

## **The identification of salient beliefs concerning university students' decision to participate in sport**

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20

## 21 Abstract

22

23 The aim of this study was to identify salient beliefs towards university provided recreational  
24 sport in first year undergraduate students. A purposive sample of 76 students (36 males, 40  
25 females; mean age:  $19.2 \pm 1.7$  years) undertaking various degree subjects at a higher  
26 education institution in the North of England, UK, was used in the study. The instrument was  
27 a theory-based open-ended questionnaire informed by the Theory of Planned Behavior  
28 addressing behavioral, normative and control beliefs. Thematic content analysis and coding  
29 was conducted on 30 randomly selected questionnaires followed by a frequency count to  
30 identify the modal salient beliefs. The modal set revealed 17 beliefs from a possible 53; six  
31 behavioral, five normative, and six control. These beliefs were related to health benefits,  
32 enjoyment, friendships, time constraints, study workloads, awareness, and the perception of  
33 family, friends, and academics. The results highlight the factors that should be targeted for  
34 intervention and provide data to be utilized for a second main quantitative study which will  
35 identify more specific belief targets. Due to equivocal intervention success, this formative  
36 research can serve to help increase the number of students participating in university  
37 recreational sport.

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44 *Keywords:* Theory of Planned Behavior, recreational sports, physical activity, intervention

45           With a decline in various health related behaviors often seen in late adolescence,  
46 higher education settings provide great opportunities to target improvements (Hensley, 2000;  
47 Kwan, Bray, & Martin Ginis, 2009; Leslie, Sparling & Owen, 2001). The provision of sport  
48 and recreation activities has demonstrated numerous benefits within academia including an  
49 increase in success rates (Huesman, Brown, Lee, Kellogg, & Radcliffe, 2009) and a reduction  
50 in stress (Kanters, 2000). Furthermore, the greater sense of campus community promoted  
51 through such activities (Elkins, Forrester, & Noël-Elkins, 2011) can contribute to the  
52 improvement of retention rates (Kampf & Teske, 2013). Scott and Willits (1998) also found  
53 that the performance of various leisure activities, including sport, continued to be performed  
54 in adulthood when done so during adolescence.

55           Despite these benefits, participation in sport usually decreases when students begin  
56 university (Gucciardi & Jackson, 2015). Similar results have been found in physical activity  
57 (PA) (Bray & Born, 2004; Romaguera et al., 2011). Bray and Born (2004) found a 22%  
58 decrease in the numbers who performed PA prior to university compared to the first two  
59 months of life in higher education (66% were active prior compared to the 44% during).  
60 Although sport and PA may share similarities, there are differences between the two. Sport  
61 includes some amount of physical exertion, but it also includes organized conditions and  
62 rules (Coakley, 2009). As such, this paper uses sport to refer to those organized activities  
63 provided by the university.

64           Another important distinction concerns the nature of sport offered in higher education.  
65 In the UK, higher institutions offer both organized formal competitions and recreational  
66 activities. Regarding the former, British Universities and Colleges Sport (BUCS) provide  
67 institutions with the opportunity to compete with one another in a variety of sports. However,  
68 similar to the interscholastic model used in the United States, this approach limits the number  
69 of students that can participate (Kanters, Bocarro, Edwards, Casper, & Floyd, 2013). As less

70 *sporty* students may be put off participating or may withdraw due to its competitive nature  
71 (Wechsler, Devereaux, Davis, & Collins, 2000; Weiss & Ferrer-Caja, 2002), ensuring that  
72 participation is not based around athletic ability is important (Barnett, Morgan, van Beurden,  
73 Ball, & Lubans, 2011). As an alternative, UK institutions also offer additional informal and  
74 intramural activities promoted using a noncompetitive process, lack of membership  
75 subscriptions, and flexible timetabling. Despite catering to include all students (Tsigilis,  
76 Masmanidids, & Koustelios, 2009), a limited number of students participating in these  
77 recreational sporting activities has been found (Sport England, 2012).

78         Upon recognizing the important role institutions have in developing and maintaining  
79 interest in sporting activities, Sport England committed itself to involving over 75% of  
80 university students in sport as part of the 2012-2017 Sport England Youth and Community  
81 Strategy (Sport England, 2012). Specifically, the organization has recently made considerable  
82 investments into two large projects with the aim of establishing a sporting habit for life by  
83 attracting school and college leavers to participate in sport at least once a week for thirty  
84 minutes. The Active Universities showed a 2% increase in participation across three years,  
85 with the majority of change seen during the first year (2011-2012). As such, during the  
86 remaining two years there was no increase in sporting participation (Sport England, 2014).  
87 Similar modest gains have been observed in the Sport Activation Fund to date. These limited  
88 affects could be explained by the neglect of psychological behavior change theory in the  
89 development of the interventions, especially as interventions underpinned by theory have  
90 been shown to demonstrate effectiveness above atheoretical approaches (Taylor, Conner, &  
91 Lawton, 2012). From the plethora of behavior change theories available, one of the most  
92 cited, utilized and critiqued is the Theory of Planned Behavior (TPB; Ajzen, 1985).

93         According to the TPB, an individual's intention is the proximal determinant of their  
94 behavior and represents a person's motivation of their conscience plan or decision to exert

95 effort to perform the behavior (Fishbein & Ajzen, 1980). Intention is determined by three  
96 factors, namely attitude, subjective norm, and perceived behavioral control. The attitude  
97 component refers to the individual's perception toward the behavior, whether it be favorable  
98 or unfavorable (Fishbein & Ajzen, 2009). Subjective norm concerns perceptions of social  
99 pressure from significant others to perform the behavior (Ajzen & Fishbein, 1980). Perceived  
100 behavioral control relates to the perceptions of the ease and difficulty of actually performing  
101 the behavior. Just as intentions are held to have determinants, attitude, subjective norm, and  
102 perceived behavioral control are also held to have determinants in the form of beliefs. As  
103 individuals hold a large number of beliefs relevant to a specific behavior and can only attend  
104 to a relatively small number at any given time (Miller, 1956), the TPB postulates that it is  
105 these salient behavioral, normative and control beliefs that govern behavior (Ajzen, 2002).  
106 Behavioral beliefs are the perceived consequences of engaging in behavior, and people's  
107 evaluation of these consequences (Ajzen & Fishbein, 1980). Normative beliefs are the  
108 perceived expectations of important referents such as family members, friends, and doctors,  
109 and by a person's motivation to comply with the wishes of these important others (Ajzen,  
110 1985). Finally, control beliefs are people's evaluation about the presence of factors that may  
111 facilitate or impede performance of the behavior (Ajzen & Madden, 1986).

112           One of the most important recommendations of the TPB is that belief elicitation must  
113 be conducted, which highlights beliefs important for change and identifies suitable  
114 intervention belief-based targets (Ajzen, 2002). As beliefs vary from population to population  
115 (Fishbein & Manfredo, 1992), elicitation should be conducted specific to each behavior. To  
116 define behavior precisely, Ajzen (1988) asserts that the *target*, *time*, *action* and *context* must  
117 be taken into consideration (TACT). Although this process is arbitrary, the purpose of this  
118 strict procedure is a consequence of a change in one of these elements will redefine the  
119 behavior. Although it is more effective to elicit individual beliefs and deliver tailored

120 interventions, it is more practical to gain the beliefs held most commonly amongst the  
121 population through the identification of the modal set. The elicitation study is then followed  
122 by a main quantitative study which highlights those specific beliefs to target. Elicitation  
123 studies are conducted using open-ended questions within a questionnaire, focus groups, or  
124 interviews (Ajzen & Fishbein, 1980), with questionnaires more commonly used due to the  
125 time taken to transcribe and identify key themes. There is no definitive sample size (Epton et  
126 al., 2015), with ranges varying considerably (Downs & Hausenblas, 2005a). Despite this, a  
127 small convenience sample within the target population is appropriate as long as a  
128 comprehensive range of salient beliefs are captured (Francis et al., 2004). Saturation  
129 techniques are employed whereby additional data yields little further information (Ajzen &  
130 Fishbein, 1980).

131         As the modal set is not based on idiosyncratic beliefs (Ajzen, 1991) and may therefore  
132 include beliefs not relevant to each participant (Francis et al., 2010), Sutton (2002) suggests  
133 there must be a trade-off between maximizing the number of the person's salient beliefs that  
134 fall in the modal set and minimizing the number of beliefs that aren't salient to the individual.  
135 Various methods have been used to conduct this. For example, Chatzisarantis and Hagger  
136 (2005) selected the three to five most salient beliefs whereas Ungar, Sieverding, Ulrich and  
137 Wiskemann (2015) and Rowe et al. (2016) included those beliefs that a minimum of three  
138 participants had identified. A widely used procedure has been the use of a percentage  
139 criterion whereby beliefs mentioned between 20-30% of the sample are identified as being  
140 modal (e.g., Epton et al., 2015; Spinks & Hamilton, 2015; Vayro & Hamilton, 2016).  
141 According to Vayro and Hamilton (2016), this number ensures that a wide range of  
142 underlying beliefs are included for the main study.

143         The theory has received a huge amount of attention with hundreds of cross-sectional  
144 studies attesting to the predictive validity of attitude, subjective norm, and perceived

145 behavioral control (Downs & Hausenblas, 2005b; Hagger, Chatzisarantis, & Biddle, 2002).  
146 Compared to the plethora of prediction studies, there has been a surprisingly small number  
147 undertaking the elicitation procedure (Fishbein & Middlestadt, 1995). Although prediction  
148 studies are useful, the information gained is insufficient for intervention development. For  
149 example, Gucciardi and Jackson (2015) found attitude and perceived behavioral control to  
150 explain intention to continue participation in sport. However, it is unclear as to the beliefs  
151 influencing these determinants and to therefore target. As a consequence, interventions are  
152 often created on intuition (Quine, Rutter, & Arnold, 2001) or by targeting beliefs that have  
153 been identified to be similar to their own target behavior (Curtis, Weiler, & Ham, 2010).  
154 However, guessing influential beliefs or utilizing beliefs from another study involving a  
155 different context may not represent the perceptions of those under investigation (de Leeuw,  
156 Valois, Ajzen & Schmidt, 2015). A meta-analysis by Webb, Joseph, Yardley and Michie  
157 (2010) examining online interventions to change various health behaviors found that although  
158 many were based on the TPB, none of them correctly conducted the elicitation process. The  
159 targeting of non-salient beliefs (Hardeman et al., 2002) could, perhaps, explain why  
160 interventions using the TPB have demonstrated limited effectiveness to date (Ajzen, 2015).

161         Despite the paucity of elicitation studies, a few studies have informed the  
162 development of PA interventions for undergraduate students (Cowie & Hamilton, 2014;  
163 Epton et al., 2015; Riecken, Mark, & Rhodes, 2013). For example, Epton et al. (2015) found  
164 that a behavioral, normative, and control belief concerned 'health', 'family', and 'time  
165 restrictions' respectively. Although studies concerning PA and sport may identify  
166 overlapping beliefs, participation in sport could be underpinned by different perceptions and  
167 would thus require alternative interventions. In line with Henderson's (2009, p. 64)  
168 suggestion that 'the motivators for sports participation are likely quite different than the  
169 motivators to exercise for most people', Kilpatrick, Hebert, and Bartholomew (2005) found



170 that exercise participation was influenced by perceptions of appearance whereas sport  
171 participation was governed by enjoyment factors. In a study more closely related to sport,  
172 Sniehotta (2009) conducted an experimental study to change elicited behavioral, normative,  
173 and control beliefs concerning the use of university sport and recreation services. Although  
174 the belief elicitation was not reported separately, some of the beliefs targeted during the  
175 interventions included 'health', 'family', 'time', and 'feelings of discomfort or  
176 embarrassment.' However, as this study concerned a wide range of sports available, including  
177 both competitive and recreational, as well as use of the gym facilities, different beliefs may  
178 be required for intervention design where gym facilities are not included. It could therefore,  
179 be more beneficial to conduct an elicitation study regarding recreational sport in isolation.

180 In summary, there has been a lack of elicitation studies conducted concerning  
181 participation in university sport, with the majority of studies focusing on PA. This subtle, yet  
182 important distinction could result in the identification of different beliefs, meaning alternative  
183 interventions would be necessary. Furthermore, those that have targeted sport have done so  
184 without distinguishing between the recreational and competitive sports offered which, again,  
185 fail to differentiate between different beliefs. As far as the authors are aware, no study has  
186 conducted elicitation with first year university students concerning participation in university  
187 provided recreational sports. Given the minimal success of interventions to date (Sport  
188 England, 2012) and the encouragement to use theory in the development of interventions  
189 (Michie, Johnston, Francis, Hardeman, & Eccles, 2008), it is important that such research is  
190 conducted concerning the behavior within this subpopulation.

191 Due to the lack of research in the UK examining participation in higher education  
192 sport, the purpose of the study was to conduct an elicitation study specifically aimed at  
193 highlighting the salient behavioral, normative, and control beliefs to participate in  
194 recreational sport provided by a university. This formative work is crucial as it identifies

195 potential targets for intervention and also informs a proceeding quantitative study which will  
196 highlight more specific beliefs to be altered during intervention.

## 197 **Method**

### 198 **Sample**

199 A sample of 80 students was selected at a small sized higher education institution in  
200 the North of England (36 males, 40 females; mean age =  $19.2 \pm 1.7$  years). The response rate  
201 was 76 with 4 non-attendees at class during the time the survey was administered.  
202 Participants from different programs of study were selected in order to generalize to the wider  
203 first year population. The number of participants recruited and their respective degree courses  
204 were as follows: Nutrition, Food and Health (n=20), Secondary Physical Education and  
205 Sports Coaching (n=20), Child and Family Welfare Studies (n=18), and English (n=18). First  
206 year students were selected due to the decline in activity that this demographic has previously  
207 shown (Kwan et al., 2009) and the various benefits that can be seen. The study was  
208 undertaken in the second semester to allow ethical clearance to occur.

### 209 **Procedure**

210 As the study aimed to generalize to the first year population, a purposive sampling  
211 technique was used to ensure the inclusion of different subject areas. Prior to data collection,  
212 ethical approval was gained from the University board in Semester 1 (September –  
213 December), hence the study was undertaken in Semester 2 (January – June). The researcher  
214 made prior contact with academic lecturers via email to establish participant availability and  
215 lecture times. As recruitment was seen as being potentially problematic, this strategy was  
216 seen to ensure a higher response rate. Once teaching times and locations were established, the  
217 researcher approached the participants in class, after lectures and tutorials had finished. The  
218 researcher gave a brief overview of the study purpose and their potential involvement in it.

219 Students who were happy to participate were asked to read the participant information sheet  
220 and sign the consent form. The participant information sheet explained the study in more  
221 detail and included a definition of the behavior. This definition was formed using the TACT  
222 principle, which was explained more within the detailed description of the instrument. To  
223 emphasize the importance of this principle, the definition was also stated verbally by the  
224 researcher prior to questionnaire initiation. Furthermore, to ensure that participants  
225 understood what was meant by 'participation in sport', similar to Sutton et al. (2003),  
226 examples of the behavior were given by the researcher. For example, the researcher provided  
227 examples of university recreational sports such as 'tennis' and 'squash' that were explained  
228 to be part of the university recreational sports offered outside of the BUCS competitive sport  
229 leagues at this university. It was also explained that university sport concerned the sports that  
230 the university provided both on and off campus and was not targeting those offered by  
231 governing bodies (i.e., BUCS), nor did it relate to elite sports participation. This was due to  
232 the difference between competitive and non-competitive sport previously highlighted.  
233 Participants were therefore clear regarding the behavioral definition and were instructed to  
234 follow this definition throughout the questionnaire. The researcher explained to participants  
235 that participation was optional and that they were under no pressure to partake. Participants  
236 were assured of confidentiality and anonymity and were given the opportunity to ask any  
237 questions. Participants were asked to complete the questionnaire without interacting with  
238 other participants. The questionnaire took approximately 15 minutes to complete. Upon  
239 completion, participants were thanked for their involvement in the study.

#### 240 **Instrument**

241 The study developed a questionnaire to assess behavioral, normative and control  
242 beliefs towards participating in recreational sport at university. This was done using  
243 recommended guidelines of Ajzen (2002) and questions utilized in prior elicitation studies

244 (e.g., Rhodes, Blanchard, Courneya, & Plotnikoff, 2009; Vayro & Hamilton, 2015). Using  
245 the TACT principle (Ajzen, 1991), the study followed the recommendations of Sport England  
246 (2014) to define the behavior as the following: sports (target), participation (action), at  
247 university (context), once a week, for 30 minutes (time). The definition was provided within  
248 the questionnaire and, as already highlighted, was emphasized verbally by the researcher.

249 Behavioral beliefs were assessed using three questions; 'What do you see as the  
250 advantages of you participating in sport at University for at least 30 minutes, once a week for  
251 the next month?', 'What do you see as the disadvantages of you participating in sport at  
252 University for at least 30 minutes, once a week for the next month?', and 'What else comes to  
253 mind when you think about participating in sport at University for at least 30 minutes, once a  
254 week for the next month?' Normative beliefs were assessed by asking the following; 'Please  
255 list the types of individuals or groups who would approve or think you should participate in  
256 sport at University for at least 30 minutes, once a week for the next month', 'Please list the  
257 individuals or groups who would disapprove or think you should not participate in sport at  
258 University for at least 30 minutes, once a week for the next month' and 'Are there any other  
259 individuals or groups who come to mind when you think about participating in sport at  
260 University for at least 30 minutes, once a week for the next month?' Control beliefs were  
261 accessed by asking; 'Please list any factors or circumstances that would make it easy or  
262 enable you to participate in sport at University for at least 30 minutes, once a week for the  
263 next month', 'Please list any factors or circumstances that would make it difficult or prevent  
264 you from participating in sport at University for at least 30 minutes, once a week for the next  
265 month?' and 'Are there any other issues that come to mind when you think about the  
266 difficulty of participating in sport at University for at least 30 minutes, once a week for the  
267 next month?'

268           The questionnaire also included items concerning the following demographics: age,  
269 gender, and course of study.

### 270 **Data analysis**

271           From the 76 questionnaires obtained, 30 questionnaires were selected at random to be  
272 analyzed. This is a number within the range of those typically used in elicitation studies, with  
273 that number specifically used by Belanger-Gravel, Godin, Bilodeau, Poirier and Dagenais  
274 (2013). To ensure that saturation had been reached, the study followed the analysis of the  
275 initial 30 questionnaires with the analysis of another three (i.e. the 31<sup>st</sup>, 32<sup>nd</sup>, and 33<sup>rd</sup>). Thus,  
276 thirty questionnaires were analyzed first, followed by a subsequent three. This consecutive  
277 rule has been used in a prior study (Robertson, Mullan, & Todd, 2014) and is suggested to be  
278 effective (Francis et al., 2010). To select the questionnaires randomly, they were first divided  
279 into the four degree programs and each third questionnaire was selected. In total, this  
280 procedure led to the analysis of the following numbers from the various degree courses;  
281 Nutrition, Food and Health (n=8), Secondary PE and Sports Coaching (n=7), Childhood and  
282 Welfare Studies (n=7), and English (n=8). An additional questionnaire from the first three  
283 programs were selected as the saturated questionnaires.

284           Data were analyzed using an iterative deductive-inductive approach. Thematic content  
285 analysis initially identified broad categories which were then refined into themes. This was  
286 attained by identifying frequently cited words and phrases. For example, the belief  
287 “enjoyment” was created from responses such as “have fun” and “it’s a laugh.” This  
288 represented the inductive approach. Following the analysis of thirty questionnaires, no new  
289 beliefs were added beyond this number as the following three questionnaires only yielded  
290 repetitive information (Glaser & Strauss, 1967). With saturation reached, categories were  
291 developed from the responses of 30 participants. These categories were then placed under the  
292 TPB belief-based headings (behavioral, normative, and control). The utilization of this

293 deductive approach allowed for the development of a coding frame which was used to  
294 identify the frequency of responses. A frequency count was used to identify the number of  
295 responses for each category. To ensure reliability of the frequency count, a second coder  
296 assisted with this procedure. Specifically, the second coder analyzed fifteen randomly  
297 selected questionnaires from the thirty analyzed by the main researcher. A similar procedure  
298 to the above provided the randomization. The results of the coder matched those of the  
299 researcher, thus inter-rater reliability was achieved (100% agreement). Finally, the modal set  
300 was gained by arranging the number of responses per belief in descending order under their  
301 respective category (behavioral, normative and control) and applying the 30% criterion  
302 (Spinks & Hamilton, 2015). That is, those beliefs mentioned by at least 30% of the sample  
303 were selected as the modal set and those mentioned by less than 30% of participants were not  
304 retained.

305

### Results

306 A total of 53 beliefs were elicited; 18 behavioral, 11 normative, and 24 control. When  
307 the 30% rule was applied, 17 beliefs remained; six behavioral, five normative, and six control  
308 (see Table 1). This is consistent with prior elicitation studies, with a mean of seven  
309 behavioral, four normative and six control found in a systematic review (Downs &  
310 Hausenblas, 2005a).

311

312 [Table 1 near here]

313

#### 314 Behavioral beliefs

315 As can be seen in Table 1, four behavioral beliefs were elicited relating to the

316 advantages of performing recreational sport at university and two beliefs relating to the  
317 disadvantages. Thus, six behavioral beliefs were mentioned in total by a minimum of 10  
318 participants (30%). The advantage mentioned most frequently was 'health and fitness',  
319 followed by 'enjoyment', 'opportunities to meet new people' and 'improves mental well-  
320 being'. The disadvantages were that sport can be 'time consuming' and the 'attention taken  
321 away from University studies'.

### 322 **Normative beliefs**

323 Table 1 shows the normative beliefs elicited by at least 30% of the sample. Two  
324 referents were highlighted as being approving and three seen to be disapproving. Both of  
325 those that were seen to approve the behavior were also seen to disapprove of it. Specifically,  
326 the influence of friends was seen as being equally the most salient positive (80%) and  
327 negative normative referent (53.3%). Family members were also seen to largely approve and  
328 disapprove of the behavior. Academic staff was the only referent mentioned in one of the  
329 categories, with 40% stating that this particular referent would not be supportive of their  
330 decision to participate in recreational university sport.

### 331 **Control beliefs**

332 As shown in Table 1, six control beliefs were elicited from the sample when the 30%  
333 criterion was applied. Having 'less time constraints' was the main belief that would make  
334 sports participation easier with 76.7% sharing this view. Following this, 11 participants  
335 (36.7%) stated that 'awareness' would ease participation and 33.3% had concerns relating to  
336 'study'. Issues regarding academic study were also mentioned as an inhibitor with 56.7% of  
337 the sample claiming that this made sports participation more difficult. 'Time restrictions' was  
338 the next salient belief pertaining to difficulty (46.7%), followed by a lack of motivation  
339 (43.3%).

340

## Discussion

341 The aim of this study was to identify the modal salient behavioral, normative, and  
342 control beliefs to participate in recreational sport at university within a sample of first year  
343 undergraduate students. This is the first study, to our knowledge, that has done so using the  
344 elicitation procedure outlined within the TPB. As such, similarities and differences will be  
345 discussed in relation to elicitation studies concerning sports and recreation facilities, and PA.

### 346 Behavioral beliefs

347 A salient behavioral advantage concerned health and fitness which is unsurprising,  
348 particularly as students are educated individuals and both the short and long-term benefits are  
349 well known (Lumpkin, 2011). This belief has also been elicited within PA studies (Cowie &  
350 Hamilton, 2014; Epton et al., 2015). What is surprising, however, is that this belief was  
351 mentioned more frequently than the enjoyable nature of sport. Such a finding is not in line  
352 with those of Kilpatrick et al. (2005) who found such affective beliefs to be related to sport.  
353 Although the belief wasn't the most modally salient, it is interesting to note that enjoyment  
354 was included within the modal set whereas perceptions of the tangible, competitive nature of  
355 sport were not. This supports the notion that perceptions vary between the nature of sport  
356 offered (Kanters, Bocarro, Greenwood, Casper, Suau, & McKenzie, 2012; Weiss & Fener-  
357 Caja, 2002). Specifically, the results suggest that recreational sport is attributed to factors of  
358 enjoyment as opposed to competition. The improvement of mental well-being has been  
359 supported by Sniehotta (2009) and it is well-documented that sport participation can reduce  
360 stress (Kanters, 2000). The opportunity of friendship gains is also common amongst the  
361 university sample (e.g., Cowie & Hamilton, 2014; Epton et al., 2015; Riecken et al., 2013).  
362 The time that sport takes alongside potential impacts on academic study were seen as  
363 disadvantages of participation. Such findings may be attributed to the life transitions and  
364 increased responsibilities that first year students contend with (Bray & Bom, 2004). Such



365 concerns are also common within PA elicitation studies (Cowie & Hamilton, 2014; Epton et  
366 al., 2015). Together this suggests that engaging in behaviors concerning recreational sport  
367 and PA are perceived to be a hindrance in that they may interfere with study.

368         The elicited behavioral beliefs suggest that the physical and mental health related  
369 benefits of recreational sport should be emphasized alongside the opportunities to make new  
370 friendships and have fun. Furthermore, the time that participation takes up and the negative  
371 influence that it can have on academic studies should also be downplayed. If successfully  
372 performed, a resulting positive attitude, intention and behavior should ensue (Fishbein &  
373 Ajzen, 2009).

#### 374 **Normative beliefs**

375         Due to the opportunities recreational sport provides for social groups, particularly  
376 amongst those students adjusting to life in their first academic year, it is not surprising that  
377 friends were mentioned as the most influential referent. The encouragement of friends has  
378 been found within sports recreational facilities (Sniehotta, 2009). With time spent away from  
379 family, it may be surprising that family members have an influence on students' perceptions.  
380 Nevertheless, due to the adaption process of first year study and as has been highlighted  
381 within a number of PA studies (Cowie & Hamilton, 2014; Epton et al., 2015), contact with  
382 family members is often maintained. Finally, academic staff were seen to be discouraging of  
383 the behavior. Within extra-curricular classes, it is common for such referents to be perceived  
384 as being negative (Anderson, Layland, & Ling, 2013). Although these referents were  
385 identified within the modal set, the prediction study of Gucciardi and Jackson (2015) failed to  
386 find support for the subjective norms construct, thus suggesting its role is limited in sports  
387 participation. However, as the study focused on competitive sports, it could be that normative  
388 referents do not necessarily approve of such competitive environments and play a more  
389 significant role in recreational sports, as demonstrated in the present study. A sense of

390 campus community developed from such recreational sports (Elkins et al., 2011) rather than  
391 pressures from referents such as teammates or gym users (Sniehotta, 2009) suggests that  
392 different normative beliefs underpin recreational university sport.

393         These results suggest that interventions should focus particularly on the perceptions  
394 that friends, family members, and academic staff have towards students participating in  
395 recreational sport.

### 396 **Control beliefs**

397         Two facilitators were also identified as inhibitors with beliefs concerning time and  
398 study mentioned in both categories. Time constraints were found as a control belief within  
399 university sports facilities (Sniehotta, 2009) as well as undergraduates' decision to perform  
400 PA (Epton et al., 2015; Riecken et al., 2013). The similarities between those and the present  
401 study suggest that first year students perceive they lack the time to perform these types of  
402 behaviors. Similar to this belief, over half of the sample put forth a barrier relating to that of  
403 academic studies. Cowie and Hamilton (2014) found study commitments were the most  
404 salient control belief in new students' decision to participate in PA. The final belief elicited  
405 by at least 30% of the sample concerning the ease of participation was 'awareness', which  
406 was not found in other elicitation studies. A lack of knowledge has been highlighted in  
407 literature away from TPB research however, with the suggestion that organizers should  
408 'effectively advertise and promote their programs/activities' (Masmanidis Gargalianos &  
409 Kosta, 2009, p. 164). Finally, a lack of motivation was also mentioned as a barrier. Similar to  
410 Cowie and Hamilton (2014), it could be that the transition to university leaves students  
411 feeling demotivated to participate in recreational sport. It is interesting to note that feelings of  
412 embarrassment identified in Sniehotta's (2009) study were not found here. This may be due  
413 to the nature of recreational sport participation, with students not too concerned about how  
414 they are perceived.

415           In summary, the results concerning control beliefs suggest that time constraints,  
416 academic study, awareness, and motivation should all be targets for intervention. In doing so,  
417 there is a potential to increase sporting participation.

### 418 **Limitations of the Present Study**

419           Although the study highlights salient beliefs in a university sample, it is not without  
420 limitations. First, the beliefs elicited may not be representative of the whole university  
421 population and may also not be generalizable to other institutions. Second, the study was  
422 cross-sectional meaning that it is possible that beliefs were a result of behavior rather than a  
423 causal role of behavior. Next, the study utilized a 30% cut off criteria to highlight modal  
424 salient beliefs, therefore a number of beliefs were not included within the final set. However,  
425 as there is no specific way to select modal beliefs, it is difficult to include the beliefs of all  
426 participants. Further, the omitted beliefs could still prove useful by being introduced in  
427 intervention. Although intervention targets were highlighted utilizing the TPB framework, the  
428 theory is silent in how to actually achieve change. As such, it can be difficult to know which  
429 methods and techniques should be used. The recently developed taxonomy of change (Michie  
430 et al., 2013) aims to classify behavior change techniques and can be used to facilitate  
431 practitioners in altering identified cognitive processes. For example, planning strategies can  
432 be used to negate issues of time (Gollwitzer, 1996). Finally, the study did not identify  
433 whether there were any meaningful differences between the courses studied. As the study  
434 aimed to provide a generalized number of beliefs representative of the student population,  
435 analysis of individual degree courses was not deemed important. If, however, the researcher  
436 is interested in identifying beliefs relating to a specific course of study, it would be best to  
437 elicit from those within that population.

### 438 **Conclusions and Future Prospects**

439           Using the TPB, the present study highlighted seventeen modal salient beliefs relating

440 to participation in recreational university sport. This research provides two avenues for future  
441 research. First, beliefs identified within the study could be target for intervention. Second, the  
442 results can inform the development of a quantitative study highlighting more specific key  
443 beliefs to target (Ajzen, 2006). Undergoing such rigorous formative work may lead to  
444 significant improvements in the number of students participating in university recreational  
445 sport.

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631 Table 1

632 *Modal salient behavioral, normative and control beliefs*

633

	Category	Belief	Total Number of Participants	Percentage of Participants (%)
Behavioral	Advantages	Health and fitness	24	80
		Enjoyment	18	60
		Opportunities to make new friends	9	30
		Improves mental well-being	9	30
	Disadvantages	Time consuming	22	73.3
		Attention taken away from University Studies	10	33.3
Normative	Approve	Friends	24	80
		Family	19	63.3
	Disapprove	Friends	16	53.3
		Academic Staff	12	40
		Family	11	36.7
Control	Easier	Less time Constraints	23	76.7
		More awareness	11	36.7
		Study Related	10	33.3
	Difficult	Study related	17	56.7
		Time restrictions	14	46.7
		Lack of motivation/energy	13	43.3

634