Psychology of Sport and Exercise 33 (2017) 66–74

Contents lists available at ScienceDirect

Psychology of Sport and Exercise

journal homepage: www.elsevier.com/locate/psychsport

Emotional or instrumental support? Distinct effects on vigorous exercise and affect

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ARTICLE INFO

Article history:
Received 22 December 2016
Received in revised form
31 July 2017
Accepted 31 July 2017
Available online 2 August 2017

Physical activity (PA) is an umbrella-term for any movement of the body produced by skeletal muscles (Caspersen, Powell, & Christenson, 1985). Whereas, exercising can be conceptualized as "… planned, structured, and repetitive bodily movement" (Biddle & Mutrie, 2001, p. 7). Vigorous exercising is associated with rapid breathing, sweating and an increase in the heart rate (WHO, 2017). Several studies from recent years have demonstrated the positive impact of exercising on health (e.g., Cavill, Kahlmeier, & Racioppi, 2006; Pate et al., 1995; Warburton, Nicol, & Bredin, 2006). Health benefits of exercising depend on the intensity and duration (Warburton et al., 2006), with more pronounced health benefits following from vigorous exercising. In contrast, leading a sedentary lifestyle may increase the risk of developing a heart disease, type 2 diabetes, or chronic back pain (CDC, 2015a). However, in most western industrialized countries (Hardman & Stensel, 2003), most adults do not reach the exercise levels recommended by health organizations (e.g., CDC, 2015b; WHO, 2010, 2017). Therefore, it is important to identify modifiable factors that help people to engage in regular exercising. One can distinguish between modifiable factors of exercising that either mainly focus on the person, such as self-regulation abilities (e.g., Gollwitzer & Sheeran, 2006), or factors that focus on the person's environmental context (e.g., access to sports facilities, like public swimming pools, etc.) and their social network, such as the social support from important others (e.g., family and friends). Several studies demonstrated that social support plays a crucial role in the adoption and maintenance of exercise (Courneya, Plotnikoff, Hotz, & Birkett, 2000; Kouvonen et al., 2012; Lippke, 2004; Trost, Owen, Bauman, Sallis, & Brown, 2002; Spanier & Allison, 2001). The receipt of social support can also be associated with negative and positive affective states (e.g. Benedict et al., 2015; Thoits, 2011), but the evidence is, to some degree, contradictory (Thoits, 2011). Therefore, this paper will investigate the interplay of different kinds of received social support with vigorous exercise and affect on a weekly base separately.

1. Social support

Social support can be defined as a resource provided by others to help someone (Hobfoll, 2002; Schwarzer & Knoll, 2010). Referring to health behaviour, the aim of social support is to assist the target person in terms of facilitating the target behaviour by providing tangible or emotional resources (Lewis & Butterfield, 2005). Several types of social support can be distinguished such as emotional, or instrumental social support (Schwarzer & Knoll, 2007). Emotional social support refers to the emotional well-being of the recipient and covers aspects such as encouragement and comfort. Instrumental social support refers to supporting the recipient by means of practical help such as giving advice or assistance (Schwarzer & Knoll, 2010). The definition of social support also covers the qualitative aspects of social relationships such as the perception of potential help from the network (perceived support) or the concrete support one receives (received support) when needed (Uchino, 2009). Thus, received social support is described as the concrete and tangible support an individual receives. It also depicts the actual support transaction of individuals involved in the supporting actions. It is noticeable that most research in the domain of health-related social support has targeted *perceived* social support (Knoll, Rieckmann, & Kienle, 2007; Shrout, Herman, & Bolger,

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http://dx.doi.org/10.1016/j.psychsport.2017.07.011

2006). In contrast, *received* social support has been understudied, even though the concrete support a person receives is considered as highly important in health behaviour and health behaviour change research (e.g. Boehmer, Luszczynska, & Schwarzer, 2007; Knoll et al., 2007; Rackow, Scholz, & Hornung, 2015).

2. Social support and vigorous exercise

The associations between social support and vigorous exercising are, to some degree, equivocal. On the one hand, several studies have demonstrated positive associations between social support and the adoption (e.g., Courneya, Plotnikoff, Hotz, & Birkett, 2000; Fischer Aggarwal, Liao, & Mosca, 2008; Trost et al., 2002) and maintenance of vigorous exercising (e.g., Kouvonen et al., 2012). On the other hand, there are just as many studies that could not demonstrate such associations (e.g. Burke, Beilin, Cutt, Mansour, & Mori, 2008; Stiggelbout, Hopman-Rock, Crone, Lechner, & van Mechelen, 2006). One possible explanation of these discrepancies is that the distinction between *emotional* and *instrumental* social support has not consistently been made in research so far (e.g., Duncan & McAuley, 1993; Duncan, McAuley, Stoolmiller, & Ducan, 1993; McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003). In contrast, in existing theoretical approaches, such distinction is stressed (e.g., Schwarzer & Knoll, 2007). Cutrona and Russell (1990), for example, postulated social support as being in general beneficial for well-being. Thrasher, Campbell, and Oates (2004) have found separated effects of different kinds of social support on different health behaviours. However, in studies that deal with social support and exercising in adults' samples, usually a composite score derived from different social support measures was utilized (e.g., Duncan & McAuley, 1993; Duncan et al., 1993; Gellert, Ziegelmann, Warner, & Schwarzer, 2011; McAuley et al., 2003; Molloy, Dixon, Hamer, & Sniehotta, 2010). However, the distinction of the associations between emotional and instrumental social support with exercise is more often made in research on parental support for children's exercise levels (e.g. Beets, Cardinal, & Alderman, 2010). In this context, results indicate that it is the instrumental support that matters for exercise (e.g. Beets et al., 2010; Siceloff, Wilson, & van Horn, 2014). For adults, it can be assumed that both kinds of social support may play a role for exercising behaviour. Emotional social support such as encouragement, for example, helps to build up self-efficacy that one feels able to exercise on a regular base (e.g Ayotte, Margrett, & Hicks-Patrick, 2010) but might not be associated with exercising itself. In contrast, instrumental social support in the sense of e.g. exercising together may help to better stick to an exercise routine (e.g. Giles-Corti & Donovan, 2002). To address this limitation in the research dealing with adults' samples, we investigated emotional and instrumental social support separately.

3. Social support and affect

Affect is a short lasting emotional state that varies throughout a given period of time (Eschenbeck, 2009). Watson and Tellegen (1985) use two dimension to describe affect: positive (e.g. feeling excited, inspired) and negative affect (e.g. feeling ashamed, upset). As with vigorous exercise, study results for the associations between social support and negative and positive affective states are, somewhat, contradictory (Thoits, 2011). In terms of positive associations, especially emotional social support seems to be beneficial for positive affect (Benedict et al., 2015; Taylor & Stanton, 2007; Turner & Lloyd, 1999). Lakey, Orehek, Hain, and Van Vleet (2010) have found that overall received support from several sources has been associated with positive affect. In terms of instrumental social support, Shrout et al. (2006) found the provision of instrumental support as beneficial for the recipient's affect during a stressful event. On the other hand, there are also studies that demonstrated negative associations of received social support with the recipient's affect (e.g., Bolger, Zuckerman, & Kessler, 2000; Deelstra et al., 2003; Sandler & Barrera, 1984; Shrout et al., 2006; Vella, Kamarck, & Shiffman, 2008). Shrout et al. (2006) also found that the provision of emotional social support was related to higher negative affect, as indicated by an increase in anger, anxiety and depressed mood. However, DeLongis, Capreol, Holtzman, O'Brien, and Campbell (2004) found that received emotional social support is associated with positive affect. Therefore, it is crucial to further examine the possible distinct contributions of the different kinds of social support on affect.

We assume that affect is fluctuating daily or even hourly, therefore studies that investigate affect should apply an intensive longitudinal design (e.g. Siedlecki, Salthouse, Oishi, & Jeswani, 2014). Moreover, investigating within-person variations of received social support, exercising and affect better depict the joint change of those constructs. This kind of temporal process reflect changes in received social support and the links between received social support and vigorous exercising, positive and negative affect a given period of time (Bolger & Laurenceau, 2013).

4. Dual effects of social support on exercising and affect

The dual-effects model of social control integrates those contradictory findings of social exchange processes on health behaviour, on the one hand, and affect on the other hand by assuming that social control is beneficial for health behaviour but leads to negative affect (Lewis & Rook, 1999). We consider social control and social support both as social exchange processes that are relevant for health behaviour and affect (e.g. Knoll, Burkert, Scholz, Roigas, & Gralla, 2012). Therefore, the dual effects model is an excellent framework to also study the effects of social support on vigorous exercise and affect. Because of the inconsistent effects of received social support on affect and exercising, this study aims at applying the dual-effects model to social support in the context of exercising. For the effects of social support on affect, Bolger and Amarel (2007) propose several mechanisms. The first is that the recipient does not feel competent anymore, because he/she is depended on the support of other people. This causes the recipient to make upward social comparison and might result in negative affect. However, the actual performance of the health behaviour might be unaffected by this, because the exercise episode might have been performed anyway. The second mechanism is that the help of others may draw more attention to the problem than the recipient prefers and, again, the recipient might feel uncomfortable with this, which leads to negative affect. Thirdly, the recipients' sense of autonomy is violated and this makes him/her feel bad, and, finally, the recipient feels obliged to the provider. This again might be positive for the actual performance of the health behaviour, especially in the short run, but again might increase the likelihood of negative affect. Thus, the dual-effects model is a suitable approach for studying associations between social support, exercising and affect.

5. Aims of the present study

This study belongs to a larger intervention project that aimed at investigating the impact of a new exercise companion on received social support and vigorous exercising (Rackow, Scholz, & Hornung, 2014; 2015). The present article is unique in its contribution because it analysis the data on a weekly base. These more fine-grained analyses help to discover the temporal process of changes in emotional and instrumental social support over time and the links between the types of social support and vigorous exercise and