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Running head: SUPPORT TYPE AND SUPPORT VISIBILITY

Enacted support and golf-putting performance: The role of support type and support visibility

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Enacted support and golf-putting performance: The role of support type and support visibility

Highlights

1. Enacted support can have mixed effects upon novices' performance
2. Both the visibility and the type of enacted support are important.
3. Esteem support is best provided in a direct and visible manner.
4. Informational support is best provided in an indirect and invisible manner.

Abstract

Objectives: This study examined whether the impact of enacted support on performance differed across type (esteem and informational) and visibility (visible and invisible) of support. It further tested whether self-efficacy mediated the enacted support-performance relationship. **Design:** A one-factor (support manipulation) between subjects experiment. **Method:** A fellow novice golfer — in reality a confederate — was scripted to randomly provide one of five support manipulations (visible informational support, invisible informational support, visible esteem support, invisible esteem support, and no support) to participants (n = 105). Immediately after, participants completed a self-efficacy measure and then performed a golf-putting task. **Results:** The results demonstrated that participants given visible esteem support significantly outperformed those given no support and those given invisible esteem support. Participants given invisible informational support significantly outperformed those given no support. Although non-significant, the observed mean difference and moderate effect size provided weak evidence that those in the invisible informational support condition may have performed at a higher level than those in the visible informational support condition. There was no evidence that self-efficacy could explain any of these effects. **Conclusion:** The results suggest that enacted support can benefit novices' performance and that it is crucial to consider both the type and the visibility of the support. Esteem support is particularly effective when communicated in an explicit and direct manner but informational support appears more effective when communicated in a more subtle, indirect manner.

Keywords: esteem support, informational support, visible and invisible support, performance, self-efficacy

1 Enacted support and golf-putting performance: The role of support type and support visibility

2 Consistent with quantitative research that has observed a relationship between social
3 support and a variety of beneficial sport outcomes (Freeman & Rees, 2008; Rees & Freeman,
4 2007), perhaps not surprisingly, athletes consistently cite social support as a key ingredient of
5 their success (Connaughton, Wadey, Hanton, & Jones, 2008; Fletcher & Sarkar, 2012;
6 Kristiansen & Roberts, 2010; Rees & Hardy, 2000). Indeed, such findings underpin
7 researchers' recommendations to encourage the exchange of supportive actions in
8 performance contexts (e.g., Connaughton et al., 2008). Evidence suggests, however, that such
9 acts of support are not always helpful. In fact, various studies in sport and social psychology
10 have demonstrated that the influence of supportive actions is quite variable and sometimes
11 associated with null or even negative effects on outcomes (e.g., Deelstra et al., 2003;
12 Freeman, Rees, & Hardy, 2009; Searle, Bright, & Bochner, 2001). Given these contrasting
13 findings, there is a need to better understand what makes supportive actions effective. In the
14 present study, we focused on two key factors of the support process: (a) the type of the
15 support, and (b) the visibility of the support.

16 Conceptualised as a situational factor (Barrera, 2000), researchers have used the term
17 'enacted support' to refer to the interpersonal exchanges of verbal and nonverbal supportive
18 acts between support providers and support recipients (Dunkel-Schetter & Bennett, 1990;
19 Goldsmith, 2004; Lakey 2010). These specific supportive actions can be provided —the
20 observable actions that individuals perform to help an individual (Cohen, Lakey, Tiell, &
21 Neely, 2005; Tardy, 1985), and/or received —the recipient's perception of the receipt of
22 support resources during a specific time frame (Uchino, 2009). As such, 'supportive' actions
23 may be perceived by the provider or the recipient to benefit the recipient (Shumaker &
24 Brownell, 1984) but could occur without being recognised by the provider or the recipient
25 (e.g., Cohen et al., 2005).

When support is enacted, one might intuitively expect it to be beneficial in helping recipients cope more effectively with situational demands (Uchino, 2009)—a proposal that is supported by the positive links between enacted support and self-confidence (Freeman & Rees, 2008), as well as performance (e.g., Rees & Freeman; 2010). However, evidence from studies in sport and social psychology suggests that enacted support can also be unhelpful (e.g., Barry et al., 2009; Bolger & Amarel, 2007; Freeman, Coffee, Moll, Rees, & Sammy, 2014; Howland & Simpson, 2010). For example, in an intervention study in which golfers were provided with support through a focused professionally-led intervention, all golfers reported an increase in received support but only one golfer showed significant performance improvements (Freeman et al., 2009).

In light of these mixed findings, it is vital to identify factors that influence the effectiveness of enacted support. With recent studies (e.g., Freeman et al., 2014; Lu et al., 2016) revealing unique effects for different supportive behaviours, one such factor to consider is the type of support exchanged. Both the sport (e.g., Freeman et al., 2014) and social (e.g., Cutrona & Russell, 1990) psychology literature has suggested that at least four key types of support can be distinguished: emotional, esteem, informational, and tangible support. Given their importance across a wide range of performance domains, including sport (Rees & Freeman, 2012), the present study focused on esteem support and informational support. Esteem support has been defined as "bolstering a sense of competence or self-esteem" through, for example, encouragement and positive reinforcement. Informational support has been defined as "the provision of advice and guidance" (Cutrona & Russell, 1990, p. 322).

Various studies have examined the effects of these two types of support in a variety of achievement contexts. Although esteem support has led to poorer performance (Baumeister, Hutton, & Cairns, 1990; Tardy, 1994), it has generally been linked to a number of favourable outcomes including self-confidence (e.g., Freeman et al., 2014) and performance (e.g.,

Deelstra et al., 2003; Searle et al., 2001; Thorsteinsson, James, & Gregg, 1998), and has been widely regarded as the most effective form of support in achievement contexts (Cutrona & Russell, 1990; Rees & Freeman, 2012). Indeed, various researchers have noted that receiving esteem support may be beneficial because positive feedback and expressions of belief can foster individuals' (a) sense of control and (b) belief in their capabilities to successfully execute a specific task (i.e., their self-efficacy; Bandura, 1997). In contrast, although informational support has been positively associated with performance (Tardy, 1994), it has frequently had no effects upon self-confidence and performance (Freeman et al., 2014; Searle et al., 2001), and worse still, detrimental effects upon self-esteem and distress (Bolger & Amarel, 2007; Nadler, Fisher & Ben-Itzhak, 1983; Uno, Uchino, & Smith, 2002). Although the focus of informational support may be on helping recipients to meet task demands (Cutrona & Russell, 1990; Shrout et al., 2006), its receipt may in fact undermine an individual's sense of control and evoke/reinforce feelings of incompetence and inefficacy by communicating one's inability to deal with a certain stressor/situation (Shrout et al., 2006; Trobst, 2000).

The majority of self-report or experimental studies examining the effects of enacted support have focused on supportive actions recognised by the recipient. Bolger and colleagues (2000) argued that it is particularly these direct, explicit or 'visible' acts of support that risk increasing a recipient's sense of incompetence and inefficacy. They suggested that support acts that are accomplished without being visible to the recipient, so called 'invisible support', might avoid these potential costs (Bolger et al., 2000). According to Bolger and colleagues (2000), there are two ways in which supportive acts can be invisible. First, acts of support may occur completely outside of the recipient's awareness. Second, invisible support may involve a provider purposely communicating support in such a skilful and indirect manner that, although a recipient may be aware of the communication, he/she does not

consider it to be *support*. Because the recipient does not interpret the act as support, it may minimise the negative psychological reactions associated with receiving direct, explicit support. For example, a golfer (provider) may give a fellow golfer (recipient) putting advice (visible support). Although intended to help, the advice could undermine the fellow golfer's sense of competence and efficacy, thereby negating the potential benefits of the advice. When the golfer (the provider) conveys the same point to the recipient but as an idea that all golfers should consider, the costs associated with the direct provision of the advice may be avoided and the advice may be more effective.

A number of studies have examined the influence of support visibility in performance domains (e.g., Bolger & Amarel, 2007; Bolger et al., 2000; Shrout et al., 2010). For example, in a daily diary study, Bolger and colleagues (2000) found that partner support in the week leading up to an acute stressor (an important exam) was beneficial for the examinees' emotional responses (e.g., depressed mood and anxiety) on days when partners reported providing support but examinees did not acknowledge receiving support (invisible support). Other studies have examined how support visibility influenced emotional and physiological responses to delivering a speech in a laboratory setting (Bolger & Amarel, 2007; Kirsch & Lehman, 2015). For example, in three separate experiments, Bolger and Amarel (2007) examined the influence of visible and invisible support on the emotional reactivity of students prior to a speech task. Visibility of support was especially important when informational support was provided: Invisible informational support reduced emotional reactivity (relative to visible and no support), but visible informational support was either ineffective or led to increased emotional reactivity. Bolger and Amarel (2007) found that these divergent effects of invisible and visible information support on emotional reactivity were mediated by the recipients' self-efficacy. That is, participants receiving visible informational support felt less efficacious and in turn more distressed than those receiving no support. Those receiving

invisible informational support felt more efficacious and subsequently less distressed than those in the no support condition. Bolger and Amarel (2007) also examined the effects of visibility upon emotional support (with their emotional support manipulation also including elements of esteem support). Although invisibly providing emotional support seemed most effective for lowering distress levels, its effects were far less distinct, with no distress differences emerging between the invisible emotional support and the no support condition. Furthermore, participants' distress levels in the visible emotional support condition did not differ from those in the no support condition. Bolger and Amarel (2007) did not examine whether invisible emotional support would benefit self-efficacy. In a laboratory based study which observed support interactions between couples discussing a personal goal, Howland and Simpson (2010) found no benefits of invisibly provided emotional support (including "positive feedback", p.1881) in relation to recipients' self-efficacy whereas it did improve recipient's mood.

These findings support the idea that invisible support may be superior to visible support in reducing emotional and physiological responses immediately prior to a performance task and that it may be particularly important for informational support. Furthermore, they provide initial evidence for the mediating role of self-efficacy in explaining the effects of informational support. However, we are not aware of any study to date that has examined the effects of invisible support on objective task performance — the most important outcome in a sports context. Further, no studies have (a) explicitly examined the effect of support visibility on esteem support; (b) the effects of both esteem and informational support and support visibility in the same study or (c) tested self-efficacy as a potential mediator for these effects.

The aim of the current study, therefore, was to examine how the impact of enacted support on performance differed across type (esteem and informational) and visibility (visible

and invisible) of support. A secondary aim was to examine whether self-efficacy could explain any differential effects of support type and support visibility upon performance. To achieve this, we developed an experimental paradigm which involved the manipulation of support immediately prior to novices performing a golf-putting task. We made the following key hypotheses: First, based upon the existing findings from the sport psychology literature (e.g., Rees & Freeman, 2010), we predicted that visible esteem support would be more effective for performance on the golf-putting task than receiving no support. We further predicted that these performance effects could be explained by the positive impact of esteem support upon recipients' self-efficacy levels. Given the mixed findings for invisible emotional support (Bolger & Amarel, 2007; Howland & Simpson, 2010) and the lack of research on how invisibility influences esteem support, no specific predictions were made as to how invisible esteem support would influence self-efficacy and performance. Second, based on the support visibility literature (e.g., Bolger & Amarel, 2007), we predicted that invisible informational support would lead to better performance than receiving no support and visible informational support. We further predicted that these performance effects could be explained by the efficacy benefits of invisibly providing informational support. Given the mixed effects of visible informational support upon performance (Searle et al., 2001; Tardy, 1994), we were uncertain as to whether performance differences would emerge between no support and visible informational support even though we predicted that receiving (visible) informational support would negatively influence self-efficacy levels.

Methods

Participants and Design

A convenience sample of 105 undergraduate students (female, $n = 62$; male, $n = 43$; $M_{age} = 19.77$ years, $SD = 1.40$ years) was recruited for the study. All participants were right-handed and only those who rated themselves on a pre-entry self-report measure as having no

experience or very little experience in golf-putting were included (this was an inclusion criteria on the information sheet). Their golf experience was further confirmed with a question on the demographics form. All participants met the inclusion criteria. This study used a between-subjects experimental design with participants randomly assigned to one of five support conditions (per condition, $n = 21$: visible informational support; invisible informational support; visible esteem support; invisible esteem support; no support).[1] The sample size was based on an a priori power analysis (G-power version 3.1; Faul, Erdfelder, Lang, & Buchner, 2007). An expected effect size ($f = 0.35$) was derived from previous research (Bolger & Amarel, 2007; Rees & Freeman, 2010) and entered along with power at 0.80 and an alpha of .05. This indicated a sample size of 105, with a minimum of 21 participants in each of the five experimental conditions was required.

Procedure

The study was approved by the institutional ethics committee. Participants signed up for an experimental study lasting approximately 20 minutes with the purpose of: "examining the effects of thoughts and feelings upon a golf-putting task". Participants arrived individually at the laboratory and were welcomed in a waiting area by the 26 year old male experimenter. Participants provided written consent after which the experimenter gave an overview of the task. The experimenter further explained to participants that, due to timing issues, another participant was still completing the task in the testing area. In reality, this participant was the 21 year old male confederate who was unfamiliar to the participants. To ensure that participants perceived our confederate as a fellow participant, the confederate was dressed in a casual fashion. The experimenter was more formally dressed. Throughout the experiment, the roles of the experimenter and the confederate were fully scripted to ensure standardisation across interactions and participants, and to prevent uncontrolled interactions

with participants. The experimenters and confederate were also trained to ensure the support was provided in a natural manner.

The experimenter asked participants to remain seated in the waiting area and to complete a demographics form so that the experimenter could finish the experiment with the confederate. Shortly after participants had completed the form, they were invited into the testing area, where they were informed that the confederate — seated close to where the experimenter walked to with the participant — was in the process of completing a final measure. Although the experimenter pointed out the presence of the confederate to the participants, he continued explaining the task to avoid any unwanted interactions between them.

The experimenter informed participants that the golf-putting task would consist of performing 10 putts towards the target and their performance would be determined by the average distance away from the target. A competitive situation was created by telling participants that: (a) the five best performers would win prize money; and (b) their performance would be displayed on a leader board, which would be visible throughout the study and circulated to all participants after the study was completed (e.g., Cooke, Kavussanu, McIntyre, & Ring, 2010). In reality, the leader board consisted of 20 false scores (M = 47.50 cm, SD = 22.14 cm; range =12.70 – 87.30 cm).

As scripted, immediately after the experimenter had finished these instructions, the confederate signalled that he had completed the final measure. The experimenter thanked the confederate for his participation and asked whether he had any questions. The confederate responded with one of the five support manipulations (described below). Following the support manipulation, the confederate was thanked for his participation and left the testing area. Immediately thereafter, participants completed a measure of self-efficacy before performing the task.

For the golf-putting task, participants used a standard golf putter to putt 10 standard white golf balls to a white circular target measuring 10.8 cm in diameter from a distance of 3m. The task was performed on a rectangular artificial putting green (5.80 m long and 2.34 m wide). Following the task, participants completed a manipulation check and were thanked for their participation. In addition, participants were invited to ask questions and asked whether they had felt any suspicion during the experiment particularly with respect to the presence of the fellow participant (none of the participants stated anything suspicious) and fully debriefed regarding the real purpose of the study.

Support manipulation. The support behaviours were designed to appear credible and appropriate given the confederate's role as a fellow participant. As noted previously, the support manipulation occurred after the experimenter had finished the task instruction and the confederate signalled that he had completed his final measure. At this point, the confederate stood up from his chair, and positioned himself in close proximity of the participant and the experimenter to gain their attention. The experimenter then addressed the confederate and said: "Thank you for your time and your willingness to take part in this experiment. Before 'we' move on (at that point the experimenter would move his posture to face the participant as an attempt to engage the participant), do you have any questions or anything else to say before leaving the room?"

Table 1 shows the scripts for the confederate's replies. The support type was manipulated through changing the content of the supportive message. The esteem support message was based on Cutrona and Russell's (1990) definition of esteem support and previous support manipulations incorporating elements of esteem support (Bolger & Amarel, 2007; Rees & Freeman, 2010). Similarly, consistent with Cutrona and Russell's definition, the informational support message conveyed advice; specifically, a simplified message adapted from previous research that found focusing on 'where you want to aim' benefits

putting performance (e.g., Lohse, Wulf, & Lewthwaite, 2012). Support visibility was manipulated utilising the same approach as Bolger and Amarel (2007). That is, in the visible conditions, the confederate addressed the informational (advice) or esteem (encouragement) support directly to the participant such that it would be interpreted as a supportive act (visible). In the invisible support conditions, the confederate addressed the same support messages indirectly as a comment to the experimenter so that it would be helpful to the participant but not perceived as support (invisible).

To reduce the possibility of bias, the confederate (who was blind to the experimental hypotheses) remained blind to the experimental condition until immediately prior to signalling to the experimenter that he had completed the final measure. At this point, the confederate finished his final questionnaire and turned the sheet to find out which condition to implement. The experimenter remained blind to the experimental condition until the support manipulation was conveyed to the participant.

Measures

Self-Efficacy. Self-efficacy was assessed with a putting-specific questionnaire developed for this study following Bandura's recommendations (1997). The questionnaire listed 10 bands, which corresponded to 10 cm wide bands on a metre ruler placed on the artificial green projecting from the centre of the target. For each band, participants indicated their belief they could achieve an average score equal to or better than the band (*yes*/*no*). For each affirmed band, they rated the degree of confidence (*0-100%*) of getting their average putt equal to or better than that band. Scores for self-efficacy were determined by adding up the total confidence scores and dividing the scores by the total number of levels (i.e., 10).

Performance. Putting performance was assessed by the mean radial error (the average distance a ball finished from the target in centimetres) of the 10 putts (Mullen &

Hardy, 2000). For putts that finished on the centre of the target, zero was recorded and used in the computation of the mean radial error.

Manipulation check. After performing the golf-putting task, participants completed a manipulation check. Similar to Bolger and Amarel (2007), the manipulation check for informational support was the item: "The other student offered me advice or guidance (*yes/no*)". The manipulation check for esteem support was the item: "The other student encouraged me to do well (*yes/no*)". These items were embedded in a final 17-item questionnaire. In line with the *purpose* of the study, the remaining items asked participants about their thoughts and feelings prior to the golf-putting task (e.g., "I thought about my putting stroke").

Data Analysis

To examine whether self-efficacy and performance differed across support conditions, two one-way between-groups analyses of variance were conducted with Tukey HSD post-hoc tests. Effect sizes were calculated using partial eta squared for the omnibus F-tests and Cohen's d for the post-hoc analyses. To determine whether any between-group differences in performance were mediated by self-efficacy, analyses were conducted using the MEDIATE SPSS custom dialog (Hayes & Preacher, 2014). This custom dialog tests the total, direct, and indirect effect of an independent variable on a dependent variable through a proposed mediator and allows inferences regarding indirect effects using percentile bootstrap confidence intervals. In the present study, the independent variable (support manipulation) was multi-categorical (the five support conditions). Hayes and Preacher (2014) have developed an indicator coding method (also referred to as dummy coding) to analyse indirect and direct effects involving a multi-categorical variable. Actually, the indirect effect is *relative* because the indirect effect is quantified by the effect of being in one condition relative to another condition. Using MEDIATE, we first set the 'no support' condition as the

reference group to examine the indirect effects of each support condition relative to the 'no support' condition on performance through self-efficacy. We further tested the *relative* indirect effects using visible informational support and visible esteem support as the reference groups.

Results

Manipulation Check

In the visible informational support condition, 18/21 participants reported receiving advice while 18/21 reported receiving encouragement from the fellow participant. In the invisible informational support condition, 3/21 reported receiving advice and 5/21 reported receiving encouragement. In the visible esteem support condition, 18/21 participants reported receiving encouragement from the fellow participant while 12/21 reported receiving advice. In the invisible esteem support condition, 1/21 reported receiving encouragement and 0/21 reported receiving advice. These results suggest that the manipulations were largely successful, as participants rarely reported the receipt of support in both invisible support conditions and almost always reported the receipt of support in the visible support conditions. It should be noted, however, that many participants reported receiving encouragement in the visible informational support condition and some participants reported receiving advice in the visible esteem support condition (see Discussion for more on this point).

Performance

Means, standard deviations, and 95% confidence intervals of putting performance (mean radial error) as a function of the five support conditions are displayed in Table 2. Data met the assumption of normality. A Levene's test demonstrated that the variances for putting performance were not equal for the different support conditions ($F_{4,100} = 3.12$, $p = .02$). However, given that group sizes were equal, we conducted the one-way independent ANOVA without corrections (Field, 2009). There were significant differences in performance between

the support conditions ($F_{4,100} = 7.25$, $p < .001$, $\eta_p^2 = .23$). Tukey's HSD pairwise comparisons revealed that participants given visible esteem support performed significantly better than those given no support ($p = .01$, $d = .97$) and those given invisible esteem support ($p = .001$, $d = 1.17$). No significant performance differences emerged between participants given invisible esteem support and those given no support ($p = .92$ $d = .21$). Participants given invisible informational support performed significantly better than those given no support ($p = .01$, $d = 1.02$) but not significantly better than those given visible informational support ($p = .70$, $d = .50$). No significant performance differences emerged between participants given visible informational support and those given no support ($p = .25$, $d = .64$) or visible esteem support ($p = .73$, $d = .46$). In addition, participants given invisible informational support and visible informational support performed significantly better than those given invisible esteem support ($p = .001$, $d = 1.21$; $p = .04$, $d = .85$). No significant performance difference emerged between participants given visible esteem support and those given invisible informational support ($p = 1.00$, $d = .02$). All the significant differences between the conditions correspond to large effect sizes (Cohen, 1988).[2, 3]

Self-Efficacy

Three participants did not complete the self-efficacy measure correctly and were therefore excluded from analysis. Means, standard deviations and 95% confidence intervals of self-efficacy as a function of the five support conditions are displayed in Table 2. Assumptions of normality and homogeneity of variances were met ($p > .05$). The one-way ANOVA revealed no significant differences in self-efficacy between any of the support conditions ($F_{4,97} = 2.34$, $p = .07$, $\eta_p^2 = .09$).[2, 3]

Mediation Analyses

To estimate the significance of the indirect effects, we used percentile bootstrap confidence intervals (based on 5000 samples). In contrast with the steps outlined by Baron

and Kenny (1986) to establish mediation that (a) the independent variable must affect the mediator (path *a*); (b) the independent variable must affect the dependent variable (path *c*); and (c) the mediator must affect the dependent variable (path *b*), recent recommendations (Hayes, 2013; Zhao, Lynch Jr., & Chen, 2010) suggest that the only requirement for mediation is a significant indirect effect, *a* x *b,* "even if either *a* or *b* (or both) are not statistically significant" (Hayes, 2013, p.168). Therefore, even though the experimental manipulation did not lead to significant differences between conditions for self-efficacy, we still performed mediation analyses for self-efficacy. For all mediators, homogeneity of regression slopes was met ($p > .05$). Using indicator coding with the no support group as the reference, there was no significant relative indirect effect for self-efficacy, because each 95% confidence interval contained zero (absolute effect sizes ranged from .09, 95% CI [-1.23, 1.70] to 1.73, 95% CI [–5.34, .49]). [4]

Discussion

The aim of the present study was to examine how the provision of visible or invisible esteem and informational support influenced the performance of novices on a golf-putting task. The results were largely in line with our hypotheses, with visible esteem support and invisible informational support appearing particularly beneficial for performance. That is, as predicted, participants given visible esteem support significantly outperformed those given no support (as well as those given invisible esteem support); participants given invisible informational support significantly outperformed those given no support. Despite the statistically non-significant difference between the invisible and visible informational support conditions, the associated mean difference and moderate effect size suggest that the direction of effect may be in favour of the invisible informational support condition performing at a higher level. Given the relatively small sample size, however, this result would benefit from further testing. Although again non-significant, the mean difference and moderate effect size

suggest that visible informational support may have been beneficial compared to no support (and was at worst no different from no support). With the observed means for invisible esteem support and no support being approximately equal (and with a corresponding small effect size), invisibly providing esteem support seemed ineffective. There were no differences in self-efficacy between any of the support conditions, and self-efficacy could not explain the performance differences observed between the support conditions.

In line with previous work (e.g., Rees & Freeman, 2010), the findings provide further evidence that the provision of visible esteem support can have an immediate beneficial effect upon performance. There was evidence that invisibility worsened the effectiveness of esteem support. That is, invisible esteem support led to poorer performance relative to visible esteem support and was no different from no support. These findings clearly contradict Bolger and Amarel's (2007) notion that invisibility maximises the benefits of provided support but complement and extend other recent work suggesting that invisibility may not necessarily enhance the effectiveness of esteem support across both acute (Biehle & Mickelson, 2012; Priem & Solomon, 2015) and chronic stressors (Vilchinksy et al., 2011). One possible explanation is that in an attempt to reduce the costs — feelings of incompetence and inefficacy — associated with receiving support (e.g., Bolger & Amarel, 2007), invisibility may have simply obscured the purpose of esteem support — to bolster an individual's sense of competence (Cutrona & Russell, 1990). Considering the novelty of the performance task, the golfers may indeed have preferred explicit (visible) provision of esteem support. This aligns with Girme and colleagues' (Girme, Overall, & Simpson, 2013) findings that their visible 'emotional' support (which included esteem support elements) was only helpful for those recipients who were distressed. It should be noted, however, that although Girme and colleagues showed that invisible emotional support was not immediately beneficial, it did

appear to facilitate goal achievement over time. Future performance-based research might therefore take into account both short- and long-term effects of support visibility.

Consistent with our hypotheses, invisible informational support appeared particularly important for performance. This finding is in line with the theorising of Bolger and Amarel (2007) and adds to the existing body of research revealing the benefits of invisibly providing informational support in relation to a variety of outcomes (Bolger & Amarel, 2007; Howland & Simpson, 2010; Kirsch & Lehmann, 2015). For example, Bolger and Amarel (2007) found that invisible informational support reduced emotional reactivity prior to a performance task. The findings of the present study move beyond this research in that they provide the first experimental evidence that invisibly providing informational support can benefit actual performance.

Interestingly, although non-significant, the moderate effect size suggests that visible informational support was likely better (and certainly not worse) for performance than no support. This differs from previous studies (Bolger & Amarel, 2007; Howland & Simpson, 2010) that demonstrate the negative effects of visible informational support upon psychological states such as negative affect and distress. Whereas those previous studies used acute stressors (i.e., a speech task, Bolger & Amarel, 2007; setting a personal goal, Howland & Simpson, 2010), over which participants may have perceived a high level of control, we used a novel performance task (golf-putting) over which participants may have perceived relatively little control. As such, in the current study, participants may have felt less undermined in their sense of competence and control when receiving visible informational support. Furthermore, although unintended, many participants who were given visible informational support reported the receipt of both advice and encouragement. Indeed, researchers have noted that supportive actions may sometimes serve multiple functions (Cutrona & Russell, 1990; Goldsmith, 2004). For example, individuals can perceive

messages of advice as an expression of care and/or encouragement (Goldsmith, McDermott, & Alexander, 2000). In the current study, then, the perception of visible informational support as not only advice but also encouragement may, in turn, have limited its potential undermining effect. This might also explain why visible informational support appeared (albeit non-significantly so) to be 'better' than no support. Notwithstanding these speculative comments, both the significant performance difference between those in the invisible informational support condition and those in the no support condition, combined with the observed higher performance level of those receiving invisible informational support compared to those receiving visible informational support, suggest that any potential benefits of informational support may indeed have been hindered by its visible provision.

Given the suggested importance of self-referent judgments of competence and efficacy in mediating the effects of support (e.g., Bolger & Amarel, 2007; Newsom, 1999), we tested whether self-efficacy mediated the effects of the experimental manipulation on performance. No differences emerged in participants' self-efficacy beliefs as a result of the support manipulations and there was no evidence to suggest that self-efficacy could explain why visible esteem support and invisible informational support were most beneficial for performance. One possible explanation is that it may have been difficult for novice participants to judge their self-efficacy beliefs because of a lack of task-specific knowledge (Feltz, Short, & Sullivan, 2008), reducing the predictive strength of self-efficacy on putting performance. Further, exploring just one mediator may not have captured the complexity through which the support manipulations influenced performance (Uchino et al., 2012). The enactment of support may lead to a host of cognitive and emotional states (e.g., perceived control, anxiety), which in turn lead to differential outcomes. Future research should include multiple mediators (Uchino et al., 2012) to try to disentangle the psychological mechanisms underpinning the observed effects.

Taken together, the findings add to the existing research by highlighting the need to consider the type of support when examining the effects of enacted support upon outcomes (Freeman et al., 2014). Many studies examining the effects of enacted support have used aggregate measures (e.g., Freeman & Rees, 2008; Howland & Simpson, 2010) or manipulated a combination of support behaviours (Rees & Freeman, 2010). The present research focused on a specific type of support in each manipulation, allowing us to establish the differential effects of esteem support and informational support on performance.

The present findings advance the social support literature in understanding the influence of visibility upon the effectiveness of enacted support in performance situations. Whereas researchers (e.g., Bolger & Amarel, 2007; Bolger et al., 2000; Howland & Simpson, 2010) have argued that invisibility would maximise the benefits of provided support regardless of the type of support, the present findings emphasise that support visibility and support type should be considered in combination. This is consistent with recent research revealing the benefits of invisibly provided informational support upon psychological distress, self-efficacy, and physiological stress reactivity (Bolger & Amarel, 2007; Kirsch & Lehman, 2015) but no effects for invisible emotional support upon physiological stress recovery (Priem & Solomon, 2015). Broadening our understanding of how support visibility and support type influence other outcomes in performance situations is an important avenue for future research.

As a whole, the strong performance effects for both visible esteem support and invisible informational support suggest the need for a caveat to the suggestion that esteem support is the most effective type of support in achievement contexts (Cutrona & Russell, 1990; Rees & Freeman, 2012). The present study along with other experimental studies (Bolger & Amarel, 2007) and field observations (Shrout et al., 2010) demonstrates that informational support can be equally as effective as esteem support, but that providers should be educated as to how best to provide it. For the provision of esteem support, support

providers such as coaches and fellow athletes should attempt to give esteem support —e.g., positive feedback and encouragement— that is explicit and clearly directed to the recipient. For the provision of informational support, it is important that providers are aware of indirect ways to impart task-related knowledge and/or strategies. For example, based on the current study, athletes could help a fellow athlete who is experiencing difficulties with a certain task by expressing their own problems with the task and their way of overcoming it rather than directly addressing the other's difficulties. Alternatively, athletes could aid the struggling fellow athlete by asking for advice from the coach on the task, covertly helping the fellow athlete. Furthermore, coaches and fellow athletes could indirectly communicate advice by telling a story about their own or other more prominent athletes' experiences (Goldsmith, 2004). By conveying knowledge and strategies in this indirect manner, individuals are able to provide advice without undermining athletes' sense of autonomy, control and competence.

Against the backdrop of the performance effects in the present research, several limitations have to be acknowledged. First, the experimenter was aware of the study hypotheses. To minimize any experimenter bias, the experiment was fully scripted and the experimenter remained blind to the experimental condition until the confederate conveyed the support manipulation to the participant (Bolger & Amarel, 2007). Second, the provision of support by an unacquainted confederate in an isolated laboratory situation poses a threat to ecological validity. Although the confederate was identified as a fellow participant to increase similarity between the confederate and the participant, this dyadic relationship remains quite different from close interpersonal relationships. Indeed, the nature of the provider-recipient dyad might moderate the effectiveness of enacted support (Uchino et al., 2011). For example, individuals who receive support from lower -quality relationships (i.e., strangers) may be more sensitive to the support enacted (Uchino et al., 2011) so the findings of the present study may not correspond with support enacted in naturalistic settings. Third,

researchers have argued that providing visible informational support might be less undermining and visible esteem support more pressuring when enacted by individuals with more expertise (Cutrona & Suhr, 1992; Rosenfeld et al., 1989). Accordingly, future studies could test the role of support visibility and support type in existing dyadic relationships across a range of providers (i.e., coaches, teammates), ideally, in real world performance contexts. This would not only enhance external validity but also further explore the applicability of invisible (informational) support in sporting contexts. Finally, as suggested by Schweizer and Furley (2016), we based the sample size of our experiment on observed effect sizes from existing studies (Bolger & Amarel, 2007; Rees & Freeman, 2010). However, we acknowledge that the current experiment's power was insufficient to detect small- to moderate-sized effects and that smaller sample sizes may have an increased likelihood of producing a false-positive (Schweizer & Furley, 2016). Therefore, future studies are needed to demonstrate the reproducibility of our findings.

In conclusion, the findings of the present study suggest that the provision of support can facilitate performance, but it is vital to consider the type and visibility of support. The findings add to the existing literature by demonstrating that visible esteem support can have immediate and direct effects upon performance. The findings are unique in that they show that informational support can also be beneficial for performance and appears most effective when provided in a subtle, indirect, and invisible manner. Consistent with Connaughton and colleagues (2008), we encourage the provision of support in performance contexts but emphasise that support providers should consider the content of support and the manner of its provision.

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Footnotes

[1] A Chi-square test revealed a similar number of males and females across conditions (χ^2 [4, n = 105] = .63, p = .96).

[2] Researchers have argued that gender might moderate the effects of provided support (e.g., Uchino, 2009). When factoring in a between-group independent variable 'gender' (males/females), a two-way between-subjects ANOVA on performance revealed a main effect of provided support upon performance ($F_{4, 95}$ = 6.92, p < .001, η_p^2 = .23) with the same pattern of results across conditions as in the original analyses. There was a main effect for gender ($F_{1, 95}$ = 18.93, p < .001, η_p^2 = .17) with male participants generally performing better on the golf putting task than female participants but no interaction effect ($F_{4, 95}$ = .158, p = .959, η_p^2 = .01), ruling out gender as a potential confounder in this study. For self-efficacy, the two-way between-subjects ANOVA revealed no main effects for provided support ($F_{4, 91}$ = 2.28, p = .07, η_p^2 = .09), again similar to the original analyses. There was a main effect for gender ($F_{1, 91}$ = 7.36, p = .008, η_p^2 = .08) with male participants feeling more efficacious prior to the golf-putting task than female participants but no interaction effect ($F_{4, 91}$ = .67, p = .61, η_p^2 = .03).

[3] Although the support manipulations were largely successful, some participants reported the receipt of support in the invisible conditions and receiving no support in the visible support conditions. Removing these participants revealed nearly identical results for the effects of provided support upon performance ($F_{4, 86}$ = 6.76, p < .001, η_p^2 =.24). Again participants given esteem visible support and informational invisible support outperformed those given no support and esteem invisible support (all p < .01). Also, for self-efficacy, identical results were observed ($F_{4, 86}$ = 2.11, p = .09, $_p^2$ = .09). We therefore used the full sample in the reported analyses.

[4] Similar results were obtained with informational visible support and esteem visible support as the reference group.

Table 1

Support Manipulations per Condition

Condition	Peer response
Visible informational support	"No not really. But, can I say something to the participant? The task was okay, really. But to do well I would say make sure that you relax, take your time, and focus on the target."
Invisible informational support	"No not really. The task was okay, really. As long as everyone relaxes, takes their time, and focuses on the target, they can do well."
Visible esteem support	"No not really. But can I say something to the participant? The task was okay, really. I think that you will be able to do fine on this task. Really, you have nothing to worry about. I am sure you can do well"
Invisible esteem support	"No not really. The task was okay. I think that everyone will do fine on this task. Really there is nothing to worry about. I'm sure everyone can do well."
No support	"No not really."

Table 2

Means, Standard Deviations, and 95% Confidence Intervals of Putting Performance (cm) and Self-Efficacy per Support Condition

Condition	Performance		Self-efficacy	
	M (SD)	95% CI	*M (SD)*	95% CI
Visible informational support	56.21[a] (13.38)	[50.12 – 62.30]	40.10 (13.24)	[33.90 – 46.29]
Invisible informational support	49.28[b,d] (14.34)	[42.76 – 55.81]	46.12 (16.27)	[38.02 – 54.21]
Visible esteem support	49.55[c,e] (15.57)	[42.46 – 56.64]	53.62 (16.21)	[46.24 – 61.00]
Invisible esteem support	71.73[a,b,c] (21.93)	[61.74 – 81.71]	52.87 (20.15)	[43.69 – 62.04]
No support	67.20[d,e] (20.36)	[57.93 – 76.46]	44.69 (18.61)	[36.22 – 53.16]

[a,b,c,d,e] Means with similar superscripts are significantly different from one another (based on the Tukey HSD test) at the $p < .05$ level.