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37 **The Relationship Between Motivation Profiles for Health-Oriented Physical**
38 **Activity, Basic Psychological Needs and Emotional Regulation**

39 Motivation has been widely studied in the research literature because it identifies
40 what directs human behaviors toward specific purposes, such as physical activity (PA;
41 Boiché et al., 2016; Deci and Ryan, 1985; Knittle et al., 2018). In this study, the focus is
42 on motivations for health-oriented PA in adults, as several works have proved that there
43 is a decrease in healthy habits in adulthood, with less motivation for PA as well as a high
44 percentage of sedentarism (Haskell et al., 2007; La Rosa et al., 2021; Molanorouzi et al.,
45 2015; Wullens et al., 2016). According to the World Health Organization, sedentarism is
46 the fourth most important risk factor for mortality (World Health Organization, 2023).
47 Moreover, sedentarism increases the incidence of diseases such as cancer, metabolic
48 syndrome, cardiovascular diseases, obesity, among others (Guo et al., 2019; Lätt et al.,
49 2015). This emphasizes the importance of motivation for health-oriented PA as a way to
50 prevent sedentary behaviors and promote PA (Brunet and Sabiston, 2011).

51 According to self-determination theory (SDT) (Deci and Ryan, 1985), there are
52 different forms of motivation: intrinsic, extrinsic and amotivation. Intrinsic motivation
53 relates to behavior including internal strength, values, pleasure, personal beliefs and
54 initiative (Deci and Ryan, 2000). Extrinsic motivation refers to behavior conditioned by
55 external agents. Amotivation is defined by the absence of motivation. Deci and Ryan
56 (2000) indicate that extrinsic motivation (ordered from lowest to highest degree of
57 autonomy) includes external, introjected, identified and integrated regulation. External
58 regulation occurs when people try to satisfy external demands, avoid punishment or are
59 driven by material interest. Introjected regulation is considered a relatively controlling
60 form of motivation in which a person is regulated toward seeking interpersonal approval
61 and ego improvement. Identified regulation occurs when people perform an action

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62 because the sociocultural environment values it. In integrated regulation, the behavior is
63 carried out freely because it is congruent with personal values. The combination of all
64 types of motivation in profiles may act as a way to summarize the coexistence of different
65 motivation levels in people, which may explain their behavioral patterns. The same
66 person can simultaneously perceive different levels of all the subtypes of motivation,
67 which explains their behavior. Moreover, combining motivational variables according to
68 a person's perception may help to detect dysfunctional profiles that could be reversed
69 through specific interventions.

70 SDT postulates that emotional regulation (ER) strategies can be predicted
71 depending on the motivation that people experience (Ryan and Deci, 2017). This happens
72 because emotions indicate the relevance of people's purposes and objectives, influencing
73 their behavior and choice capabilities (Roth et al., 2019). In addition, it has been
74 demonstrated the influence of ER on mental health variables (Cisler and Olatunji, 2012),
75 obesity (Fernandes et al., 2017; Garnefski et al., 2002; Martínez and Sánchez, 2021), and
76 sedentary behavior (Bernstein and McNally, 2018; Isasi et al., 2013). Cognitive ER refers
77 to the conscious cognitive techniques that people apply to handle emotionally arousing
78 information (Garnefski et al., 2007). ER strategies are classified as adaptive (e.g.,
79 acceptance, positive refocusing, refocus on planning, positive reappraisal and putting into
80 perspective), and less adaptive strategies (e.g., self-blame, rumination, catastrophizing
81 and blaming others; Garnefski et al., 2002). According to Garnefski et al. (2001)
82 acceptance involves having thoughts that accept the negative event that occurred. Positive
83 refocusing arises when people think about pleasant situations instead of thinking about
84 the problematic event (Garnefski and Kraaij, 2007). Refocus on planning consists of
85 studying the steps to face a problem. Positive reappraisal allows people to learn from
86 adverse situations experienced and perceive them as an opportunity for personal growth

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87 (Garnefski et al., 2001). Putting into perspective allows you to downplay negative
88 situations experienced by comparing them with other events (Garnefski et al., 2002).
89 Self-blame means attributing responsibility to oneself for an event (Garnefski and Kraaij,
90 2006). Rumination consists of repeatedly thinking about the feelings perceived during
91 negative or unpleasant situations (Garnefski et al., 2002). Catastrophizing involves
92 having thoughts that emphasize the fear of an experience that has happened. Blaming
93 others involves considering other people responsible for the negative consequences
94 suffered (Garnefski and Kraaij, 2007).

95 Previous studies addressed the relationship between motivation, ER and coping
96 strategies; which is a related concept to ER. Nevertheless, it seems that literature relating
97 motivation profiles and ER is scarce. This is particularly salient because much
98 information is lost when motivation is measured from a bivariate approach rather than a
99 person-centered one. A bivariate approach neglects the coexistence of different types of
100 motivations in the same person. Thus, it is needed to examine the different degrees of
101 motivation through a multivariate approach. To explain the relationship between
102 motivation and ER it is specified that in some PA (like dance), the participants must
103 overcome enormous psychological and physical tension, such as technical and physical
104 demands, judgments from coaches, parents and public pressure, among others. For this
105 reason, participants tend to use strategies that allow them to control and modify stressful
106 situations, such as, adaptive emotional regulation strategies (Amado et al., 2011). These
107 same researchers revealed in their study that participants who perceived dance as a
108 pleasant and satisfying experience (self-determined motivation) tended to make use of
109 adaptive ER (Amado et al., 2011). In other previous research, Delgado et al. (2016) found
110 that intrinsic motivation is associated with positive reappraisal. Knee et al. (2002)
111 revealed that self-determined motivations were positively linked to using positive

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112 reassessment and acceptance. On the other hand, Ntoumanis et al. (2018) specified that
113 extrinsically motivated people tended to employ behaviors oriented to problem-coping
114 that were related to refocusing on planning. Otherwise, Amiot et al. (2004) found that
115 non-self-determined motivation was positively associated with avoidance strategies, such
116 as positive refocusing.

117 The influence of motivation on basic psychological needs (BPNs) is another of
118 the pillars of SDT (Deci and Ryan, 2000), since SDT postulates that the satisfaction of
119 BPNs depends on motivation and vice versa. Satisfied BPNs result in an energizing state
120 that is conducive toward health and well-being. Otherwise, unsatisfied needs contribute
121 to pathology and ill-being (Ryan and Deci, 2000). BPNs are inherent requirements that
122 can guide behavior to achieve psychological well-being (Ryan and Deci, 2000). The
123 BPNs are autonomy, competence and relatedness. Autonomy is the degree of initiative
124 people feel in directing their actions. Competence is people's perception of their ability
125 to perform a task, while relatedness is the sensation of being included within a social
126 environment.

127 Previous research that related motivation to BPNs in exercise revealed that
128 autonomous motivations are related to perceived BPN satisfaction (Matsumoto and
129 Takenaka, 2022). Likewise, other researchers found that intrinsic and extrinsic motivation
130 with a high degree of self-determination correlates with BPN satisfaction (Vallerand and
131 Losier, 1999; Wilson et al., 2002). More specifically, in the work of Teixeira et al. (2012)
132 it was observed that many intrinsic reasons for the person to exercise are related to the
133 search for relatedness. However, in the project of Matsumoto and Takenaka (2022) a
134 positive relationship was found between autonomous and controlled motivations in
135 exercise and relatedness BPN. On the other hand, Wilson and Rogers (2008) found that
136 autonomously motivated athletes tended to feel competent in the exercise. However,

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137 controlled motivations do not predict the satisfaction of competence (Matsumoto and
138 Takenaka, 2022). In addition, some people are extrinsically motivated to exercise to
139 improve their perception of ability and condition (Kirkland et al., 2011), that is, to try to
140 satisfy the BPN of competence. People perceive amotivation when they do not feel
141 competent in PA (Teixeira et al., 2012). Regarding the BPN of autonomy, in the project
142 of Matsumoto and Takenaka (2022) and Van der Burgt et al. (2019) it was found that the
143 satisfaction of the aforementioned BPN was positively related to intrinsic motivation and
144 identified regulation. However, amotivation was negatively related to autonomy
145 satisfaction. This may occur because when the sociocultural environment extrinsically
146 does not coerce but offers support (extrinsic motivation), people can make decisions,
147 satisfying autonomy (Mageau and Vallerand, 2003). However, exogenous control
148 enhances amotivation and autonomy is not satisfied (Amorose and Anderson-Butcher,
149 2007).

150 Previous studies that examined the influence of motivation in ER (Gillet et al.,
151 2010; Moreno and Martínez, 2006) and the satisfaction of BPNs (Amorose and Anderson-
152 Butcher, 2007; Teixeira et al., 2012) did not use the profiling methodology or examine
153 these variables simultaneously. It means that previous research did not take into account
154 that the same person can simultaneously perceive different types and levels of motivation.
155 It limits the possibility of intervening when the perceived motivations play a
156 dysfunctional role in ER and the BPNs. Earlier works found that motivations with a high
157 degree of self-determination are associated with behavior oriented to the problem
158 strategies involved in ER (Amado et al., 2011; Delgado et al., 2016) and the satisfaction
159 of BPNs (Losier et al., 1993; Vallerand and Losier, 1999; Wilson et al., 2002). In addition,
160 motivations with a low degree of self-determination are associated with avoidance
161 strategies or less adaptive ER strategies (Amiot et al., 2004) and the dissatisfaction of

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162 BPNs (Van der Burgt et al., 2019). Therefore, this paper aimed to analyze motivation for
163 health-oriented PA by identifying the related profiles and to examine whether participants
164 from distinct profiles significantly differed in ER and BPNs. As previous studies found
165 that intrinsic motivation (Delgado et al., 2016) and self-determined motivations (Knee et
166 al., 2002) are related to adaptive ER strategies and non-self-determined motivation is
167 related to non-adaptive ER (Amiot et al., 2004). Besides, a high degree of self-
168 determination motivation is associated with the satisfaction of BPN (Vallerand and
169 Losier, 1999) unlike controlled motivations (Matsumoto and Takenaka, 2022) and
170 amotivation (Amorose and Anderson-Butcher, 2007). The established hypotheses were:
171 (1) Profiles with high scores in an intrinsic and high degree of self-determined motivation
172 will develop functional ER and BPN satisfaction; and (2) Profiles with low scores in
173 intrinsic motivations and low degree of self-determined motivation will develop
174 dysfunctional ER and BPN dissatisfaction.

175 **Method**

176 **Participants**

177 The study sample consisted of 808 Spanish participants aged between 18 and 65
178 years old ($Mage=33.90$; standard deviation= 12.91 ; 366 men and 440 women) and a
179 simple random sampling method was used. Therefore, it was possible to access a large
180 population and obtain a high and representative sample size. Regarding the characteristics
181 of the sample, most of the participants worked part time or full time ($n=406$), while some
182 were students ($n=284$), and a minority were unemployed ($n=94$) or retired ($n=24$). Most
183 of the participants engaged in PA (walked or did some kind of physical exercise; $n=606$)
184 and the rest were sedentary (they did not carry out any type of exercise, they did not have
185 a habit of walking and they used passive transport to get around; $n=202$). Concerning the
186 hours spent engaged in PA, a number of them carried out between 0 and 10 hours ($n=580$),

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187 others between 10 and 15 hours ($n=175$), and some between 15 and 20 ($n=35$) or more
188 than 20 hours ($n=18$).

189 In terms of inclusion criteria, the Spanish population older than or equal to 18
190 years old and those under 65 years old were selected. The aim was to discover whether
191 the action of motivation influenced ER and the satisfaction of BPNs in adulthood in a
192 sample of Spanish adults. As such, people with different types of lifestyles (more or less
193 physically active) participated to ensure the greatest replicability of the results obtained.
194 Hence, the motivation profiles obtained will be similar to a greater percentage of the
195 Spanish population compared to the option of choosing participants who are only
196 physically active or sedentary.

197 **Instruments**

198 *Sociodemographic Variables*

199 To measure the PA levels and the sociodemographic variables, an *ad hoc*
200 instrument was created. The questionnaire examined the following aspects: biological
201 variables (gender, and age), sociodemographic variables (marital status and employment)
202 and variables related to PA (PA vs. sedentary behavior, number of daily steps and type of
203 PA practiced). It was made up of seven items. Some questions were closed-ended, but
204 there were also dichotomous (e.g., gender), and open ones (e.g., height, weight, age). For
205 instance: “What is your gender?” (male/female), “What is your height?”, “What is your
206 weight?”, “What is your age?”, “Do you carry out PA?” (yes, no), “Do you count your
207 number of daily steps?” (less than 5000 – sedentary, between 5000 and 7499 – little
208 active, between 7500 and 9999 – somewhat active, more than 12500 very active or I do
209 not count this variable) (Tudor-Locke and Bassett, 2004) and “What type of intensity of
210 PA do you practice?” (moderate, vigorous, I alternate between moderate and vigorous PA

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211 or none). This previous classification of the type of intensity of PA was according to
212 Macintosh et al. (2021). However, we also wanted to find out if there were participants
213 who combined both intensities of PA or were completely sedentary.

214 *Motivation for Health-Oriented PA*

215 This study utilized the Spanish version (González-García et al., 2023) of the scale
216 evaluating motivation for health-oriented PA (ÉMAPS) (Boiché et al., 2016). It is an
217 instrument with 30 items used to examine intrinsic motivation (five items; $\alpha=.90$; e.g., “I
218 exercise for the pleasure I feel”), external regulation (five items; $\alpha=.87$; e.g., “I exercise
219 to avoid receiving reproach from others”), introjected regulation (five items; $\alpha=.80$; e.g.,
220 “I exercise because I will feel bad if I do not exercise”), identified regulation (five items;
221 $\alpha=.91$; e.g., “I exercise because I think PA is good for my personal development”),
222 integrated regulation (five items; $\alpha=.90$; e.g., “I exercise because PA is part of my
223 identity”), and amotivation (five items; $\alpha=.86$; e.g., “I do it but I wonder what it brings
224 me”). The responses correspond to a Likert-type scale ranging from 1 (does not
225 correspond at all) to 7 (corresponds very strongly). Previous studies confirmed the
226 sufficient reliability and validity of the ÉMAPS Spanish version (González-García et al.,
227 2023; García-Vélez and Carrasco-Martínez, 2023).

228 *Cognitive ER*

229 To measure cognitive ER, the Spanish version of the Cognitive ER Questionnaire
230 (CERQ; Garnefski and Kraaij, 2006) was utilized. It is an 18-item questionnaire used to
231 measure an individual’s personal capacity to face negative or unpleasant events. To
232 answer the CERQ questionnaire, participants must indicate which of the statements on
233 the questionnaire represents them, and which signify different strategies for coping with
234 adverse situations. The CERQ questionnaire includes the factors of self-blame (two items;

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235 e.g., “I feel that I am to blame for what happened”), acceptance (two items; e.g., “I think
236 I have to accept what happened”), rumination (two items; e.g., “I am worried about what
237 I feel and think about what has happened to me”), positive refocusing (two items; e.g., “I
238 think that this situation also has positive parts”), refocus on planning (two items; e.g., “I
239 think about how to change the situation”), positive reappraisal (two items; e.g., “I think
240 that this situation also has positive parts”), catastrophizing (two items; e.g., “I usually
241 think that what happened to me is the worst thing that can happen to someone”), putting
242 into perspective (two items; e.g., “I think it hasn’t been so bad compared to other things”)
243 and blaming others (two items; e.g., “I think others are to blame for what happened to
244 me”). Based on Garnefski et al. (2002), all these factors could be grouped into adaptive
245 (acceptance, positive refocusing, refocus on planning, positive reappraisal, and putting
246 into perspective; $\alpha=.80$) and less adaptive strategies (self-blame, rumination,
247 catastrophizing and blaming others; $\alpha=.73$). The questionnaire is based on a Likert-type
248 scale, with five response options ranging from 1 (rarely) to 5 (almost always).

249 *BPN Satisfaction*

250 To examine the satisfaction of the BPNs, the Spanish version (González-Cutre et
251 al., 2015) of the Basic Needs Satisfaction in General Scale (BNSG-S; Gagné, 2003) was
252 used. The scale is made up of 21 items that measure the satisfaction of autonomy (three
253 items; $\alpha=.76$; e.g., “I feel that I am free to decide for myself how to live my life”),
254 competence (six items; $\alpha=.70$; e.g., “I often don’t feel very competent”) and relatedness
255 (seven items; $\alpha=.84$; e.g., “I get on well with the people I usually interact with”). The
256 BNSG-S is based on a Likert-type scale, with seven response options ranging from 1 (not
257 true) to 7 (totally true). Previous studies have proved the reliability and validity of the
258 BNSG-S Spanish version (González-Cutre et al., 2015; Martínez-Martínez et al., 2022).

259 **Procedure**

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260 This study was approved by the ethics committee of Universidad Internacional de
261 La Rioja (UNIR; No. 074/2022) and met the Helsinki principles. The sample participants
262 were contacted online through the publication of an advertisement and posting of the
263 study conditions on social networks (Facebook, Twitter and Instagram). The following
264 information was provided in the announcement: purpose of the research, sample of
265 participants to whom it was directed, and email of the main researchers. Recruitment takes
266 place between August and September of 2021. The questionnaire was organized by the
267 main researchers and was created through “Google Forms”. After ensuring the consent
268 and interest in participating of the participants, they received a link to the questionnaires
269 by email. Moreover, the participants completed an informed consent form. To preserve
270 their anonymity, their IP addresses were not recorded. Then, the participants completed
271 the questionnaire with the different instruments. Finally, all the data were stored and there
272 were no missing data, as completing all the questions was compulsory to finish the survey.

273 **Data Analyses**

274 The statistical analyses were conducted through Mplus version 7.3 (Muthén and
275 Muthén, 2012). A latent profile analysis (LPA) approach was used to test the profiles’
276 combination and the relationship among the motivational profiles, BPNs and ER.

277 First, LPA models are grounded in a series of modeling steps, starting with the
278 specification of a one-class model until there is no further improvement, as adding another
279 class would result in meaningless classes (Martinent and Nicolas, 2016). To ensure that
280 the model followed good fit indexes in LPA, several statistical indicators were present.
281 As such, a combination of statistical indicators was used to decide which model had the
282 best fit: the log-likelihood value, Akaike information criterion (AIC; Akaike, 1987),
283 Bayesian information criterion (BIC; Schwartz, 1978), adjusted BIC (ABIC; Sclove,
284 1987), entropy, and Lo, Mendell, and Rubin likelihood ratio test (LRT; Lo et al., 2001).

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285 As a cut-off point, the model that contains the smallest values for the AIC, BIC, and ABIC,
286 and the highest values for the log-likelihood value and the entropy, indicated the best-
287 fitting model (Martinent and Nicolas, 2017). In addition, the LRT was used for model
288 comparison (chi-square difference test). Although there are no firm rules of thumb
289 concerning the required sample size in LPA, Collins and Wugalter (1992) suggested a
290 minimum N of almost 250. Subsequently, this study was deemed to have a large enough
291 sample to conduct this analysis. Another limitation in LPA is the number of indicators,
292 because when this increases, it can raise the number of possible response patterns, which
293 could lead to data sparseness (Collins and Lanza, 2010). Thus, researchers generally
294 prefer using fewer indicators (from four to 10 indicators) with LPA (Collins and Lanza,
295 2010). Hence, this work abides by Collins and Lanza (2010), as there were six indicators.

296 Second, BPNs and ER were incorporated as time-varying covariates of the
297 motivation profiles. In the analyses, a significance interval of $p < .05$ was used in the
298 logistic regression. In addition, coefficients and the odds ratio (OR) were utilized in the
299 different statistical analyses.

300 **Results**

301 **Latent Profile Analysis**

302 Table 1 includes the fit information (log-likelihood ratio, AIC, BIC, ABIC, entropy,
303 and LRT) for LPA models ranging from one to five classes to examine the profiles'
304 combinations. In balancing the statistical and theoretical considerations, the three-class
305 profile solution made more theoretical sense than the two-class one, whereas a fourth
306 class did not add anything substantive (Figure 1). Three profiles were chosen as the
307 correct solution because greatest drops in AIC, BIC, and ABIC are seen and where the
308 highest entropy value is reported.

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309 The motivation profiles were defined as: (a) low scores in self-determined
310 motivation, and average-high scores in non-self-determined motivation, comprising
311 people with low scores in intrinsic and integrated motivation, average scores in identified
312 and introjected motivation, and high scores in external regulation and amotivation
313 ($n=148$); (b) average scores in self-determined and non-self-determined motivation that
314 included participants with average scores in intrinsic motivation, integrated, identified,
315 introjected, external regulation, and amotivation ($n=287$); and (c) high scores in self-
316 determined motivation and average and high in non-self-determined motivation
317 encompassing people with high scores in intrinsic motivation, integrated regulation,
318 identified regulation, average in introjected regulation, and high in external regulation
319 and amotivation ($n=373$) (Table 2).

320 **Covariation of Motivation Profiles on BPNs and ER**

321 A logistic regression was performed to examine the established hypotheses: (1)
322 Profiles with high scores in an intrinsic and high degree of self-determined motivation
323 will develop functional ER and BPN satisfaction, and (2) Profiles with low scores in
324 intrinsic motivations and low degree of self-determined motivation will develop
325 dysfunctional ER and BPN dissatisfaction. In the logistic regression, the independent
326 variables were the profiles, and the dependent variables were BPNs and ER (Table 3).

327 The logistic regression coefficients indicated that there were significant
328 differences in competence (-0.54 ; $Z=-3.07$; $p<0.01$; $OR=0.58$) and relatedness (-0.60 ; $Z=-$
329 3.81 ; $p<0.01$; $OR=0.55$) which indicates that for a one-unit increase in those constructs
330 (i.e., the greater the perception of competence, the higher the relatedness), there were
331 significant decreases in the odds of being in profile (a) to profile (b). In addition, the
332 results indicated that there were significant differences in autonomy (0.36 ; $Z=2.26$;

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333 $p<0.05$; OR=1.43) and adaptive regulation (1.33; $Z=5.84$; $p<0.01$; OR=3.78), which
334 significant decreases in the odds of being in profile (b), compared to profile (a).

335 Furthermore, logistic regression coefficients revealed a significant difference
336 between profile (a) and profile (c), in autonomy (0.47; $Z=3.01$; $p<0.01$; OR=0.62) and
337 adaptive regulation (1.29; $Z=5.85$; $p<0.01$; OR=0.27), indicating that there were
338 significant decreases in the odds of being in profile (c) compared to profile (a). Finally,
339 the logistic regression coefficients results revealed significant differences between profile
340 (b) and profile (c), in competence (0.43; $Z=3.02$; $p<0.01$; OR=0.64) and relatedness (0.53;
341 $Z=3.93$; $p<0.01$; OR=0.58), in which there were significant decreases in the odds of being
342 in profile (b) compared to profile (c).

343 **Discussion**

344 This study aimed to analyze motivational profiles relating to health-oriented PA
345 and examine whether participants from distinct profiles significantly differed in ER and
346 BPNs. The results revealed the coexistence of different motivational profiles with distinct
347 combinations of ER and BPNs. Following Ryan and Deci (2000), in profile (a) defined
348 as low scores in self-determined motivation, and average-high scores in non-self-
349 determined motivation. This implies that this group has not developed a true internal self-
350 determination that guides them toward the practice of PA for health purposes. This fact
351 was directly related to the low levels registered in intrinsic and integrated regulation. In
352 other words, PA is not part of the internal personal values of this group. Moreover, it does
353 not seem that people with the aforementioned profile (a) have any real desire to improve
354 their social acceptance with the practice of PA (introjected regulation is low). In addition,
355 these participants are also defined by the presence of other subtypes of extrinsic
356 motivation (average identified regulation, and high external regulation). In this case,
357 people seek to be healthy for two reasons. The first is because people attempt to start

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358 valuing something that they consider unpleasant because the rest of society interprets it
359 as fundamental (Deci and Ryan, 2000; 2008). The second reason is related to the intention
360 to satisfy external pressures, avoid punishment or obtain an exogenous reward (Boiché et
361 al., 2016). Finally, the high level of amotivation reveals that there is no internal or external
362 force that directs the behavior of the participants toward the practice of PA.

363 Profile (b), defined as average scores in self-determined and non-self-determined
364 motivation, includes participants with average scores in intrinsic motivation, integrated
365 regulation, identified regulation, introjected regulation, external regulation, and
366 amotivation (self-determined motivations being slightly higher). In this case, the highest
367 scores in intrinsic motivation and integrated regulation mean that the participants view
368 PA as part of their internal personal values. On the other hand, the average scores in
369 identified regulation reflect that part of the value given to PA is because it is positively
370 considered by the environment. Likewise, it seems that participants within this profile
371 have a desire to improve their social acceptance with the practice of PA (average scores
372 for introjected regulation). The slightly lower scores in external regulation and
373 amotivation show that few participants practice PA because they are controlled by
374 external agents or directly, they are not interested in PA practice.

375 Profile (c) refers to high scores in self-determined motivation and average-high in
376 non-self-determined motivation, and comprises people with high scores in intrinsic
377 motivation, integrated regulation, identified regulation, external regulation and
378 amotivation, and average introjected regulation. In this case, there are people who are
379 highly motivated towards PA by internal forces (intrinsic and integrated regulation).
380 Likewise, these participants are highly motivated by PA because it is highly valued by
381 the context (identified regulation) and are moderately driven to achieve social approval
382 (introjected regulation). Finally, some people with this profile practice PA because they

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383 are pressured by the environment (external regulation) or are not interested in PA practice
384 (amotivation). To sum up, the coexistence of the different motivational variables in the
385 profiles revealed the continuum of SDT, as proved by previous studies grounded on this
386 theory (Boiché et al., 2016; Cece et al., 2019; Deci and Ryan, 2002; Moreno and Martínez,
387 2006). As such, as confirmed in this study, self-determined motivation, non-self-
388 determined motivation and amotivation may coexist to a certain degree in the same
389 person. This information may encourage practitioners to put more emphasis on working
390 to create the most self-determined motivation contexts possible (Sheldon and Filak, 2008)
391 because this kind of motivation has revealed better outcomes in the practice of PA for
392 health purposes (Amado et al., 2011; Delgado et al., 2016).

393 Second, there were significant differences between profile (a), which refers to low
394 scores in self-determined motivation and average-high scores in non-self-determined
395 motivation, and profile (b), average scores in self-determined and non-self-determined
396 motivation regarding the BPNs of autonomy, competence and relatedness in PA. The
397 results revealed that individuals were more likely to have greater autonomy, competence
398 and relatedness levels in profile (b) with respect to profile (a). In particular, for profile
399 (a), it was not expected that positive scores in autonomy would be found, because
400 exogenous control enhances external regulation and does not help to satisfy this BPN
401 (Amorose and Anderson-Butcher, 2007). In the same way, in profile (b) there are scores
402 higher than in profile (a) in two autonomous forms of motivation (intrinsic motivation
403 and identified regulation). Previously, Matsumoto and Takenaka (2022) and Van der
404 Burgt et al. (2019) found that the satisfaction of autonomy in PA was satisfied when
405 participants were motivated by intrinsic motivation and identified regulation.

406 Regarding the BPN of competence, Wilson and Rogers (2008) found that
407 autonomously motivated athletes tended to feel competent in the exercise. Therefore, it

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408 is logical that profile (b) scores higher in competence, given that self-determined
409 motivations (intrinsic, integrated, and identified regulation) are higher. This coincides
410 with what was stated by Matsumoto and Takenaka (2022), who affirmed that controlled
411 motivations do not predict the satisfaction of competence in exercise. Likewise, it should
412 be considered that within the profile (b) there are high presence of external regulation.
413 Hence, this type of person performs a behavior under pressure and tends to abandon it
414 early, hindering the possibility of dominating the action developed (in this case, PA).
415 Moreover, profile (a) includes individuals with high scores in amotivation, which usually
416 arises when someone considers themselves unable to perform a task (Pope and Wilson,
417 2012).

418 In the case of relatedness, it is vital to specify that the coercion that people feel
419 when they are extrinsically pressured (external regulation) makes them perceive a lack of
420 affection from the environment, and they do not try to satisfy the need for affiliation
421 (relatedness; Deci and Ryan, 2002). Likewise, amotivation does not enhance the
422 development of good interpersonal relationship skills (Deci and Ryan, 2002;
423 Vlachopoulos and Michailidou, 2006), which could hinder being included in the group of
424 PA practitioners. On the other hand, in the work of Teixeira et al. (2012) it was observed
425 that many intrinsic reasons for the person to exercise are related to the search for
426 affiliation (relatedness). Intrinsic motivation is higher in profile (b) than in profile (a),
427 which could indicate that participants perform PA to feel affiliated with a group. Thus,
428 the higher presence of amotivation and non-self-determined motivation may hinder the
429 experience of competence, autonomy and relatedness in PA practice. As such, this may
430 advert practitioners the need to minimize those external factors that may foster
431 amotivation and non-self-determined motivation, such as, undemocratic treatment of the
432 coach, uncaring environment, etc (Akyüz et al., 2016; Troncoso et al., 2015).

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433 In addition, logistic regression analysis revealed significant differences between
434 individuals with profile (a), classified as low scores in self-determined motivation and
435 average-high scores in non-self-determined motivation and profile (b), average scores in
436 self-determined and non-self-determined motivation, in the use of adaptive regulation
437 strategies. Specifically, the results revealed that participants with profile (b) were more
438 likely to develop adaptive ER strategies. The use of adaptive ER strategies in the
439 aforementioned profile (b) can be explained because of the presence of higher self-
440 determined motivation than in profile (a) (Amado et al., 2011; Knee et al., 2002).
441 Moreover, individuals with profile (a) have higher scores in external regulation, a non-
442 self-determined form of motivation (that is not associated with the use of adaptive ER;
443 Amiot et al., 2004). Hence, Delgado et al. (2016) found that intrinsic motivation is
444 associated with adaptive ER strategies and the highest scores in intrinsic motivation were
445 in profile (b). Thus, the enhancement of a climate of intrinsic motivation (p.e., enjoying
446 task processing, affection, positive emotions) from coaches may serve as a strategy to
447 foster those adaptive ER strategies (Ruíz et al., 2019; Sarason, 1988) because motivation
448 determines behavior and emotions (Vallerrand, 1997).

449 Furthermore, the results revealed a significant difference between profile (a),
450 classified as low scores in self-determined motivation and average-high scores in non-
451 self-determined motivation, and profile (c), high scores in self-determined motivation and
452 average-high in non-self-determined motivation, in autonomy and adaptive regulation.
453 The findings revealed that the higher the autonomy and adaptative regulation levels are,
454 the more likely an individual is to be grouped in profile (a) rather than (c). A priori, it
455 does not seem logical that in profile (a) there are positive scores in autonomy as this is
456 the profile with high amotivation (Matsumoto and Takenaka, 2022; Van der Burgt et al.,
457 2019), which implies the absolute inexistence of personal initiative toward PA. Therefore,

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458 the autonomy level should be low. Moreover, in profile (a) there are high scores in
459 external regulation. According to Matsumoto and Takenaka (2022) and Van der Burgt et
460 al. (2019) autonomy satisfaction occurs when people have self-determined motivations
461 (e.g., something opposite to external regulation). However, it should be considered that
462 the scores in external regulation and amotivation are lower than in profile (c). This could
463 explain the greater probability of being in profile (a) based on the satisfaction of the BPN
464 of autonomy. Regarding adaptive ER strategies, these tend to be presented as people
465 perceive greater self-determined motivations (Amado et al., 2011). In this case, people
466 who make use of adaptive ER strategies are more likely to belong to profile (a), achieving
467 high scores in external regulation and amotivation, than profile (c), which refers to high
468 motivation and amotivation, given that the scores in self-determined motivation are
469 higher in profile (a).

470 Finally, significant differences were found between profile (b), defined as average
471 scores in self-determined and non-self-determined motivation, and profile (c), which
472 refers to high scores in self-determined motivation and average-high in non-self-
473 determined motivation, in the BPNs of competence and relatedness. The results revealed
474 that the higher the levels of competence and relatedness, the more likely an individual is
475 to be grouped in profile (c) rather than (b). Theoretically, it seems more probable that the
476 need for competence and relatedness in PA is satisfied in profile (c) because it is the one
477 where the highest powers in self-determined motivations are differentiated, and this
478 positively influences BPN satisfaction (Leo et al., 2022; Losier et al., 1993; Vallerand
479 and Losier, 1999; Wilson et al., 2002). However, it should not be ignored that profile (c)
480 is the one that reports the highest scores in external regulation and amotivation, two forms
481 of non-self-determined motivation (Ryan and Decy, 2000). Based on the results obtained,
482 perhaps it could be considered that in this sample, the BPNs are more influenced by

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483 intrinsic motivations and other subtypes of motivations with a high degree of self-
484 determination than by external regulation and amotivation. This would explain why
485 profile (c), which encompasses high scores in self-determined motivation and average-
486 high in non-self-determined motivation is the one that reports the greatest satisfaction of
487 the BPNs of competence and relatedness.

488 One of the limitations of this research is that the variables examined were
489 evaluated with Spanish adults. Nevertheless, the sample taken was the one that better
490 aligned with the study purposes. Hence, the results may not be generalizable to people
491 from other nationalities and different age ranges. Therefore, in future research it would
492 be advisable to include samples from varying nationalities and age groups to check if the
493 most functional combinations of motivational types have the same effect on ER and
494 BPNs. Moreover, the methodology used is based on data analysis obtained from a self-
495 report questionnaire. Self-report measures may introduce small objectivity biases, such
496 as social desirability or memory biases. However, the instruments utilized were the most
497 appropriate for the examined variables and the target population. In addition, future
498 research could add psychophysiological variables to further examine affective states as a
499 wellness measure that may complement the self-reported variables.

500 In terms of practical implications, this work conveys that there is a connection
501 between motivation, ER, and BPN satisfaction, understanding motivation from a
502 multivariate perspective rather than a bivariate one. Hence, the scores for ER and BPNs
503 are modified depending on the combination of different types of motivation for health-
504 oriented PA that a person has. This means that people with a blend of motivations and a
505 high degree of self-determination will have functional ER skills that may help them
506 become more responsible for their behaviors in PA and, consequently, may help them
507 maintain an active lifestyle. In the same way, being able to intervene regarding the

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508 motivations perceived by individuals could be a useful way to help adults consider
509 themselves freer, more effective, and more included within a PA context, with the aim of
510 making individuals feel fulfilled and helping them to achieve a high psychological
511 adjustment.

512 In conclusion, different levels of motivation can coexist within the same person.
513 The coexistence of different health-oriented PA motivations significantly influences ER
514 and BPNs. In people where the combination of motivational variables presents higher
515 scores in the more self-determined forms of health-oriented PA, better functional ER
516 strategies are appreciated, and people actively face adversities. Likewise, the combination
517 of health-oriented PA self-determined motivation variables aids in the satisfaction of the
518 BPNs and the perception of a better psychological adjustment. Identifying functional
519 motivational health-oriented PA profiles in adults could assist in improving emotional
520 and psychological well-being in society.

521

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524

525 **Conflict of interest Statement**

526 The Authors declare that there is no conflict of interest.

527

528 **Ethic Statement**

529 The participants were informed of the purpose of the research, signed a self-informed
530 consent, and remained anonymous. The study was approved by the ethics committee of
531 Universidad Internacional de La Rioja (UNIR; No. 074/2022).

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Tables

Table 1. *Fit Indices for Latent Profile Analysis Models.*

No. of classes No. of free parameters	1	2	3	4	5
log likelihood	-8363.227	-8363.227	-7702.052	-7520.551	-7307.005
The Akaike information criterion (AIC)	16764.455	16764.455	15456.103	15107.101	14694.009
Bayesian information criterion (BIC)	16853.651	16853.651	15578.162	15262.022	14881.792
Akaike's Bayesian information criterion (ABIC)	16793.315	16793.315	15495.597	15157.228	14754.769
Likelihood Ratio Test (LRT)	-	1236.119*	1322.351*	363.002*	431.205
Entropy	-	0.915	0.938	0.916	0.914
Bootstrap Likelihood Ratio Test (BLRT)	-	1236.119*	1322.351	363.002*	431.205

731 *Notes. *p < 0.05*

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Table 2. Estimates of Latent EMAPS Scores and Prevalence of Motivation Profiles for the LPA Model.

<i>Estimates of latent EMAPS scores and prevalence of motivation profiles</i>	Motivation profiles		
	(a) Low scores in self-determined motivation and average-high scores in non self-determined motivation (<i>n</i> = 148)	(b) Average scores in self-determined and non-self-determined motivation (<i>n</i> = 287)	(c) High scores in self-determined motivation and average-high in non-self-determined motivation (<i>n</i> = 373)
Intrinsic Motivation	2.29	4.54	5.78
Integrated Regulation	1.89	4.48	5.15
Identified Regulation	3.61	4.89	6.31
Introjected Regulation	2.00	4.55	3.70
External Regulation	6.00	3.48	6.23
Amotivation	5.44	3.48	6.23

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Table 3. Logistic Regression Coefficients for the LPCA Model with Basic Psychological Needs and Emotional Regulation.

	Covariates	Logistic regression coefficients	Standard Errors	Z-values	P - values	Odds Ratio
CLASS 1 VS C2	Competence	-0.54	0.17	-3.07	0.002*	0.58
	Autonomy	0.36	0.15	2.26	0.023*	1.43
	Relatedness	-0.60	0.15	-3.81	0.00*	0.55
	Adaptive Strategies	1.33	0.22	5.84	0.00*	3.78
	Less Adaptive Strategies	0.01	0.18	0.09	0.92	1.01
CLASS 1 VS C3	Competence	-0.10	0.17	-0.59	0.54	1.11
	Autonomy	0.47	0.15	3.01	0.00*	0.62
	Relatedness	0.06	0.16	-0.38	0.70	1.06
	Adaptive Strategies	1.29	0.22	5.85	0.00*	0.27
	Less Adaptive Strategies	0.19	0.18	1.05	0.29	0.82
CLASS 2 VS C3	Competence	0.43	0.14	3.02	0.00*	0.64
	Autonomy	0.10	0.12	0.87	0.37	0.89
	Relatedness	0.53	0.13	3.93	0.00*	0.58
	Adaptive Strategies	-0.04	0.18	-0.21	0.82	1.04
	Less Adaptive Strategies	0.17	0.15	1.13	0.25	0.84

736 *Notes. *p < 0.05.*

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738 *Figure 1. Fit information for the model.*



739