



Adolescents “walking the talk”: How value importance and enactment relate to well-being and risk-taking

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Abstract

Using structural equation modeling (SEM), this study examines how adolescents’ rated importance (talk) and enactment (walk) of extrinsic values (wealth, beauty, and fame) and intrinsic values (affiliation, self-acceptance, and community) relate to their well-being and risk-taking. An online questionnaire was filled out by 647 adolescents (57.1% girls), aged between 14 and 17 years old ($M_{\text{age}} = 15.5$ years). Talk intrinsic values were positively associated with well-being, whereas talk extrinsic values were non-significantly related to it. As for the walk measures, we found an interaction between extrinsic and intrinsic values in the prediction of well-being. Extrinsic values enactment and well-being were positively related among adolescents reporting lower intrinsic values enactment, but not among adolescents who reported higher intrinsic values enactment. Finally, using either talk or walk measures, only extrinsic values were associated with higher risk-taking behaviors.

Keywords Self-determination theory · Values · Well-being · Risk-taking · Adolescence

Introduction

Adolescence is a key period for exploring and embracing values that will become central to one’s identity (Knafo and Schwartz 2004). This developmental task is also seen as essential for a healthy transition into adulthood (Erikson 1968; Knafo and Schwartz 2004; La Guardia and Ryan 2002). Self-determination theory (SDT; Deci and Ryan 2000; Ryan and Deci 2017), a macrotheory of human motivation and personality, has shown that the content of adopted values has important implications in terms of personal well-being and functioning. *Extrinsic values* (EV; or materialistic values, such as wealth, physical appearance, and popularity), when prioritized over *intrinsic values* (IV; such as intimacy in social relationships, self-acceptance, and community feeling), are thought to be detrimental (Kasser and Ryan 1996; Kasser 2002). This is of particular concern as young people are highly exposed to materialistic values through their media consumption and advertisement (Schor 2004;

Opree and Kühne 2016). Among adolescents, studies have observed that a high focus on EV compared to IV related to negative outcomes, including higher risk-taking (Williams et al. 2000) and lower subjective well-being (Brown and Kasser 2005). However, because previous research mostly focused on the combined effects of IV and EV using difference scores (i.e., IV-EV), there is still some ambiguity regarding the way in which IV and EV respectively relate to adolescent well-being and risk-taking. Adolescence being a period marked by psychological and physical vulnerability, with risky behaviors increasing and depressed moods reaching a peak in the middle of adolescence (DiClemente et al. 1996; Petersen et al. 1993), understanding how values relate to their psychological functioning is essential.

Values conceptualization

Values are at the heart of human beings’ personality and identity. They influence the attitudes, emotions, aspirations, and behaviors of those who adopt them (Kasser 2002, 2016; Emmons 1989). A value is defined as an “enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode” (Rokeach 1973, p. 5). They transcend specific situations, guide people’s assessment of themselves and others,

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and are ordered according to their relative importance (Schwartz and Bilsky 1987).

It has been shown, through factor analyses and across 15 countries (Grouzet et al. 2005), that intrinsic and extrinsic values form two distinct factors (Kasser and Ryan 1996). According to SDT, IV are considered to be the product of human beings' natural tendencies toward growth and actualization (Kasser 2002). Theoretically, only IV would allow direct satisfaction of the three basic psychological needs of autonomy, competence and relatedness (Kasser 2002). Optimal functioning and well-being would depend on the satisfaction of these innate and universal needs (Deci and Ryan 2000; Ryan and Deci 2017). In contrast, pursuing aspirations related to EV would not be satisfactory in and of itself with respect to basic psychological needs. Their appeal would mainly rest on the promises of feeling admired and worthy in the eyes of others (i.e., high contingent self-esteem; Kasser 2002). EV could even have detrimental effects on well-being if they become out of balance with IV (Sheldon et al. 2004).

Measurement issues

When investigating the links between value content and mental health measures such as well-being and risk-taking, researchers have often computed the "relative intrinsic versus extrinsic value orientation" (RIEVO), which consists of subtracting the average importance ratings of EV from the average importance of IV (Kasser and Ryan 2001). Although calculating this index aims to address the degree to which someone prioritizes IV over EV, instead of investigating each type of values in isolation, the validity of the RIEVO as an index of value prioritization has been questioned. First, although this difference score is premised on the idea that IV and EV are situated at opposites of a single continuum, the exact nature of this continuum has yet to be established. Importantly, the frequently found positive correlation between IV and EV rather suggests that they actually may represent two distinct, yet related, dimensions (Bradshaw 2019). Second, arbitrary variations in the ways associations between the RIEVO and various outcomes are interpreted in the literature suggest that this index lacks in validity. Indeed, associations with the RIEVO are not solely interpreted in terms of IV-EV discrepancies: they are sometimes interpreted as resulting from the presence of EV, absence of IV, or vice versa.

Contrary to what it is said to measure, as a difference score, the RIEVO doesn't truly allow to test how the discrepancy between IV and EV relates to another variable (Zuckerman et al. 2002). Rather, the association between the RIEVO and a certain outcome could be uniquely driven by correlations between that outcome and the RIEVO's constituents (i.e., IV, EV, or both; Van Den Broeck et al. 2019). In addition, using this difference score doesn't allow to distinguish

cumulative from interactive effects. The frequently made claim that EV are only detrimental when they exceed IV suggests an interactive effect (Sheldon et al. 2010; Sheldon and Kasser 2008). In order to obtain a better picture of how IV, EV, and their combination are associated with functioning, we examined IV and EV ratings separately in path analysis models and tested their interaction.

Value talk vs. walk

Recently, Sheldon and Krieger (2014b) argued that researchers would not only benefit from assessing the importance that people say they place on values (talk), but also the degree to which they report acting concretely according to these values (walk). In their study, they computed the RIEVO for both value importance and enactment. They found that the degree to which adult participants reported *enacting* more IV than EV was a better predictor of lower depression, lower anxiety, and higher positive affect than the degree to which they reported *valuing* IV to a greater extent than EV. In the present study, we aimed to examine how value importance and enactment relate to adolescents' psychological functioning by investigating IV, EV and their interaction separately to shed light on the unique and joint contributions of IV and EV. We focused on well-being and risk-taking, which are important concerns during adolescence (Arnett 1992; DiClemente et al. 1996).

Values and well-being

A large body of research has shown that rating IV as more important than EV (the RIEVO subtraction) is associated with greater well-being (Kasser and Ryan 1993, 1996; Ryan and Deci 2017). This is true for both hedonic well-being, which emphasizes the search for pleasure and the avoidance of suffering, as well as for eudemonic well-being, which refers to the degree to which a person is functioning optimally through, for example, meaning in life and self-realization (Huta and Ryan 2009; Ryan and Deci 2001). These results have been replicated in several nations such as Russia (Ryan et al. 1999), Germany (Schmuck et al. 2000) and South Korea (Kim et al. 2003). Some longitudinal (Hope et al. 2014, 2019; Kasser et al. 2014; Sheldon 2005) and experimental studies (Kasser et al. 2014; Lekes et al. 2012) have also provided support to the idea that a higher RIEVO is associated with well-being improvement and less mental health problems.

Recently, Bradshaw (2019) conducted a meta-analysis to clarify the cross-sectional links between values and well-being. A small positive association was observed between the RIEVO and well-being. In addition, zero-order correlations with simple average IV and EV importance scores showed a small positive association between IV and

well-being, whereas there was no link between EV and well-being. Neither age, gender, socio-economic status (SES), nor country of origin moderated these relations.

Some RIEVO studies with adolescents have found positive association with well-being (e.g., Schmuck et al. 2000; Brown and Kasser 2005). These results may have led researchers to expect a negative relation between adolescent EV and well-being (e.g., Van Den Broeck et al. 2019). However, a few studies examining separate ratings of IV and EV suggest that it may not be the case. In a North American and a Chinese sample, Lekes et al. (2010), who included both IV and EV importance ratings in a SEM model, found that IV importance was positively associated with 12–17 year-olds' well-being, whereas EV importance was not associated with it. Li and Feng (2018) found that the well-being of Chinese adolescents correlated with their IV but were unrelated to their EV. Davids et al. (2017) found the same pattern of results in a South African sample of adolescents when predicting positive affect. Surprisingly, Williams (2014) found that life satisfaction and positive affect of high school Australian students were positively associated with both IV and EV. In the present study, we thus expected a positive relation between IV (importance and enactment) and well-being, but no significant relation between EV (importance and enactment) and well-being.

Values and risk-taking

Although well-being is a central psychological health outcome, adolescents' physical safety is a very important concern. Adolescence is indeed a period of life during which individuals are prone to sensation seeking, exploration, and risk-taking (e.g., alcohol and drug use, unprotected sex, and unsafe driving; Dahl 2004; Steinberg 2008; Kann et al. 2018). Although normative, these behaviors can have serious repercussions such as poorer physical or mental health (Willoughby et al. 2007), sexually transmitted infections (Kann et al. 2018), school failure or even death (Irwin et al. 2002). Longitudinal studies have also shown that adolescent risk-taking is linked to poorer functioning in adulthood, manifested in education or employment problems, as well as physical and psychological health problems including substance abuse and law-breaking behaviors (Childs et al. 2016; Hair et al. 2009; Mun et al. 2008).

Given the significant impact of risk-taking, it is warranted to focus on the motivational factors that may influence it, such as values. In adults, the RIEVO has been negatively associated with alcohol and drug use (Kasser and Ryan 2001; Sheldon and Krieger 2014a), and materialistic values have been associated with compulsive spending (Dittmar 2005; Rindfleisch et al. 1997). More recently, Djeriouat (2017) observed that individuals who prioritize EV over IV tend to engage in risky behaviors in many

different life domains. Regarding adolescents, Williams et al. (2000) found that the more they attached importance to EV compared to IV, the more they were susceptible to smoke, drink alcohol, and use drugs. Similarly, Auerbach et al. (2009) showed that the more Chinese adolescents prioritized EV over IV, the more likely they were to engage in risky behaviors.

Since the influence of IV and EV were not examined separately in these studies, it is impossible to know whether these associations between values and risk-taking were due to low levels of IV, high levels of EV, or a combination of both. However, associations were often interpreted by focusing on the potential detrimental effect of EV. Examining IV and EV separately would clarify how they each relate to adolescents risk-taking.

The present study

This study thus examined how adolescents' IV and EV importance (talk) and enactment (walk) are associated with their well-being and risk-taking behaviors. We derived a well-being factor from four well-being indicators (i.e., life satisfaction, positive affect, presence of meaning, and vitality). We also examined the contribution of both types of values separately to avoid the limitations of a composite subtraction score incorporating IV and EV (Van Den Broeck et al. 2019). Yet, we included IV and EV simultaneously in tested models to control for their respective effects. In addition, we tested whether relations between one type of values with well-being and risk-taking were moderated by the other type of values. Finally, each well-being indicator was examined separately in exploratory models, as they differ in terms of nature (hedonic vs. eudemonic well-being) and temporality (shorter vs. longer term).

We formulated several hypotheses. First, we expected that (H1) valued/enacted IV would be positively linked to adolescents' well-being and that (H2) valued/enacted EV would be positively linked to risk-taking behaviors. We anticipated no link between valued/enacted IV and risk-taking nor between valued/enacted EV and well-being. Yet, based on Sheldon et al. (2004), we also hypothesized that IV could moderate the associations between EV and adolescent outcomes. Specifically, we expected that (H3) there would be a negative association between valued/pursued EV and well-being of adolescents with lower levels of valued/enacted IV. Similarly, we expected that (H4) the positive link between valued/pursued EV and risk-taking would be stronger among adolescents with low levels of valued/enacted IV. Lastly, we generally anticipated that walk measures of values would explain greater variance than talk measures (Sheldon and Krieger 2014b).

Methods

Participants

The sample consisted of 647 adolescents (56% girls) recruited in Montreal and surrounding areas (Quebec, Canada). To participate, they had to be between 14 and 17 years old ($M_{age} = 15.5$ years) and speak French. Although participants were invited to report their cultural identity, 23.5% of this information was missing, as some did not provide an answer to the question and others misunderstood it (e.g., reported the color of their skin). Participants who provided this information reported various cultural identities: Canadian/Quebecer (33.2%), Arab or Muslim (15.1%), Haitian or African-American (7.4%), European (7.4%), Asian (7%), Southeast Asian (2.3%), Hispanic (2.6%), and Mixed (1.4%). It should be noted that the majority of their parents (87.3% of mothers and 86.1% of fathers) had completed post-secondary education.

Procedure

Most adolescents (74%) were recruited at their high school. Others were recruited by word-of-mouth. In five out of seven participating schools, the main researcher and a research assistant introduced the study to students during their lunch break, informing them that participants would receive a \$10 electronic gift card as compensation (choosing between an electronics, movie, or fast food store), and collected interested participants' email addresses. The link to access the online questionnaire (password protected survey platform Qualtrics) was then emailed to interested students. In addition, paper flyers containing the link to the online questionnaire were handed out to students. In another school, an email containing information about the study and the link to the online questionnaire was directly sent to students. In the last school, students were given the opportunity to complete the online questionnaire during a class period.

The questionnaire took between 20 and 40 min to complete and adolescents were required to provide their consent to participate in the study. Parental consent was not requested as in Quebec (Canada), minors of 14 years old and older are allowed to consent to participate in a study if it doesn't expose them to more than minimal risk. In order to ensure anonymity, a unique numerical code was associated with each participant to ensure that no email address could be linked to participants' data. Email addresses were stored in a password protected file on a password protected computer only used to send electronic gift cards. No other contact information was collected. Survey responses were

verified in order to exclude participants engaging in suspicious response patterns (e.g., straightlining).

Measures

Intrinsic and extrinsic values

In order to assess adolescent talking and walking of IV and EV, we administered two versions of the Aspiration Index (AI; Kasser and Ryan 1996). We first describe the original version of Kasser and Ryan (1996) before describing its adaptation, based on Sheldon and Krieger (2014b).

Importance (talk) The first administered version was the Aspiration Index's original version that assesses the degree to which respondents attach importance to different life goals reflecting IV and EV. We took fourteen items from the French translation by Grouzet et al. (2005) and translated fifteen items with a back translation procedure (Vallerand 1989). We put all items in infinitive form to match the items in Kasser and Ryan's (1996) survey. Participants were asked to indicate the degree to which each value was important to them on a 7-point Likert-type scale (1 = *Not at all important* to 7 = *Very important*). The six categories were: EV of wealth (e.g., "to have many expensive possessions"), fame (e.g., "to have my name appear frequently in the media"), and image (e.g., "to keep up with fashion in hair and clothing"), as well as IV of relationships (e.g., "to have good friends that I can count on"), personal growth (e.g., "to know and accept who I really am"), and community (e.g., "to help people in need"). We didn't include the seventh category of physical health as it isn't considered specifically intrinsic or extrinsic. The original version contains five items per value category, but in the present study, we excluded one of the items for the "image" extrinsic value because of its non-relevance for adolescents (i.e., "to successfully hide the signs of aging".) This questionnaire's test-retest reliability has been demonstrated (Ryan 1998) and the internal consistency in the present study was good ($\alpha_{IV/EV} = 0.90/0.86$). A factor analysis using Maximum Likelihood with an oblimin rotation was performed to confirm the classification of subscales into two distinct factors (IV and EV talk). Each of the six subscales had loadings of at least 0.56 on the expected factor and not more than 0.12 on the other factor.

Enactment (walk) In the second administered version of the AI, adolescents indicated how much they behave concretely according to IV and EV. The question for this "walk" version was based on the Sheldon and Krieger (2014b) scale, but we used the same set of items as in the first administered version of the AI described above (importance scale). In our study, Cronbach's alphas for intrinsic and extrinsic scales were both of 0.89. We performed a factor analysis using

Maximum Likelihood with an oblimin rotation to confirm the classification of subscales into two distinct factors (IV and EV walk). Each of the six subscales had loadings of at least 0.57 on the expected factor and no more than 0.13 on the other factor.

Life satisfaction

Adolescents completed the Satisfaction with Life Scale (Diener et al. 1985), a self-reported questionnaire with five items (e.g., “In most ways, my life is close to my ideal”). Respondents rated their agreement on a 7-point Likert-type scale (1 = *Strongly disagree* to 7 = *Strongly agree*). The French version of the scale has good validity ratings (Blais et al. 1989). In the present study, the internal consistency was good, with a Cronbach’s alpha of 0.80.

Positive affect

Adolescents completed the 10-item Positive Affect subscale of the validated French version (Gaudreau et al. 2006) of the Positive and Negative Affect Schedule (PANAS; Watson et al. 1988). Factor analysis supported the validity of the scale when administered to adolescents (Huebner and Dew 1995). Respondents indicated the extent to which they felt each positive emotion (e.g., “interested”, “enthusiastic”) over the past few days on a 5-point Likert-type scale (1 = *Very little or not at all* to 5 = *Very much*). The internal consistency of the subscale was good in the present study ($\alpha = 0.79$).

Vitality

We administered the individual difference level version of the Subjective Vitality Scale to adolescents (Ryan and Frederick 1997). Vitality refers to feeling alive and alert and having energy available to the self (Ryan and Frederick 1997; Ryan and Deci 2001). Respondents stated their level of agreement on a 7-point Likert-type scale (1 = *Not at all true* to 7 = *Very true*; e.g., “I feel alive and full of life”). As recommended by Bostic et al. (2000), we used the version with six items rather than seven. The French translation (Salama-Younes et al. 2009) demonstrated good convergent validity and good structural characteristics. In the present study, the internal consistency was excellent ($\alpha = 0.90$).

Presence of meaning

Meaning is a key aspect of eudemonic well-being (Ryan and Deci 2001). Participants completed the French version of the Presence of Meaning subscale from the Meaning in Life Questionnaire (MLQ; Steger et al. 2006). On a 7-point Likert-type scale (1 = *Totally False* to 7 = *Totally True*),

respondents indicated how much they agree with five statements (e.g., “I have a good sense of what makes my life meaningful”). This subscale has demonstrated good concurrent validity (Steger et al. 2006) and has been validated with adolescents (Rose et al. 2015). The Cronbach’s alpha of 0.82 in the present study suggests good internal consistency.

Risk-taking

Adolescents completed nine items, translated with a back translation procedure (Vallerand 1989), taken from the Risk-Taking subscale of the Risk-Taking and Self-Harm Inventory for Adolescents (RTSHIA; Vrouva et al. 2010). Each item referred to a type of risky behavior (e.g., “Have you ever had so much alcohol that you were really drunk?”). Adolescents indicated how often they did each behavior on a Likert-type scale (1 = *Never* to 4 = *Many times*). The scale has demonstrated excellent test–retest reliability over three months ($r = 0.90$) and good concurrent, convergent, and divergent validity (Vrouva et al. 2010). This scale’s internal consistency, as measured by Cronbach’s alpha, was 0.80 in the present sample.

Socio-demographic information

The questionnaire ended with socio-demographic questions about the participant’s age, gender, academic level and cultural identity. Adolescents also reported their parents’ employment and highest level of education completed.

Analytic strategy

First, we examined data distributions, descriptive statistics and zero-order correlations between all observed variables. We planned to include any demographic variable that was correlated with our variables of interest as covariates in our main analyses to control for their potentially confounding impact. All structural equation modeling (SEM) analyses were performed using Mplus version 7 (Muthén and Muthén 1998–2012). We handled missing data with full information likelihood using the Maximum Likelihood Robust estimator (MLR). Allowing to use all the available information, this method is superior to alternative methods of handling missing data such as the exclusion of missing values by complete case analysis (listwise deletion; Schafer and Graham 2002). As preliminary SEM analyses, we first conducted a confirmatory factor analysis to ensure the adequacy of the well-being measurement model. The latent factor of well-being was estimated with four observed variables: life satisfaction, positive affect, vitality, and presence of meaning, thus considering both hedonic and eudemonic aspects of well-being (Ryan and Deci 2001).

Table 1 Descriptive statistics

Continuous variables	<i>n</i>	<i>M</i>	<i>SD</i>	Intervals	
				Theoretical	Observed
Age	647	15.49	0.98	–	14.00–17.00
Mother's education	643	3.84	1.00	1–5	1.00–5.00
Father's education	633	3.84	1.04	1–5	1.00–5.00
Intrinsic values					
Talk	645	5.63	0.79	1–7	2.80–7.00
Walk	622	5.01	1.00	1–7	1.00–7.00
Extrinsic values					
Talk	645	3.73	1.07	1–7	1.00–7.00
Walk	623	3.40	1.10	1–7	1.00–6.87
Well-being					
Life satisfaction	644	4.93	1.15	1–7	1.40–7.00
Vitality	642	4.30	1.27	1–7	1.00–7.00
Presence of meaning	645	4.64	1.26	1–7	1.00–7.00
Positive affect	645	3.25	0.65	1–5	1.10–4.90
Risk-taking	644	1.60	0.53	1–4	1.00–3.56
Categorical variables					
		<i>n</i>	%		
Gender					
Male		276	42.7		
Female		369	57.0		

For our main SEM analyses, we tested two separate models, one for the talk and one for the walk value measures, to avoid multicollinearity problems. Indeed, talk and walk measures were correlated (talk and walk EV: $r=0.80$, $p<0.001$; talk and walk IV: $r=0.57$, $p<0.001$), particularly strongly in the case of EV. For each model, we used global scores to assess each variable and created a latent variable to capture participants' overall well-being. In the first structural model, we regressed well-being and risk-taking on the talk IV (mean-centered), talk EV (mean-centered), their interaction, and the covariates. We then removed non-significant interaction terms to interpret main effects. Following the procedure outlined by Dawson (2014), we plotted significant interactions into graphs for interpretation. In the second structural model, we used the same procedure, but entered the walk measures (walk IV, walk EV, and their interaction). As exploratory analyses, we ran the talk and the walk models again but including the four well-being indicators separately instead of the well-being measurement model.

As recommended by Hu and Bentler (1999), we examined different fit indices to assess the well-being measurement model's adequacy as well as the two structural models. The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) should both be above 0.90 for an acceptable fit. The Standardized Root Square Mean Residual (SRMR) and Root Mean Square Error Approximation (RMSEA) are expected to have a value of 0.08 or less (Little 2013; Browne and

Cudeck 1992; West et al. 1995). Lastly, we did not interpret the chi-square because it is highly sensitive to sample size and our sample is larger than 400 (Kenny 2015).

Results

Preliminary analyses

First, we examined variables to identify univariate extreme scores, verify the normality of their distribution, and assess the extent of missing data. The number of univariate extreme scores was limited, ranging from 0 to 6 per variable. We replaced all extreme scores with scores corresponding to a Z score of 3.29 to avoid their impact on observed means (Tabachnick and Fidell 2013). Variable distributions were all considered normal according to Kline's (2011) recommendations (between -3 and 3), with skewness values ranging from -1.29 to 1.24 and kurtosis values ranging from -1.01 to 1.49 . Finally, missing data were limited, with percentages ranging from 0 to 3.9% missing data per variable. The means, standard deviations, theoretical and observed intervals, and the number of participants providing data for each variable are presented in Table 1.

Next, in order to examine the difference between the importance and enactment scores as well as between intrinsic and extrinsic scores, we ran a 2 (Type of value: Intrinsic vs.

Table 2 Zero-order correlations between variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender ^a	–											
2. Age	0.09*	–										
3. Mother’s education	0.06	– 0.09*	–									
4. Father’s education	0.04	– 0.05	0.49**	–								
5. Intrinsic values (talk)	– 0.28**	– 0.03	0.03	– 0.01	–							
6. Intrinsic values (walk)	– 0.08	– 0.03	0.01	– 0.01	0.57**	–						
7. Extrinsic values (talk)	0.10*	0.10*	0.04	0.02	0.01	– 0.01	–					
8. Extrinsic values (walk)	0.11*	0.05	0.01	0.02	– 0.08	0.20***	0.80**	–				
9. Life satisfaction	– 0.01	– 0.12*	0.04	0.06	0.17**	0.26**	– 0.07	0.06	–			
10. Vitality	0.09*	– 0.09*	0.03	0.03	0.15**	0.32**	0.06	0.21**	0.51**	–		
11. Presence of meaning	0.01	– 0.05	– 0.01	0.02	0.15**	0.24**	– 0.04	0.07	0.39**	0.46**	–	
12. Positive affect	0.07	– 0.07	0.00	0.03	0.19**	0.30*	0.13**	0.23**	0.44**	0.69**	0.37**	–
13. Risk-taking	0.14**	0.20**	0.04	– 0.02	– 0.04	– 0.01	0.19**	0.18**	– 0.20**	– 0.10*	– 0.13**	– 0.03

N=608–647

^aGender: 1 = female, 2 = male

p* < 0.05, *p* < 0.01

Extrinsic) × 2 (Frame: Talking vs. Walking) MANOVA with repeated measures on both factors. Consistent with Sheldon and Krieger (2014b), IV were generally more strongly endorsed than EV, $F(1619) = 1173.32, p < 0.001, \eta^2 = 0.66$, and scores of value enactment were generally lower than value importance scores, $F(1619) = 299.84, p < 0.001, \eta^2 = 0.33$. Also consistent with Sheldon and Krieger (2014b), we observed a significant interaction between the type of value and frame factors, $F(1619) = 95.33, p < 0.001, \eta^2 = 0.13$. There was a more important gap between the talking and the walking of IV (– 0.62) than between the talking and walking of EV (– 0.32; see means in Table 1).

Zero-order correlations between all observed variables are presented in Table 2. Associations generally supported our hypotheses, although the importance of EV was positively associated with positive affect and the enactment of EV was positively associated with positive affect and vitality.

Since age and gender were significantly correlated with several dependent variables, we included them in the tested models as control variables. In this sample, older adolescents reported lower life satisfaction and vitality as well as a higher level of risk-taking. Being a boy was also associated with higher levels of vitality and risk-taking.

Main analyses

Measurement model

We verified the adequacy of our measurement model estimating adolescent well-being from life satisfaction, vitality, presence of meaning, and positive affect. The fit indices,

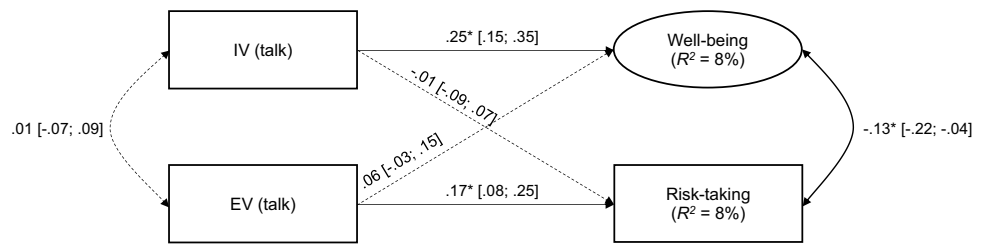
all satisfactory, indicated that the measurement model is adequate: RMSEA = 0.08, CFI = 0.99, TLI = 0.96, and SRMR = 0.02 (Hu and Bentler 1999; Little 2013). The $\chi^2(2) = 10.430$ was significant. In addition, all factor loadings were greater than 0.50 and significant at $p < 0.001$.

First structural model: talk¹

Using SEM analysis, we modeled talk IV, talk EV, and their interaction term (IV × EV) to predict well-being and risk-taking, while controlling for gender and age. We also included covariances between these three predictors, and between the disturbances (unexplained variances) of well-being and risk-taking. Contrary to expectations (H3 and H4), the interaction between IV and EV was not significant in the prediction of well-being ($\beta = 0.01, p = 0.78$), nor in the prediction of risk-taking ($\beta = - 0.03, p = 0.20$). We thus removed the interaction terms to examine main effects. The model fit indices were satisfactory: RMSEA = 0.06, CFI = 0.95, TLI = 0.91 and SRMR = 0.04. The $\chi^2(17) = 58.71$ was significant. Together, talk IV and talk EV explained 8% of the variance in well-being and 8%

¹ To facilitate comparisons with other studies, we tested the same structural model using the talk RIEVO in the place of talk IV, talk EV, and their interaction. To compute it, we first standardized talk IV and talk EV to give them the same weight. Next, we subtracted the EV average score from the IV average score. The model fit indices were satisfactory (RMSEA = .06, CFI = 0.96, TLI = 0.92 and SRMR = 0.04) although the $\chi^2(25) = 827.311$ was significant. Talk RIEVO was positively associated with well-being ($\beta = 0.12, p = 0.01$) and negatively associated with risk-taking ($\beta = 0.13, p = 0.005$) and explained 3% of the variance in well-being and 7% in risk-taking.

Fig. 1 Path analysis between IV and EV importance, well-being, and risk-taking



Note. IV = intrinsic values; EV = extrinsic values. Coefficients are standardized. Dashed lines denote the non-significant coefficients and solid lines denote significant coefficients. The 95% intervals are indicated in brackets. Covariables (age and gender) and well-being latent factors' indicators are not depicted for simplicity. $N = 647$.

* $p < .05$.

of the variance in risk-taking. As shown in Fig. 1, supporting H1, the more adolescents gave IV importance, the more they reported experiencing well-being. In contrast, the talking of EV was not associated with well-being. With respect to adolescent's risk-taking, the more they valued EV, the more they tended to engage in it, thus supporting H2. IV importance was not associated with this problematic behavior.

Associations with observed well-being indicators Next, we ran the same model again but predicting positive affect, life satisfaction, vitality, and meaning in life as observed variables instead of using the well-being latent variable. The four interaction terms were removed from the model as none were significant. Talk IV was positively associated with the four well-being indicators, that is positive affect ($\beta = 0.18$, $p < 0.001$), life satisfaction ($\beta = 0.27$, $p < 0.001$), vitality ($\beta = 0.31$, $p < 0.001$), and meaning in life ($\beta = 0.28$, $p < 0.001$). Talk EV was not significantly related to life satisfaction, vitality, nor meaning in life, but was positively related to positive affect ($\beta = 0.12$, $p = 0.004$).

Second structural model: walk²

We then modeled walk IV, walk EV, and their interaction term (IV \times EV) to predict well-being and risk-taking, controlling for gender and age. We also included covariances

between walk IV, walk EV and IV \times EV, and between the disturbances of well-being and risk-taking. The interaction between walk IV and walk EV was not significant in the prediction of risk-taking ($\beta = 0.00$, $p = 0.84$), contradicting H4. We thus removed this interaction term in the prediction of risk-taking to examine main effects, but kept it in the prediction of well-being. The fit of this model was satisfactory: RMSEA = 0.05, CFI = 0.97, TLI = 0.95 and SRMR = 0.03. The $\chi^2(21) = 49.60$ was significant. Walk IV and walk EV explained 20 and 8% of the variance in well-being and in risk-taking, respectively. As shown in Fig. 2, supporting H2, the more adolescents reported behaving according to their EV, the more they tended to engage in risk-taking behaviors. In contrast, acting according to their IV was not associated with these problematic behaviors.

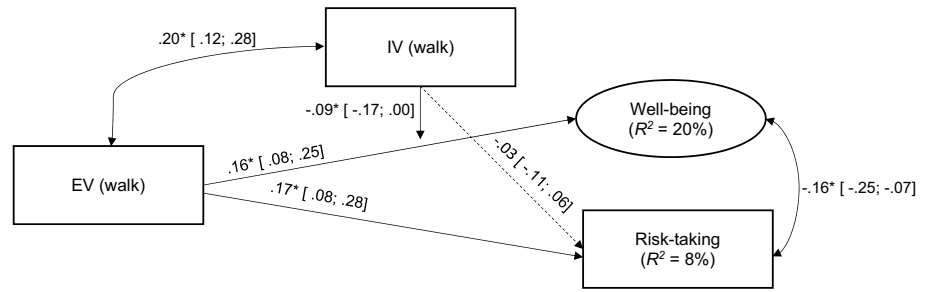
There was a small but significant interaction between walk IV and walk EV in the prediction of well-being ($\beta = -0.09$, $p = 0.049$). When decomposed,³ contradicting H3, the interaction showed that for adolescents who reported a low level of IV enactment, EV enactment was positively related to their well-being ($b = 0.15$, $p < 0.001$). However, EV enactment was not significantly related to the well-being of adolescents who reported a high IV enactment ($b = 0.05$, $p = 0.24$; see Fig. 3).

Associations with observed well-being indicators Next, we ran the same model again but predicting positive affect, life satisfaction, vitality, and meaning in life as separate

² To facilitate comparisons with other studies, we also tested the same structural model using the walk RIEVO in the place of walk IV, walk EV, and their interaction. To compute it, we first standardized walk IV and walk EV to give them the same weight. Next, we subtracted the EV average score from the IV average score. The model fit indices were satisfactory (RMSEA = 0.06, CFI = 0.96, TLI = 0.93 and SRMR = 0.04) although the $\chi^2(14) = 46.677$ was significant. Walk RIEVO was positively associated with well-being ($\beta = 0.12$, $p = 0.01$) and negatively associated with risk-taking ($\beta = 0.12$, $p = 0.007$) and explained 3% of the variance of well-being and 7% of the variance of risk-taking.

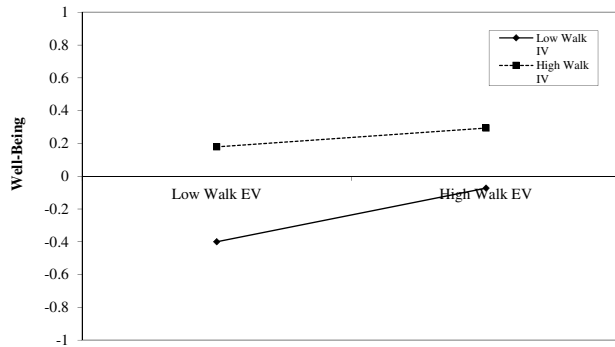
³ For information purposes only, we also decomposed this interaction to examine how enactment of EV moderates the relation between IV enactment and well-being. Walk IV was positively associated with well-being at any walk EV level, although this positive relation was stronger among adolescents with a low EV enactment ($b = 0.29$, $p < 0.001$), than among those with a high EV enactment ($b = 0.18$, $p < 0.001$).

Fig. 2 Path analysis between IV and EV enactment and well-being and risk-taking, including the moderation of the association between EV enactment and well-being by IV enactment



Note. IV = intrinsic values; EV = extrinsic values. Coefficients are standardized. Dashed lines denote the non-significant coefficients and solid lines denote significant coefficients. The 95% intervals are indicated in brackets. Covariables (age and gender) and well-being latent factor's indicators are not depicted for simplicity. $N = 647$.

* $p < .05$.



Note. IV = intrinsic values; EV = extrinsic values.

Fig. 3 Decomposition of the interaction between walk EV and walk IV in the prediction of adolescent well-being

observed indicators. We found only one significant walk IV and walk EV interaction, in the prediction of positive affect. Once the non-significant interaction terms were removed from the model, this interaction in the prediction of positive affect was only marginally significant ($\beta = -0.05$, $p = 0.09$). When decomposed,⁴ it suggested that the positive link between EV enactment and positive affect tends to be stronger ($b = 0.13$, $p < 0.001$) among adolescents with a low IV enactment, than adolescents with a high IV enactment ($b = 0.07$, $p = 0.02$). Walk IV was also positively related to life satisfaction ($\beta = 0.26$, $p < 0.001$), vitality ($\beta = 0.29$,

$p < 0.001$), and meaning in life ($\beta = 0.23$, $p < 0.001$). As for walk EV, it was positively related to vitality ($\beta = 0.15$, $p < 0.001$), but not significantly related to life satisfaction nor meaning in life.

Discussion

This study aimed to shed light on how IV and EV are associated with well-being and risk-taking during adolescence, a life period during which exposure to materialistic values is particularly strong (Schor 2004). By investigating the unique contribution of each type of value, as well as by testing their interaction, we were able to gain clarity about their associations. The present study also allowed us to examine two aspects of adolescent values, their importance (talk) and their enactment (walk) in relation to well-being and risk-taking. Supporting H1 and H2, the extent to which IV are valued was associated with greater well-being, whereas the extent to which EV are valued and pursued was associated with greater risk-taking. Regarding value enactment and well-being, a surprising interaction emerged, contradicting H3. We found a surprising positive link between EV enactment and well-being, but only among adolescents reporting lower IV enactment. Based on Sheldon et al. (2004) we had expected that EV would be negatively linked to the well-being of the teens pursuing less IV. Before discussing each of these findings, we first discuss some interesting preliminary results.

First, the positive association between EV's rated importance and enactment was stronger than the positive association between the talking and the walking of IV. The MANOVA analysis indeed confirmed that there was a greater talking-walking consistency for EV than for IV. These findings corroborate observations made among adults samples by Sheldon and Krieger (2014b).

⁴ For information purposes only, we also decomposed this interaction to examine how EV enactment moderates the relation between IV enactment and positive affect. Walk IV was positively associated with positive affect at any levels of walk EV, although this positive relation was stronger ($b = 0.21$, $p < 0.001$) among adolescents with a low EV enactment, than among those with a high EV enactment ($b = 0.14$, $p < 0.001$).

Next, correlational links observed with demographic variables were consistent with the literature, with boys reporting less IV (talk) and more EV (talk and walk) than girls (Kasser and Ryan 1993). Boys also tended to report greater well-being (Lekes et al. 2010) and to engage in more risk-taking behaviors (Byrnes et al. 1999) than girls. Finally, older adolescents reported more risk-taking (Williams et al. 2000), less well-being (Merikangas et al. 2010), and greater EV importance (Pinto et al. 2017) than younger ones. This pattern of results suggests that age and sex were important factors to consider in the main analyses.

Values and well-being

In line with our hypothesis, SEM analyses revealed that valued IV, such as community contribution, meaningful relationships, and personal development, were positively associated with adolescent well-being. There was no significant interaction between the talking of IV and EV. Thus, regardless of how prominent EV were in their lives, adolescents seemed to benefit from giving importance to IV for their psychological well-being. According to SDT, this positive association may be due to the fact that IV are congruent with humans' natural actualizing and growth tendencies (Kasser and Ryan 1996). This finding is in line with the numerous studies reporting a positive relation between IV and well-being (Bradshaw 2019) and points to the significance of IV for adolescents. Only few studies have shown this relation in adolescents by examining IV and EV separately (see Lekes et al. 2010, for exceptions; Davids et al. 2017). The fact that the talking of IV was associated with more life satisfaction, presence of meaning, positive affect, and vitality, as revealed by exploratory analyses, also supports the idea that giving importance to IV is related to both hedonic and eudemonic aspects of well-being (Ryan and Deci 2000; Kasser et al. 2014).

With respect to EV, as expected, we did not observe any significant link between their rated importance and adolescent well-being. This is consistent with studies conducted with adults (Visser and Pozzebon 2013; Olčar et al. 2019; Van Den Broeck et al. 2019) and adolescents (Lekes et al. 2010; Davids et al. 2017). Results with observed well-being indicators even pointed to a positive relation between positive affect and EV rated importance. These results provide support for the idea that in and of itself, finding that EV are important would not be a systematic risk factor for adolescents' well-being. Indeed, prior well-being benefits of the RIEVO (EV subtracted from IV) could have been explained by greater IV importance rather than a greater IV-EV discrepancy. Moreover, the absence of interaction effect, which contradicted our expectations, challenges the idea that talk EV becomes generally problematic when they are more prominent than IV (Sheldon and Krieger 2014b).

As for the walking of IV and EV, we found a surprising moderation effect suggesting that EV enactment could offer a slight compensation for a lack of IV enactment, in terms of hedonic wellness. Indeed, for adolescents putting less IV into practice, actively pursuing EV (trying to gain popularity, beauty, money) was positively associated with their well-being. This link was not found among adolescents who put more IV into practice. Considering that this interaction effect was small and unexpected, it should be replicated before being interpreted at length. If it proves accurate, it may reflect that teens putting *some* (albeit extrinsic) values into practice have a greater general goal engagement, leading to greater well-being (Koestner et al. 2002; Bradshaw 2019). The ones who reported low enactment for both IV and EV may be amotivated and even experience apathy. It should be noted that exploratory analyses only found a similar pattern of interaction for positive affect, which was only marginally significant.

In addition, exploratory analyses showed that IV enactment was positively associated with vitality, life satisfaction and meaning in life, whereas EV enactment was only positively associated with vitality. Thus, potential benefits of enacting EV may be restricted to fleeting wellness experiences. Indeed, whereas life satisfaction and presence of meaning require a certain hindsight to assess life in its entirety, positive affect and vitality are experiences felt in the present moment and are more ephemeral. It may be that for a teenager, getting fashionable clothing for example can be associated with joy, pride, and vitality momentarily, without being associated with global and long-term indicators of wellness. This would support the claim made by Ryan and Deci (2000) that EV could relate to short-term happiness rather than eudemonic well-being.

Another possibility that may explain that some adolescents could benefit from enacting EV in terms of well-being is that the mere fact of acting in accordance with one's values would contribute to making values enactment gratifying, whatever they are. Indeed, a study by Lundgren et al. (2012) showed that youth who acted according to their values (no matter their nature) reported a higher level of life satisfaction. Finally, another way to explain this finding is the North American social context of adolescents, where the emphasis on materialistic values is particularly important. Indeed, studies have shown that adolescents are particularly inclined to judge their peers on the quality and quantity of their material possessions, and that not following fashion may lead to social exclusion (Isaksen and Roper 2012; Wooten 2006). It may be that the ambient materialism to which adolescents are exposed makes it potentially gratifying or comforting to behave according to EV, at least in the short term.

Values and risk-taking

With regard to the SEM analyses pertaining to links between values and risk-taking, results partially supported our hypotheses. First, both the talking and the walking of EV were associated with more risk-taking, no matter how much teens endorsed IV. Perhaps certain risky behaviors are directly involved when extrinsic aspirations are targeted. For instance, delinquent behavior could lead to obtaining money and drug use could allow to increase one's popularity. Some adolescents who attach greater importance and behave on the basis of popularity, physical appearance, and financial success to a greater extent may also be more likely to engage in risky behaviors due to a vulnerability to peer pressure. For example, a teenager whose self-esteem is contingent upon external gratification such as EV may fear disappointing others or being criticized for wearing a bicycle helmet or requiring protection against sexually transmitted infections (STIs).

In addition, risk-taking and EV could be positively associated because both can result from thwarted basic psychological needs of relatedness, competence, and autonomy. For example, a teenager whose need for autonomy is frustrated as a result of controlling parenting could rebel against it by using illegal substances (Van Petegem et al. 2015). Studies have indeed pointed out that risk-taking can be seen as a compensatory strategy for unsatisfied psychological needs (Neighbors et al. 2007) and EV are considered as psychological needs substitutes according to SDT (Kasser et al. 2004).

Concerning IV, as we expected, they were unrelated to risk-taking behaviors. Moreover, we found no interaction between IV and EV in the prediction of risk-taking, such that IV level does not seem to mitigate or prevent the higher risk-taking linked with EV. It thus appears that the relation observed in prior studies between the greater prioritization of EV vs. IV and more adolescent risk-taking (Auerbach et al. 2009; Williams et al. 2000) primarily stems from EV as a risk factor rather than IV as a protective factor. This result concurs with the fact that when discussing a positive relation between this composite measure and risk-taking, researchers have chosen to emphasize the role of EV, rather than IV (Williams et al. 2000).

Talk and walk

As predicted, measuring the extent to which adolescents put values into practice (walk) allowed us to better explain their level of well-being ($R^2 = 20\%$) than measuring how important these values were to them (talk; $R^2 = 8\%$). This supports the idea that working towards IV could lead to more well-being, presumably through experiences that foster basic psychological needs' satisfaction as well as self-determined motivation (Kasser 2002). Moreover, it seems that EV enactment may contribute to well-being in some instances,

whereas it does not seem to be the case for EV importance. As for risk-taking, contrary to our hypothesis, the explained variance was identical when using the talk or walk measure. This suggests that the positive relation between EV and risk-taking could depend as much on adolescents' endorsement of EV as their enactment of them.

The fact that the walk measure explained a greater part of the variance in well-being than the talk measure and that different patterns of associations emerged shows the importance of further investigating how the walk and talk measures differ. In order to establish with confidence the unique contributions of the talking and walking of values in the prediction of well-being and risk-taking, future studies should include both measures in a single model.

Strengths and limitations

One of the main strengths of this study is the examination of how IV and EV, as conceptualized in the SDT framework (Kasser and Ryan 1996), relate to adolescent well-being and risk-taking by using the traditional talk measure as well as the recent walk measure of values. To our knowledge, the walking of values had never been measured among adolescents. Since the association between one's values and the behaviors toward them can sometimes be very modest (Bardi and Schwartz 2003), paying attention to the degree to which IV and EV are put into practice is relevant to better understand these two types of values and their correlates. Moreover, we administered a larger number of items instead of a small subset (seven items were used in Sheldon and Krieger 2014b), giving us a more thorough portrait of adolescent values.

Separating IV from EV within statistical models also contributed to a better understanding of their respective associations with well-being and risk-taking. For instance, we found that the walking of EV is positively linked with adolescent well-being when they have a low level of IV enactment, whereas researchers have often suggested that EV are negatively associated with well-being (e.g., Soenens et al. 2015). The present study also clarifies that EV appear to be more strongly related to risk-taking than IV during adolescence, while the use of aggregated IV-EV measures in past studies led to somewhat ambiguous conclusions in this regard (Auerbach et al. 2009; Williams et al. 2000).

Taking an interest in risk-taking in addition to well-being also provided a more complete picture of adolescents' experiences and psychological health. Investigating risk-taking is important in this developmental period because adolescents are especially inclined to engage in risky behaviors, which can threaten their well-being (Steinberg 2008).

In the same vein, using four different indicators to form a global, latent measure of well-being allowed us to consider a wider range of adolescents' emotional and cognitive

experiences. The fact that we used well-being indicators tapping into both hedonic and eudemonic experiences (positive affect, life satisfaction, vitality, presence of meaning) contributed to the extent and richness of this measure. In addition, subsequently exploring associations separately for each well-being indicator helped us to draw a more nuanced portrait.

In addition to these strengths, several limitations should be discussed. First, we cannot conclude that there are causal links between variables due to our correlational, cross-sectional design. For example, having a high level of well-being could help adolescents endorse or follow certain values. Longitudinal and experimental studies, however, have already shown that an increase in IV can improve well-being levels (Lekes et al. 2012; Niemiec et al. 2009). Considering the correlational nature of the study and its single time-point, replicating these results in another sample but this time using a longitudinal design would be particularly useful.

Next, all of this study's data was self-reported. Social desirability could lead participants to report, for example, a higher level of well-being, a lower level of risk-taking, as well as a greater commitment to socially desirable values than what they experience in reality. Importantly, all measures were reported by the same respondent, adolescents, which introduces the possibility of illusory correlations due to the common method variance (Podsakoff et al. 2003).

Another limitation pertains to the walk measure of values, whose similarity with the talk measure prevented us from including both types of measures in a single model. Considering that the same items were used, there is a possibility that some participants actually did not notice the difference between the talk and the walk measures. The level of correspondence between the two could thus have been overestimated. Unfortunately, this limits our ability to make further comparisons between the talking and the walking phenomena. It is likely that the importance measure captures, to a certain degree, the level to which adolescents feel they act upon values and vice versa. Developing a more distinctive walk measure may help address this issue in future studies.

Implication and future directions

In conclusion, this study suggests that future research on IV and EV could benefit from incorporating a walk measure, especially to better understand adolescent well-being. It would also be especially valuable to add other informants (e.g., peers, parents) to assess adolescent risk-taking for instance, and/or their behaviors towards IV and EV. Given the observable nature of the walk measure of values, it seems better suited than the talk measure of values for an assessment by a third party. This would represent a significant methodological progress, since most IV and

EV studies rely on only one informant (Bradshaw 2019). Secondly, it would be interesting to explore the mechanisms that drive adolescents who are more inclined toward EV to take more risks. In our view, potential mediators include perceived social pressure (Steinberg 2008), contingent self-esteem (Lahey et al. 2014), and frustration of basic psychological needs (Neighbors et al. 2007). Future studies could also explore whether endorsement of EV in adolescents' peer group could moderate the link between values and psychosocial well-being.

In sum, the present research supports the idea that as early as adolescence, psychological well-being is positively associated with IV, even if extrinsic, materialistic values are often predominant in the social environment during that life period. It also suggests that adolescents putting EV into practice are not systematically more likely to have lower well-being and may even report higher well-being if they don't actively pursue IV to a great extent. However, there could be a pitfall for teenagers in cherishing and working towards EV as it was only related to hedonic wellness and associated with more risk-taking. Future longitudinal studies could assess whether positive links between EV and well-being are sustainable and explore how the talk and walk indicators of IV and EV fluctuate over time (Niemiec et al. 2009).

In light of the present results, it seems that to foster adolescent well-being and limit their risk-taking, it could be beneficial that socialization agents in their environment (e.g., parents, teachers, coaches) promote IV rather than EV. For instance, a social climate in educational settings characterized by helpfulness and cooperation instead of competition conveys different values (Allodi 2010). In addition, simply allocating some time to reflect on one's intrinsic values has been shown to foster greater prioritization of IV over EV (Lekes et al. 2012). Lastly, since it is thought that human beings naturally prioritize IV when their psychological needs are supported, one avenue might be to encourage parents to adopt more need-supportive practices such as unconditional positive regard (Rogers 1961) and autonomy support (Joussemet et al. 2008; Vasquez et al. 2016). These practices could foster greater IV and limit the development of EV.

Author contributions JT and MJ contributed to the study conception and design. Data collection was performed by JT. Data analysis was performed by JT and VK, with MJ and GAM contributing to results interpretation. The manuscript was drafted by JT and all other authors reviewed and commented on previous versions of the manuscript. All authors have read and approved the final manuscript.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This project was approved by the “Comité d’éthique de la recherche en arts et en sciences” of the University of Montreal (CERAS # 2017-18-101-D).

Informed consent Informed consent was obtained from all individual participants included in the study. Parental consent was not requested as the Article 21 of the Civil Code of Quebec (Canada) allows minors of 14 years old and older to consent to participate in a study if it doesn’t expose them to more than minimal risk.

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