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The role of social support and social identification in challenge and threat, perceived stress, and life satisfaction

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Abstract

Individualistic appraisals have dominated contemporary stress theory and have too often overlooked socially derived perceptions of group resources. The aim of this study was to examine the effect of social support and social identification on individuals' challenge and threat appraisal, perceived stress, and life satisfaction across a range of group contexts. An online survey was completed by 480 participants across four groups: students ($n = 110$), workplace employees ($n = 126$), team sport athletes ($n = 116$), and group exercisers ($n = 128$) on one occasion. We found a positive relationship between social support and social identification along with significant associations of these social factors being positively related with self-efficacy, control, approach, and challenge, while negatively related with threat. Avoidance, along with challenge and threat was positively associated with perceived stress, while self-efficacy was negatively associated with perceived stress. Further, control, self-efficacy, social identification, and social support was positively associated with life satisfaction, while approach, threat, and perceived stress was negatively associated, with life satisfaction. Social identification also moderated the positive association between social support and life satisfaction. Overall, we found evidence for the

resource appraisals outlined in contemporary theory being associated with both social support and social identification, along with perceived stress and life satisfaction across different group contexts. Therefore, when understanding individuals' stress responses and associated life satisfaction, research and practice should consider the combination of individual and social factors.

KEYWORDS

challenge and threat, cognitive appraisal, social identity, stress and coping

1 | INTRODUCTION

For an event to be experienced as stressful it must be appraised as such, a notion posited by the ancient Stoics, and a position formalised in Lazarus' cognitive appraisal theory (Lazarus & Folkman, 1984). Contemporary theory of stress and coping have conceptualised the transactional nature of stress within a challenge and threat framework, which suggests differing psychophysiological responses to stressful situations. For example, in the Theory of Challenge and Threat States in Athletes (TCTSA; Jones et al., 2009; Meijen et al., 2020) it is posited that on approach to a motivated performance situation (e.g., exam, public speaking, sporting performance), an individual evaluates perceived situational demands (demand appraisals) and perceived personal resources (resource appraisals). If the perceived resources outweigh the perceived demands, a challenge state occurs. On the other hand, if perceived demands outweigh the perceived resources, a threat occurs. The TCTSA extends an earlier theory, the biopsychosocial model of challenge and threat (BPSM; Blascovich & Mendes, 2000), by introducing three inter-related resource appraisals that inform an individual's perception of their resources, namely self-efficacy, perceptions of control, and achievement goals. Self-efficacy beliefs are judgements of what an individual can accomplish with his or her skills (Bandura, 1986). Perceived control refers to the beliefs the individual has about how much control is available (Jones et al., 2009). Achievement goals relate to an individual's motivation and the TCTSA adopts the 2 × 2 achievement goal framework that consist of mastery and performance goals associated with either goal approach or goal avoidance (Elliot & McGregor, 2001). In sum, high self-efficacy, perceived control, and a focus on approach goals, indicate sufficient resource appraisals on approach to a motivated performance situation; a challenge state. Alternatively, low self-efficacy, perceived control, and a focus on avoidance goals, indicate insufficient resource appraisals on approach to a motivated performance situation; a threat state.

The demand appraisals comprise the perception of danger, uncertainty, and required effort (Jones et al., 2009). The BPSM has been revised to include the availability of support as an antecedent of challenge and threat (Blascovich, 2008), yet the exact mechanisms are unclear and warrants further examination (Moore et al., 2014). Challenge and threat theories such as the BPSM and the TCTSA have largely focused on egocentric appraisals (i.e., individual factors) of situational demands and resources, excluding socially derived perceptions (i.e., appraisal of group resources). A recent revision of the TCTSA (TCTSA-R; Meijen et al., 2020) does acknowledge the potential that psychosocial factors such as perceived social support can have on influencing the cognitive appraisal process. However, empirical evidence examining social factors in challenge and threat literature is scant, and our understanding of the role that social factors play in challenge and threat is in its infancy.

There has been an emerging focus on the role of group memberships and associated identities in influencing the psychology and biology of stress. For instance, Slater et al. (2016) suggested that social support may be a

valuable resource to encourage challenge states particularly when underpinned by high social identification. Central to social identification is the Social Identity Theory (Tajfel & Turner, 1979) and Self-Categorisation Theory (Turner et al., 1987) which suggests that the groups we belong to define who we are, and the way in which we think and behave are coherent with our personal or social identity. Researchers have shown that the greater number of groups an individual identifies with is associated with better health and well-being outcomes (Sani et al., 2015), while the positivity and quality of those groups are also important factors (White et al., 2021). Within the socio-psychobio model (Haslam et al., 2019), social identity processes are key and can be seen to buffer against stress in three ways: (a) social identity alters appraisal processes; (b) social identity increases social support; and (c) social identity increases the effectiveness of social support. It has been suggested that a shared social identity can influence the appraisal process by providing a common interpretive framework (e.g., Haslam & Reicher, 2006). For example, members of the group share common perspectives on the situation and interpret it in similar ways. Social identity can shift the appraisal process from the individual to group level (Häusser et al., 2020). As a result, when coping with a stressor, the resources from the group are taken into account within the individual appraisal process (Haslam et al., 2004, 2005). An example of this could be seen from the perceptions of social support.

Having multiple group memberships means one is likely to have access to more sources of social support (Haslam et al., 2008). Social support is an effective resource in the face of stressors and can come in a number of forms; emotional support (i.e., empathy and acceptance), instrumental/tangible support (i.e., provision of material aid) or appraisal/informational support (i.e., provision of information that leads to alternative assessments of the stressor itself or one's ability to cope with it; Cohen and McKay, 1984; House, 1981). Individuals who identify strongly with a certain group (e.g., with their work organization) are also more likely to perceive greater social support from other members of that group (Haslam et al., 2005). Across two studies, Haslam et al. found that social support mediated the relationship between social identification with both stress and life/job satisfaction. In another study, Levine and colleagues demonstrated that individuals are likely to offer help to people they perceive as belonging to the in-group (Levine et al., 2005). Taken together, these findings suggest that a shared social identity was a basis for social support. However, some researchers have suggested that there is a reciprocal relationship between social identification and social support (e.g., Haslam et al., 2005). In other words, social identification promotes social support which in turn fosters and reinforces social identification and so on. A recent study by Häusser et al. (2023) examined the relationship between social identification and perceived social support over time among first year university students and found evidence of a reciprocal relationship.

Having a shared social identity not only increases the possibility of social support, but it has also been shown to increase the effectiveness of the support received. This influence is largely down to the idea that a shared social identity provides a basis for individuals to interpret support in ways that are more beneficial (Haslam et al., 2012). For example, a shared social identity can be useful to prevent individuals from making misinterpretations towards implicit criticism (e.g., feelings of inequality, threat to self-esteem; Häusser et al., 2020). This suggests that developing social identification is central for moderating the effectiveness of social support to achieve beneficial effects to health and well-being.

Despite the reported benefits of social identification and social support outlined above, the stress and coping literature tends to be individualistically focused, omitting the potential explanatory power of the social relationships and groups (Folkman & Moskowitz, 2004). In addition, the relationship between social support and social identification in the stress and coping process is not well established (McKimmie et al., 2020). To capture and enhance the understanding of human stress, it is important to explore the psychological process involved in group functioning in line with contemporary stress theory (i.e., TCTSA). Even though social support is clearly important for the stress response, challenge and threat researchers have rarely acknowledged (see Dixon et al., 2016; Dixon & Turner, 2018; Gillman et al., 2023; Miller et al., 2020; Slater et al., 2018; for some exceptions) or examined the potential effects that social factors, such as perceptions of social support and social identification, can have on an individual's challenge and threat responses to a motivated performance situation. For example, researchers have previously found associations between challenge and threat cognitive appraisals with both social support and social

identification in workplace employees (Gillman et al., 2023). However, they did not measure the specific resource appraisals outlined in the TCTSA (Jones et al., 2009; Meijen et al., 2020) to allow for a more granular understanding. It has been suggested that if accompanied with perceptions of social identification, social support could be a valuable resource appraisal on approach to a stressful situation (Freeman & Rees, 2009; Hartley & Coffee, 2019; Slater et al., 2016, 2018). Therefore, in the current study we aim to build upon the literature by looking at the social factors alongside the specific resource appraisals as outlined in contemporary stress theory (i.e., TCTSA). In addition, we aim to extend the field of social identification and social support by providing a greater understanding of stress and health, which has tended to focus on the original transactional model of stress (Lazarus & Folkman, 1984), rather than more contemporary theory.

In the present study we explore the relationships between social factors and challenge resource appraisals to better understand individuals' responses to stress. Specifically, examining the associations between social support, social identification, challenge and threat appraisals, perceived stress, and life satisfaction across a range of group contexts. We wanted to capture various group settings where social interactions tend to take place to aid generalizability of findings. This builds and extends knowledge by providing evidence concerning the associations between social support and social identification on the resource appraisals (i.e., self-efficacy, control, achievement goals) outlined in the TCTSA and TCTSA-R. By understanding the link between the social factors and the resource appraisals, then this would allow a more holistic approach to interventions aimed at encouraging adaptive approaches to pressured situations. We also aim to provide evidence to address the suggestion of reconsidering the resource appraisals to include social support as outlined in the TCTSA-R (Meijen et al., 2020).

Based on previous research, we predicted that perceptions of social support and social identification would be closely related given the evidence of a reciprocal relationship (e.g., Häusser et al., 2023), and that this interaction would then lead to positive influences on stress and life satisfaction. Specifically, it was hypothesized that there would be a positive relationship between social support and social identification (H1), and that greater social support and social identification would be related to greater perceptions of self-efficacy, control, approach goals, challenge, and lower threat and avoidance goals (H2). We also predicted that greater perceptions of social support, social identification, resource appraisals and challenge, along with lower threat and avoidance goals would be related to less stress (H3a) and greater life satisfaction (H4a). We further wanted to examine whether and to what extent social identification moderated the relationships between social support and perceived stress and life satisfaction. As such, we predicted that as social identification increased, so to would the strength of the relationships between social support on perceived stress (H3b) and life satisfaction (H4b).

2 | METHOD

2.1 | Participants

A total of 480 (female = 275, male = 205) participants (M_{age} = 32.01, SD_{age} = 10.02 years) took part in the study. The participants represented four groups: (a) university students (n = 110); (b) workplace employees (n = 126); (c) team sport athletes (n = 116); and (d) group exercisers (n = 128). These groups were targeted through convenience, opportunistic, and purposeful sampling due to their typical group environments and access to various social interactions and exchanges. These groups are also representative of motivated performance situations, which is central to the TCTSA (Jones et al., 2009; Meijen et al., 2020). Participants selected the group most salient to them. Participants were recruited through the distribution of an online survey via social media (i.e., Twitter and Facebook), and Survio's consumer panel (Survio, 2016). Survio is a data collection tool which allows the distribution of questionnaires to those who meet the inclusion criteria and has been used in past research (Fontes et al., 2019). There were 557 responses to the questionnaire. Following screening for the inclusion criteria (i.e., over the age of 18, identified to one of the four groups, informed consent provided) and data quality (i.e., incomplete measures,

unrealistic completion time compared to the mean, straight-line responses), 77 respondents were removed from the dataset. This resulted in 480 eligible participants. Of these 480 participants, 341 (71.0%) were recruited via Survio. With a power of 0.80 and an alpha of 0.05, a sample of 395 was deemed sufficient to detect a small effect ($f^2 = 0.02$) according to an a priori calculation using G*Power for multiple regression analysis.

2.2 | Measures

2.2.1 | Social factors

The Single-Item Social Identification (SISI: Postmes et al., 2013) measure was used to assess individual's identification to the group. The question asked individuals to rate how far they agree with the following statement in relation to their group that is, "I identify with my (academic course/workplace/team/or exercise class)" on a 7-point Likert-scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS: Zimet et al., 1998). This contained three subscales of different sources of support: family, friends, and significant other. Participants were asked to rate how they feel about twelve statements on a 7-point Likert-scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). An example item included "There is a special person who is around when I am in need". A total social support score was created by calculating an average score for all twelve items. The MSPSS is one of the most widely used self-report measures of perceived social support and has adequate internal consistency reliability (Osman et al., 2014). Cronbach's alpha for the total social support score in the current sample was $\alpha = 0.92$, demonstrating excellent internal consistency.

2.2.2 | Resource appraisals

Perceived control was measured by asking individuals to indicate to what extent they agreed or disagreed with the following statement: "As a student/workplace employee/athlete/group exerciser, I feel I have control over my skills" on a 5-point scale, ranging from 0 (*not at all*) to 4 (*extremely*). This measure was based on a control item used in Meijen et al. (2014).

A shortened version of The Achievement Goals Questionnaire (AGQ; Conroy et al., 2003) was used which measures mastery approach goals (MAp), mastery avoidance goals (MAv), performance approach goals (PAp), and performance avoidance goals (PAv). Originally 12 items, participants were asked four questions (one item for each subscale) relating to general tasks related to their group on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). The items were "It is important to me to perform as well as I possibly can" (MAp), "I worry that I may not perform as well as I possibly can" (MAv). "It is important to me to do well compared to others" (PAp), "I just want to avoid performing worse than others (PAv). An approach score was created by taking the mean scores from MAp and PAp, and an avoidance score were created by taking the mean scores from MAv and PAv. This shortened measure has also been used in previous research (e.g., Turner et al., 2013).

The General Self-Efficacy Scale (GSE: Schwarzer & Jerusalem, 1995) measured the belief that an individual can perform a novel or difficult task, or cope with adversity in various domains of human functioning. A total of fourteen questions were rated on a 4-point Likert-Scale ranging from 1 (*not at all true*) to 4 (*exactly true*). An example item included "I can always manage to solve difficult problems if I try hard enough". This measure has been used internationally and has high reliability and has been shown to have construct validity in numerous studies (Luszczynska et al., 2005). Cronbach's alpha for the GSE in the current sample was $\alpha = 0.86$, demonstrating good internal consistency.

2.2.3 | Challenge and threat

The Cognitive Appraisal Scale (CAS: Skinner & Brewer, 2002) measured challenge and threat appraisals across eighteen items based on Lazarus and Folkman's (1984) concept. All items are rated on a 6-point Likert-scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). An example challenge item included "I tend to focus on the positive aspects of any situation". An example threat item included "I worry that I will say or do the wrong things". Cronbach's alpha for the CAS subscales in the current sample was challenge $\alpha = 0.85$, which demonstrates good consistency, and threat $\alpha = 0.93$, demonstrating excellent internal consistency.

2.2.4 | Perceived stress

Stress was measured using the Perceived Stress Scale (PSS: Cohen et al., 1983). The ten-item measure assessed individual's feelings and thoughts during the last month. Items are measured using a 5-point Likert scale 0 (*never*) to 4 (*very often*). An example item included "In the last month, how often have you been upset because of something that happened unexpectedly?". This is a widely used psychological instrument of stress and has been well validated in a range of populations (e.g., Lee, 2012). Cronbach's alpha for the PSS in the current sample was $\alpha = 0.73$, demonstrating acceptable internal consistency.

2.2.5 | Life satisfaction

Life satisfaction was measured using the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS: Seligson et al., 2003). The six items were measured on a 7-point Likert-scale ranging from 1 (*terrible*) to 7 (*delighted*). An example item included "I would describe my satisfaction with my family life as". One question was adapted to fit in accordance with the groups for the current study, as this was the only question that was in reference to a student. This was replaced with either workplace, team, or exercise class. Cronbach's alpha in the current sample was $\alpha = 0.85$, demonstrating good internal consistency.

2.3 | Procedure

The study received institutional ethical approval prior to data collection. An online survey was created using Qualtrics. Survio and social media (i.e., Twitter and Facebook) was used to distribute the measures to participants through a purposive and snowballing sampling effect. Survio's consumer panel was utilized as this allowed to target specific populations and social media allowed for re-sharing of the study. The online survey took 10 minutes to complete.

2.4 | Analytic strategy

Data were first examined for outliers and normality to ensure data met the assumptions for parametric testing. Significant outliers with z scores greater than two were winsorized (Salkind et al., 2010; Smith, 2014). Overall, 5.13% of the data were winsorized. Data analyses were completed in three phases to test our hypotheses. First, to test H1 and H2, Pearson correlations were calculated between social support and social identification (H1), and how these relate with resource appraisals and challenge and threat (H2). Second, a six-step multiple hierarchical regression was conducted with perceived stress as the outcome variable (H3). Group was entered at step one of

regression, age and sex were entered at step two, the resource appraisals (control, approach goals, avoidance goals, self-efficacy) were entered at step three, challenge and threat entered at step four, social identity and social support entered at step five, and the social support and social identity interaction term entered at step six. Then a seven-step multiple regression was conducted with life satisfaction as the outcome variable (H4), which followed the previous model but added perceived stress in step seven. We wanted to account for the group, hence the variable being entered at step 1 of the regressions. The demographics (i.e., age and sex) were entered at step 2, as important control variables (covariates) to account for. We then entered the independent variables, with the resource appraisals in the next block. Challenge and threat came next as these states are determined by the resource appraisals according to the theory (i.e., TCTSA). We then included the social factors to assess their effects above and beyond the previously entered variables (and representing one of the novel aspects of the study in the context of TCTSA theory). Perceived stress was added in the final step of the regression with life satisfaction as the outcome variable as we wanted to account for its effects, especially as perceived stress is related to life satisfaction (e.g., Civitci, 2015).

3 | RESULTS

Table 1 contains descriptive statistics and bivariate correlations coefficients between all study variables. No correlation coefficient exceeded 0.80 indicating that multicollinearity was not an issue in further analysis. In support of H1, a moderate positive correlation was found between social identification and social support ($r = 0.37$, $p < 0.001$). In support of H2, a small to moderate positive correlation was found for both social support and social identification on self-efficacy (social support: $r = 0.30$, $p < 0.001$, social identification: $r = 0.38$, $p < 0.001$), control (social support: $r = 0.25$, $p < 0.001$, social identification: $r = 0.30$, $p < 0.001$), approach (social support: $r = 0.22$, $p < 0.001$, social identification: $r = 0.38$, $p < 0.001$), and challenge (social support: $r = 0.41$, $p < 0.001$, social identification: $r = 0.29$, $p < 0.001$). Whereas a small, negative correlation was found for threat (social support: $r = -0.11$, $p = 0.02$, social identification: $r = -0.10$, $p = 0.03$). For avoidance, no significant relationships were found.

3.1 | Associations with stress and life satisfaction

As shown in Table 2, the hierarchical multiple regression for perceived stress revealed that all steps were significant in the model. When all variables were included in step six ($R^2 = .257$, $F(12, 478) = 14.777$, $p < 0.001$), standardised coefficients revealed group ($\beta = 0.12$, $p = 0.006$), avoidance goals ($\beta = 0.17$, $p = 0.004$), self-efficacy ($\beta = -0.11$, $p = 0.028$), challenge ($\beta = 0.14$, $p = 0.01$), and threat ($\beta = 0.32$, $p < 0.001$), were significant predictors of perceived stress, such that greater avoidance goals, challenge, threat, and lower self-efficacy were related to greater stress. However, contrary to our hypothesis (H3b), we found a non-significant interaction effect between social support and social identity for perceived stress ($\beta = 0.02$, $p = 0.67$).

For life satisfaction, the hierarchical multiple regression revealed that all steps were significant in the model (Table 3). When all variables were included in step seven ($R^2 = .493$, $F(13, 478) = 36.763$, $p < 0.001$), standardised coefficients revealed control ($\beta = 0.09$, $p = 0.017$), approach goals ($\beta = -0.10$, $p = 0.022$), self-efficacy ($\beta = 0.10$, $p = 0.020$), threat ($\beta = -0.11$, $p = 0.014$), social identification ($\beta = 0.14$, $p < 0.001$), social support ($\beta = 0.47$, $p < 0.001$), social support and social identity interaction term ($\beta = -0.09$, $p = 0.008$), and perceived stress ($\beta = -0.15$, $p < 0.001$), were significant predictors of life satisfaction. That is, greater control, social identification, social support, and lower approach goals, threat, and perceived stress, were related to greater life satisfaction. In support of our hypothesis (H4b), we also found a significant interaction effect between social support and social identity for life satisfaction ($\beta = -0.09$, $p = 0.007$). The interaction is illustrated in Figure 1. The standardized slope for the effect of social support on life satisfaction was significant when social identification was one SD below the mean

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TABLE 1 Means, Standard Deviations, and Bivariate Correlations for all variables.

N = 480	M	SD	Scales (Cronbach's alpha)	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Group	2.51	1.12		-	-0.03	0.07	-0.07	0.01	-0.09*	-0.12**	0.04	0.07	-0.19**	-0.14**	0.17**	-0.15**
2. Age	32.01	10.02			-	-0.03	0.11*	-0.06	-0.28**	0.18**	0.07	-0.27**	0.06	0.16**	-0.14**	0.12*
3. Sex	0.57	0.49				-	-0.04	0.05	0.05	-0.08	0.13**	0.10*	0.00	0.13**	0.13*	-0.03
4. Control	3.88	0.73	1–5				-	0.27**	-0.06	0.36**	0.31**	-0.19**	0.30**	0.25**	-0.18**	0.33**
5. Approach	5.35	0.95	1–7					-	0.51**	0.23**	0.22**	0.11*	0.38**	0.22**	-0.01	0.13**
6. Avoidance	4.62	1.34	1–7						-	-0.08*	-0.09*	0.53**	0.09	0.00	0.27**	-0.11*
7. Self-efficacy	30.65	3.64	1–4 (0.86)							-	0.48**	-0.31**	0.38**	0.30**	-0.25**	0.40**
8. Challenge	4.63	0.74	1–6 (0.85)								-	-0.03	0.29**	0.41**	-0.01	0.35**
9. Threat	3.90	1.11	1–6 (0.93)									-	-0.10*	-0.11*	0.46**	-0.28**
10. Social identity	5.34	1.17	1–7										-	0.37**	-0.17**	0.41**
11. Social support	5.30	1.10	1–7 (0.92)											-	-0.15**	0.61**
12. Perceived stress	17.84	5.05	0–4 (0.73)												-	-0.32**
13. Life satisfaction	5.21	0.93	1–7 (0.85)													-

Note: *$p < 0.05$, **$p < 0.01$. Sex: males were coded 0, and females were coded 1. Group: (1) university students (male = 34, female = 76; M_{age} = 22.55, SD_{age} = 5.64 years); (2) workplace employees (male = 57, female = 68, missing = 1; M_{age} = 35.83, SD_{age} = 9.66 years); (3) team sport athletes (male = 63, female = 53; M_{age} = 32.69, SD_{age} = 9.23 years); and (4) group exercisers (male = 50, female = 78; M_{age} = 35.78, SD_{age} = 8.70 years).

TABLE 2 Hierarchical regression analyses for resource appraisals, challenge and threat, social identity, and social support, predicting perceived stress.

Variable	Step 1 b	SE	β	95% CIs	Step 2 b	SE	β	95% CIs	Step 3 b	SE	β	95% CIs	Step 4 b	SE	β	95% CIs	Step 5 b	SE	β	95% CIs	Step 6 b	SE	β	95% CIs
Group	.764	.203	.170	.365, 1.163**	.707	.201	.157	.313, 1.101**	.777	.191	.173	.401, 1.153**	.613	.183	.136	.252, .973**	.517	.187	.115	.149, .885*	.523	.188	.116	.153, .892*
Age					-.068	.022	-.136	-.112, -.024**	-.010	.022	-.020	-.054, .033	.005	.021	.010	-.036, .047	.010	.021	.020	-.032, .052	.010	.021	.020	-.032, .052
Sex					1.209	.455	.119	.316, 2.102**	1.005	.427	.099	.165, 1.845*	.650	.414	.064	-.163, 1.463	.737	.415	.072	-.078, 1.553	.756	.417	.074	-.064, 1.576
Control									-.332	.324	-.048	-.969, .306	-.356	.313	-.051	-.970, .259	-.271	.313	-.039	-.887, .345	-.254	.316	-.037	-.876, .367
Approach									-.808	.285	-.152	-1.368, -.249**	-.667	.227	-.125	-1.210, -.124*	-.519	.286	-.097	-1.080, .043	-.528	.287	-.099	-1.092, .035
Avoidance									1.276	.199	.338	.886, 1.667**	.651	.223	.173	.213, 1.089**	.651	.222	.173	.215, 1.088*	.652	.222	.175	.215, 1.089*
Self-Efficacy									-.200	.065	-.144	-.328, -.072**	-.175	.071	-.126	-.313, -.036*	-.156	.071	-.112	-.296, -.016*	-.157	.071	-.113	-.297, -.017*
Challenge													.718	.335	.105	.060, 1.376*	.942	.349	.137	.255, 1.628*	.939	.350	.137	.252, 1.626*
Threat													1.456	.235	.321	.994, 1.918**	1.421	.235	.313	.959, 1.882**	1.421	.235	.313	.959, 1.883**
Social identity																	-.261	.204	-.060	-.661, .139	-.252	.205	-.058	-.654, .151
Social support																	-.370	.214	-.080	-.791, .051	-.367	.215	-.079	-.788, .055
Social support x Social identity																					.063	.147	.017	-.225, .351
R²	.027** (ΔR²=.029**)				.056** (ΔR²=.033**)				.173** (ΔR²=.123**)				.252** (ΔR²=.081**)				.258** (ΔR²=.009)				.257** (ΔR²=.000)			

Note: *p < 0.05, **p < 0.01. Males were coded 0, and females were coded 1.

TABLE 3 Hierarchical regression analyses for resource appraisals, challenge and threat, social identity, social support and perceived stress predicting life satisfaction.

Variable	Step 1				Step 2				Step 3				Step 4				Step 5				Step 6				Step 7			
	b	SE	β	95% CIs	b	SE	β	95% CIs	b	SE	β	95% CIs	b	SE	β	95% CIs	b	SE	β	95% CIs	b	SE	β	95% CIs	b	SE	β	95% CIs
Group	-.117	.037	-.141	-.190, -.043**	-.113	.037	-.136	-.186, -.039**	-.087	.034	-.106	-.155, -.020*	-.085	.34	-.103	-.152, -.019*	-.007	.029	-.009	-.064, .050	-.013	.029	-.015	-.069, .044	.001	.029	.002	-.055, .058
Age					.011	.004	.116	.003, .019*	-.001	.004	.016	-.006, .009	.001	.004	.009	-.007, .009	-.004	.003	-.046	-.011, .002	-.004	.003	-.043	-.010, .002	-.004	.003	-.045	-.011, .002
Sex					-.034	.085	-.018	-.200, .132	.017	.077	.009	-.134, .168	-.026	.076	-.014	-.175, .123	-.121	.064	-.065	-.248, .065	-.139	.064	-.075	-.266, -.013*	-.119	.063	-.064	-.244, .006
Control									.253	.058	.198	.138, .367**	.206	.057	.162	.093, .319**	.138	.049	.108	.043, .233*	.122	.049	.095	26, .217*	.115	.048	.090	.020, .209*
Approach									.064	.051	.066	-.036, .165	.009	.051	.010	-.090, .109	-.095	.044	-.097	-.182, -.008*	-.086	.044	-.088	-.173, -.001	-.100	.044	-.102	-.186, -.014*
Avoidance									-.084	.036	-.121	-.154, -.014*	.014	.041	.020	-.066, .095	.008	.034	.012	-.059, .076	.008	.034	.011	-.059, .075	.026	.034	.037	-.041, .092
Self-efficacy									.073	.012	.285	.050, .096**	.040	.013	.157	.014, .065**	.028	.011	.111	.007, .050*	.030	.011	.116	.008, .051*	.025	.011	.100	.004, .047*
Challenge													.276	.062	.219	.155, .367**	.053	.054	.042	-.053, .159	.056	.054	.044	-.050, .161	.081	.053	.064	-.024, .186
Threat													-.164	.043	-.197	-.249, -.079**	-.130	.036	-.156	-.201, -.058**	-.131	.036	-.156	-.201, -.059**	-.092	.037	-.110	-.164, -.019*
Social identity																	.130	.032	.163	0.68, .192**	.121	.031	.152	.059, .183**	.114	.031	.144	.053, .175**
Social support																	.411	.033	.485	.346, .476**	.407	.033	.481	.343, .472**	.397	.033	.470	.333, .462**
Social support x Social identity																					-.061	.023	-.092	-.105, -.017*	-.059	.022	-.089	-.103, -.016*
Perceived stress																									-.027	.007	-.147	-.041, -.013**
R²	.018**(ΔR²=.020**)				.028**(ΔR²=.014*)				.208**(ΔR²=.185**)				.249**(ΔR²=.044**)				.471**(ΔR²=.220**)				.478**(ΔR²=.008**)				.493**(ΔR²=.016)			

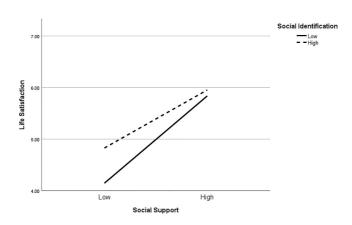*Note:* * *p* < 0.05, ** *p* < 0.01. Males were coded 0, and females were coded 1.

FIGURE 1 Interaction between social support and social identification on life satisfaction. Variables are plotted at 1 *SD* above and 1 *SD* below the mean.

($\beta = 0.607$, $p < 0.001$) and one SD above the mean ($\beta = 0.435$, $p < 0.001$). In sum, as social identification and social support increased, life satisfaction increased regardless of low or high levels of social identification.

4 | DISCUSSION

The aim of the present research was to investigate the associations between social support, social identification, challenge and threat appraisals, perceived stress, and life satisfaction across a range of group contexts. Specifically, we aimed to better understand the role of the social factors in challenge and threat appraisal in line with prominent theory (i.e., TCTSA-R; Meijen et al., 2020). We found a positive relationship between social support and social identification in support of H1, such that greater perceived social support was related to greater social identification. Significant associations were also found in line with H2, with both social support and social identification being positively related with self-efficacy, control, approach, and challenge, and negatively related with threat. In other words, greater perceived social support and social identification was associated with greater self-efficacy, control, approach, and challenge, and lower threat. However, no significant correlations were found for avoidance. Results also indicated partial support for H3a in that avoidance, and challenge and threat were positively associated with perceived stress, while self-efficacy was negatively associated, with perceived stress. No significant interaction effect was found for social identification moderating the relationship between social support and perceived stress (H3b). Further, we found some support for H4a in that control, self-efficacy, social identification, and social support were positively associated with life satisfaction, while approach, threat, and perceived stress were negatively associated with life satisfaction. We also found a significant interaction effect, indicating that social identification functioned as a moderator in the relationship between social support and life satisfaction (H4b). Specifically, social identification strengthened the positive relationship between social support and life satisfaction. Taken together, we found cross-sectional evidence for the resource appraisals outlined in the TCTSA-R are associated with both social support and social identification, along with having an association with perceived stress and life satisfaction across a range of group domains.

The positive relationship between social support and social identification found in the current study is in line with past research (e.g., Avanzi et al., 2015; Haslam et al., 2012). This is in support of the notion that individuals who identify strongly with a certain group (e.g., their work organisation) are also more likely to perceive greater social support from other members of that group (Haslam et al., 2005). Furthermore, it has been argued that the provision of social support is always dependant on the relationship between the provider and recipient (Haslam et al., 2012). The

current finding that social support and social identification were positively associated with challenge and negatively associated to threat coincides with postulations from Slater et al. (2016) and the sociopsychobio model (Haslam et al., 2019), in that social identity processes play an important role in the likelihood of effective social support and thus leading to more adaptive responses to stress. In addition, both social support and social identification were positively associated with the resource appraisals outlined within the TCTSA-R. These novel findings provide evidence to suggest that the social factors could be considered additive and interactive with the three interrelated resource appraisals proposed in the TCTSA-R. Further, we offer evidence to support the reconsideration of the resource appraisals to include social support as outlined in the TCTSA-R. That is, having greater social identification and social support is more likely to lead to greater perceptions of self-efficacy, control, and approach goal focus when faced with a stressful situation, as well as greater life satisfaction. In other words, high levels of identification can influence the appraisal process of an individual to consider the group resources (i.e., social support) which in turn can also bolster the resource appraisals. Therefore, the interplay between social identification and social support is important to establish more adaptive outcomes to stress. It is worth noting that given the small to moderate relationships found, caution should be applied when interpreting the strength of these findings.

The results also revealed that avoidance and challenge and threat were positively associated with perceived stress, whilst self-efficacy was negatively associated with perceived stress. Avoidance goals reflect a drive to avoid incompetence and is seen as maladaptive and more likely to result in a threat state (Jones et al., 2009). It could be that avoidance goals are also likely to increase perceptions of stress, and researchers have shown avoidance-based coping strategies to increase stress compared with active strategies (Chao, 2011). Further, avoidance goals have been linked with less perceived control which has also been positively associated with increased perceived stress and well-being (Dijkstra & Homan, 2016). It is not surprising to see positive relationships between challenge and threat and perceived stress in the current findings. Challenge and threat theory does not suggest an absence or reduction of perceived stress in the face of a motivated performance situation, rather, challenge and threat are the resultant appraisal of the stressful situation predicting adaptive or maladaptive responses. In other words, an individual can still perceive high levels of stress on approach to a motivated performance situation and still feel they have appropriate resources to outweigh the demands and elicit a challenge state.

The finding that self-efficacy was negatively associated with perceived stress is in support of previous research (e.g., Coffman & Gilligan, 2002; Shilpa & Prasad, 2017). Individuals with high levels of self-efficacy tend to use more active problem-focused coping, as opposed to those with low levels of self-efficacy who tend to apply more passive-emotional coping (Luszczynska et al., 2005). Self-efficacy is an important resource appraisal outlined in the TCTSA-R and refers to the belief that one has the skills necessary to execute the courses of action required to succeed, which contributes to the perception that they can cope with the demands of the situation (Jones et al., 2009). While self-efficacy is usually defined as context specific, it may also be conceptualised and measured in a more general way (Luszczynska et al., 2005), as seen within the current study. Contrary to predictions and past research, there was no significant relationships or interaction effect between the social factors (i.e., social identification and social support) in predicting perceived stress in the current findings. Although there were significant negative bivariate correlations, it could be that other variables (i.e., self-efficacy) were stronger predictors of perceived stress. This observation could also indicate that social identification and social support exerts its beneficial effects by strengthening other resource appraisals, which has been suggested in past research (e.g., Gallagher et al., 2014; Rees & Freeman, 2009; Slater et al., 2016, 2018). For example, Rees and Freeman (2009) found that social support was associated with increases in self-efficacy among golfers.

With regards to predicting life satisfaction, control, self-efficacy, social identification, and social support were positively associated, while approach, threat, and perceived stress were negatively associated with life satisfaction. These findings are in accordance with challenge and threat theory in that they suggest an increase in perceptions of resource appraisals can lead to more adaptive responses to stress (Blascovich & Mendes, 2000; Jones et al., 2009). In other words, those with more adaptive (challenge) responses to stress will tend to report greater life satisfaction. Although this could be reciprocal, in that life satisfaction could also bolster challenge responses to stressful

situations. While longitudinal designs are needed to establish causation, the present study extends the current theory due to life satisfaction not specifically featuring within in the BPSM or TCTSA-R, and therefore offers a more holistic approach to understanding life satisfaction. Perhaps surprisingly, is the finding that approach was negatively associated with life satisfaction despite being a resource appraisal deemed important to promote a challenge state (an adaptive response to stress). Approach goals reflect a drive for competence and can be useful in the face of challenging situations. For example, within sport, goals are important for an athlete's response to a stressful event and can have both promoting and deleterious effects on well-being through the appraisal process (Holt & Dunn, 2004). Although, when personally relevant goals are believed to be threatened, higher levels of anxiety are experienced (Lewthwaite, 1990). Therefore, despite striving for competence, it may be that this is at the cost of positive life satisfaction in certain circumstances where important goals are thwarted.

Social identification and social support can have more positive effects to broader health and wellbeing outcomes including life satisfaction (e.g., Cohen et al., 2000; Sani et al., 2012; Uchino, 2009), thus consistent with the current findings. Specifically, we found a significant interaction effect to suggest that social identification moderated the positive association between social support and life satisfaction. This indicates that social support may be more effective when there are greater levels of social identification which is consistent with social identity theory (Tajfel & Turner, 1979) and the sociopsychobio model (Haslam et al., 2019). It is thought that social identification can help buffer the effects of everyday stressors by creating a perception of collective meaning (i.e., belonging and purpose) and increasing the likelihood of social support and in turn enhancing satisfaction with life (Jetten et al., 2009). High levels of identification can provide social psychological resources and a growing body of social cure literature provides evidence to suggest that a strong sense of belonging and support can promote individuals' mental health and wellbeing (Haslam et al., 2018). In one study, Coffman and Gilligan (2002) found that students who reported higher levels of social support and self-efficacy and lower levels of perceived stress also reported higher levels of life satisfaction, which are akin to the present findings. Therefore, it is important to consider the nature of the relationship and shared identity among individuals in order for social support to have a positive effect on life satisfaction. For example, applied interventions should look to promote a shared identity alongside social support-based interactions/exchanges to ensure greater benefits to life satisfaction.

Despite the current findings, the research is not without its limitations. First, given that the study is a cross-sectional atemporal design, we can make no inferences pertaining to cause and effect. Therefore, longitudinal research designs with multiple data collection points would be useful in future research. This would be particularly useful in exploring the directionality of the relationship between social support and social identity, as well as how these social factors may mediate/moderate the relationships between the resource appraisals to determine challenge and threat and other outcome variables (i.e., perceived stress, life satisfaction). Second, the use of self-report measures can result in response biases (i.e., social desirability) and there are issues when trying to capture cognitive appraisals through self-report, given that these often occur at an unconscious and automatic level (Blascovich & Mendes, 2000; Seery, 2011). Researchers could investigate emotional experience and challenge and threat using more objective psychophysiological markers (see Uphill et al., 2019) to better understand appraisals, emotions, and coping. Third, the current study explored relationships between the social factors and challenge and threat on stress and life satisfaction across a range of various groups. While we wanted to ensure individuals identify with a group which represented a motivated performance situation in order to measure the resource appraisals outlined in the TCTSA (Jones et al., 2009; Meijen et al., 2020), we did not capture multiple group membership (identification) which could relate to perceived stress and life satisfaction. For example, researchers have shown that it is those groups that are perceived to be important and supportive which are most beneficial to life satisfaction and wellbeing, rather than simply the total number of group memberships (Bentley et al., 2020; Jetten et al., 2017). Therefore, researchers could look to measure identification to multiple groups related to motivated performance situations to examine the associations to perceived stress and life satisfaction. In addition, by focusing on the four groups in the current study, it perhaps overlooked some of the intricacies of the group context such as the individual's role within the group and specific group outcomes (i.e., performance). By exploring constructs associated

with the group specifically (e.g., satisfaction with university, workplace stress etc), it would allow for a more detailed analysis. Further, in the current findings, the group continued to be significantly associated with perceived stress when the other variables were included in analyses. However, it is not clear why this was the case across the four contextual groups we investigate, and thus in future studies, researchers may wish to examine this further. Therefore, by focusing solely on specific groups (i.e., team sport athletes), it would allow for a greater understanding and exploration into the nuances of the aforementioned relationships.

To conclude, the present study was one of the first to investigate the associations between social identification, social support, challenge and threat appraisals on both perceived stress, and life satisfaction. Adopting a cross-sectional design across a range of group contexts, we provide evidence for the resource appraisals outlined in the TCTSA-R being associated with both social support and social identification, along with perceived stress and life satisfaction. Researchers should look to examine these relationships between the social variables and perceived stress, utilising a more experimental methodology.

CONFLICT OF INTEREST STATEMENT

We have no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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