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Adolescents' competence metaperceptions and self-perceptions, motivation, intention to be physically active and physical activity

Meta-percepciones y auto-percepciones de competencia en adolescentes,
 motivación, intención de práctica de actividad física y actividad física

Metapercepções e auto-percepções de competência em adolescentes,
 motivação, intenção da prática de atividade física e atividade física

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Abstract: It is widely acknowledged that physical activity can play a potentially important role in enhancing public health. However, rapid and significant decreases in physical activity practice occur during adolescence. Elements such as parents' perceptions of their children competence, children's self-perceptions of competence and motivation appear to be important in this process. The main goal of this study was to test the following sequence of motivational processes related to physical activity: Competence Metaperceptions (parents) - Competence Self-Perception - Self-Determined Motivation - Intention to be Physically Active - Physical Activity. 459 adolescents (257 males, 202 females), age range 12-17 years, agreed to participate. Descriptive and exploratory analysis, bivariate correlations and path analysis were performed. The testing of the hypothesized model showed a good fit to the data. Results reinforce the influence of parents' views on their children's physical activity competence perception, and its consequences on the adolescents' physical activity.

Keywords: health; parents; self-determined motivation

Resumen: Es ampliamente reconocido que la actividad física puede jugar un papel potencialmente importante en el aumento de la salud pública. Sin embargo, durante la adolescencia tienen lugar disminuciones significativas y rápidas de los niveles de práctica de actividad física. Elementos como las percepciones de los padres de la competencia de los hijos, las auto-percepciones de estos de su propia competencia y la motivación parecen ser importantes en este proceso. El objetivo principal del presente estudio fue testar la siguiente secuencia de procesos motivacionales relacionados con la actividad física: Metapercepción de Competencia - Auto-percepción de Competencia - Motivación Auto-Determinada - Intención de ser

Físicamente Activo - Actividad Física. 459 adolescentes (257 varones y 202 mujeres), con un rango de edad de 12 a 17 años, accedieron a participar. Se realizaron análisis exploratorios y descriptivos, correlaciones bivariadas, y un análisis Path. La evaluación del modelo hipotetizado mostró un buen ajuste a los datos. Los resultados refuerzan la influencia de la visión de los padres en la percepción de competencia de actividad física de los hijos y sus consecuencias en los niveles de actividad física.

Palabras clave: salud; padres; motivación auto-determinada

Resumo: É amplamente reconhecido que a atividade física pode desempenhar um papel potencialmente importante no aumento da saúde pública. No entanto, as diminuições significativas e rápidas nos níveis de prática de atividade física ocorrem na adolescência. Elementos como a percepção dos pais sobre a competência das crianças, auto-percepção de sua própria competência e motivação parecem ser importantes neste processo. O objetivo principal do presente estudo foi testar a seguinte sequência de processos motivacionais relacionados à atividade física. Metapercepção de Competência - Auto-percepção de Competência - Motivação Autodeterminada - Intenção de ser Físicamente Ativo - Atividade Física. 459 adolescentes (257 homens e 202 mulheres), com faixa etária de 12 a 17 anos, concordaram em participar. Foram realizadas análises exploratórias e descritivas, correlações bivariadas e uma análise Path. A avaliação do modelo de hipótese mostrou um bom ajuste para os dados. Os resultados reforçam a influência da visão dos pais sobre a percepção da competência de atividade física das crianças e suas consequências sobre os níveis de atividade física.

Palabras chave: saúde; pais; motivação autodeterminada

Significant evidence exists supporting the numerous health benefits of engaging in regular physical activity during the early stages of life (Warburton, Nicol, & Bredin, 2007). Different studies have showed that children who exhibit

adequate levels of health-related fitness have a reduced risk of experiencing anxiety and depression (Parfitt, Pavey, & Rowlands, 2009), and they are more likely to do better academically (Van Dusen, Kelder, Kohl, Ranjit, & Perry, 2011). In spite of the widespread evidence supporting the protective effects of physical activity, physical inactivity during adolescence continues to increase (Heitzler, Lytle, Erickson, Sirard, Barr-Anderson, & Story, 2011), and insufficient physical activity among youngsters has been

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linked to increased risk of obesity and related metabolic disorders (Ekelund, Tomkinson, & Armstrong, 2012).

The Social Cognitive Theory (Bandura, 1986) considers that individuals both influence and are influenced by different personal, environmental and behavioural factors. Researchers have stressed the need to distinguish between direct perceptions and metaperceptions (Webster & Whitmeyer, 1999). Direct perceptions relate to the beliefs that individuals hold for themselves or others, while metaperceptions are estimations formed by people regarding the thoughts of significant others (Kenny & Acitelli, 2001). In other words, metaperceptions are perceptions of how other people view us (Kaplan, Santuzzi, & Ruscher, 2009) and they are notably important coming from others such as parents. The role of metaperceptions has long been the subject of research within social psychology (Kenny & DePaulo, 1993), but not in relation to physical activity.

Shrauger & Schoeneman (1979) believe that there is a hierarchical nature of metaperception formation. Individuals are more concerned about the evaluations of those more powerful, but also more knowledgeable or expert, such as parents (Kaplan et al., 2009). Current models describe parental influences on adolescents' physical activity (Trost et al., 2003). These models are guided by the Expectancy Value Theory (Eccles et al., 1983) which considers that an individual's behaviour is regulated by outcome expectations and the values placed on those outcomes.

On the other hand, Deci, Vallerand, Pelletier, and Ryan (1991) reported that self-determined motivation has been linked to a number of positive outcomes. When people are intrinsically motivated to exercise, they tend to be physically active for long life periods (Hein, Müür, & Koka, 2004). Similarly, individuals who experienced greater support for physical activity evidenced greater autonomous self-regulation for physical activity, and better attendance in physical activity intervention programs (Edmunds, Ntoumanis, & Duda, 2009).

However, few studies have tested the predictive capacity of social cognitive theories to explain physical activity (Plotnikoff, Costigan, Karunamuni, & Lubans, 2013). Rooted in the theoretical framework of the Self-Determination Theory (Ryan & Deci, 2000), it was hypothesized that adolescents' competence metaperception (their parents' views of them) will positively predict their competence self-perception. The second hypothesis was that competence self-perception will predict self-determined motivation. The third hypothesis was that self-determined-motivation will predict intention to be physically active. The final hypothesis was that the intentions to be physically active will positively predict PA levels.

Method

Participants

A total of 459 secondary education students (257 males, 202 females), age range 12-17 years ($M = 14.34$, $SD = 1.90$) from 8 different high schools of the same city in the northern part of Spain agreed to participate.

Measures

Competence Self-Perception. The Competence subscale of the Intrinsic Motivation Inventory (IMI; McAuley, Duncan, & Tammen, 1989) was used to assess adolescents' competence self-perception. Participants were asked to rate their agreement/disagreement with several statements (e.g. "I am pretty skilled doing physical activity") in a likert scale (1= strongly disagree, 5= strongly agree). It showed acceptable internal consistency ($\alpha = .89$).

Competence Meta-Perception. In order to assess parents' meta-perceptions of their children's competence, the IMI (McAuley et al., 1989) was modified. The stem "My parents believe that..." was added to each item. The Cronbach's alpha coefficient was acceptable ($\alpha = .87$).

Motivation. Participants completed the Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000) which measures amotivation, external regulation, identified regulation and intrinsic motivation in a likert scale (1 = strongly disagree, 7 = strongly agree). Given that the SIMS assesses motivation across the range of the self-determination continuum, a self-determination index (SDI) was calculated ($SDI = 2 \times \text{intrinsic motivation} + \text{identified regulation} - \text{external regulation} - 2 \times \text{amotivation}$; Lemyre, Treasure, & Roberts, 2006).

Intention to be physically active. The Intention to be Physically Active (Hein et al., 2004) is a 5-item scale (e.g., After graduation, I would like to be physically active). It showed adequate internal consistency ($\alpha = .83$).

Physical Activity. Participants' physical activity levels were measured using the following question: "How often have you participated in physical activities for 20–30 min per session during your free time over the past three months?" (Godin, Lambert, Owen, Nolin, & Prud'homme, 2004). Response choices offered were: 1= never, 2= about once per month, 3= about 2-3 times per month, 4= about once per week, 5= about 2 times per week, 6= about 3 times per week, and 7= about 4 times or more per week.

Procedure

The implementation of the project involved three steps: first, permission from the Ethics Committee of the researchers'

University was obtained. Second, an informed consent was signed by all the participants' parents. Third, all questionnaires were administered by one of the researchers.

Data analysis

Analyses were conducted using the SPSS 18.0 and the EQS 6.2 programs. Descriptive statistics and bivariate correlations were conducted to explore the trends and relationships among variables. The hypothesized model was tested through a Path analysis. Given that preanalyses revealed substantial multivariate kurtosis (8.55), analyses were based on the Satorra-Bentler scaled chi-square statistic (S-B χ^2 ; Satorra & Bentler, 1988), since it serves as a correction for χ^2 when distributional assumptions are violated. In testing the initial model, evaluation of goodness-of-fit to the data was determined on the basis of multiple criteria (Byrne, 2008): Comparative Fit Index (*CFI), Root Mean-Square Error of Approximation (*RMSEA), and Standardized Root Mean Square Residual (SRMR). The *CFI represents the robust version of the CFI and it ranges in value from zero to 1.00. The *RMSEA is a robust version of the usual RMSEA;

values less than .05 indicate good fit and values as high as .08 represent reasonable errors of approximation in the population. To complete the analysis, the 90% confidence interval provided for *RMSEA was included. Lastly, the SRMR is the average standardized residual value derived from fitting the hypothesized variance covariance matrix to that of the sample data with value ranging from zero to 1.00.

Results

Descriptive statistics and bivariate correlations

Table 1 shows means, standard deviations and bivariate correlations among all variables studied. The highest mean scores were obtained in physical activity level and the lowest in competence self-perception. Correlation analysis showed that all variables were positively correlated. As expected, the highest scores were measured between intention to be physically active and physical activity level, followed by competence meta and self-perception. Correlations between SDI and competence self-perception and between SDI and intentions to be physically active were also high.

Table 1. Means, standard deviations and bivariate correlations of all variables.

	M	SD	1	2	3	4
1. Competence meta-perception	3.83	.81				
2. Competence self-perception	3.68	.75	.64**			
3. Self-Determination Index (SDI)	7.46	5.32	.44**	.57**		
4. Intention to be physically active	4.16	.86	.21**	.26**	.52**	
5. Physical activity	4.61	1.15	.13**	.23**	.41**	.66**

** $p < .05$

Path analysis

The initial testing of the hypothesized model yielded a good fit to the data: S-B $\chi^2_{(6)} = 914.87, p = .021; *CFI = .98; SRMR$

$= .03; *RMSEA (90\% CI) = .057 (.020-.094)$. Therefore, these results reinforce the hypothesized model (Figure 1).

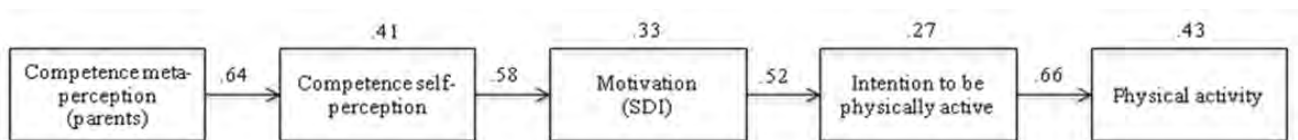


Figure 1. Tested model depicting the predicted relationships among variables.

Discussion

The purpose of this study was to explore a motivational sequence hypothesizing relationships between adolescents'

competence metaperceptions (parents' views), self-perceptions and physical activity levels of practice. The results of the study provided strong support for our hypothesis.

Adolescents' competence metaperception (their parents'

views of them) significantly predicted their competence self-perception (explaining 41% of its variance). Parents become involved in their children's sport activities taking them to practice, but also providing feedback and influencing their self-perceptions (Lorenzo & Sampaio, 2005).

Adolescents' competence self-perception significantly predicted SDI (explaining 33% of its variance) which is congruent with Vallerand's hierarchical model (1997). The need for competence self-perception drives the efforts to achieve goals and feel successful and it increases self-determined motivation (Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002).

Furthermore, SDI positively predicted adolescents' intentions of being physically active (explaining 27% of its variance), which is consistent with previous research: promoting self-determined motivation may be an effective means of ensuring that physical education programs are

able to increase physical activity levels, foster self-initiated physical activity behaviours and enhance adolescents' health (Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009).

Finally, adolescents' intentions of being physically active significantly predicted their physical activity levels (explaining 43% of its variance). Sallis, Prochaska and Taylor (2000) reported that physical activity intentions had consistent and positive associations with adolescent physical activity behaviour.

In conclusion, the tested model reflects how important parents' influence is on their children's physical activity levels. Parental physical activity is not transmitted to their children to the degree that is often believed (Andersen, Wold, & Torsheim, 2006), but our results show that their influence is still strong. This study provides additional information to help reduce the rapid decreases in physical activity detected among adolescents.

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