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Received social support and exercising: An intervention study to test the enabling hypothesis

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Objectives. Received social support is considered important for health-enhancing exercise participation. The enabling hypothesis of social support suggests an indirect association of social support and exercising via constructs of self-regulation, such as self-efficacy. This study aimed at examining an expanded enabling hypothesis by examining effects of different kinds of social support (i.e., emotional and instrumental) on exercising not only via self-efficacy but also via self-monitoring and action planning.

Design and methods. An 8-week online study was conducted. Participants were randomly assigned to an intervention or a control group. The intervention comprised finding and then exercising regularly with a new exercise companion. Intervention and control group effects were compared by a manifest multigroup model.

Results. Received emotional social support predicted self-efficacy, self-monitoring, and action planning in the intervention group. Moreover, received emotional social support was indirectly connected with exercise via the examined mediators. The indirect effect from received emotional social support via self-efficacy mainly contributed to the total effect. No direct or indirect effect of received instrumental social support on exercise emerged. In the control group, neither emotional nor instrumental social support was associated with any of the self-regulation constructs nor with exercise.

Conclusion. Actively looking for a new exercise companion and exercising together seems to be beneficial for the promotion of received emotional and instrumental social support. Emotional support in turn promotes exercise by enabling better self-regulation, in particular self-efficacy.

Statement of contribution

What is already known on this subject?

With the 'enabling hypothesis', Benight and Bandura (2004, *Behav. Res. Ther.*, *42*, 1129) claimed that social support indirectly affects behaviour via self-efficacy. Research in the domain of physical exercise has provided evidence for this enabling hypothesis on a correlational basis only preventing causal inferences.

What does this study add?

- We found evidence for the enabling hypothesis of received social support via self-efficacy on physical exercise in an intervention study.
- Moreover, this study demonstrated the distinct contribution of received emotional and instrumental social support in the context of the enabling hypothesis.

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The social support of important others (e.g., family and friends) can play a crucial role in the adoption and maintenance of physical activity and exercise (cf. Courneya, Plotnikoff, Hotz, & Birkett, 2000; Trost, Owen, Bauman, Sallis, & Brown, 2002). On the one hand, several studies have provided evidence for the direct effect of social support on physical activity (e.g., Gellert, Ziegelmann, Warner, & Schwarzer, 2011; Giles-Corti & Donovan, 2002; Lippke, 2004; Spanier & Allison, 2001). On the other hand, there is a growing body of research that investigates mediators of the path from social support to physical activity to explain the psychological mechanisms through which social support promotes physical activity (e.g., Anderson, Wojcik, Winett, & Williams, 2006; Duncan & McAuley, 1993; McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003; Molloy, Dixon, Hamer, & Sniehotta, 2010). This is based on the 'enabling hypothesis' (Benight & Bandura, 2004) which describes that receiving social support may help a person with regard to his/her self-regulative attempts by enabling one's abilities to master challenges (Schwarzer & Knoll, 2007). Originally, this enabling effect was focused on self-efficacy. It is highly likely, however, that this effect also translates to other self-regulatory variables, as for example specified in the Health Action Process Approach (HAPA, Schwarzer, 2008). For example, received social support might be in the form of planning the exercising together and thereby enhancing action planning or also in the form of setting joint goals and trying to achieve these goals jointly. This in turn might promote self-monitoring because the exchanges with the supporting partner might trigger the question whether or not the set goals have been achieved within a certain period of time.

However, those studies reported above have seldomly investigated more than one mediating mechanism between the association of social support and physical activity. Moreover, so far the role of different types of social support for physical activity has been understudied. Therefore, this study aimed at expanding the existing knowledge by investigating several mediators of social support and exercise in an intervention study. Additionally, the impact of different types of social support will be focused on.

Direct and indirect effects of social support on physical activity and exercising

Social support can broadly be defined as any kind of behaviour that supports an individual in achieving desired goals (e.g., Duncan, Duncan, & Strycker, 2005; Taylor, Baranowski, & Sallis, 1994). Several types of social support can be distinguished, such as emotional and instrumental social support (Schwarzer & Knoll, 2007). Emotional social support refers to the emotional assistance in achieving a desired goal. This emotional assistance can happen as encouragement or as comforting the recipient (Schwarzer & Knoll, 2007). The latter, for example, is important for successful health behaviour change because it makes it easier for the recipient to cope with possible rebounds. Instrumental social support refers to supporting the recipient by means of tangible assistance in achieving a desired goal such as changing one's health behaviour (Schwarzer & Knoll, 2010). Moreover, it can be differentiated into perceived social support and received social support (cf. Uchino, 2009). *Perceived* social support refers to the perception of potential help from the network, and *received* social support is the concrete support one receives when it is actually needed (Uchino, 2009). Received social support depicts the actual support transaction of the people involved in the supporting actions. Most studies investigate perceived social support instead of received support (e.g., Knoll, Rieckmann, & Kienle, 2007). However, as the latter is much more an indicator of what really happened in terms of social support (albeit still subjectively perceived by the support receiver) than is perceived support, the current study focussed on received social support for exercise.

Spanier and Allison (2001) demonstrated that perceived social support in terms of having contact with important others was associated with higher levels of physical activity. Moreover, Lippke (2004) demonstrated that perceived social support helped participants of a rehabilitation treatment to increase their exercise frequency. In terms of received instrumental social support, Giles-Corti and Donovan (2002) showed that the greater the number of important others who exercised regularly with the respondent, the more likely the recommended levels of physical activity were achieved. Gellert *et al.* (2011) implemented a health promotion programme for older adults and found that participants, whose spouses were also involved in the programme, were able to increase their physical activity over time. Moreover, with regard to received social support in general, the authors could demonstrate an interaction effect of exercising with the spouse or not. Those participants who exercised with their spouse also reported higher levels of received social support. Thus, the authors concluded that received social support is a potential mechanism that helps to enhance physical activity. Therefore, although some of these studies targeted particular contents of received social support (e.g., the received instrumental social support by the spouse), so far no study has investigated the discriminate functions of received instrumental and emotional social support for exercise in an intervention study.

The results reported above provided evidence for the direct effect of both perceived and received social support on physical activity. Additionally to this direct effect, there is a growing body of research focussing on mediators of the social support–physical activity relationship to explain the psychological mechanisms through which social support positively affects health behaviour. In this regard, Benight and Bandura (2004) specified the 'enabling hypothesis': They found in studies on recovery from traumatic stress that perceived social support *enabled* self-efficacy and this in turn facilitated recovering from stressful events. In the domain of exercise, McAuley *et al.* (2003) demonstrated a similar effect of perceived social support influencing exercise behaviour via self-efficacy (see also Duncan & McAuley, 1993).

Self-efficacy is one of the strongest correlates of physical activity and exercising (Ayotte, Margrett, & Hicks-Patrick, 2010; Resnick, Itkin Zimmerman, Orwik, Furstenberg, & Magaziner, 2000). However, besides self-efficacy, several other self-regulatory strategies are important for successful health behaviour change. In general, self-regulation can be defined as any kind of effort an individual undertakes to change a certain kind of behaviour (e.g., Carver & Scheier, 1998). It is important for behaviour change processes because it facilitates initiation and maintenance of a behaviour by preparing and controlling performance (Burkert, Scholz, Gralla, Roigas, & Knoll, 2011). Self-monitoring is one strategy to self-regulate a behaviour. Should individuals, for example, want to exercise three times a week, they need to monitor themselves in order to evaluate whether they have performed actions corresponding with the intended goal (cf. Bandura, 1991; Scholz, Nagy, Schüz, & Ziegelmann, 2008). Self-monitoring has been identified as a powerful behaviour change technique (Abraham & Michie, 2008). Another self-regulative strategy important for health behaviour change is action planning. It means formulating simple plans of when, where, and how to change a certain behaviour or adopt a new behaviour (e.g., Gollwitzer, 1999; Leventhal, Singer, & Jones, 1965; Sniehotta, Scholz, & Schwarzer, 2006).

Self-regulative strategies have been assumed to be mediators of the path from social support on physical activity. For example, Anderson *et al.* (2006) demonstrated that perceived social support indirectly affected physical activity via self-efficacy and several self-regulative strategies (e.g., action planning). Furthermore, action planning mediated

the association between received social support and physical activity as well (Molloy *et al.*, 2010).

Although the studies reported above have demonstrated several indirect effects that social support has on physical activity via self-regulative mediators, no study has so far focussed in detail on the combined investigation of two different self-regulative strategies and self-efficacy as mediators from different types of received social support and exercise applying an intervention study.

Aims of the study

The aim of our study was twofold. First, it was to investigate the enabling effect of received social support on exercise via self-efficacy, and to expand the enabling hypothesis by action planning, and self-monitoring as possible mediators of the association between received social support and exercise in an intervention study. We expect that exercising together with a new sport companion compared to exercising with a sports companion with whom one is used to exercise with for a certain time results in social support and that this will be translated into self-efficacy, action planning, and self-monitoring. This is not expected for the control group. Our rationale for assuming that this enabling only applies to the intervention group is the following: The support of a new sports companion in the intervention group might include trying a new kind of sport, or helping to overcome barriers the participants used to experience when exercising (e.g., resulting in running at a faster pace or exercising more often). This should booster the volitional factors, which in turn should translate into more physical exercise. For the participants in the control group, these effects will not be present with a sports companion who already exercises together for a certain time.

The second aim was to depict potential discriminative effects of received instrumental and emotional social support for the enabling of self-efficacy, self-monitoring, and action planning for exercise. Due to a lack of theoretical and empirical basis, this second aim was exploratory in nature.

Method

Participants and procedure

This study is part of a larger project, which investigated the contribution of received social support on exercise as a social support intervention (Rackow, Scholz, & Hornung, 2014[1]). Its design was longitudinal with four points of measurement, and the overall duration was 8 weeks. We recruited participants, who wanted to begin or increase their own physical exercise, in two different ways. First, participants were recruited in two locations of a Swiss federal research institute. Second, we recruited via health-related websites, an advertisement in a university journal, and flyers for display in medical group practices of a health insurance company. Hereby, we were able to reach 336 persons who clicked on the link of the baseline questionnaire (T0). Of these, 223 were eligible and were randomized to either the intervention (n = 121) or control group (n = 102). After randomization, participants in the intervention group were instructed to search a new

[1] *The manuscript (Rackow et al., 2014) focuses on the time course of exercise and received instrumental and emotional social support. In contrast, the present manuscript deals with the indirect effect of received social support on exercise via the mediators self-efficacy, self-monitoring, and action planning. Thus, although both manuscripts use data from the same study, there is relatively little overlap and the present paper addresses a unique research question not yet covered by another publication.*

sports companion and to exercise with this person for the next 8 weeks. We hypothesized that this will promote the receipt of instrumental and emotional social support and that this will enhance the physical exercise of the participants of the intervention group. Three individuals in the intervention group reported to not have found a new sports companion and were therefore excluded from all analyses, resulting in a total of $n = 118$ participants in the intervention group. The control group did not receive such an instruction. In contrast to other studies that either examined perceived and received exercise-specific social support by family members (e.g., Anderson *et al.*, 2006; Gellert *et al.*, 2011) or significant others (e.g., Giles-Corti & Donovan, 2002), we explicitly focussed on a new sports companion. This allowed us to investigate the effects of a newly developed exercise team as well as to examine the possible underlying mechanisms. This also established a comparable condition for all participants in the intervention group. After randomization, participants received three questionnaires every 4 weeks (first time of measurement, T1, participants remaining in the study: $n_{\text{intervention group}} = 100$, $n_{\text{control group}} = 82$; second time of measurement, T2, participants remaining in the study: $n_{\text{intervention group}} = 71$, $n_{\text{control group}} = 62$; third time of measurement, T3, participants remaining in the study: $n_{\text{intervention group}} = 65$, $n_{\text{control group}} = 50$). Participants who answered all questionnaires received a voucher worth 50 CHF (approximately 33 USD) for an online book and media store after completing the study. All participants were treated in accordance with the ethical guidelines of the Helsinki Declaration 2000.

Dropout analyses revealed that there were no significant differences between participants who only filled out T1 and participants who filled out the following two questionnaires concerning age, $t(169.41) = -1.65$, $p = .10$; dropout: M (SD) = 33.63 (8.6); continuers: M (SD) = 36.22 (10.40), gender, $\chi^2(1) = 0.37$, $p = .54$, exercising at T1, $t(161) = -1.57$, $p = .12$; dropout: M (SD) = 152.8 min per week (138.9); continuers M (SD) = 191.9 min per week (155.0), received emotional social support at T1, $t(144) = -1.57$, $p = .12$; dropout M (SD) = 4.98 (1.45); continuers: 5.37 (SD) = 1.20, as well as received instrumental social support at T1, $t(145) = -1.57$, $p = .12$; dropout M (SD) = 4.27 (1.61); continuers: 4.70 (SD) = 1.42.

The majority of participants were women ($n = 141$, 64.1%) and had a mean age of 34.6 years ($SD = 11.1$ years) with a range from 17 to 71 years. Of all participants, 113 (51.4%) reported to work full-time, 71 participants (32.3%) reported to be university student, and seven participants (3.2%) reported to be unemployed. Having a school degree, which qualifies for attending a university, was reported by 116 participants (52.7%), 63 individuals (34.8%) reported to have other job qualifying degrees (e.g., vocational training). About half of the participants ($n = 97$, 44.1%) reported being single or divorced, 85 (38.6%) were married or in a committed relationship. About one-fifth ($n = 45$, 20.5%) indicated to have children.

Measures

The socio-demographic variables were assessed at T0. In this study, we focused on received social support and exercise assessed at T1, action planning, self-efficacy, and self-monitoring assessed at T2, and exercise assessed again at T3. The sample means of the respective constructs are reported below. The group means for intervention and control participants are reported in Table 1.

Received emotional social support within the past 7 days was assessed with the subscale received emotional social support of the Berlin Social Support Scales (Schulz &

Table 1. Intercorrelations and descriptive statistics for received emotional and instrumental social support, action planning, self-monitoring, self-efficacy, and physical exercise, displayed separately for intervention and control group

	2	3	4	5	6	7	Range	*M*	*SD*
Control group									
1. Emotional social support (T1)	.34**	−.05	−.07	.14	−.05	−.04	1–7	5.26	1.36
2. Instrumental social support (T1)		−.21	.003	.08	−.04	.01	1–7	4.26	1.52
3. Self-efficacy (T2)			.31*	.27*	.10	.20	1–6	4.44	0.89
4. Action planning (T2)				.65**	.21	.06	1–6	4.33	1.11
5. Self-monitoring (T2)					−.23	.20	1–6	3.93	1.29
6. Physical exercise (T1)						.40*	0.50–9.00 hr[a]	2.78 hr[a]	2.81 hr[a]
7. Physical exercise (T3)							0.17–11.34 hr[a]	2.87 hr[a]	2.95 hr[a]
Intervention group									
1. Emotional social support (T1)	.53**	.38**	.26*	.31*	.21	.16	1–7	5.22	1.26
2. Instrumental social support (T1)		.08	.27*	.05	.02	−.10	1–7	4.79	1.37
3. Self-efficacy (T2)			.43**	.41**	.50**	.42**	1–6	4.38	0.96
4. Action planning (T2)				.40**	.10	.19	1–6	4.50	1.09
5. Self-monitoring (T2)					.42**	.36**	1–6	3.70	1.29
6. Physical exercise (T1)						.38**	0.19–9.60 hr[a]	3.07 hr[a]	2.35 hr[a]
7. Physical exercise (T3)							0.34–9.00 hr[a]	4.44 hr[a]	2.56 hr[a]

Note. [a]Reported for the last 7 days.
*$p < .05$; **$p < .01$.

Schwarzer, 2003) adapted to the context of exercise. In the intervention group, the participants were asked to think of their new exercise companion when answering the items. In the control group, participants were instructed to think of someone with whom they have been exercising on a regular or irregular basis. The scale comprises five items, for example 'This person comforted me with regard to my physical exercise'. The response range was from 1 (not at all true) to 7 (exactly true). T1 received emotional social support had a sample mean of 5.24 (*SD* = 1.32) and Cronbach's α of .86.

Received instrumental social support was also assessed by a context-adapted version of the corresponding subscale of the Berlin Social Support Scales (Schulz & Schwarzer, 2003) and the provided answers again referred to the past 7 days. The same instructions were given as for received emotional social support. The scale comprises seven items, for example 'This person offered me his/her help to maintain my physical exercise'. Having the same response range as received emotional social support, T1 received instrumental social support had a sample mean of 4.53 (*SD* = 1.45) and Cronbach's α of .90.

Action planning was assessed by four items (Scholz, Schüz, Ziegelmann, Lippke, & Schwarzer, 2008). The item stem 'I have a detailed plan. . .' was, for example, followed by the item '. . . when to do my physical exercise'. Participants provided their answers on a 6-point scale ranged from 1 (not at all true) to 6 (exactly true). T2 action planning had a sample mean of 4.42 (*SD* = 1.10) and Cronbach's α of .88.

Self-monitoring was assessed by three items (Scholz, Nagy, *et al.*, 2008). The items were introduced by the stem 'During the last 7 days, I have. . . (a). . . constantly monitored myself whether I exercise frequently enough, (b). . . always been aware of really exercising on a regularly basis, (c). . . constantly monitored myself whether I exercise the way I intended'. The response range was from 1 (not at all true) to 6 (exactly true). T2 self-monitoring had a sample mean of 3.82 (*SD* = 1.29) and a Cronbach's α of .84.

Self-efficacy (Scholz, Schüz, *et al.*, 2008) was assessed with the following introduction: 'After having started engaging in physical exercise regularly on a long-term basis, how confident are you that you will succeed in doing so?' The item stem 'I am confident to engage in physical exercise regularly on a long-term basis . . .' was followed by four items covering typical barriers that may impede exercising, such as 'even if I cannot see any positive change immediately'. The response range was from 1 (not at all true) to 6 (exactly true). T2 self-efficacy had a sample mean of 4.41 (*SD* = 0.93) and a Cronbach's α of .83.

Physical exercise Vigorous physical exercise at T1 and T3 was assessed following the International Physical Activity Questionnaire (IPAQ; Booth, 2000). Participants were asked to indicate how often during the past 7 days they had engaged in vigorous physical activities such as jogging, swimming, or weight lifting. Additionally, they indicated how much time they usually spent performing those activities per exercise occasion. Frequency and average duration per exercise occasion were then multiplied to obtain a measure of weighted duration for the past 7 days. At T1, participants exercised on average 2.93 hr a week (*SD* = 2.23 hr). At T3, they exercised on average 3.66 hr a week (*SD* = 3.45 hr).

Data analyses

Descriptive statistics, scale values, and Cronbach's alphas were computed with SPSS 22 (IBM Corp., IBM SPSS Macintosh, Armonk, NY, USA). Path analyses with maximum-likelihood estimation were employed to examine associations between received social support, action planning, self-monitoring, self-efficacy, and exercise. All models were

calculated with M*plus* 6.1 (Muthén & Muthén, 2010) and were manifest models. To statistically compare intervention and control group, multigroup modelling was used (Hoyle, 2011) by forcing all regression weights to be equal. This restricted model is nested in a model that allows free coefficient estimation for both groups. Nested models can be compared via chi-square difference test (Crayen, 2010; Geiser, 2010). Moreover, to confirm the significance of the indirect effect of received social support via self-efficacy, action planning, and self-monitoring on physical exercising, bias-corrected bootstrapping was used (Geiser, 2010; MacKinnon, 2008). Missing values were treated using full information maximum likelihood (FIML; Arbuckle, 1996). A requirement of the FIML in Mplus is that participants need to have responded to at least one item of every scale. Thus, the final numbers of participants included in the analyses were $n = 79$ for the control group and $n = 96$ for the intervention group.

Results

Descriptives

Correlations between all variables and descriptives of all variables under study are presented separately for intervention and control group in Table 1. At T1, significant differences in received instrumental social support between control and intervention group emerged, $t(173) = -2.29$, $p = .02$, $d = .35$. Participants in the intervention group reported to receiving more instrumental social support. In contrast, no significant differences between the groups at T1 emerged for emotional social support, $t(173) = 0.62$, $p = .54$; $d = .09$.

Path analyses

The calculated models were saturated with no testable constrains. Therefore, no model fit indices were reported (see Geiser, 2010). Thus, the data fit can only be estimated by the path coefficients and the coefficients of determination (R^2) (Geiser, 2010).

Figure 1 displays the multigroup path analyses, separately for intervention and control group, for testing the enabling effect of received *emotional* social support (T1) on physical exercise (T3) via the mediators action planning, self-monitoring, and self-efficacy (T2). Results showed that for the control group, received emotional social support at T1 was not associated with action planning, self-monitoring, or self-efficacy at T2. Moreover,

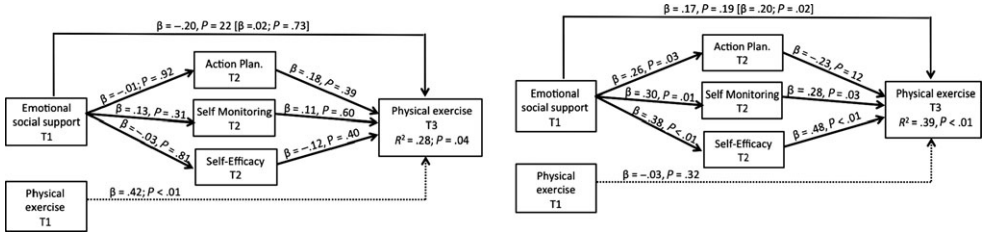

Figure 1. Relationships between received emotional social support, action planning, self-monitoring, self-efficacy, and physical exercise for the control group (left panel; $n = 79$) and for intervention group (right panel; $n = 96$). Standardized path coefficients are reported; correlations between the constructs are omitted in the figure; Action plan. = action planning.

these constructs were in turn not able to predict physical exercise at T3. The only significant predictor for physical exercise at T3 was past behaviour (physical exercise at T1). A different picture emerged for the intervention group: Received emotional social support at T1 positively predicted action planning, self-monitoring, and self-efficacy at T2. In turn, self-monitoring and self-efficacy (T2) predicted physical exercise at T3. Furthermore, a total indirect effect across all mediators became significant ($\beta = .20$, $p = .02$). More specifically, the indirect effect from received emotional social support to physical exercise via self-efficacy ($\beta = .18$; $p = .02$) mainly contributed to this indirect effect. In contrast, neither the indirect effect of action planning ($\beta = .06$, $p = .22$) nor the indirect effect of self-monitoring ($\beta = .08$, $p = .18$) was significantly different from zero. To confirm these indirect effects, bias-corrected bootstrapping was employed (Geiser, 2010; MacKinnon, 2008), and both significant indirect effects were confirmed (total indirect effect: 95% confidence interval [CI] [0.01, 0.40]; specific indirect effect via self-efficacy: 95% CI [0.02, 0.34]).

To evaluate whether the model of the control group and the model of the intervention group differed from each other when loadings were forced to be equal, a chi-square difference test (Crayen, 2010) was computed. One path after the other was stepwise forced to be equal in the control as well as in the intervention group. The final model with all paths fixed to be equal resulted in a significant chi-square difference test, indicating that the two groups differed from each other, $\chi^2(\Delta \text{ df} = 8) = 17.14; p = .03$. In particular, with only the two paths from received emotional social support to self-efficacy and from self-efficacy to physical exercise fixed, the model also resulted in a significant chi-square difference test, $\chi^2(\Delta \text{ df} = 2) = 14.14; p = .01$.

In Figure 2, the results of the path analyses for testing the enabling effect of received *instrumental* social support (T1) on physical exercise (T3) via the mediators action planning, self-monitoring, and self-efficacy (T2) are presented. Results show that for the control group, received instrumental social support at T1 was not associated with action planning, self-monitoring, or self-efficacy at T2. Again, these constructs were not able to predict physical exercise at T3, and the only significant predictor for physical exercise at T3 was past behaviour (physical exercise at T1). For the intervention group, the findings were more heterogeneous. Received instrumental social support at T1 positively predicted action planning at T2, but did not predict self-monitoring and self-efficacy. Self-efficacy and self-monitoring, but not action planning, in turn predicted physical exercise at T3. Past behaviour (physical exercise at T1) did not contribute to the explanation of physical exercise at T3. Moreover, there was no significant indirect effect

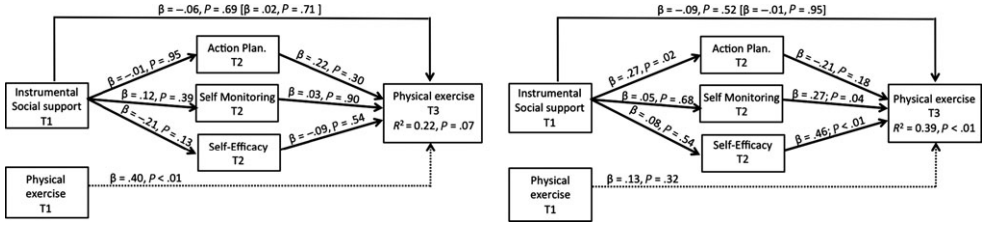

Figure 2. Relationships between received instrumental social support, action planning, self-monitoring, self-efficacy, and physical exercise for the control group (left panel; $n = 79$) and for the intervention group (right panel; $n = 96$). Standardized path coefficients are reported; correlations between the constructs are omitted in the figure; Action plan. = action planning.

from received instrumental social support via the three mediators on exercise behaviour. We again computed chi-square difference tests to evaluate whether the control and the intervention group differed from each other when effects were forced to be equal. Again, we stepwise forced one path after the other to be equal in both groups. For the final model with all paths fixed to be equal, the chi-square difference test resulted in a 10% level significant effect, indicating a slight tendency for the groups to differ in the examined effects, $\chi^2(\Delta\ df = 8) = 14.82$; $p = .06$. Specifically, we again fixed the two paths from received emotional social support to self-efficacy and from self-efficacy to exercise, and the model again resulted in a significant chi-square difference test, $\chi^2(\Delta\ df = 2) = 9.07$; $p = .01$.

Discussion

The aim of our study was twofold. The first was to investigate the enabling effect of received social support on exercise via self-efficacy, and to expand the enabling hypothesis by action planning, and self-monitoring as possible mediators of the association between received social support and exercise in an intervention study. The second aim was to depict potential discriminative effects of received instrumental and emotional social support for the enabling of self-efficacy, self-monitoring, and action planning for exercise.

For the intervention group, our results confirmed the enabling hypothesis. In particular, the indirect effect of received emotional social support on exercise via self-efficacy contributed to the total indirect effect, which is directly in line with the original enabling hypothesis of social support (Benight & Bandura, 2004). Action planning and self-monitoring were both positively related to social support, although only self-monitoring was related to exercise. Indirect effects of social support by these two additional constructs, however, were not significant. Thus, with regard to enabling, our results rather indicate that the effects are mainly present for self-efficacy rather than for other self-regulatory constructs. In contrast, for the control group, received emotional social support was neither associated with one of the mediators, nor with exercise. Thus, no enabling developed for those participants who were not explicitly instructed to find a new sports companion.

Moreover, for our study, it seems that especially receiving emotional social support from the new sports companion in terms of encouragement and being sympathetic is beneficial for enabling self-efficacy. It may thus be concluded that specific kinds of social support (in our case received emotional social support) are more appropriate for enabling self-efficacy than others. This finding is in line with Bandura's view of verbal or social persuasion as one source of self-efficacy (Bandura, 1991). Effective verbal persuasion from a credible source triggers self-efficacy by convincing the target person that he/she is able to master the challenges of a new task or behaviour. It seems that this is what happens when the participants received emotional social support and this in turn boots the exercising in the intervention group. With regard to the control group, we assume that the support they receive is qualitatively different from the support in the intervention group in that participants might rather be supported within their usual exercising that might not further boost their self-efficacy nor further promote their exercising. A different picture emerged for received instrumental social support: No enabling effect could be demonstrated for either group. These findings were rather unexpected, because the idea of finding a new sports companion to exercise with should target instrumental social

support, that is practical assistance (Schwarzer & Knoll, 2010). At the same time, intervention and control group differed from each other with regard to instrumental social support at T1, in that participants in the intervention group reported to receiving more instrumental social support. One possible explanation for this mean difference at T1 is that the process of searching and finding a new sports companion that took place between T0 and T1 boosted received instrumental social support. Thus, the intervention effects unfolded before the T1 assessment took place. The reason for not assessing received social support earlier (i.e., at T0) was that the items were related to the new sports companion in the intervention group that was not existent at T0. Future studies should make an effort to also capture the process of finding a sports companion and the support received during and directly after such a situation by applying a diary design.

An explanation for the prominent role received emotional social support played in this study might be that individuals already engaging in relatively regular exercise, and whose aim was to enhance, rather than start exercising, benefit more from this kind of support and encouragement than from instrumental social support. Future studies should follow up on this idea by comparing people who start exercising with people who increase their exercising.

There are also limitations that need to be mentioned. First, exercise was assessed by self-report only. However, previous findings indicate that self-report activity measures are sufficiently valid (e.g., Ainsworth, Sternfeld, Richardson, & Jackson, 2000; Bernstein *et al.*, 1998) and that objective measures and self-reports have displayed comparable results (Johnston, Johnston, Pollard, Kinmonth, & Mant, 2004). Second, due to the relatively small sample size, it was not possible to calculate the multigroup models with different types of exercise serving as dependent variables. However, as the type of exercise did not differ much among our participants, it seems to be of minor importance for this study. In relation to the sample size, another aspect is that we calculated manifest path analyses and therefore could not assume the constructs and relationships to be free of measurement error, which would have been the case if we had been able to use structural equation modelling with latent factors. Third, during the study, we nearly lost half of our participants from T1 to T3. Keeping dropout rates low is always a challenge in longitudinal studies (e.g., Bolger & Laurenceau, 2013) and for this we offered incentives for regular participation. We can only speculate if other kinds of incentives (e.g., cash money) or a larger monetary value of the vouchers would have made a difference. However, we compensated these high dropout rates using an appropriate method of missing imputation (Graham, 2009).

Several aspects, which have not been yet covered by this study, need to be addressed in future research. The participants in our study reported relatively high exercise levels at T1. Thus, the question arises if our results are applicable for those who do not exercise at all. This should be addressed in future studies. Another point future research should deal with is the source of the received social support. In our study, participants were free to choose a friend, a work colleague, the spouse, or another person to be their new sports companion. To have a closer look at the contribution of different sources of social support on exercise, larger samples should be studied.

In terms of practical relevance, our results indicate that received social support from a new sports companion can help to consolidate intended behaviours, because in the intervention group, past exercising (measured at T1) was not a significant predictor for exercising 8 weeks later, at T3. In contrast, for the control group, exercising at T1 was the only significant predictor for exercising at T3, indicating a higher stability with regard to

lower levels of activity. Thus, the social support intervention countered the impact of past behaviour and thereby enabled new behaviour.

To conclude, our study provides evidence that receiving exercise-related emotional social support by a new sports companion can enhance exercise-related self-efficacy, self-monitoring, and action planning. And that self-efficacy in turn translates into exercising. Moreover, our results emphasise the importance of considering different types of received social support and their role for health behaviour change, as the enabling effect could only be demonstrated for received emotional but not for instrumental social support.

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