they forget everything else around them (cf. Csikszentmihalyi, 1990). Employees who *enjoy* their work and feel happy make a very positive judgment about the quality of their working life (cf. Veenhoven, 1984, 1996). This enjoyment or happiness is the outcome of cognitive and affective evaluations of the flow experience (cf. Diener, 2000; Diener & Diener, 1996). Finally,

intrinsic work motivation refers to the need to perform a certain work-related activity with the aim of experiencing the inherent pleasure and satisfaction in the activity (cf. Deci & Ryan, 1985). Intrinsically motivated employees are continuously interested in the work they are involved in (Harackiewicz & Elliot, 1998). Employees who are motivated by the intrinsic aspects of their work tasks want to continue their work; they are fascinated by the tasks they perform (Csikszentmihalyi, 1997).

3. What are the antecedents of flow?

Csikszentmihalyi (1990) discovered that artists and athletes are particularly prone to experiencing flow. Does this also apply to music teachers? According to Klausmeier (1978), the practice, performance, and transference of music offers many reasons to become totally immersed in the activity. The identification with the music allows the musician to feel at one with and become absorbed in the music (Palmer, 1989). In addition, the high level of effort that is required to perform well coincides with high concentration. We may therefore expect that musicians frequently experience flow. However, what are the factors in music teachers' working environment that contribute to flow experiences?

Csikszentmihalyi's (1997) experience sampling studies have shown that people more often experience flow during their work than during free time. These studies show, for example, that boredom is more likely when people spend their leisure time on activities such as watching television. This suggests that one has to invest time and energy to experience flow. Indeed, research has shown that people need challenges to facilitate flow in a range of activities, including work. Moreover, researchers generally agree that the occurrence of flow is most likely when people perceive a balance between the challenge of a situation and their own skills to deal with this challenge (e.g., Clarke & Haworth, 1994; Csikszentmihalyi, 1990; Ellis et al., 1994; Massimini & Carli, 1988). For example, a tennis player experiences a balance when he is confronted with an opponent who is approximately equally skilled. In this situation, an exciting game may develop in which the tennis players have to do their utmost to beat the opponent. On the contrary, theoretically, there is a higher probability of boredom if the opponent has fewer skills (low challenge in the situation, self high skills), and a high probability of stress if the opponent is much better (high challenge, low skills). There is indeed some empirical evidence for this pattern of experiences (e.g., Csikszentmihalyi, 1997; Edwards, 1996; Karasek, 1979; Massimini & Carli, 1988). Relevant to the activity examined in the present study, Csikszentmihalyi and Csikszentmihalyi (1988, p. 261) have argued that "a beginning piano player will see learning the keys corresponding to the various notes as challenging, and might feel in flow simply by running the scales on the keyboard. As soon as the player feels confident with the scales, however, new challenges need to be found or he or she will get bored."

Applied to the work situation, this means that employees are more likely to experience flow when their job demands or challenges match their professional skills. There is balance when, for example, experienced music teachers succeed in teaching

jazz music to inexperienced students who only learned to play rudimentary and specific pieces of classical music. Such a goal will particularly be reached when employees have certain professional skills (cf. the Person-Environment fit model; Edwards, 1996), or have sufficient resources in their work—such as support from colleagues, performance feedback, good material, and autonomy (Bakker, Demerouti, De Boer, & Schaufeli, 2003a; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Karasek, 1979). Research has indeed shown that such job resources make a positive contribution to the motivation, commitment, and performance of individuals (De Jonge, 1995; Hackman & Oldham, 1980; Loher, Noe, Moeller, & Fitzgerald, 1985; Orpen, 1979; Schaufeli & Bakker, in press), and may buffer the undesirable influence of job demands on stress reactions (Karasek, 1979; Van Vegchel, De Jonge, Bakker, & Schaufeli, 2002). Possibilities for self-growth, for example, will enable employees to cope better with the demands of their work, and feedback about performance makes clear to what extent work-related goals have been reached (Locke, 1968). On the basis of these previous findings, the following hypothesis is formulated (see also Fig. 1):

Hypothesis 1. Music teachers' job resources, including autonomy, performance feedback, social support from colleagues, and supervisory coaching, have a positive influence on the balance between their challenges and skills. This balance, in turn, contributes positively to the experience of flow (absorption, work enjoyment, and intrinsic work motivation).

4. Is flow contagious?

Several field and experimental studies have shown that positive and negative emotions can crossover from one person to another (for an overview, see Hatfield,

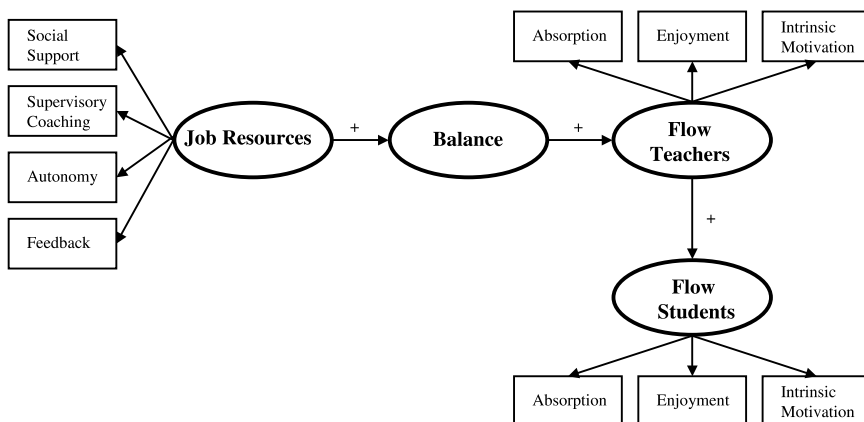


Fig. 1. The Flow Model.

Cacioppo, & Rapson, 1994). For example, Field, Woodson, Cohen, Garcia, and Greenberg (1982) showed that the facial expression of a newborn child resembles the facial expression of the mother. Likewise, the emotions of mothers can be influenced by the facial expressions of their newborn children (Frodi et al., 1978). Campos and Sternberg (1981) have called this *social referencing*. This phenomenon has also been described as *emotional contagion*, defined as: “The tendency to automatically mimic and synchronize facial expressions, vocalizations, postures and movements with those of another person and, consequently, to converge emotionally” (Hatfield et al., 1994, p. 5). An experiment of Lanzetta, Sullivan, Masters, and McHugo (1985), in which individuals were filmed and questioned while they were watching a speech of President Reagan, showed that supporters shared his enjoyment when he was telling something happy, and reported tension when he was telling something fearful. Although opponents reported negative feelings during the whole speech, their facial expressions were congruent with those of Reagan. In addition, assessments of their galvanic skin responses showed that both supporters and opponents were more relaxed during the happy messages than during the disturbing announcements.

Recent organizational studies have shown that employee well-being may take contagious forms as well. For example, Bakker and Schaufeli (2000) showed that teachers, general practitioners (Bakker, Schaufeli, Sixma, & Bosveld, 2001), and employees working for an insurance company (Bakker, Demerouti, & Schaufeli, 2003) caught the burnout symptoms of their colleagues, particularly when they were susceptible to the emotions of others (an individual difference variable; cf. Stiff, Dillard, Somera, Kim, & Sleight, 1988), and when they frequently discussed work-related stress. In addition, in a series of crossover studies among couples, (Westman, 2001; Westman & Etzion, 1995; Westman & Vinokur, 1998) has shown that burnout and depression may transfer from one spouse to another. Taken together, these findings indicate that our emotions are influenced by those of others whether we like the others or not, and whether we want to or not. Note that the evidence found in field research for crossover relates solely to *negative* emotions (e.g., strain, burnout, and depression). There is little, if any, evidence for positive crossover in the workplace. However, since stressful demands or a bad day at work have a negative impact on colleagues’ well-being, positive experiences at work may also crossover and have a positive effect on others’ well-being (cf. Westman, 2001).

It is still unclear which different mechanisms play a role in the process of crossover or emotional contagion. The perception and (unconsciously) adoption of facial expressions seems important (e.g., Adelman & Zajonc, 1989). For intonation and speed of speech it has been shown that partners mutually influence and adjust to each other, and that the tone height and speed of the speaker influences the way he or she feels (Hatfield et al., 1994). Thus, based on emotional contagion theory, we may expect that flow experiences of music teachers have a positive influence on those of their students. During the teaching, several ongoing interactive (verbal as well as non-verbal) processes take place between the teacher and his or her students. In addition to seeing each other and talking to each other, the teacher plays an important role in designing the lessons. The mood of the teacher thus influences many

factors to which students are exposed during the lesson, and in this way, the processes of emotional contagion may take effect. In addition, the flow experience of a teacher not only includes a component of work enjoyment, which may influence the student, it also contains the components of intrinsic work motivation and absorption. This may determine the quality of the lesson and, indirectly, the enjoyment of the student. Therefore, the second hypothesis is:

Hypothesis 2. There exists a positive relationship between the experience of flow (absorption, work enjoyment, and intrinsic work motivation) of music teachers and the flow experiences of their students.

5. Method

5.1. Procedure and participants

In consultation with the Royal Dutch Society for Music Artists (Koninklijke Nederlandse Toonkunstenaars Bond), 28 music schools were approached, of which 16 participated (57% of the schools). The 405 music teachers who were employed at these schools received questionnaires in their mailboxes at work. In addition to questions about demographics, the questionnaire included items to assess job resources and the balance between challenges and skills, as well as items about work-related flow experiences. The accompanying letter explained that the goal of the study was to examine 'teacher well-being.' In addition, all teachers were asked to randomly distribute a short flow questionnaire (including the three dimensions of absorption, enjoyment, and intrinsic motivation) to four of their students during one of the lessons. The items were somewhat adjusted for the students, by referring to flow experiences when playing their musical instrument. In total, 178 teachers (44%) and 605 students filled out the questionnaire. Reasons not to fill out the questionnaire were: "I am too busy," "We already have to fill out too many forms," and "Participation is not anonymous if I fill out my age and instrument." For 67% of all teachers, 4 students filled out the flow questionnaire, for 80% of all teachers at least 3 students filled out the questionnaire, and for 92% of all teachers at least 2 students filled out the questionnaire (for all teachers at least 1 student). Teachers and students turned in the questionnaires separately at the reception desk of their music school.

The sample included 75 men (42%) and 103 women (58%). On average, they were teaching 12 h ($SD = 7.1$ h) per week at their music school and organizational tenure was on average 13 years ($SD = 10.2$ years). The mean age of the participants was 41 years ($SD = 9.8$). Of all teachers, 40% performed other activities as well, such as providing private lessons and playing in an ensemble or professional orchestra (or both). In total, 36% only taught individual students. The remainder taught both groups and individuals. The average age of the students was 19 years ($SD = 13.2$). On average, they had received music lessons for five years and generally studied between 2 and 4 h per week. The teaching concerned several instruments, particularly piano (17%), flute (12%), guitar (12%), violin (10%), and keyboard (9%). Regarding genre, 57% of the

teachers taught only classical music, 27% classic and pop music, and 16% only pop music. In addition, 20% of the teachers included jazz music in the curriculum, always in combination with classical music or pop music. Preliminary analyses showed that none of the demographics was related to the model variables. Therefore, these factors will not be included in the following analyses.

5.2. Measures

Job resources. Four job resources were included in the questionnaire. *Autonomy* was measured with a short scale developed by Bakker, Demerouti, Taris, Schaufeli, and Schreurs (2003c). Autonomy or job control is considered a job resource since many studies have shown that this work characteristic enables employees to cope with job demands (Van der Doef & Maes, 1999), and has motivational potential (Fried & Ferris, 1987; Hackman & Oldham, 1980). The scale includes three items referring to decision authority (i.e., freedom of action in accomplishing the formal work task). A sample item is: “Can you decide yourself how you execute your work?” Items are scored on a five-point Likert scale (1 = never, 5 = always). *Social support* was also assessed with a three-item scale developed by Bakker et al. (2003c). A sample item is: “Can you ask your colleagues for help if necessary?” (1 = never, 5 = always). *Coaching by the supervisor* was measured using a Dutch adaptation of Graen and Uhl-Bein’s (1991) Leader-Member exchange scale (Le Blanc, 1994). The scale includes five items, such as: “My supervisor uses his/her influence to help me solve my problems at work” (1 = never, 5 = always). *Performance feedback* was assessed with a three-item scale developed by Bakker et al. (2003c). A sample item is: “I receive sufficient information about the goal of my work” (1 = never, 5 = always). All responses were coded such that higher scores referred to more job resources.

The *Balance* between challenges and skills was assessed with a five-item scale, based on French, Caplan, and Harrison (1982). Sample items are: “I am well able to meet the demands of my work,” and “I have sufficient skills to carry out my work tasks properly.”

Flow was assessed with a recently developed instrument named the Work-reLated Flow scale (WOLF for short; Bakker, 2001). The WOLF includes 13 items measuring absorption (4 items), work enjoyment (4 items) and intrinsic work motivation (5 items). Examples are: “When I am working, I forget everything else around me” (*absorption*), “When I am working very intensely, I feel happy” (*work enjoyment*), and “I get my motivation from the work itself, and not from the rewards for it” (*intrinsic work motivation*). The participants were asked to indicate how often they had each of the experiences during the preceding week (0 = never, 1 = almost never, 2 = sometimes, 3 = regularly, 4 = often, 5 = very often, 6 = always). Seven previous studies among a total of 1346 employees from different organizations and occupations have shown that the three factors can be empirically distinguished, and have good reliabilities (Bakker, 2001). Cronbach’s α -coefficients for absorption, work enjoyment and intrinsic work motivation ranged from .75 to .86, .88 to .96, and .63 to .82, respectively. In addition, a longitudinal study among 248 consultants who filled

out the WOLF twice with 6 weeks between both waves showed that the test–retest reliabilities of the subscales are satisfactory (Bakker, 2001). The test–retest correlations were .74, .77, and .71 for absorption, work enjoyment, and intrinsic work motivation, respectively. To determine flow among *students*, the items were slightly adjusted. All items that refer to work were changed by referring to playing music, for example: “When I am playing music, I forget everything else around me.” The scores on each of the three flow dimensions were calculated for groups of students by using the average of all students for each teacher.

5.3. Analyses

To test the two hypotheses simultaneously, structural equation modeling (SEM) analyses were carried out with the AMOS software package (Arbuckle, 1997). In order to test the fit between the model and the data, the traditional χ^2 value, the goodness-of-fit index (GFI) and the root mean square error of approximation (RMSEA) were calculated. As a rule of thumb, a GFI $\geq .90$ and a RMSEA $\geq .08$ indicate a reasonable fit between the model and the data (Browne & Cudeck, 1993). Because these indices are dependent on sample size, as recommended by Marsh, Balla, and Hau (1996)—the non-normed fit index (NNFI), the incremental fit index (IFI), and the comparative fit index (CFI) were also examined. These indices should have values of .90 or higher (Hoyle, 1995).

The model, as displayed in Fig. 1, consists of hypothetical constructs or latent variables that are all estimated by two or more manifest variables that are directly observed (i.e., the scales introduced before). The latent exogenous factor ‘job resources’ was operationalized by four observed, manifest variables, namely social support, supervisory coaching, autonomy, and performance feedback. In addition, the structural model includes two latent mediating variables: (1) balance between challenges and skills, and (2) flow among music teachers. The scale for assessing ‘balance’ was split in two reliable halves (cf. Bakker et al., 2000) that served as the indicators of the latent variable ‘balance.’ The first subscale includes two items and has a reliability of .76 ($r = .61, p < .001$). The second subscale includes three items and has a reliability of .79. The latent factor ‘flow among music teachers’ was indicated by absorption, work enjoyment, and intrinsic work motivation. Finally, the three respective flow scales indicated the latent endogenous factor ‘flow among students’.

6. Results

6.1. Descriptive statistics

Table 1 shows the means, standard deviations, reliability coefficients, and correlations between all study variables. As can be seen, all constructs that were assessed demonstrated good internal consistencies. In addition, Table 1 shows that the four job resources correlate significantly with each other, and with teachers’ flow experiences. The intercorrelations between the three flow components are relatively high,

Table 1

Means, standard deviations, reliability coefficients (Cronbach's α ; on the diagonal), and correlations between the variables, $N = 178$ music teachers and 605 students

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1 Social support by colleagues	3.37	1.07	(.86)											
2 Supervisory coaching	3.17	.98	.39**	(.90)										
3 Autonomy	3.70	.74	.28**	.39**	(.75)									
4 Performance feedback	2.89	1.08	.33**	.33**	.30**	(.77)								
5 Balance (indicator 1)	4.28	.62	.20**	.11	.08	.18*	(.76)							
6 Balance (indicator 2)	4.20	.64	.12	.01	.07	.22**	.75**	(.79)						
7 Absorption teacher	3.78	1.11	-.10	-.08	.03	-.12	.17*	.20**	(.76)					
8 Work enjoyment teacher	4.67	.93	.23**	.07	.18*	.18*	.28**	.34**	.44**	(.88)				
9 Intrinsic work motivation teacher	3.98	1.02	.13	-.02	.18*	.07	.21**	.24**	.50**	.66**	(.71)			
10 Absorption Students	3.73	.83	.30**	.05	-.02	.09	-.01	-.06	.15*	.06	.18*	(.91)		
11 Enjoyment students	4.76	.56	.18*	.03	.09	.05	.09	.10	.10	.15*	.27**	.62**	(.90)	
12 Intrinsic motivation students	4.72	.49	.07	-.02	.14	.09	-.04	.09	.10	.11	.27**	.40**	.69**	(.91)

* $p < .05$.

** $p < .01$.

for both the teachers and the students. Furthermore, teachers' flow experiences partly correlate with those of the students. Another noticeable finding is that social support reported by teachers correlates significantly with students' levels of absorption and enjoyment when playing music.

6.2. Test of the flow model

According to Hypothesis 1, job resources have a positive relationship with the balance between challenges and skills, which, in turn, contributes to explaining variance in music teachers' experiences of flow (absorption, work enjoyment, and intrinsic work motivation). In addition, Hypothesis 2 states that there is a positive relationship between teachers' flow and that of their students (contagion hypothesis; see also Fig. 1). To test these hypotheses simultaneously, SEM analyses were carried out with the AMOS software package (Arbuckle, 1997).

The first row in Table 2 shows that the hypothesized model fits reasonably well to the data. Only the NNFI is, at .87, somewhat lower than the criterion value of .90. The GFI, CFI, and IFI are all .90, and—together with a RMSEA of .08—this indicates an acceptable fit between the model and the data. In addition, all indicators had significant loadings on the intended factors. For job resources, these factor loadings ranged from .54 to .63. The factor loadings for absorption, (work) enjoyment and intrinsic (work) motivation were .59, .80, and .74, respectively, for flow among teachers, and .63, .95, and .71 for flow among students.

To test the alternative hypothesis that job resources also have a *direct* relationship with flow among teachers and flow among students, both paths were included in the model. The results (see Table 2) showed that this alternative model (M2) does *not* fit better to the data than the proposed hypothetical model, Delta $\chi^2(2) = 1.74$, *n.s.* Moreover, both path coefficients had the same, non-significant value of .10 (*t's* < 1). In a third model (M3), the path from balance to flow among students was added to M1. This did also not result in a better fit of the model to the data (Delta $\chi^2(1) = .27$, *n.s.*), and the coefficient of the additional path proved to be non-sig-

Table 2
Results of SEM-analyses: Fit indices of the flow model and the alternative models, standardized maximum likelihood estimates, *N* = 178 music teachers and 605 students

Model	χ^2	<i>df</i>	GFI	RMSEA	NNFI	CFI	IFI
M1. Flow Model	113.50	51	.90	.08	.87	.90	.90
M2. Alternative Model	111.76	49	.91	.08	.87	.90	.90
M3. Alternative Model	113.23	50	.90	.08	.87	.90	.90
M0. Null Model	673.94	66	.59	.23	–	–	–

Note: χ^2 , chi-square; *df*, degrees of freedom; GFI, goodness-of-fit index; RMSEA, root mean square error of approximation; NNFI, non-normed fit index; CFI, comparative fit index; IFI, incremental fit index; M2, alternative model, including the path from job resources to flow among teachers, and from job resources to flow among students; and M3, alternative model, including the path from balance to flow among students.

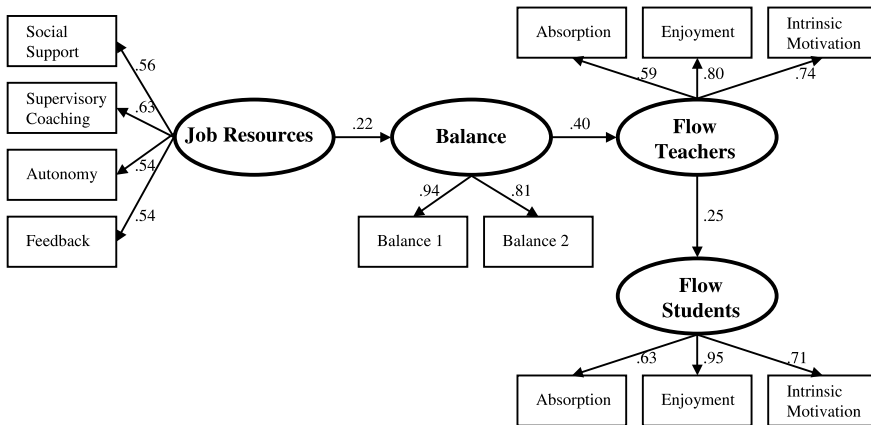


Fig. 2. The Flow Model: Standardized solution (maximum likelihood estimates), $N = 178$ teachers/605 students.

nificant ($\beta = .17, t = 1.52$). These results of the alternative models offer additional support for the hypothetical model.

The results of the final flow model, which is identical to the hypothetical model, are summarized in Fig. 2. The model explains 5% of the variance in ‘balance between challenges and skills’, 16% of the variance in flow among teachers, and 6% of the variance in flow among students.

6.3. Flow as a peak experience

In all previous analyses, flow was conceptualized as a phenomenon with three underlying dimensions (absorption, (work) enjoyment, and intrinsic (work) motivation), and it was assumed that individuals could score low or high on each of them. In other words, the three flow dimensions were operationalized as continuous variables, and the latent factor flow was indicated by each of these variables in the SEM-analyses. However, one could argue that the peak experience of flow is an *all or nothing* phenomenon: an experience that one either has or does not have (dichotomous variable). To examine whether this alternative operationalization of flow would lead to different results, an additional SEM-analysis was performed. Because externally validated criteria for *cut-off* scores on each dimension do not exist, the following rule of thumb was used: teachers and students have a peak experience if they score higher than or equal to the 75th percentile of *each* of the three flow dimensions. According to this criterion, 19 teachers (10.7%) and 20 groups of students (11.2%) reported experiences of flow (and were assigned the number ‘1’ in the analyses). The flow model was tested again, but now flow was included in the model as an observed, manifest variable (participants scored 0 or 1). This model also turned out to fit the data well, $\chi^2(19) = 26.31, p = .12, GFI = .96, RMSEA = .05, NNFI = .96, CFI = .97, IFI = .97$. In this model, the relationship between ‘balance’ and flow

among teachers was 17. ($CR = 1.98, p < .05$), and the relationship between flow among teachers and flow among students was also .17 ($CR = 2.23, p < .05$). Taken together, these findings are consistent with those in Fig. 2, although the relationships in the model are less strong.

It should be noted that maximum likelihood (ML) estimation assumes that variables are continuous instead of dichotomous. Unfortunately, Asymptotically Distribution Free (ADF) estimation cannot be used to circumvent this problem in the present study, because of the relative small sample size (cf. Hoogland & Boomsma, 1997). I therefore checked the appropriateness of the findings by comparing the ML estimations with the results of logistic regression analyses (cf. Jones, 1998). Logistic regression is similar to linear regression but is suited to models where the dependent variable is dichotomous. The results of this analysis confirmed that the balance between challenges and skills is significantly related to flow among music teachers ($B = 1.15, p < .05$), and that flow among music teachers is significantly related to flow among students ($B = 1.23, p < .05$).

7. Discussion

The central aim of this study was to answer two questions, namely whether job resources are possible antecedents of flow experiences among music teachers, and to what extent flow may crossover from teachers to their students. To answer both questions, flow at work was first defined as a short-term peak experience that is characterized by absorption, work enjoyment, and intrinsic work motivation (cf. Bakker, 2001; Csikszentmihalyi, 1997; Ellis et al., 1994). Individuals who experience flow forget everything else around them, evaluate the quality of their working life very positively, and perform certain work-related activities with the aim to experience enjoyment and satisfaction that is inherent to these activities. In addition, on the basis of previous research, it was predicted that flow is most likely when individuals perceive a balance between the challenges of a situation and their own skills to cope with these challenges (e.g., Clarke & Haworth, 1994; Csikszentmihalyi, 1990; Ellis et al., 1994; Massimini & Carli, 1988). Resources in the working environment would facilitate this balance, because job characteristics such as autonomy, performance feedback, social support, and supervisory coaching can foster personal growth and the realization of goals (cf. Bakker et al., 2003c; Demerouti et al., 2001). Therefore, the first hypothesis was that job resources would have a positive relationship with music teachers' balance between their challenges and skills, which, in turn, would contribute to explaining flow (absorption, work enjoyment and intrinsic work motivation).

The results of SEM-analyses supported this hypothesis. More specifically, the findings showed that job resources—a combination of autonomy, performance feedback, social support from colleagues and supervisory coaching—had a positive relationship with the balance between challenges and skills, and that this balance, in turn, had predictive value for the frequency of flow among music teachers. These findings confirm and expand Csikszentmihalyi's (1997, 1990) flow theory. They

emphasize the importance of the fit between the skills of the person and the challenges he or she is exposed to at work (cf. French et al., 1982). In addition, the results show that besides the facilitating role of information about the goals and results of one's work (cf. Csikszentmihalyi), social support from colleagues, supervisory coaching and autonomy may also contribute to such a balance.

However, there is another issue at stake here. In terms of balance, one may specify that it involves equilibrium between job demands (challenges) and skills, but more generally, one may argue that balance involves equilibrium between job demands and all accessible resources (*personal* resources, including e.g. skills, self-efficacy, and self-esteem; and *job* resources, including performance feedback, autonomy, social support, and coaching). Resources in excess of demands may yield increased boredom, and demands in excess of resources may yield increased distress. This means that if job demands are held constant, resources and the likelihood of flow will take on a quadratic function (cf. Warr, 1987). As resources increase, the likelihood of flow will increase, presumably mitigating stress along the way. This positive relationship should hold until equilibrium between job demands and resources is achieved. As resources exceed the fixed job demands, then the likelihood of a flow state may decline because boredom will become the more likely state. Some evidence for such a pattern of responses has indeed been found in previous *job stress* studies with the demand-control model (De Jonge & Kompier, 1997) and the job demands—resources model (Bakker, Demerouti, & Euwema, 2003b).

The second hypothesis was that there exists a positive relationship between music teachers' flow (absorption, work enjoyment, and intrinsic work motivation) and the experience of flow among their students. This hypothesis was also confirmed by the findings; the more flow experiences music teachers reported, the higher the frequency of comparable experiences among their students. This finding is in line with emotional contagion theory (Hatfield et al., 1994), and is one of the first demonstrations in field research that positive emotions may crossover from one person to another (Westman, 2001). The correlational analysis suggested that, in particular, teachers' *intrinsic work motivation* was related to flow experienced by students. This flow dimension showed the strongest positive relationships with students' intrinsic motivation, and was also related to their absorption and enjoyment. In addition, music teachers' and students' absorption and enjoyment also showed positive relationships, and enjoyment had the highest loading on the latent variable 'flow' in the SEM-analyses. Thus, these results suggest that students 'caught' the flow experience of their teachers in a partly conscious and partly unconscious way. The crossover process may include the automatic imitation of a cheerful and happy teacher, but also the more conscious crossover of teachers' dedication to their work (cf. Hatfield et al., 1994). In addition, motivated teachers probably put more effort and energy in the search for nice and suitable music for the students; they presumably have a more positive attitude toward work that motivates their students to concentrate during the music lesson and to perform well.

In previous studies, researchers have applied various methods to assess flow. Csikszentmihalyi (1990) usually applies the *experience sampling* method

(Csikszentmihalyi & Larson, 1992; Kimiecik & Stein, 1992). Participants are requested to react several times a day to a short questionnaire (*experience sampling form*) when they receive a random signal from an electronic device during a certain period of time (usually one week). Jackson and Marsh (1996) have argued that more research is needed to examine the reliability and validity of this method in field research, and ask for attention to the practical problems that are inherent in this research strategy (see Kimiecik & Stein, 1992). The results of the present study suggest that simple questionnaires may offer a reasonable alternative. Note, however, that Csikszentmihalyi (1990), although primarily assessing the three dimensions of absorption, enjoyment, and intrinsic motivation, has described several other ‘elements’ of flow, including the balance between challenges and skills, a clear goal, feedback, concentration and focus, control, loss of self-consciousness, transformation of time, and an “autotelic” experience (the activity becomes a goal in itself). According to Csikszentmihalyi, the frequency of flow will increase with an increase in each of these eight factors. More research is needed to find out whether the three elements used in the current study sufficiently measure the experience of flow.

In the present study, the three flow dimensions were each assessed on a continuum, ranging from ‘never’ to ‘always’. The question is, therefore, to what extent we really examined *peak* experiences among teachers and their students. One could argue that individuals only experienced flow if they scored high on *each* of the three flow factors (for example, \geq the 75th percentile). The results of additional analyses showed that approximately 11% of all teachers and students met this criterion, and that the relationships in the flow model were comparable with those between continuous variables (although weaker). The disadvantage of this approach is that nuances in the experience of flow are lost, since one does not distinguish between the three underlying dimensions (absorption, (work) enjoyment and intrinsic (work) motivation). The advantage of a combined measure is that it may be very useful for organizational practice. Interestingly, the conceptualization of flow as a combined measure is comparable with the approach of *job burnout* by Schaufeli and Van Dierendonck (2000), who define the risk of burnout as a combination of relatively high scores on the three dimensions measuring the syndrome, namely exhaustion, cynicism, and reduced professional efficacy.

7.1. Study limitations

A limitation of the present study is its cross-sectional character. Thus, the current findings, although framed in terms of cause and effect, did not demonstrate causality but merely relationships. Using existing theories, certain cause–effect relationships were assumed, but the existence of reversed causal effects cannot be excluded. For example, it is conceivable that teachers also experience more flow when their students have more of such peak experiences. Therefore, it is desirable that future studies examine such *reciprocal* effects. However, a strong point of this study is that two sources of information were used, namely music teachers and their students. Common method variance is a non-issue for the contagion hypothesis in this study.

A second limitation is that only teachers' self-reports were used in the examination of relationships between job resources, balance and flow. Here the problem of common method variance may have played a role. Because the study was conducted at 16 different schools, we could examine to what extent the flow experience per school was a function of the resources available at that school. Additional analyses showed that the scores on the flow dimensions absorption, work enjoyment, and intrinsic work motivation were highest at those schools where many resources were available (particularly supervisory coaching and autonomy). These findings indicate that the subjectively reported job characteristics were anchored in the objective working situation. The results thus offer specific starting-points for interventions aimed at mobilizing job resources and the promotion of flow experiences at music schools.

Third, it should be noted that the model explained only a limited amount of variance (16% of the variance in flow of teachers, and 6% of the variance of the flow among students). This can partly be explained by the use of different sources of information, which leads to an underestimation of the strength of relationships (cf. Frese & Zapf, 1988). It can be expected that both sources of information (in this study teachers and students) have their own unique causes of (statistically independent) error variance. If one uses only one method, the sources of error variance are the same. The consequence of this is inflated correlations. In addition, it should be noted that our strategy of analysis reduced the variance in students' flow experiences. More specifically, for each teacher, students' scale scores on each of the flow dimensions were summed for groups of students. This implies that the variance in the student responses was restricted. Future studies with a similar design may circumvent this drawback by using multi-level analyses techniques.

Fourth, although teachers were asked to *randomly* distribute short flow questionnaires among their students, it is unclear to what extent they complied with this request. It cannot be excluded that the teachers were selective. On the other hand, most teachers (67%) found *four* students who were willing to indicate the extent to which they experienced absorption, enjoyment and intrinsic motivation during the lessons. A limitation that we cannot overcome is that the average scores of the students on the three flow dimensions were, in some cases, based on less than four students.

Finally, regarding the crossover of flow, this study is limited to the context of music teachers and their students. Since the contagion hypothesis was confirmed regarding flow, it would be interesting and relevant to examine this phenomenon in other teacher–student relationships, such as in non-traditional teacher–student relationships (i.e. sport teachers and their students). In addition, it would be interesting to find out whether flow may also crossover from employees to their colleagues or partners. Several recent studies have shown that stress and strain can crossover at work (Bakker & Schaufeli, 2000; Bakker et al., 2003) and from work to private life (e.g., Westman, 2001). From a practical and theoretical point of view it would be valuable to carry out more organizational studies to examine whether positive experiences, including flow, can crossover to others.

7.2. Practical implications

It can be concluded that it is important for music teachers to have sufficient resources available in their work. Autonomy, social support from colleagues, supervisory coaching, and performance feedback are examples of such resources, but one could also consider skill variety, possibilities for self-growth, participation in decision making, and high quality communication (see also Bakker et al., 2003a, 2003b, 2003c). After completion of the present study, the participating schools received feedback about their most important job resources. Using histograms, it was explained how teachers at each school scored relative to the research group as a whole and in comparison with an external benchmark, including information that has been collected in recent years in many different companies (e.g., Bakker et al., 2003b, 2003c). On the basis of this information, it is possible to optimize the working environment. If, for example, one school's scores are relatively low on supervisory coaching and the flow scores of the teachers and students are inferior to those of teachers in other schools, it may be desirable to offer additional training to supervisors regarding leadership styles. Feedback could be mobilized as a resource by making job evaluations, and by regularly informing music teachers about the results of their work. Since we know that music teachers' experiences of flow coincide with those of their students, such resources seem not only important for teachers themselves, but also for the happiness and motivation of their students.

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