



Overprotective social support leads to increased cardiovascular and subjective stress reactivity

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ABSTRACT

Objective: Self-determination theory suggests that autonomy-enhancing social support helps individuals to perceive stressors as challenging rather than stressing. Overprotective support may reduce stress in the short-run but undermines autonomy, thus hampering stress-coping in the long run, particularly when social support is terminated.

Method: Heart rate, blood-pressure and ratings were examined in N = 44 undergraduate students receiving autonomy support (calculation steps) or overprotection (solutions) from a close friend or no support for solving arithmetic tasks as well as during a subsequent *stress-challenge* (solving arithmetic tasks alone).

Results: Overprotection resulted in increased heart rate, diastolic blood-pressure, stress ratings, and decreased subjective control during *stress-challenge*. Autonomy support did not lead to unfavorable stress responding.

Conclusion: The current findings are in line with assumptions derived from self-determination theory and indicate that autonomy support can help to prevent stress. Overprotection does not buffer stress and is associated with increased stress when discontinued.

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1. Introduction

The social support stress-buffering hypothesis (Cohen & Wills, 1985) suggests that social support reduces detrimental cardiovascular reactivity (CVR) in stressful situations, which is a predictor of reduced risk for developing hypertension or coronary heart disease (Treiber et al., 2003). Although numerous studies support the stress-buffering and health-promoting effect of social support, there are significant differences between effects of perceived and received support (Haber, Cohen, Lucas, & Baltes, 2007; Uchino, 2009). Perceived support describes a person's potential access to supportive resources in everyday life, is independent of the actual reception of support (Cohen & Wills, 1985), and is associated with increased cardiovascular health and decreased cardiac and all-cause mortality (Barth, Schneider, & von Känel, 2010; Berkman, Glass, Brissette, & Seeman, 2000; Holt-Lunstad, Smith, & Layton, 2010; House, Landis, & Umberson, 1988; Shor, Roelfs, & Yogeve, 2013). Received social support on the other hand refers to actual support that a person receives within a certain time frame and

situation (Wills & Shinar, 2000) and has generated rather mixed results. Forster & Stoller (1992) for example found received support to be associated with an increase in mortality. These effects seem to reflect more than just the health status of a person and their need for support (Uchino, Carlisle, Birmingham, & Vaughn, 2011). A high amount of support is often perceived as overprotection and therefore a threat to one's self-efficacy. Reinhardt, Boerner, and Horowitz (2006) argued that a high amount of instrumental support is detrimental in individuals with chronic impairment because it draws their attention to their inabilities/difficulties in daily activities. Increased stress and decreased self-efficacy/self-esteem due to received overprotective support have been found in different chronic conditions: cardiac patients (Berkhuysen, Nieuwland, Buunk, Sanderman, & Rispens, 1999; Clarke, Walker, & Cuddy, 1996; Condon & McCarthy, 2006; Coyne & Smith, 1991; Joekes, Van Elderen, & Schreurs, 2007), cancer patients (Kuijjer et al., 2000; Lepore, Glaser, & Roberts, 2008), patients with disabilities (de Leon, Gold, Glass, Kaplan, & George, 2001; Dunbar, Ford, & Hunt, 1998), patients with visual impairment (Cimarolli, Reinhardt, & Horowitz, 2006; Reinhardt et al., 2006), dialysis patients (Jansen et al., 2014), and patients with multimorbidity (Warner et al., 2011).

Laboratory studies examining the social support stress-buffering hypothesis typically investigated the influence of the presence of supportive others, or the mental activation of support-

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ive ties in a standardized stress task (e.g. public speaking). In a meta-analysis by Thorsteinsson and James (1999) received social support was related to attenuated heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), skin conductance level and cortisol levels. On the other hand some studies have failed to find a stress-buffering effect of social support (Anthony & O'Brien, 1999; Taylor et al., 2010), and some studies found increased physiological stress reactivity to social support (Gramer & Reitbauer, 2010; Hilmert, Christenfeld, & Kulik, 2002; Phillips, Gallagher, & Carroll, 2009) or presence of others (Gramer, 2002). While type and quality of the relationship to the support provider seem to have a huge impact on the stress-buffering effect of receiving social support in the laboratory (Gramer, 2002; Gramer & Supp, 2014; Uno, Uchino, & Smith, 2002), exaggerated reactivity has often shown to be a consequence of evaluation aspects of the experimental situation (Phillips et al., 2009) meaning that participants feel controlled and lose self-efficacy, which may in turn increase stress reactivity (Hodgins, Brown, & Carver, 2007).

Self-Determination-Theory (SDT) by Ryan and Deci (2000) provides an interesting approach for reconciling the seemingly contradictory effects of received social support. SDT states three basic psychological needs. These are *autonomy*, the feeling that one's behavior is self-congruent and intrinsically determined; *competence*, the need to feel the capability of influencing the environment in ways one intends to; and *relatedness*, the feeling of being close to and connected with one's social environment. These basic needs are considered critical for intrinsic motivation (Teixeira, Carraca, Markland, Silva, & Ryan, 2012), coping with stress (Ntoumanis, Edmunds, & Duda, 2009) and psychological well-being (Milyavskaya & Koestner, 2011). Viewing the social support stress-buffering hypothesis from a SDT perspective, receiving support should be most helpful when it fosters one's basic needs. Accordingly, the supported person should perceive themselves as autonomous, should feel competent to cope with the stressor, and should feel related to the person or environment that provides the support. In an autonomy-supporting environment individuals tend to experience stressful situations as challenging rather than threatening and, in turn, cope more actively with them (Weinstein & Ryan, 2011). Typically, an autonomy supporting environment also responds to other basic needs and individuals feeling autonomous in their behavior tend to perceive themselves as more competent and related (Baard, Deci, & Ryan, 2004). This can increase self-efficacy in coping with stressful situations (Hodgins et al., 2007). An overprotective support style on the other hand may undermine the individual's basic needs, induce feelings of being controlled and evaluated (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011) and may therefore undermine an individual's subjective competence and self-efficacy (Joeke, Van Elderen, & Schreurs, 2007). Receiving "too much" support may therefore be an additional stressor rather than a stress-buffer.

To our knowledge, not many studies have investigated the relationship of autonomy support on physiological parameters. In a study by Hodgins et al. (2010) participants showed improved task performance and attenuated cardiovascular response after motivational priming towards autonomous rather than controlled motivation. In a more recent study of Weinstein et al. (2016), couples underwent a laboratory conflict conversation and participants that rated their partner as more autonomy supporting in general, showed lower DBP activation after the conversation. Social support studies that shed light on the important role of autonomy according to the stress-buffering hypothesis are studies investigating "invisible support" – a support style that is characterized as non-evaluative and non-directive because the supported individual is not aware of the support act (Bolger & Amarel, 2007; Kirsch & Lehman, 2014). In these studies "invisibly supported" participants showed decreased SBP and DBP to a speech task compared to par-

ticipants that received directive support for the task. The authors argue that this style of support can reduce feelings of being evaluated, which may reduce related negative emotions and enhance realizing one's coping resources (Howland & Simpson, 2010). While this research sheds light on the importance of preserving an individual's autonomy during support interactions, up to date no study investigated how receiving overprotective support affects CVR and whether receiving autonomy support can foster individual's feelings of being in control with regards to stressors in the long-term.

Based on this previous research we would expect overprotective social support to increase stress rather than buffering it, because individuals can be expected to feel evaluated and threatened in their self-esteem. Additionally, we would expect autonomy support not to be a direct stress-buffer, but rather to have a beneficial effect on the long-term. If an autonomy supporting environment fosters an individual's self-efficacy and control experience in coping with a stressor, individuals should show decreased CVR also when facing a stressor alone. In contrast overprotection may rather undermine one's competence and self-efficacy, leading to increased stress when the need arises to face a stressor without the (overly) comforting support.

Therefore the current experiment aimed at investigating effects of autonomy support vs. overprotection from a close friend on physiological reactivity and stress appraisal in a four-phase laboratory stress task: A *practice phase*, in which participants got used to the task setting, a *learning phase* in which participants "learned" to cope with a stressor within a specific supportive type available, a *stress-challenge phase* in which participants had to cope with the stressor without support, and a *recovery phase* without activity. We expect that positive effects of autonomy support would particularly affect the *stress-challenge phase* because these participants were expected to perceive themselves as strengthened in their own competence of facing a stressor alone. In contrast the overprotected participants were expected to be particularly negatively affected by the threat of facing a stressor alone. This view is in line with other authors that have suggested that effects of supportive interactions are more likely to be found delayed in general (e.g. Gramer & Supp, 2014). Therefore we expected (1) that autonomy support should decrease physiological reactivity in the *stress-challenge phase*, while overprotective support should increase it. We also expected that (2) overprotective support should increase appraisal of stress and decrease appraisal of control in the *stress-challenge phase*.

2. Methods

2.1. Participants

Fifty-two undergraduate students were recruited from the student pool of the University of Würzburg, Germany who received course credits for study participation. Exclusion criteria included acute or chronic cardiovascular disease and being on current cardiovascular medication. Four participants were excluded from the analysis because they stated at the end of the experimental procedure in an open-ended question that they were suspicious of the manipulation (see "Procedure"); four participants were excluded due to technical failure during physiological data recording, resulting in a final sample of 10 men and 34 women (mean age: 21.39 years, *SD*: 5.25). For enhanced transparency, the main analysis was also conducted with the extended sample including the four suspicious participants. Essentially, this did not change the main results (see Supplement 1). Written study information was sent to all participants in advance per email. Informed consent was obtained from all participants and confederates at the beginning of the experimental procedure.

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