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23 Abstract

24

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

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

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

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

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

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

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

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

97 effort to perform the behavior (Fishbein & Ajzen, 1980). Intention is determined by three
98 factors, namely attitude, subjective norm, and perceived behavioral control. The attitude
99 component refers to the individual's perception toward the behavior, whether it be favorable
100 or unfavorable (Fishbein & Ajzen, 2009). Subjective norm concerns perceptions of social
101 pressure from significant others to perform the behavior (Ajzen & Fishbein, 1980). Perceived
102 behavioral control relates to the perceptions of the ease and difficulty of actually performing
103 the behavior. Just as intentions are held to have determinants, attitude, subjective norm, and
104 perceived behavioral control are also held to have determinants in the form of beliefs. As
105 individuals hold a large number of beliefs relevant to a specific behavior and can only attend
106 to a relatively small number at any given time (Miller, 1956), the TPB postulates that it is
107 these salient behavioral, normative and control beliefs that govern behavior (Ajzen, 2002).
108 Behavioral beliefs are the perceived consequences of engaging in behavior, and people's
109 evaluation of these consequences (Ajzen & Fishbein, 1980). Normative beliefs are the
110 perceived expectations of important referents such as family members, friends, and doctors,
111 and by a person's motivation to comply with the wishes of these important others (Ajzen,
112 1985). Finally, control beliefs are people's evaluation about the presence of factors that may
113 facilitate or impede performance of the behavior (Ajzen & Madden, 1986).

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

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

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

145 The theory has received a huge amount of attention with hundreds of cross-sectional
146 studies attesting to the predictive validity of attitude, subjective norm, & perceived behavioral

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

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

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

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

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

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

199 **Method**

200 **Sample**

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

211 **Procedure**

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

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

242 **Instrument**

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

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

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

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

272 **Data analysis**

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

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

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

307 **Results**

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

313

314 [Table 1 near here]

315

316 **Behavioral beliefs**

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

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

324 **Normative beliefs**

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

333 **Control beliefs**

334 As shown in Table 1, six control beliefs were elicited from the sample when the 30%
335 criterion was applied. Having 'less time constraints' was the main belief that would make
336 sports participation easier with 76.7% sharing this view. Following this, 11 participants
337 (36.7%) stated that 'awareness' would ease participation and 33.3% had concerns relating to
338 'study'. Issues regarding academic study were also mentioned as an inhibitor with 56.7% of
339 the sample claiming that this made sports participation more difficult. 'Time restrictions' was
340 the next salient belief pertaining to difficulty (46.7%), followed by a lack of motivation
341 (43.3%).

342

Discussion

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

348 Behavioral beliefs

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

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

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

376 **Normative beliefs**

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

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

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

398 **Control beliefs**

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

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

420 **Limitations of the Present Study**

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

440 **Conclusions and Future Prospects**

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

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

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633 Table 1

634 *Modal salient behavioral, normative and control beliefs*

635

	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

636