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The Effects of Social Identity and Perceived Autonomy Support on Health Behaviour Within the Theory of Planned Behaviour

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Abstract The present study employed constructs from self-determination theory, social-identity theory, and the theory of planned behaviour to examine the combined effects that social identity and perceived autonomy support exerted on attitudes, intentions and health behaviour. A prospective design was employed measuring constructs from the theory of planned behaviour, group norms, group identification, and perceived autonomy support at baseline and physical activity behaviour 5 weeks later. Self-report questionnaires were administered to 231 pupils (male=113, female=118, *M*=14.21 years, *SD*=.90). Hierarchical regression analysis demonstrated that group norms predicted participation in physical activities and attitudes, but only for participants who identified strongly with their group. Perceived autonomy support predicted attitudes, intentions and behaviour. The effects of perceived autonomy support and social-identity constructs were independent. It was concluded that both social identity and perceived autonomy support should be included in the theory of planned behaviour.

Keywords Self-determination theory · Social-identity theory · Theory of planned behaviour · Leisure-time physical activity

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Health professionals' ability to effectively communicate health messages to young people has become an important concern in recent years (Stice et al. 2007). A general consensus is that influencing young people's behaviour is a notoriously difficult task, and health professionals are not always successful in promoting health behaviour (Hagger and Chatzisarantis 2005). Thus, there is still a need for theoretically-guided research that furthers the understanding of the nature of adherence to health behaviours among young people (Stice et al. 2007).

The Theory of Planned Behaviour

The theory of planned behaviour has been one of the most influential models of intentional behaviour in social psychology and has been widely applied to the prediction and understanding of health behaviour (Ajzen 1991). The theory of planned behaviour is a theory of rationale decision-making describing what and how information is processed during deliberative decision making. The theory proposes that behaviour can be best predicted from intention, which is an indicator of how hard people are willing to try and how much effort people plan to exert towards performance of future behaviour (Ajzen 1991).

The theory also suggests that intention is based on consideration of three variables: attitudes (positive or negative evaluation of performing future behaviour), subjective norms (perceived influences that significant others may exert on the execution of future behaviour), and perceived behavioural control (the extent to which people believe that they can control performance of future behaviour). Thus far a number of meta-analytic reviews and experimental have shown that attitudes and perceived behavioural control explain a substantial portion of variance in intentions (Armitage and Conner 2001; Chatzisarantis and Hagger 2005; Hagger et al. 2002; Webb and Sheeran 2006). Intentions have also shown to predict health behavior (Armitage and Conner 2001; Hagger et al. 2002). Notwithstanding this corroborating evidence, meta-analytic reviews have shown that the effect of subjective norms on intentions is relatively small and often non-significant (Armitage and Conner 2001).

Social Identity and the Theory of Planned Behaviour

Some researchers have argued that the lack of predictive validity for subjective norms in the theory of planned behaviour is due to its operational definition which covers interpersonal influences from significant figures (i.e., parental influence) and not group influences (i.e., peer influence; Armitage and Conner 2001; Hagger et al. 2002; Hagger and Chatzisarantis 2006). Like interpersonal influences, group influences do affect intentions and behaviour, but in a different way. For example, social identity theory and self-categorization theory suggest that people often identify with a group (e.g., peers in school) and consequently define themselves in terms of a salient social category or a group (Tajfel and Turner 1986; Turner 1985). When this is the case, people tend to (1) accentuate similarities between in-group members, and differences between in-group and out-group members and (2) favour the beliefs, attitudes, and behaviours of the in-group members over the out-group

members (Tajfel and Turner 1986). Thus, social identity theory predicts that people who identify strongly with a group, and consequently develop a social identity by embedding their personal identity within a particular group, will tend to adopt the norms (i.e. accepted goals, attitudes, intentions, and behaviour) sanctioned by group members because to do so serves to validate the status of oneself as a group member (Turner 1985).

To date, a number of studies have utilized the constructs of group norms and group identification to examine group influences within the theory of planned behaviour (Terry Hogg 1996; Terry et al. 1999). In general, group norms indicate the attitudes and behaviours of a behaviourally-relevant group that are deemed normative and acceptable by in-group members. Group identification indicates the strength with which an individual identifies with a behaviourally relevant group. So far, research has supported an interaction between group norms and group identification such that the perceived behaviours and attitudes sanctioned and endorsed by a group (group norms) influences the attitudes, intentions, and behaviours displayed by an individual only to the extent that the individual identifies strongly with the group (Christian and Abrams 2003; Johnston and White 2003). When individuals do not identify with a group (i.e. when strength of identification is low), group processes become less potent determinants of behaviour, and personal variables such as attitudes and intentions become more influential of future action (Terry and Hogg 1996; Terry et al. 1999).

Perceived Autonomy Support and the Theory of Planned Behaviour

Another reason explaining the small predictive validity of subjective norms is that it only captures *pressuring forms* of social influence. This is evident in the operational definition of subjective norms which indicates the extent to which individuals perceive that significant others pressure them to adopt health behaviour (Ajzen 1991). Traditionally, however, research in social psychology suggests that perceived social pressure impedes rather than enhances motivation (Brehm 1966; Festinger and Carlsmith 1959; Deci and Ryan 1985). For example, Festinger and Carlsmith's (1959) cognitive dissonance theory predicts that when social pressure surpasses a critical threshold then it has deleterious effects on intentions and attitudes. Therefore, subjective norms may not predict intentions because social pressure captured by this construct does not always facilitate intentions.

In an attempt to account for non-pressuring forms of social influence, Chatzisarantis et al. (2007) utilized tenets of self-determination theory and proposed incorporation of perceived autonomy support within the theory of planned behaviour. In general, self-determination theory differentiates between two types of interpersonal contexts (Deci and Ryan 1985; Deci et al. 1994; Ryan and Deci 2000). A context is said to be autonomy supportive when significant others (1) encourage *choice* and participation in decision-making, (2) provide *rationale* and explain, in a meaningful way, why performance of health behaviour is important. (3) minimize pressure by *acknowledging* difficulties inherent to the process of behavioural change and (4) use non-pressuring language in communicating information (e.g., use modal operators such as may, could etc.). In contrast, the interpersonal context is said to be

controlling when significant others pressure people to act in specified ways by using pressuring language during interpersonal communication (e.g., using modal operators such as "should" and "must"), and also when significant others do not provide choice or rationale (Deci et al. 1994).

According to self-determination theory, autonomy support from significant others can influence attitudes, intentions, and behaviour of individuals by satisfying psychological needs for self-determination (need to experience oneself as the initiator and regulator of one's actions), competence (need to produce outcomes and understand the instrumentalities leading to these outcomes), and/or relatedness (need to experience satisfactory and meaningful relationships with others) (Deci and Ryan 1985). Satisfaction of psychological needs can exert pervasive effects on behaviour in a number of ways such as by increasing likening of the source of social influence (significant others) and/or by preventing psychological reactance and rejection of social influence (Brehm 1966; Chaiken 1980; Deci et al. 2006).

Although previous studies have not investigated the more specific cognitive processes by which psychological needs influence attitudes and intentions, a clear conclusion to emerge from previous research is that perceived autonomy support enhances psychological well-being, and also influences motivation and performance of health behaviours (Williams et al. 2002). Most relevant, in a series of prospective and experimental studies, Chatzisarantis et al. (2007) documented that while autonomy support influenced intentions indirectly via attitudes, less autonomy-supportive and more controlling interpersonal contexts influenced intentions directly. Interestingly, the effects of autonomy support on intentions were found to be robust and independent of a number of other constructs such as descriptive norms, subjective norms, social support, and past behaviour. These results therefore corroborate utility of the construct of perceived autonomy support in modeling social influence within the theory of planned behaviour. However, it is important to note that there are no previous studies estimating the combined effects of perceived autonomy support and social identity within the theory of behaviour. The purpose of the present study is to fill this gap in the literature.

The Present Study and Hypotheses

The present study utilises constructs from social-identity theory and self-determination theory to provide a more accurate estimation of social influence within the theory of planned behaviour. This investigation will advance theory and knowledge of the social psychological predictors of health-related behaviour for a number of reasons. First, incorporation of perceived autonomy support and social identity in the theory of planned behaviour can enhance predictive validity of the theory and provide a more accurate picture of the importance of social influence in the formulation of intentions.

Second, pitting predictive validity of perceived autonomy support against predictive validity of subjective norms and social-identity allow us to examine when influences from significant others affect group influences. That is based on tenets of self-determination theory, it can be proposed that autonomy support from significant others will influence the attitudes, intentions and behaviour of individuals regardless of whether individuals identify with a group (Ryan and Deci 2000). The

reason for this is that autonomy support is likely to enhance liking of out-group members by satisfying the psychological needs of self-determination, competence and, particularly, relatedness (Deci et al. 2006). In fact, in a recent experimental study, Rentzelas and Hagger (2007) showed that group members were more likely to adopt the behaviours and norms sanctioned by a significant other who was autonomy-supportive than from a significant other who was not. By this reasoning, influences from perceived autonomy support on intentions, behaviour, and attitudes will not depend on group identification. Rather the effects of perceived autonomy support and social identity will be independent. That is, perceived autonomy support from a significant other will predict intentions and attitudes of in-group members regardless of levels of group identification and group norms (H_1). The present study tests this hypothesis in the context of leisure-time physical activity in a sample of young people.

Method

Research Participants and Procedure

Participants comprised 231 pupils with an age range of 13 to 16 years (male=113, female=118, M=14.21 years, SD=.90). They were recruited from two co-educational high schools in Great Britain. School statistics from the previous year indicated that the majority of the pupils in each school were of white European ethnicity, with less than 10% from other ethnic minority groups. Data from the National Office for Standards in Education indicated that the school pupils were generally from a background that matched the socio-economic distribution of UK schools based on an income means test used to determine whether the young person was eligible for free school meals. Participants took approximately 15 min to complete the questionnaires in small groups of fewer than 30 individuals.

A prospective design was employed with psychological variables being assessed at two points in time. In the first wave of data collection, variables specified by the theory of planned behaviour, group norms, group identification, and perceived autonomy support were assessed. After 5 weeks, participation in physical activities during leisure-time was measured. We used a 5-week period to separate initial measures from the assessment of behaviour because, according to Kline (1993), a 5-week interval reduces memory effects and hence the likelihood for people reporting their intentions when responding to queries of physical activity behaviour.

The target behavior was vigorous physical activity (e.g., engaging in active sports and/or vigorous physical activities, for at least 30 minutes, 3 days/week, during leisure-time, over the next 5 weeks). We did not target mild and moderate physical activity because the targeting of all types of physical exercise would require aggregate measures that assess psychological constructs in the context of mild, moderate, and vigorous physical activity (Ajzen, 1991). Measures that aggregate all forms of physical activity might have been difficult for young people to understand and respond to because they are abstract in nature. Prospective responses were matched with baseline responses using dates of birth and sex as matching indexes. Prior to data collection, we obtained informed consent from the head teachers of the schools and parents.

Measures

Group norms of peers and group identification We decided to assess influences from peers because previous research has shown that peers constitute a salient source of group influence among young people (Hagger et al. 2003). Perceived norms of peers and peer identification were measured through three items each. Peer norms assessed pupils' perceptions of the behaviour and attitudes of friends and peers in schools for engaging in leisure-time physical activities (Johnston and White 2003; Terry and Hogg 1996). An example item was: "How many of your friends and peers at school would think that doing active sports and/or vigorous physical activities, for at least 30 min, 3 days/week, during your leisure-time, over the next 5 weeks is a good thing to do?" measured on a seven-point scale ranging from (one) *none* to (seven) *all*. Group identification assessed strength of identification with peers and feelings of belongingness to a peer group. An example item was: "How much do you see yourself belonging to your group of friends and peers at school?" This item was measured on a seven-point scale ranging from (one) *not very much* to (seven) *very much* (Johnston and White 2003; Terry et al. 1999).

Perceived autonomy support We assessed perceived autonomy support from teachers because previous research showed that teachers (1) influence young people's intentions to exercise and (2) represent an out-group influence for young people in schools settings (Hagger et al. 2003). Perceived autonomy support was operationally defined as participants' perceptions about whether teachers provided choice and rationale about leisure-time physical activity as well as acknowledged personal perspectives and conveyed confidence in personal ability to exercise. The perceived autonomy support scale comprised six items, and it was adapted from the perceived autonomy support scale for exercise settings (PASSES; Hagger et al. 2007). The items yielded a score on a seven-point Likert scale anchored by "strongly disagree" (one) and "strongly agree" (seven). An example was: "I feel that my physical education teacher provides me choices and options about whether or not I will engage in active sports and/or vigorous physical activities, for at least 30 min, 3 days/week, during my leisure-time, over the next 5 weeks."

The theory of planned behaviour Development of a theory of planned behaviour questionnaire followed the procedures recommended by Ajzen (1991). Three items were used to measure behavioural intentions. An example item was: "I intend to do active sports and/or vigorous physical activities, for at least 30 min, 3 days/week, during my leisure-time, over the next 5 weeks," anchored by "strongly agree" (seven) to "strongly disagree" (one). Subjective norms were measured through five items, and on a seven-point scale ranging from "strongly disagree" (one) to "strongly agree" (seven). Two items measured injunctive norms and three items measured descriptive norms. An example of an injunctive norm item was: "Others who are important to me pressure me to do active sports and/or vigorous physical activities for at least 30 min, 3 days/week, during my leisure-time, over the next 5 weeks." An example of a descriptive norms item was: "Others who are important to me will do active sports and/or vigorous physical activities for at least 30 min, 3 days/week, during my leisure-time, over the next 5 weeks."

Attitudes were assessed through five bipolar adjectives. Two adjectives reflected instrumental evaluations (useful/useless, beneficial/harmful) and three adjectives reflected affective evaluations (bad/good, unenjoyable/enjoyable, interesting/boring). All adjectives were measured on seven-point semantic differential scales (Ajzen 1991). An example was: "For me, doing active sports and/or vigorous physical activities for at least 30 min, 3 days/week, during my leisure-time, over the next 5 weeks is…." Perceived behavioural control was assessed, through three items, on seven-point scales ranging from (one) "no control at all" to (seven) "complete control"(Ajzen 1991). An example was: "I feel in complete control over whether I exercise for at least 30 min, 3 days/week, during my leisure-time, over the next 5 weeks".

Self-report physical activity (Leisure-time) An adaptation of Godin and Shephard's (1985) Leisure-Time Exercise Questionnaire was used to assess leisure-time physical activity. Independent evaluations of the Leisure-Time Exercise Questionnaire found it to be valid, reliable, easy to administer, and to display concurrent validity with objective activities and fitness indexes (Jacobs et al. 1993). The instrument contained three open-ended questions capturing the frequency of mild, moderate, and vigorous physical activity. Because the present study targeted vigorous physical activity only, participants were asked to report the frequency with which they engaged in active sports and/or vigorous physical activities, for at least 30 min, during leisure-time over the past 5 weeks.

Data Analytic Strategies

We used a series of hierarchical regression analysis to examine initial hypotheses because this is the analysis favored by proponents of the theory of planned behaviour (Ajzen 1991). Overall, we performed three sets of hierarchical regression analyses with physical activity behaviour, intentions, and attitudes as dependent variables in each respective set. Because effects of social identity imply an interaction between group norms and group identification we represented social identity effects through the group norms × group identification product term. In accordance with Aiken and West's (1992) recommendations, we utilized standard scores to calculate product terms and main effects. In addition, effects of the product term (peer norms by peer identification) on dependent variables were estimated after controlling for the main effects of independent variables.

Results

Descriptive Statistics, Correlations and Reliability Analysis

Table 1 presents descriptive statistics, correlations, and reliability information (alpha coefficients) of all psychological variables. As shown, internal consistency reliability (alpha coefficients) of variables were greater than .64. Pearson's correlation coefficients pointed out that physical activity was positively associated with

Table 1 Descriptive statistics, correlations and alpha coefficients of psychological constructs

	M	SD	α	1	2	3	4	5	6	7	8	9
Physical activity	3.59	1.44		1.0								
Intentions	5.06	1.24	.91	.45*	1.0							
Perceived control	4.76	.71	.79	.50*	.43*	1.0						
Attitudes	4.98	.67	.85	.36*	.61*	.42*	1.0					
Injunctive norms	4.02	.79	.64	.33*	.27*	.32*	.23*	1.0				
Descriptive norms	3.22	1.16	.85	.44*	.21*	.29*	.16*	.18*	1.0			
Teacher perceived autonomy support	4.91	.98	.85	.33*	.59*	.36*	.50*	.40*	.28*	1.0		
Peer norms	4.79	1.33	.73	.36*	.33*	.48*	.39*	.26*	.33*	.48*	1.0	
Peer identification	5.49	1.46	.85	.32*	.35*	.43*	.41*	.08	.11	.48*	.58*	1.0

Correlations with an asterisk are statistically significant at .05 alpha level

intentions, perceived behavioural control, perceived autonomy support, group norms, and group identification. Physical activity intentions were also positively associated with attitudes, injunctive norms, descriptive norms, and perceptions of control. Finally, perceived autonomy support, group norms, and group identification were all positively associated with intentions.

Prediction of Physical Activity Behaviour

The first step of the hierarchical regression analysis that predicted physical activity behaviour revealed that intentions and perceptions of control contributed to the prediction of physical activity participation ($F(2)=45.15$, $p<.05$; see Table 2). The second step of the analysis showed descriptive norms to predict physical activity participation over and above the contribution made by intentions and perceptions of control ($\Delta F(3)=12.47$, $p<.05$). However, attitudes and injunctive norms did not predict physical activity participation because the beta coefficients (βs) for those variables were not statistically significant. In the third step, results revealed that while the combined effect of group identification and group norms on physical activity behaviour was not statistically significant ($\Delta F(2)=2.19$, $p>.05$), group identification exerted a statistically significant unique effect on physical activity behaviour ($\beta=.14$, $p<.05$).

The fourth and fifth step of the regression analysis corroborated effects of perceived autonomy support ($\Delta F(1)=4.20$, $p<.05$) and of groups norms × group identification interaction ($\Delta F(1)=4.67$, $p>.05$) on physical activity behaviour respectively (see Table 2). Importantly, the effects observed for group norms × group identification could not be attributed to unnecessary collinearity because the correlations between the product term of peer norms × peer identification with peer norms and peer identification were below .50 (Tabachnick and Fidell 1989). Consistent with social-identity theory (Tajfel and Turner 1986), simple slope analysis revealed that while there was a positive effect of peer norms on physical activity behaviour for pupils who identified strongly with their peer group in schools ($\beta=.18$, $p<.05$), this was not necessarily the case for pupils who did not identify with their peer group in schools ($\beta=-.36$, $p<.05$). The effect of peer norms on physical activity was negative among low identifiers.

Table 2 Prediction of physical activity behavior

Model		R^2	R^2_{adj}	β	t
1	Intentions	.31*	.30*	.28	4.41*
	Perceived control			.38	5.88*
2	Intentions	.42*	.41*	.22	3.07*
	Perceived control			.23	3.34*
	Attitude			.04	.50
	Injunctive norms			.11	1.80
	Descriptive norms			.34	5.70*
3	Intentions	.43	.41	.22	2.97*
	Perceived control			.20	2.93*
	Attitude			.00	−.00
	Injunctive norms			.12	2.03*
	Descriptive norms			.34	5.59*
	Peer norms			.03	−.47
	Peer identification			.14	2.04*
4	Intentions	.45*	.42*	.27	3.50*
	Perceived control			.18	2.58*
	Attitude			.03	.39
	Injunctive norms			.16	2.57*
	Descriptive norms			.36	5.85*
	Peer norms			−.02	−.32
	Peer identification			.19	2.61*
	Perceived autonomy support			.16	2.05*
5	Intentions	.48*	.46*	.27	3.65*
	Perceived control			.22	3.20*
	Attitude			−.03	−.43
	Injunctive norms			.18	2.94*
	Descriptive norms			.30	4.88*
	Peer norms			−.02	−.26
	Peer identification	.48*	.46*	.28	3.75*
	Perceived autonomy support			.16	2.02*
	Peer norms × peer identification			.22	3.69*

Parameters with an asterisk are statistically significant at .05 alpha level; the adjusted multiple correlation is denoted as R^2_{adj}

Prediction of Physical Activity Intention

The hierarchical regression analysis predicting intentions revealed that attitudes and perceptions of control contributed to the prediction of physical activity intentions ($F(3)=38.41$, $p<.05$). Injunctive norms and descriptive norms did not predict intentions (see Table 3). The second step of the analysis did not support effects of group identification and of group norms on intentions ($\Delta F(2)=1.03$, $p>.05$). In accordance with previous research, the third step of the analysis supported direct effects of perceived autonomy support on intentions ($\Delta F(1)=31.08$, $p<.05$). However, the fourth step of analysis did not corroborate any two-way interaction between group norms and group identification ($\Delta F(1)=.02$, $p>.05$). Most relevant, in accordance with hypothesis one, results corroborated a unique effect of perceived autonomy support on intentions given that the beta coefficient of perceived autonomy support was statistically significant after controlling for group norms and group identification in the fifth step of analysis. To summarize, results from the

Table 3 Prediction of physical activity intentions

Model		R^2	R^2_{adj}	β	t
1	Attitude	.42*	.41*	.53	9.02
	Injunctive norms			.09	1.67
	Descriptive norms			.05	.84
	Perceived control			.14	2.30*
2	Attitude	.43	.41	.50	8.14
	Injunctive norms			.10	1.70*
	Descriptive norms			.04	.65*
	Perceived control			.12	1.74
	Peer norms			.04	.52*
	Peer identification			.07	1.00*
3	Attitude	.50*	.49*	.39	6.35
	Injunctive norms			.00	.05
	Descriptive norms			−.00	−.08
	Perceived control			.15	3.34
	Peer norms			.02	.24
	Peer identification			−.05	−.76
	Perceived autonomy support			.36	5.58
4	Attitude	.50	.49	.39	.25
	Injunctive norms			.00	6.21*
	Descriptive norms			−.00	.04
	Perceived control			.14	2.29*
	Peer norms			.02	.23
	Peer identification			−.05	−.76
	Perceived autonomy support			.36	5.56*
	Peer norms × peer identification			−.00	−.15

Parameters with an asterisk are statistically significant at .05 alpha level; the adjusted multiple correlation is denoted as R^2_{adj}.

regression analyses predicting behaviour and intentions indicated that group norms interacted with group identification in predicting physical activity behaviour but not intentions. In addition, perceived autonomy support predicted intentions and behavior.

Prediction of Physical Activity Attitudes

The first step of the hierarchical regression analysis that predicted attitudes revealed that group identification and group norms contributed to the prediction of attitudes ($F(2)=29.09$, $p<.05$). The second step of the analysis also supported effects of perceived autonomy support on attitudes ($\Delta F(1)=28.04$, $p<.05$). The third step of the analysis revealed significant effects for the group norm by group identification interaction ($\Delta F(1)=6.71$, $p<.05$). In addition, the effects of group norms by group identification interaction ($\beta=.16$, $p<.05$) and perceived autonomy support ($\beta=.35$, $p<.05$) on attitudes were independent because the beta coefficients of these variables were statistically significant in the third step of analysis (see Table 4). Probing of the interaction indicated that while peer norms predicted attitudes for pupils who identified with their peer group ($\beta=.43$, $p<.05$), this was not necessarily the case for pupils who did not identify with their peer group ($\beta=-.07$, $p>.05$). Most relevant, in accordance with hypothesis one, the regression analysis corroborated a unique effect

Table 4 Prediction of attitudes

Model		R^2	R^2_{adj}	β	t
1	Peer norms	.21	.20	.24	3.31*
	Peer identification			.27	3.73*
2	Peer norms	.30	.29	.15	2.11*
	Peer identification			.14	1.97*
	Perceived autonomy support			.36	5.30*
3	Peer norms	.32	.31	.15	2.06*
	Peer identification			.22	2.79*
	Perceived autonomy support			.35	5.24*
	Peer norms x peer identification			.16	2.59*

Parameters with an asterisk are statistically significant at .05 alpha level; the adjusted multiple correlation is denoted as R^2_{adj}

of perceived autonomy support on attitudes because the beta coefficient of autonomy support was statistically significant after controlling for group norms and group identification in the fourth step of analysis.

Discussion

The present study examined the influences of social-identity and perceived autonomy support on attitudes, intentions, and behaviour within the theory of planned behaviour. In accordance with social-identity theory and previous research (Tajfel and Turner 1986; Terry and Hogg 1996), the hierarchical regression analysis showed that group norms influenced the physical activity attitudes and behaviour of young people only to the extent that young people identified strongly with the group. When young people did not identify strongly with the group, the behaviour and attitudes encouraged by the group did not influence physical activity attitudes and behaviour (see also Christian and Abrams 2003; Johnston and White 2003; Terry et al. 1999). These results are consistent with tenets of social identity theory and suggest that when individuals identify strongly with a group they tend to favour beliefs and attitudes of the in-group members (Tajfel and Turner 1986).

Although group norms interacted with group identification in predicting physical activity behaviour, the interaction of group norms and group identification did not predict intentions. This finding is less consistent with previous research that has predominantly showed group norms to influence intentions and not behaviour (i.e., Terry and Hogg 1996; Terry et al. 1999). However, the direct interactive effects of group norms and group identification on behaviour are consistent with the tenets social-identity theory. According to Tajfel and Turner (1986), when people identify with a group, they tend to favor behaviours sanctioned by the group over personal and idiosyncratic characteristics such as intentions, thus allowing personal plans to be usurped by automatically-suggested group processes associated with environmental conditions. In contrast, when group norms are not a salient basis for self-conception, performance of behaviour is expected to depend more on personal characteristics and intentions and less on group processes (Terry and Hogg 1996). By this reasoning, the direct effects of social-identity (group norms × group

identification) on behaviour may reflect utility of group norms in influencing physical activity behaviour through automatic pathways and not through deliberative processes under conditions of high identification.

Turning now into the main hypotheses of the present study, it is evident that results of the regression analysis support the notion that the effects of social identity and perceived autonomy support on intentions, attitudes and behavior to be independent. In particular, consistent with previous research (Chatzisarantis et al. 2007), the hierarchical regression analysis showed that perceived autonomy support predicted attitudes, intentions and behaviour. The direct effects of perceived autonomy support on intentions compare favorably with Chatzisarantis et al. (2007) findings that showed that significant others had an impact on young people's intentions to exercise during leisure-time independent from the effects that attitudes, perceived behavioural control, descriptive norms, and injunctive norms exerted on intentions. This direct effect also supports the argument that teachers who support young people's autonomy can facilitate strong intentions to exercise in a leisure-time context even when young people have unfavorable attitudes, and incomplete control with regards to leisure-time physical activity.

The effect of perceived autonomy support on attitudes and behaviour also compares favourably with previous research that showed that significant others act as a source of information for the formation of situation-specific attitudes and for the motivation of behaviour (Hagger et al. 2003). Most critical, in accordance with hypothesis one, results from the hierarchical regression analysis showed that the effects of perceived autonomy support on intentions, behavior and attitudes did not depend on social identity. That is, no matter how strongly young people identify with their peer group and per norms, significant others such as teachers will influence young people's behavior, attitudes and intentions to the extent that significant others' style of communication is perceived to be autonomy supportive.

The effect observed for perceived autonomy also suggests ways through which socializing agents such as teachers can influence group behavior. That is, often significant others find it difficult to influence young people's behaviour because the influences from peers are very strong especially among young people who identify strongly with their peers. Results of the present study suggest that significant others stand greater chance in influencing group norms and behavior when they communicate their request in an autonomy supportive than controlling ways.

Finally, it is important to highlight some limitations of the present study which can guide future research. First, the present study has not examined the process by which perceived autonomy support influences attitudes and intentions within the theory of planned behaviour. Our prediction is that autonomy support and need satisfaction facilitate comprehension and yielding of social messages by enhancing likening of the source of social influence (Chaiken 1980; Deci et al. 2006). Second, the present study, like most of the previous studies investigating effects of perceived autonomy support within the theory of planned behaviour, have been prospective. Although there is evidence that experimentally-induced autonomy support influences intentions via attitudes (Chatzisarantis et al. 2007), we believe that it is important to investigate through experimental studies the processes by which combinations of perceived autonomy support, group identification, and group norms influence attitudes and intentions.

Summary

In conclusion, the present study demonstrates that perceived autonomy support exerts unique effects on attitudes and intentions. Findings also support the notion that social identity exerts unique effects on attitudes and health behaviour. Most important, the present study extends current knowledge by demonstrating that young people are likely to take into consideration influences from significant others who are autonomy supportive regardless of whether young people identify strongly with their peer group. The implications of these findings is that socialising agents may need to be more autonomy supportive in their attempts to promote health behaviours if they are to affect the influences that group norms exert on young people.

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