



The Prospective Relationships between Dispositional Optimism and Subjective and Psychological Well-being in Children and Adolescents

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Abstract

Optimism is a construct considered fundamental for human functioning and well-being; however, few studies link optimism to subjective and psychological well-being during childhood and adolescence. Therefore, the objective of this study is to demonstrate the prospective relationships between dispositional optimism, and subjective well-being (SWB) and psychological well-being (PWB) through a prospective study with 479 children aged 10.74 years old ($SD=0.72$) and 503 adolescents aged 13.41 years old ($SD=1.09$). Two cross-lagged models were calculated, one for each group, which responded the questionnaires in two waves one year apart from each other. The results of the first cross-lagged model with children show positive and prospective relationships between optimism (Time 1) and the cognitive and affective components of SWB (Time 2) and the indicator of PWB (Time 2). Equivalent results are observed in the cross-lagged model conducted with the adolescent sample. Finally, multi-group analysis was performed to evaluate the existence of gender-based invariance. The findings indicated variations between the models, notably, a more pronounced influence of optimism on psychological well-being was discerned among girls, encompassing both childhood and adolescence. The results were discussed, emphasizing the relevance of developing optimism as a dispositional trait at early ages.

Keywords Dispositional Optimism · Subjective Well-being · Psychological Well-being · Children · Adolescents

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Introduction

Recently, studies about the prospective predictions of human beings (Oriol et al., 2020; Baumeister et al., 2016) have gained increased attention. Prospecption represents the mental representations of the future and is a valuable resource that influences various aspects of cognitive and affective processes, and consequently human well-being (Gilbert & Wilson, 2007). In this sense, one of the most studied constructs that reflects the relevance of prospective thinking and specifically of the positive expectations for future is optimism (Gallagher & Lopez, 2018). Classical theories about optimism define this construct as a cognitive variable that reflects a favorable perspective about people's future (Scheier & Carver, 1985; Carver & Scheier, 2014) but this is not necessarily related to concrete objectives or goals. Specifically, optimism: 1) is considered a cognitive construction; 2) as well as a stable trait; 3) is a future-oriented and expectations-based construct; 4) is a key determinant of behavior (for a review, Scheier & Carver, 1985; Scheier & Carver, 2018). Optimism has been closely related to hope, as both constructs are similar and hold a strong relationship with each other; however, a meta-analysis conducted by Alarcon et al., (2013) concluded that they cannot be considered redundant to each other, since optimism is more related to confidence and hope is characterized by a sense of control and self-efficacy.

Optimism has been associated with both hedonic well-being and eudaimonic well-being (e.g., Alarcon et al., 2013; Liu et al., 2022), but most studies are conducted with adult population, and longitudinal studies linking optimism to both forms of well-being during childhood and adolescence are even more scarce (Lima & Morais, 2018; Usán Supervía et al., 2020).

Hedonic and Eudaimonic Well-being Traditions

Well-being is a construct fundamental for the understanding of adjustment during childhood and adolescence (Casas, 2011). Nevertheless, the assessment of well-being is complex, as it is a multidimensional construct that comprises two perspectives or traditions, which are different but complementary despite being related to each other (Diener et al., 2018a, 2018b). First, the more hedonic tradition is usually represented by studies that follow the subjective well-being (SWB) model proposed by Diener (1984). This model reflects two components for assessing SWB, namely an affective component defined as the presence of positive affect and the absence of negative affects, and a cognitive component characterized through the assessment of life as a whole. In recent years, the International Survey of Children's Well-Being (ISCWeB) project, which aims to assess subjective well-being in children aged 8 to 23 years old from different countries around the world, has increased the interest in studying this construct at these ages. However, studies are still predominant in adult population (Andresen et al., 2019; Casas, 2019). One of the most important conclusions reached by the

ISCWeb surveys on child and adolescent population is that, at these ages, it is more convenient the use of different scales to better capture the cognitive component of SWB (International well-being group, 2013). In this sense, in addition to single item tools often used to assess overall life satisfaction in adult population, other multi-item tools and scales have been developed and validated cross-culturally, which capture the cognitive component of SWB considering the satisfaction of the most relevant life domains of children and adolescents (Casas & Rees, 2015; Dinisman & Ben-Arieh, 2016).

Second, the eudaimonic tradition of well-being, conceptualized as psychological well-being (PWB), is associated with individual functioning (Deci & Ryan, 2008; Ryff et al., 2021). This perspective emphasizes the idea that individuals properly function when they have a sense of purpose and direction, are self-determined and can establish positive relationships with others (Deci & Ryan, 2008; Thornsteinsen & Vittersø, 2020). In concrete, the Ryff model (1995), which is one of the most studied psychological well-being models, considers that this construct is formed by six dimensions: environmental mastery, self-acceptance, positive relations with others, autonomy, purpose in life, and personal growth. As above mentioned, in recent years, many studies on well-being during childhood and adolescence have dealt with the factors contributing to high levels of children SWB (for example Casas, 2019; Dinisman & Ben-Arieh, 2016); however, fewer studies have addressed the indicators that most help explain PWB at these ages (Casas & González-Carrasco, 2021a, b). One of the obstacles faced when assessing this construct in children and adolescents is the lack of instruments, since some items are sometimes difficult to understand at these ages (Casas & González-Carrasco, 2021a, b). Nevertheless, the ISCWeB project has incorporated a PWB scale based on the Ryff model, which was recently tested in a cross-cultural study in 15 countries, showing satisfactory psychometric properties (Nahkur & Casas, 2021). This opens the debate about the need for studies with children and adolescent population that incorporate PWB in addition to SWB.

The Relationship Between Dispositional Optimism, SWB and PWB

Optimism is a construct that, in adult population, has been linked to the different components of SWB (e.g., Chang & Sanna, 2001; Daukantaite & Bergman, 2005; He et al., 2013). In this sense, it has been hypothesized that optimistic people score higher in life satisfaction than pessimistic people as they manage critical life situations better and are much more task-and solution-oriented (Segerstrom et al., 2017; Scheier & Carver, 2018). These data have been confirmed in a recent study by Diener et al., (2018a, b) which concludes that optimism is a predictor of SWB, as it directs people to seek meaning through cognitive processes that imply attention, interpretation and memory. Specifically, in addition to promoting more cognitive aspects that increase life satisfaction, optimism has also been related to positive affect (Alarcon et al., 2013; Cha, 2003). One of the most likely explanations for these relationships is that optimistic people tend to see the bright side of the events that happen to them every day, which makes them experience more positive affect (Carver & Scheier, 2014; Helweg-Larsen et al., 2002). For example, it has

been observed that optimistic people experience more positive affect and happiness than pessimistic people, since the former are more focused on their success and use positive coping strategies, whereas the latter center on distress and adversity (Schütz & Baumeister, 2017).

Regarding the relationship between optimism and SWB in child and adolescent populations, a recent study by Krok and Telka (2019) with late adolescents showed that optimism mediates the relationship between meaning in life and SWB. In addition, more optimistic adolescents seem to have elevated levels of subjective well-being (Eryilmaz, 2011). Consistent findings have emerged regarding the relationship between optimism and PWB. The construct of optimism has been established as a robust predictor of PWB within the adult population, owing to the propensity of optimistic individuals to exhibit superior competence in effectively navigating intricate and challenging situations. Moreover, individuals characterized by optimism tend to manifest elevated levels of resilience when compared to their pessimistic counterparts (Alarcon et al., 2013; Miranda & Cruz, 2020). Specifically, different studies argue that optimistic people are much more resilient, which allows them to protect their psychological well-being during stressful events and recover faster from stressing factors (Acciari et al., 2019; Ryff & Singer, 2003). In turn, optimism has also been related to key dimensions of PWB according to the Ryff model (1995), such as the establishment of interpersonal relationships with others and the mobilization of positive affective resources that act as drivers and motivational mechanisms for transcending self-interest (Carver & Scheier, 2014).

Some of the few studies with adolescent population also support the existence of a strong relationship between optimism and PWB, since adolescents who have positive expectations for future and are therefore more optimistic, also seem to show higher PWB levels, as in the case of adult population (Gallagher & Lopez, 2009; Eryilmaz, 2011). This may be relevant at this developmental stage, characterized by multifaceted transformations encompassing hormonal, physiological, cognitive, and social domains. These cumulative changes collectively amplify the inclination to engage in risky behaviors (Blackmore et al., 2020). Nevertheless, the gap in the scientific literature is still relevant. As above mentioned, there is a lack of studies that link these two constructs in both childhood and adolescence, as this form of well-being has been mainly assessed in adult populations (Casas & González-Carrasco, 2021a, b).

Gender Differences

Finally, another noteworthy aspect to consider in this study is the presence of gender differences in the prospective relationships between optimism and hedonic and eudaimonic well-being dimensions in children and adolescents. Given that existing literature has indicated gender disparities in the independent and dependent variables of this study, there arises a need to examine the presence of invariance in prospective models while accounting for gender. For instance, higher optimism scores have been observed in adolescent girls compared to boys (Webber & Smokowski, 2018), although such studies are relatively scarce in both childhood and adolescence.

Regarding subjective well-being (SWB), a recent meta-analysis that included 46 studies involving children and adolescents from different countries discovered gender group invariance in life satisfaction (Chen et al., 2020). However, other studies have yielded inconclusive results, as disparate outcomes have been observed depending on the type of SWB scales employed (for a review, see Kaye-Tzadok et al., 2017). Specifically, more pronounced gender differences have been noted when assessing SWB using multi-item scales and scales measuring satisfaction across different domains of development (González-Carrasco et al., 2017). In this context, a greater decline in SWB among girls compared to boys has been observed from the age of 11 onwards in various countries when utilizing such scales (González-Carrasco et al., 2017; Amerych et al., 2021).

Regarding PWB, studies evaluating this form of well-being in these age groups remain scarce, and consequently, the existence of gender differences in childhood and adolescent PWB is still inconclusive.

Present Study

Based on the literature, positive expectations about the future and dispositional optimism are psychological constructs that seem to notoriously contribute to the increase of well-being in adult populations (for a review, see Alarcon et al., 2013); however, more studies are needed that demonstrate these relationships in childhood and adolescence. Additionally, there is a lack of longitudinal studies that confirm the prospective relationship between optimism and both forms of well-being, especially considering that PWB has been mostly assessed in adults, and studies with children and adolescents are still scarce. Furthermore, since gender differences have been observed in both forms of well-being, it appears important to also consider the potential existence of gender invariances in longitudinal models.

In sum, the objective of this study is to demonstrate the prospective relationship between optimism and hedonic and eudaimonic measures of well-being. Since subjective well-being has been observed to decrease during adolescence (González-Carrasco et al., 2017), we expect that the relationship between optimism and well-being measures is stronger in adolescents. To test the prospective effects, a cross-lagged model was run and reverse effects were included to confirm the direction of the prospective relationship between T1 and T2. "cross-lagged model" tests two cross lagged relations (e.g., the relationship between X1 and Y2 and the relationship between Y1 and X2). To assess gender invariance, multi-group analyses were performed on age-group-specific models.

Specifically, H1) a prospective relationship between dispositional optimism (T1), and the cognitive and affective indicators of SWB and the PWB indicator (T2) is expected in children. H2) The same results are expected for the cross-lagged model with adolescents. To confirm the direction of these prospective relationships in both cross-lagged models and rule out the reversal effect, the effect of the paths of the well-being forms (T1) on optimism (T2) is expected to be non-significant. H3) Finally, it is expected to observe differential gender-based variance in both cross-lagged models.

Sample

The participants of this study are students from 20 educational centers of (Catalonia), most of them from (Girona) and its metropolitan area. According to type, 18 school centers are public and 2 are private. In total, 2,222 students participated in both data collection waves (T1 and T2), out of which only 982 presented missing values below 10% of cases and therefore were selected for the analyses of this study. The final sample was composed of 479 children (48.8%) and 503 adolescents (51.2%). Regarding the gender of participants, 45.1% were men and 54.9% were women. As for reported age, the global mean was 12.11 ($SD = 1.63$); in the case of children, this was 10.74 years of age ($DE = 0.72$), while it was 13.41 for adolescents ($SD = 1.09$).

Procedure

First, the project was submitted to Ethics Committee of (University of Girona) for approval. Once ethical consent was obtained from each educational center, the project was explained to the person responsible for communication with the research team (principal and/or academic coordinator), inviting the establishment to participate in the longitudinal study. In parallel, the information about the research project was sent via e-mail. In some cases, meetings were set with directive teams to inform them about the objectives of the study. Once the center agreed to participate in the study, a consent letter was sent to the students' families. The letter contained details about the project and asked families to authorize their children to be part of the longitudinal study. A first data collection process was conducted during the first semester of the school year (T1) and a second one (T2) was carried out the first semester of the following school year (one year apart). To gather data, a schedule was established with each school, and data collection was conducted in the classroom of each class for approximately 40 min each time (T1 and T2). On both occasions, prior to responding the survey, the objective of the study was explained to students, who were then asked to sign the informed assent in case they agreed to participate.

Measures

Regarding the assessment of hedonic and eudaimonic well-being, different scales have been considered to build the cognitive indicator of SWB, as suggested by studies with child and adolescent populations, while one scale has been selected to measure its affective component (Casas & Rees, 2015). In turn, a PWB indicator recently tested was incorporated into different countries to assess this construct at these ages (Nahkur & Casas, 2021). The same instruments were used both at T1 and T2. The scales evaluated are presented below:

Dispositional Optimism. Based on the questionnaire by Pedrosa et al. (2015), this scale is composed of 10 items (e.g., "I believe I will achieve the main goals of my life", "When I think of future, I am positive") and evaluated on a 5-point Likert

scale that ranges from totally disagree to totally agree. Likewise, in the case of T1, Ω was 0.84 and Cronbach's α was 0.80, while for T2, Ω was 0.85 and Cronbach's α was 0.81.

Positive Affect

This scale assesses the positive affects of the short version of Russell's Core Affect (Russell, 2003), which are experienced by students when they think of their lives in general. This scale assesses five positive affects (e.g., "Enthusiastic", "Happy", "Satisfied") in a scale from 0 to 10, where 0="Absolutely not" and 10="Clearly". At T1, an Ω of 0.78 was reported, while Cronbach's α was 0.77; for T2.

Psychological Well-Being

Scale based on Children's Worlds Psychological Well-Being Scale developed by Casas and González-Carrasco (2021a, b) based on Ryff (1989) that comprises 6 items (e.g., "I like being like I am", "People are nice to me in general"); likewise, this is an 11-point Likert that ranges from 0= Totally disagree to 10= Totally agree. For this scale, T1 reports an Ω and a Cronbach's α of 0.82, while an Ω and a Cronbach's α of 0.81 were reported for T2.

Cognitive Component of Subjective Well-being

To achieve a robust index for the cognitive component of SWB, an indicator was calculated, which captured different single-item and multi-item scales, as well as a scale assessing the satisfaction with the most relevant-life domains. In this sense, the single item of *Overall Life Satisfaction* (OLS) (Campbell et al., 1976), the *School Children Personal Well-being index* (PWI) developed by Tomy and Cummins (2011) and the *Multidimensional Student Life Satisfaction Scale* (BMLSS) were taken as observable variables. To build the indicator, the mean of each scale was calculated and used for calculating the latent variable. This aggregate index reports an Ω of 0.82 and a Cronbach's α of 0.81 for T1; in the case of T2, an Ω of 0.86 and a Cronbach's α of 0.85 are reported.

Data Analyses

The SPSS 23.0 and AMOS 20.0 software were used to confirm the hypothesis proposed in this study. First, descriptive analyses were performed to obtain the study's indexes. Second, analyses of variable means differences were conducted by gender and age group according to the study times. Third, variable correlation analyses were performed based on time of study and variable analyses through Pearson correlations. For the calculation of structural equation models, parcel items and score averages were employed to reduce the number of indexes in order to create the latent variables. In addition, to generate more reliable estimators, measure error was reduced through the specific variances of items. For the creation of parcel items, the

recommendations of Little et al. (2013) were followed, which consisted of randomly conducted grouping and calculating the average of the assigned items. According to this process, the variable of optimism, originally composed of 10 items became 3 parcels (parcel1 includes the first 3 items, parcel2, the following 3 items and parcel4, the last 4 items); in the case of the variable Psychological Subjective Well-Being Scale, composed of six items, 3 parcel items were created, each one associated with 2 items. In the case of the cognitive SWB indicator, this is described in the Measures section.

Once the process was completed, the cross-lagged models of the two information waves collected were calculated. The first model assesses the stability model; the second one assesses causation, and the third model addresses the reversed causation model. The detailed model is presented in Fig. 1. The model fit was tested with five common fit indexes recommended by statisticians: (1) ratio chi-square over degrees of freedom (χ^2/df), (2) the root mean square error of approximation (RMSEA), (3) the standardized root mean square residual (SRMR), (4) the comparative fit index (CFI), and (5) the Tucker-Lewis index (TLI). The model fit of the study is accepted when ($\chi^2/df \leq 5$, RMSEA and SRMR < 0.08 , and CFI and TLI > 0.90 (Kline, 2005). In addition, all coefficients concerning the variables were standardized to decrease multicollinearity.

A multigroup analysis was run to test invariance by gender for each age group. In the first step of this analysis, constraints are imposed to the factor loads.

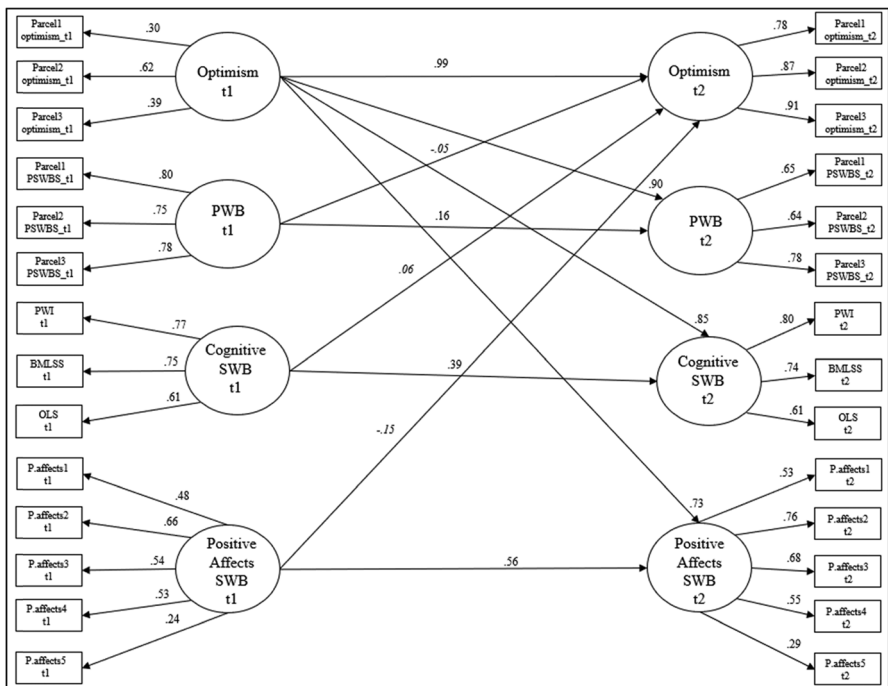


Fig. 1 The proposed longitudinal model between optimism and SWB indicators for children

second one, constraints are attributed to the covariance between the latent factors and, finally, the covariances between measurement errors are maintained equal in both samples. Chi-squared χ^2 statistical values and the probability level related to them allow verifying whether these constraints worsen the model statistical fit. When comparing both models, associated probability values above 0.05 indicate the absence of variation between both samples, since constraints do not worsen the fit of the model to data (Byrne, 2001).

The absence of significant differences between model 1 and model 2 is a minimum criterion for accepting the existence of model invariance between two samples (Arbuckle, 2006).

Results

Descriptive Statistics

Regarding variable measures at the global level, a high index is observed for both times of dispositional optimism, namely T1 ($M=3.78$, $SD=0.80$) and T2 ($M=3.69$, $SD=0.87$). As for the well-being indicators, they were assessed within a range from 0 to 10 points, with cognitive SWB as the indicator with the highest value both at T1 and T2. With respect to the indicator comparisons between children and adolescents, in T1, children score higher in optimism [$t(980)=12.37$, $p<0.01$]. The well-being indicators of children also present higher levels than those of adolescents, specifically in the indicators of PWB [$t(980)=11.80$, $p<0.01$], cognitive SWB [$t(980)=10.98$, $p<0.01$] and positive affect [$t(980)=9.63$, $p<0.01$]. From the data collected at T2, children present higher values than adolescents in optimism [$t(980)=9.63$, $p<0.01$], PWB [$t(980)=9.83$, $p<0.01$], cognitive SWB [$t(980)=11.52$, $p<0.01$] and positive affect [$t(980)=10.04$, $p<0.01$] (Table 1).

Variables Correlations

As observed in Table 2, the global model shows that between the two times there is a high correlation (Cohen, 2013). As observed at the global level, there is a close

Table 1 Descriptive statistics

		Overall	Children	Adolescents
T1	Optimism	3.78(0.80)	4.08(0.67)***	3.50(0.81)***
	PWB	8.21(1.38)	8.71(1.19)***	7.73(1.39)***
	Cognitive SWB	8.35(1.15)	8.74(0.97)***	7.97(1.19)***
	P. Affect SWB	8.21(1.30)	8.60(1.13)***	7.83(1.35)***
T2	Optimism	3.69(0.87)	3.95(0.81)***	3.43(0.85)***
	PWB	8.03(1.40)	8.53(1.28)***	7.57(1.35)***
	Cognitive SWB	8.24(1.20)	8.64(1.00)***	7.85(1.23)***
	P. Affect SWB	8.04(1.39)	8.48(1.24)***	7.63(1.39)***

Table 2 Correlations of the study's variables at the general level, children and adolescents

Level	Variable	1	2	3	4	5	6	7	8
Overall	1.Optimism T1	-							
	2.Optimism T2	.709**	-						
	3.PWB T1	.681**	.429**	-					
	4.PWB T2	.568**	.687**	.594**	-				
	5.P. P, Affect SWB T1	.544**	.357**	.619**	.422**	-			
	6.P. Affect SWB T2	.483**	.552**	.485**	.645**	.525**	-		
	7.Cognitive SWB T1	.613**	.398**	.755**	.520**	.721**	.517**	-	
	8.Cognitive SWB T2	.528**	.589**	.580**	.743**	.517**	.757**	.634**	-
Children	1.Optimism T1	-							
	2.D. Optimism T2	.652**	-						
	3.PWB T1	.696**	.395**	-					
	4.PWB T2	.531**	.705**	.473**	-				
	5. P. Affect SWB T1	.402**	.213**	.513**	.317**	-			
	6. P. Affect SWB T2	.444**	.494**	.424**	.582**	.406**	-		
	7. Cognitive SWB T1	.563**	.310**	.698**	.392**	.579**	.421**	-	
	8.Cognitive SWB T2	.506**	.610**	.495**	.736**	.388**	.663**	.505**	-
Adolescents	1.D. Optimism T1	-							
	2.D. Optimism T2	.695**	-						
	3.PWB T1	.591**	.338**	-					
	4.PWB T2	.488**	.606**	.588**	-				
	5.P. Affect SWB T1	.549**	.359**	.618**	.388**	-			
	6. P. Affect SWB T2	.401**	.517**	.423**	.621**	.529**	-		
	7.Cognitive SWB T1	.559**	.349**	.740**	.508**	.766**	.492**	-	
	8.Cognitive SWB T2	.435**	.498**	.545**	.694**	.516**	.777**	.641**	-

relationship between the indicators reported for both times. In the case of optimism, there is a correlation with optimism (T2) ($r=0.71$, $p<0.05$), for PWB between (T1) and (T2), the correlation is ($r=0.59$, $p<0.05$), while for positive affect, the correlation between (T1) and (T2) is $r=0.67$, $p<0.05$ and cognitive SWB between (T1) and (T2) has a correlation of 0.63 , $p<0.05$. In the case of children, correlations between both times are also significant for all cases. Specifically, optimism presents a correlation of $r=0.65$, $p<0.05$, PWB $r=0.47$, $p<0.05$; positive affect of $r=0.41$, $p<0.05$, and cognitive SWB of $r=0.64$, $p<0.05$. In adolescents, the correlation of optimism is $r=0.70$, $p<0.05$, of PWB is $r=0.59$, $p<0.05$, while positive affects reports $r=0.53$, $p<0.05$ and cognitive SWB exhibits an $r=0.64$, $p<0.05$.

Likewise, considering the hypotheses of the study, optimism at (T1) is observed to significantly correlate with the well-being variables of (T2). Specifically, at the general level, there is a positive correlation between T1 optimism and T2 PSWBS ($r=0.57$, $p<0.05$), positive affects T2 ($r=0.44$, $p<0.05$) and cognitive SWB T2 ($r=0.53$, $p<0.05$); in the case of children, optimism (T1) correlates with PWB (T2) ($r=0.53$, $p<0.05$), positive affect (T2) has an $r=0.44$, $p<0.05$, and the cognitive

component of SWB (T2) has an $r=0.51$, $p<0.05$. Finally, for the adolescent group, optimism (T1) correlates with PWB (T2) $r=0.49$, $p<0.05$, with positive affect (T2) $r=0.40$, $p<0.05$ and with cognitive SWB (T2), showing an $r=0.44$, $p<0.05$.

Cross-lagged Model Analysis

To explore the reciprocal relationships between optimism and the different well-being indicators, a two-wave cross-lagged model was calculated using the maximum likelihood estimator. Following the hypothesis of the study, these analyses were performed on both the adolescent and child groups. Figure 1 presents the results of the cross lagged model for the child group. First, the model exhibits adequate fit indexes ($\chi^2/df(640)=2.81$, $p<0.001$, CFI=0.91, TLI=0.90, RMSEA=0.06, SRMR=0.05). Second, regarding the relationships across the study's variables, it is observed that optimism (T1) and optimism (T2) reports $\beta=0.98$, $p<0.001$, while (T1) PWB and (T2) PWB ($\beta=0.60$, $p<0.05$), cognitive SWB between (T1) and (T2) ($\beta=0.67$, $p<0.05$) and affective SWB between (T1) and (T2) ($\beta=0.56$, $p<0.001$).

In turn, the results indicate that (T1) optimism is positively related with PWB ($\beta=0.38$, $p<0.05$), cognitive SWB ($\beta=0.20$, $p<0.05$) and positive affect ($\beta=0.58$, $p<0.05$) at (T2). Finally, the results of the reverse causation model indicate an absence of significant effects from the subjective well-being indicators at (T1) on optimism at (T2).

In turn, Fig. 2 presents the results of the cross-lagged model for adolescents. For this model, adequate fit indexes are reported ($\chi^2/df(635)=3.79$, $p<0.001$, CFI=0.90, TLI=0.90, RMSEA=0.08, SRMR=0.06). Regarding the relationships between variables, a direct and significant effect is observed between (T1) and (T2) for the stability model. In the case of optimism, there is a positive effect on its same construct ($\beta=0.99$, $p<0.05$), PWB ($\beta=0.16$, $p<0.05$), cognitive SWB ($\beta=0.39$, $p<0.05$) and positive affect ($\beta=0.56$, $p<0.05$) at (T2). In turn, the results of the causal model show that optimism (T1) has a significant effect on PWB ($\beta=0.90$, $p<0.05$), cognitive SWB ($\beta=0.85$, $p<0.05$) and positive affect ($\beta=0.73$, $p<0.05$) at (T2).

Finally, regarding reverse causation, no significant effects are observed on the relationship between the well-being indicators at (T1) and optimism at (T2).

Cross Lagged Multigroup Analysis by Gender for Children and Adolescents

Cross-lagged multigroup analyses, stratified by gender and conducted for both the child and adolescent cohorts, are summarized in Table 3. Within the child group, the regression coefficients (Betas) exhibited notable gender disparities. Specifically, the influence of optimism (t1) on Psychological Well-Being (PWB) (t2) was more pronounced in females, with a reported coefficient of $B=0.99$, compared to males, where it was $B=0.98$ ($p<0.05$). Similarly, the effect of Optimism (t1) on Cognitive Subjective Well-Being (SWB) (t2) was more substantial among females, yielding a coefficient of $B=0.94$, in contrast to males,

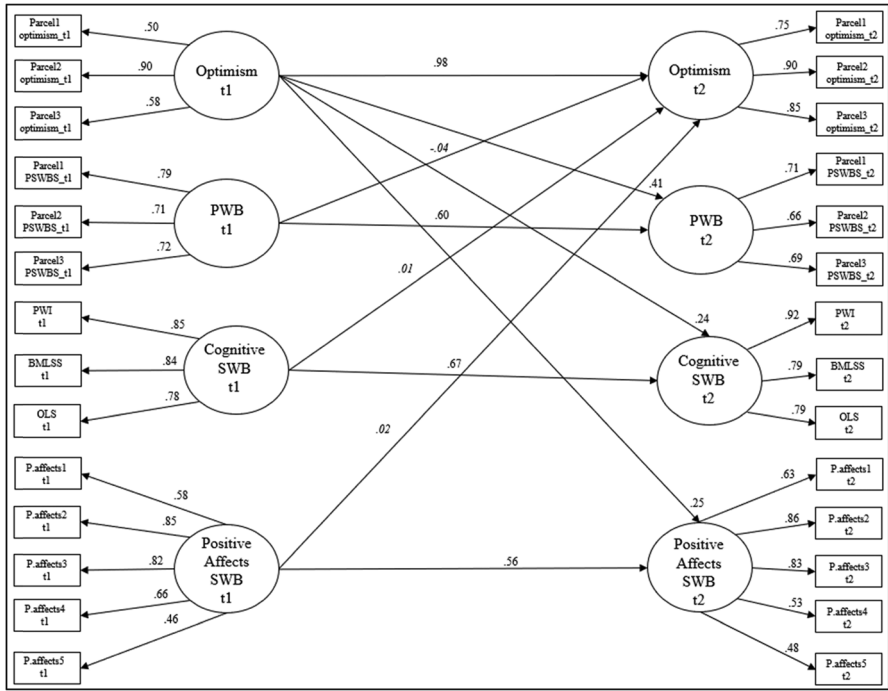


Fig. 2 The proposed longitudinal model between optimism and SWB indicators for adolescents

where it was $B = 0.71$ ($p < 0.05$). Lastly, concerning the relationship between optimism (t1) and affective SWB (t2), the impact was more substantial for females, with a coefficient of $B = 0.94$, compared to males, where it was $B = 0.71$ ($p < 0.05$).

In the adolescent group, the findings revealed a mixed pattern of results. Regarding the effect of optimism (t1) on PWB (t2), females exhibited a coefficient of $B = 0.42$, while males had a slightly lower coefficient of $B = 0.38$ ($p < 0.05$). Conversely, optimism (t1) demonstrated a significant influence on cognitive SWB (t2) for males, with a coefficient of $B = 0.24$, and for females, with a coefficient of $B = 0.23$ ($p < 0.05$). Finally, in terms of the effect of optimism (t1) on positive affective SWB (t2), males had a coefficient of $B = 0.19$, whereas females exhibited a higher coefficient of $B = 0.31$ ($p < 0.05$).

In the assessment of invariance pertaining to the age group factor in the model, significant differences were observed in both instances ($p < 0.05$). These findings indicate that notable distinctions exist between the unconstrained model (Model 1) and the models incorporating factor load invariance (Model 2). Consequently, further analyses for invariance with respect to structural weights (Model 3), covariances (Model 4), structural errors (Model 5), and unicity (Model 6) were not conducted (see Table 4).

Table 3 Cross lagged multigroup analysis by gender for children and adolescents

Children	Male	Female	Adolescents	Male	Female
Optimism(t1) -> Optimism(t2)	0.99***	0.98***	Optimism(t1) -> Optimism(t2)	0.97***	0.96***
PWB(t1) -> PWB(t2)	0.26***	0.07	PWB(t1) -> PWB(t2)	0.64***	0.58***
Cognitive SWB(t1) -> Cognitive SWB(t2)	0.58***	0.25***	Cognitive SWB(t1) -> Cognitive SWB(t2)	0.69***	0.65***
Positive affect SWB(t1) -> Positive affect SWB(t2)	0.46***	0.23***	Positive affect SWB(t1) -> Positive affect SWB(t2)	0.57***	0.55***
Optimism(t1) -> PWB(t2)	0.98***	0.99***	Optimism(t1) -> PWB(t2)	0.38***	0.42***
Optimism(t1) -> Cognitive SWB(t2)	0.71***	0.94***	Optimism(t1) -> Cognitive SWB(t2)	0.24***	0.23***
Optimism(t1) -> Positive affect SWB(t2)	0.62***	0.81***	Optimism(t1) -> Positive affect SWB(t2)	0.19***	0.31***
PWB(t1) -> Optimism(t2)	0.04	0.03	PWB(t1) -> Optimism(t2)	-0.02	0.04
Cognitive SWB(t1) -> Optimism(t2)	-0.04	-0.07	Cognitive SWB(t1) -> Optimism(t2)	0.04	-0.02
Positive affect SWB(t1) -> Optimism(t2)	0.02	0.05	Positive affect SWB(t1) -> Optimism(t2)	-0.03	0.11

Table 4 Fit indices for the Multi Group Analysis by gender across countries

	Models	χ^2	df	χ^2/df	$\Delta \chi^2$	Δdf
Children	Model 1	1894.64	642	2.95		
	Model 2	1962.84	662	2.97	68.2	20
Adolescents	Model 1	2044.41	150	3.18		
	Model 2	2065.97	170	3.12	21.56	20

Discussion

In general, the scientific literature has paid less attention to studies focusing on dispositional optimism in child and adolescent populations (Usán Supervía et al., 2020), despite this being a construct considered fundamental for human functioning and well-being (Gallagher et al., 2017). Therefore, the objective of this study was to confirm the prospective relationships between dispositional optimism and SWB and PWB indicators in children and adolescents.

The descriptive statistics show that children present higher scores in the dispositional optimism indicator of SWB and PWB and both on the data collected during T1 and T2. This confirms the decrease observed cross-culturally from 11 and 12 years of age in SWB levels (González-Carrasco et al., 2017). However, in our study, a decrease in optimism and PWB is also observed, which reinforces the idea that adolescence is a development stage of special vulnerability likely due to the maturation, cognitive and physiological changes taking place at these ages.

According to the first hypothesis of the study, prospective relationships were expected between optimism, and the cognitive and affective components of SWB and between the PWB indicator in the children model. In this sense, the results show significant and strong prospective relationships with both the cognitive and the affective component. Specifically, a stronger effect was found on the cognitive component. This is consistent with previous studies conducted with adults, in which a relationship between optimism and life satisfaction is observed in cross-sectional studies (e.g., Alarcon et al., 2013; Jiang et al., 2014). However, these relationships, and specifically in childhood, needed to be confirmed by longitudinal studies (Cabras & Mondo, 2018). Specifically, previous studies have considered that optimism is related with the cognitive component of SWB, since optimistic people use more adaptive emotional regulation strategies and are more focused on solving problems (e.g., MacCann et al., 2012; Scheier & Carver, 2018). Therefore, optimistic people also tend to experience more positive affect, since they usually try to see the positive side of future events (Scheier & Carver, 2018). This has been demonstrated by the results of this study, according to which optimism is prospectively related with positive affect in children. As in the case of the cognitive component, this relationship may also be attributed to the fact that optimism enhances the regulation of negative affect and consequently, higher levels of positive affect (Scheier & Carver, 2018). As above mentioned, the effects of paths on both the cognitive indicator and the affective indicator of SWB are strong. Nevertheless, the most important effect is observed in the prospective relationship between optimism and PWB. This fact is

particularly interesting, since we almost do not have data showing the relationship between dispositional optimism and PWB at these ages. Other studies with adult population have shown the strong relationship between optimism and PWB (Alarcón et al., 2013; Baranski et al., 2021); however, this form of eudaimonic well-being has been barely studied during childhood because it implies cognitive processes and complex comprehension paths, for which PWB has often been neglected during this period of development. However, as recently observed, the psychometric properties of the PWB scale in this study are satisfactory, which sheds light on the relevance of also studying the more eudaimonic forms of well-being during childhood (Nahkur & Casas, 2021). In this sense, the results of our study indicate that optimism may be a key factor to promote the good psychological functioning of children and, what is more important, to provide children with personal resources that help them deal more effectively with complex situations and prevent future mental health problems in subsequent stages like adolescence.

According to the second hypothesis of the study, prospective relationships were also expected between dispositional optimism and the forms of well-being in adolescence. The results show a relationship between optimism and both forms of well-being, and the weight of the effects of these relationships is stronger than in the children model. As above mentioned, the reduction observed in the different SWB and PSW indicators in adolescence could be one of the possible explanations for the stronger relationship with these indicators during childhood. In this sense, our data point out that optimistic adolescents could develop personal resources for dealing with the difficulties derived from this stage of development. In the model with adolescents, we also observe that the strongest relationship of optimism is with PWB. PWB is a type of well-being characterized by a sense of purpose, the achievement of goals and good interpersonal relationships (Deci & Ryan, 2008; Thornsteinsen & Vittersø, 2020), and optimism enables people to be more persistent in attaining their goals as well as promoting a wider social support network (Carver & Scheier, 2014). In the children and adolescent model, optimism is more strongly related with more cognitive components of well-being despite a strong relationship with the affective component, because optimistic people tend to see future in a more positive way and that makes them feel good.

The prospective relationships observed between dispositional optimism and the different components of hedonic and eudaimonic well-being underscore the relevance of developing optimism as a protective factor from early ages (Scheier & Carver, 2018; Webber & Smokowski, 2018). In this sense, childhood and adolescence are also stages in which personality develops, and key for the establishment of optimism as a dispositional trait that lasts until adult age (Rand, 2017). Adolescence is a stage of special vulnerability in which stress and anxiety are common, as well as the onset of mental health problems (Blackmore et al., 2020). Therefore, our results suggest that optimism may promote higher levels of SWB and PWB in this developmental stage.

Finally, in accordance with the third hypothesis, differences are observed in the gender-based cross-lagged models. Specifically, distinctions emerge in the prospective relationships between optimism and these two forms of well-being. In both the children and adolescent models, the effect of optimism is greater for PWB in

females. However, more inconclusive results are observed in the adolescent model, where girls exhibit a stronger prospective effect in the relationship between optimism and cognitive and affective well-being in childhood. Yet, this effect reverses during adolescence for the cognitive aspect of SWB. Despite these differing effects, it is important to note that the prospective relationships between optimism and various forms of well-being are quite robust for both genders.

In summary, the results of this third hypothesis underscore the importance of gender as an important variable to include in future studies and interventions aimed at promoting optimism during both stages of development. In this regard, it is crucial to highlight that there appears to be a more significant decline in SWB among girls during adolescence (For review, see González-Carrasco et al., 2017). Therefore, our data reinforce the idea that optimism is a highly relevant variable for increasing these levels of SWB, in addition to PWB. Consequently, intervention programs should take this into account and place special emphasis on specific strategies to promote optimism with adolescent girls.

Limitations

This study has some limitations that need consideration. First, although the sample is quite large for a longitudinal study, it is restricted to a specific region; therefore, studies in other countries are necessary to confirm the prospective relationships across variables. Second, this study had only two data collection waves. For cross-lagged studies, it would be ideal to have at least three data collection waves to improve the robustness of prospective relationships among variables.

Conclusions and Practical Implications

This study yields significant findings with important implications that warrant further examination in a scientific context. Firstly, it is essential to underscore the scarcity of the studies of PWB particularly in the context of childhood. This dearth of literature hinders our understanding of the interplay between optimism and PWB. Frequently, the intricacies of PWB involve complex cognitive processes, prompting research in this domain to primarily focus on adults. Nonetheless, findings from our study, as well as recent studies such as Webber and Smokowski (2018), underscore the suitability of investigating this more eudaimonic aspect of well-being during childhood and adolescence. In this regard, our data substantiates the pivotal role of optimism in promoting both SWB and PWB during childhood and adolescence. This observation gains particular significance when considering the cross-cultural decline in SWB documented at ages 11 and 12 in numerous countries (González-Carrasco et al., 2017), which is mirrored in PWB, as per our study's data. These shifts manifest during critical transitional phases from childhood to adolescence, rendering individuals more susceptible to risk factors.

Regarding gender differences, our study's results indicate a more pronounced impact of optimism on well-being forms within PWB, both in childhood and

adolescence. This observation is noteworthy, especially considering the heightened decrease in well-being, as previously mentioned, observed during adolescence, particularly among girls. Therefore, these findings further underscore the significance of promoting optimism development within the gender group experiencing heightened vulnerability during these transitional phases towards adolescence characterized by significant physiological, cognitive, and emotional changes.

Consequently, the promotion of optimism within educational settings and developmental programs targeting childhood and adolescence assumes paramount importance. Doing so may establish optimism as a dispositional trait and serve as a preventive measure against future mental health issues. Additionally, it can facilitate the cultivation of diverse forms of well-being, particularly during the crucial adolescent stage.

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Declarations

Ethics Approval The study protocol has been approved by the Ethics Committee of University of Girona.

Conflict of Interest No conflict of interest exists for this manuscript for any of the authors.

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