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The Task and Ego Orientation in Sport Questionnaire adapted for Youth with Intellectual Disabilities (TEOSQ-ID)

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Highlights
- The Task and Ego Orientation in Sport Questionnaire was adapted
- The factor structure was supported among youth with intellectual disabilities (ID)
- Higher Body Mass Index is positively related to ego motivation orientation
- Youth with moderate ID present higher ego and task motivation orientations
- Youth involved in sport present higher ego and task motivation orientations

Abstract

The objective of the present study was to validate a version of the Task and Ego Orientation in Sport Questionnaire (TEOSQ) adapted for youth with intellectual disabilities (ID). A sample of 362 youth with mild to moderate ID (61.0% boys, M = 15.80 years) from Australia (N = 240) and Canada (N = 122) respectively completed English and French versions of the TEOSQ-ID twice over a one-year interval. Confirmatory factor analyses supported the validity and reliability of the a priori two-factor structure of the TEOSQ-ID, as well as the weak, strict, and latent variance-covariance invariance of this factor structure across linguistic versions. The results also supported the strong invariance of a majority of the TEOSQ-ID items across linguistic versions, and revealed latent mean differences showing that English-Australian youth tended to score lower on the TEOSQ-ID factors than French-Canadian respondents. The results also supported the measurement invariance of the TEOSQ-ID over time, and revealed a lack of differential item functioning (i.e., measurement bias) as a function of youth's age, body-mass index, ID level, sex, and frequency of sport involvement. Meaningful latent mean level differences were observed on the TEOSQ-ID factors in relation to body-mass index, ID level, and frequency of sport involvement. Finally, our results supported the convergent validity of the ego and task factors in relation to a measure of perceived physical abilities.

Keywords: Motivation, sport, special education needs, goal orientation, measurement invariance, healthy lifestyle.

Individuals with intellectual disabilities (ID) experience limitations in intellectual functioning that impact their adaptive functioning in areas of conceptual skills, social skills, and/or practical skills, and these limitations begin prior to the end of the developmental period (i.e., during childhood or adolescence) (APA, 2013). A diagnosis of intellectual disability is made when one's intelligence quotient (IQ) is assessed as two standard deviations or more below the population average and, in recent diagnostic guidelines, when it is accompanied by a deficit in adaptive functioning (APA, 2013). Intellectual disability affects approximately 1%-2% of the general population (Maulik et al., 2011).

Youth with ID tend to be less physically active than their typically developing peers (Einarsson et al., 2015; Foley & McCubbin, 2009; Segal et al., 2016). This trend continues into adulthood with further increases in sedentary behaviors (Phillips & Holland, 2011), whereby adults with ID report little to no participation in physical activity (Ptomey et al., 2017). With research demonstrating that people with ID have a higher prevalence of social disadvantage and poorer health than their peers (Emerson & Hatton, 2008; Dairo et al., 2016; Ranjan et al., 2018), increasing physical activity provides people with ID with an opportunity to address these health inequalities (Dairo et al., 2016; Maïano, 2011; Maïano et al., 2016) and experiences of social exclusion (Bondár et al., 2019).

There is a paucity of interventions to increase physical activity levels in youth with ID. Furthermore, among the limited interventions, most were found to be ineffective at increasing physical activity levels when compared with a no treatment condition (McGarty et al., 2018). In fact, the design of many of these interventions was found to be problematic, suggesting the need for theoretically-grounded evidence to better inform the development of future interventions (McGarty et al., 2018). This conclusion reinforces previous indications that the best available blueprint for designing and implementing health promotion interventions for people with disabilities are programs grounded on theory (e.g., Drum et al., 2009). Herein lies an opportunity to capitalize on the significant body of research that accentuates the application of motivational theory to health promotion for people without disabilities (e.g., Gourlan et al., 2016; Rhodes et al., 2019), and yet fails to execute this application to enhance participation in physical activity for people with ID (Bondár et al., 2019).

Attempts to apply motivation theories to increase the participation of people with ID in physical activities face a conundrum. Some researchers have lamented that one of the main barriers to the success of interventions with people with ID is their apparent lack of motivation to engage in physical activity (e.g., Fernhall et al., 1988, 1989). Others suggest that motivational theories may not be relevant for people with ID, as most motivational theories are centered on cognitive qualities that people with ID may not possess, such as the capacity to hold and express perspectives about one's health and goals (e.g., Hutzler & Korsensky, 2010; McGarty, 2018).

The difficulty to directly adopt questionnaires developed for typically developing populations to populations with ID has also been emphasized as a major barrier to the adequate investigation of psychological constructs like motivation among people with ID (Bondár et al., 2019). Thus, despite the pressing need to understand the motivational drivers of participation in physical activity for people with ID to shape more effective interventions, strong empirical motivation research with people with ID remains scarce (Hutzler & Korsensky, 2010). The lack of psychometrically valid instrumentation for this population is often cast as the greatest hindrance to this research field (Frielink et al., 2017).

The Task and Ego Orientation in Sport Questionnaire (TEOSQ)

Self-Determination Theory (Deci & Ryan, 1985, 2000) and Goal Perspective Theory (e.g., Duda & Nicholls, 1992) are the two most prominent theories utilised in research focusing on motivation and its relation to physical activity and sport (Monteiro et al., 2018; Roberts & Walker, 2020). Whereas both theories reinforce the idea that motivation can be driven by one's interest in, and valorisation of, specific activities, the former considers how motivation is activated through the satisfaction of one's basic psychological needs, whereas the latter has a more direct focus on the reasons that drive someone to pursue an activity and how the context can be used to nurture motivation (e.g., Monteiro et al., 2018). Given the pressing need to understand and design environments or interventions designed to nurture and support the involvement of youth with ID in physical activities and sports, and the complexity associated with the measurement of internal states among this population (e.g., need satisfaction), Goal Perspective Theory was adopted for this study.

Goal Perspective Theory postulates that individuals define success as either task oriented or ego oriented. Task orientation refers to the goal of increasing one's skill or knowledge in the belief that success is achieved when the task is mastered (Duda & Nicholls, 1992). Conversely, ego orientation

refers to the goal of confirming one's superiority over others in the belief that success is achieved when one beats others (Duda & Nicholls, 1992). Task and ego orientation have been shown to share important associations with physical activity (Ahmed et al., 2017; Kahan & McKenzie, 2018), whereby task orientation displays a significant positive correlation with intrinsic motivation (Williams & Gill, 1995; Tomczak et al., 2020), effort and prolonged adherence (Larson & Rusk, 2011; Williams & Gill, 1995), cooperation (Duda, 1989; Lameiras et al., 2014), and ultimately performance (Ryan & Deci, 2000). Therefore, efforts to increase youth's physical activity could be greatly aided by the ability to accurately determine whether success in physical activity is defined as either task oriented or ego oriented.

The TEOSQ (Duda, 1989; Duda & Nicholls, 1992) has been identified as one of the six most highly cited sport motivation questionnaires (Clancy et al., 2017) and was initially designed to assess individual differences in achievement goal orientation (i.e., task or ego). The TEOSQ comprises 13 items rated on a 5-point Likert-type response scale designed to measure relatively stable individual dispositions for the adoption of task and ego orientations (Duda & Nicholls, 1992). Scores on the TEOSQ have demonstrated validity evidence supporting the proposed two-factor model (Chi & Duda, 1995; Li et al., 1998) and cross-cultural validity evidence in other languages and cultural settings such as US and China (Ma & Monsma, 2016), Iran (Benar et al., 2014), Poland (Tomczak et al., 2020), Korea (Kim, 1997), Japan (Wakayama et al., 2002), Spain and Portugal (Castillo et al., 2010), and Italy (Bortoli & Robazza, 2005).

The TEOSQ has been successfully utilized with both youth (e.g., Ahmed et al., 2017; Castillo et al., 2010; Williams & Gill, 1995) and adults (e.g., Lameiras 2014; Ntoumanis, 2001). The measurement invariance (i.e., the equivalence of the factor structure and psychometric properties) of scores on the TEOSQ has also been confirmed as a function of sex (e.g., Fuzhong et al., 1996). Likewise, the generalizability of the TEOSQ measurement model has been supported across samples of athletes, college students, high school students, and junior high school sports participants (Chi & Duda, 1995). Yet, despite some 30 years of research utilizing the TEOSQ, these theoretical and methodological advances have yet to be transposed to youth with ID, with few exceptions.

Research on Sport Motivation among People with ID

Research on sport motivation among people with ID is flawed. Only 11.5% of the studies assessing determinants of physical activity behaviors among populations with ID have grounded their investigations on theory (Pitchford et al., 2018), thus limiting the ability of research to identify the theories most appropriate to guide interventions and highlighting the need to identify and test theoretically-driven hypotheses about determinants of physical activity behaviors that are malleable to change. Furthermore, when correlates of physical activity have been investigated among samples of youth with ID, informant (parents, carers, etc.) reports are generally used rather than youth's self-reports (Curtin et al., 2016). Few studies give voice to the perspectives of the youth themselves, leading some researchers to conclude that people with ID have "been largely excluded from research in the past" (Everett et al., 2020, p. 333).

Some researchers are beginning to develop new quantitative tools to gather self-reports among people with ID in relation to their level of involvement in physical activity (e.g., Carbó-Carreté et al., 2016; Curtin et al., 2016). Among the few studies that have relied on self-report questionnaires to capture the motivation of youth with ID from their own perspectives, methodological flaws are widespread. For instance, when motivation has been investigated as part of a broader examination of physical activity among people with ID, studies have paid most attention to Special Olympic Athletes (e.g., Chen et al., 2016; Everett et al., 2020; Hutzler & Korsensky, 2010; Hutzler et al., 2013; Pedrinelli et al., 2012; Požeriene, et al., 2008). As a result, these studies provide only minimal insight into an understanding of motivation and its application to intervention to address the notable challenges experienced by people with ID who are not accomplished athletes.

Furthermore, when quantitative self-report measures of motivation have been administered, they have been utilized without validity evidence. For example, Shapiro (2003) developed a 14-item Sport Motivation Questionnaire and administered it to 147 adult Special Olympic Athletes with ID. Test-retest reliability was calculated and the results of individual items were discussed in relation to Goal Perspective Theory (Duda & Nicholls, 1992). However, the proposed two-factor model underpinning Goal Perspective Theory remains untested among individuals with ID. Similarly, a version of the Sport Motivation Scale was previously adapted for people with ID (Sajute, 2002). However, apart from tentative evidence suggesting that the scale score ($\alpha = 0.74$) and test-retest

(r = 0.86 to 0.94) reliability of scores obtained on this modified measure were satisfactory among a sample of 102 adolescent Special Olympic athletes (Požeriene et al., 2008), the psychometric properties of this modified Sport Motivation Scale remain unpublished (Sajute, 2002).

The TEOSQ has been applied to study adolescents with ID and Special Olympic adult athletes with ID. In a first study designed to compare the goal orientation of Greek adolescents with ID, with physical disabilities, and with multiple disabilities, the authors indicated that youth with ID (37 with mild ID, and 13 with moderate ID) tended to exhibit higher levels of goal-setting (Panagiotis & Ioannia, 2011). A Hebrew adaptation of the TEOSQ was administered to 63 young adults participating in the Special Olympics (Hutzler et al., 2013). Participants were described as having non specified ID (n = 39), Down syndrome (n=17), and Autism (n=7). Following item deletion, the authors reported scale score reliability coefficients (α) ranging from .31 to .81 for the Task Orientation subscale, and from 0.71 to 0.95 for the Ego Orientation subscale. No further psychometric testing occurred, and yet the authors concluded that this finding was of great importance, signaling this as the first study to measure motivation in athletes with ID, and that due to the reliability of its subscales, this version of the TEOSQ could now be used in research involving athletes with ID. In relation to the motivational drivers of participation among Special Olympics athletes with ID, the very limited empirical evidence currently available reveals generally mixed results. Thus, some studies found that extrinsic motivation played a greater (e.g., Požeriene et al., 2008), or similar (e.g., Everett, 2020), role in predicting athletic participation than intrinsic motivation, whereas others reported that athletic participation occurred primarily for task-oriented and social-integrative reasons rather than for ego-oriented reasons (Shapiro, 2003).

In addition to the existing limited availability of psychometrically sound measures, a dearth of scientific attention has been allocated to understanding how demographic characteristics such as age, sex, body mass-index, ID level, and sport participation were related to youth's motivation for participation in physical activities. Furthermore, the few studies among which these relations were considered were conducted among samples of Special Olympic adult athletes, so that the lack of relations reported between youth characteristics (i.e., age, sex, race, or sport type in Shapiro, 2003; sex in Požeriene et al., 2008) may not generalize to more normative samples of youth with ID. Furthermore, no study has yet investigated the associations between the motives for participation in physical activities and the body mass-index or level of sport participation of youth with ID, despite the fact that research conducted among typically developing youth demonstrates strong associations between these variables (e.g., Azeem & Antony, 2018; Mishra & Acharya, 2017). In the sole study to administer the TEOSQ to adolescents with ID outside of the Special Olympics context, equally high scores on Task and Ego orientations were reported among youth involved in physical activities (Panagiotis & Ioannia, 2011).

Importantly, these characteristics (age, sex, BMI, and sport participation) are all related to differences in body structure and development, which may in turn influence how youth perceive and respond to items designed to measure their motives for participation in sport. For this reason, it appears important to ensure that the measurement properties of responses to the TEOSQ remain unbiased as a function of these characteristics to support meaningful comparisons conducted as a function of these characteristics (Millsap, 2011). This need is even more important when youth with ID are considered, given that these youth might be, by virtue of their ID, more prone to measurement bias than typically developing youth. In this regard, it would also seem to be particularly important to ensure that youth responses remain unbiased by their levels of ID (mild versus moderate), something which has never been previously verified. Indeed, research typically considers students with ID as a homogenous group, however students with mild ID differ in cognitive skills and aptitude from students with moderate ID in a way that clearly might influence their ability to reliably respond to items referring to their internal states and motives for sport participation (Bouck & Satsangi, 2015).

In sum, as a response to the physical inactivity exhibited by youth with ID, and its damaging social and health repercussions, there is a critical need to understand motivation for physical activity for this vulnerable population. To date, advances in the measurement of the ego and task orientation of youth without disabilities via the TEOSQ, and psychometric knowledge related to the assessment of the psychometric properties of measurement instruments, have not been capitalized on to advance research and practice for youth with ID. The current study addresses this issue by validating the Task and Ego Orientation in Sport Questionnaire for English and French speaking youth with ID.

The Present Study

The objective of this study was to examine the psychometric properties of a new version of the TEOSQ adapted for youth with ID, the TEOSQ-ID. In addition, to contribute to the availability of this instrument for purposes of cross-cultural research, this new instrument was simultaneously developed in English and French. First, we examined the factor validity and reliability of the TEOSQ-ID among a sample of youth with ID. Second, we examined the measurement invariance of the factor structure of the TEOSQ-ID across linguistic versions. Third, we examined differential item functioning (DIF) and latent mean differences (and their invariance across linguistic versions) on the TEOSQ-ID as a function of youth's characteristics (i.e., age, body mass-index, ID level, sex, and frequency of sport involvement). Fourth, we examined the convergent validity of the adapted version of the TEOSQ-ID in relation to a measure of perceived physical abilities. Lacking evidence of convergent validity in relation to scores obtained on the TEOSQ among samples of youth with ID, studies conducted among samples of typically developing populations were consulted to identify relevant convergent measures, while also considering the need to have access to convergent measures validated among youth with ID. This consultation revealed that higher levels of task and ego orientations should be associated with higher levels of perceived physical ability (de Andrade et al., 2008; Nicolosi et al., 2021). Furthermore, the Self-Description Questionnaire I – Individual Administration for youth with ID (Marsh et al., 2006) made it possible to obtain reliable and valid measures of perceived physical abilities among youth with ID (Tracey et al., 2020). Fifth, we examined the measurement invariance and test-retest stability over a one-year period of the TEOSQ-ID.

Method

Participants

A sample of 362 youth (61.0% boys; Age: 11.92–21.52 years; M_{age} = 15.80 years; body mass-index [BMI]: 14.50 to 50.11 kg/m², M_{BMI} = 23.66, SD_{BMI} = 6.41) with ID participated in this study. These participants were recruited in secondary schools or community organizations located in Australia (English-speaking; N = 240; 67.5% boys; M_{age} = 15.20 years; M_{BMI} = 23.44 kg/m²) and Canada (French-speaking; N = 122; 48.4% boys; M_{age} = 16.73 years; M_{BMI} = 24.08 kg/m²). Of them, 51.1% (Australian: 59.8%; Canadian: 31.7%) had a mild level of ID and 48.9% (Australian: 40.2%; Canadian: 68.3%) had a moderate level of ID. On average, participants were involved in a sport outside of school for 1.72 weekly sessions (Australian: M = 1.58 weekly sessions; Canadian: M = 2.01 weekly sessions). A total of 235 participants (70 in Canada and 165 in Australia) completed the measures one year later (62.1% boys; 46.6% mild ID; 53.4% Moderate ID).

Procedures

Authorization to conduct the study was obtained from the research ethics committees of the first, second, and fourth authors' institutions. Participants were recruited in schools or community organizations that agreed to support this proposal. No compensation was offered for participation in Australia, whereas Canadian participants were eligible to win one out of 40 gift certificates ($30 CAD) annually. Parents (or legal representatives) of all participating youth actively provided signed informed consent for their children's participation. For parents of youth recruited in schools, this consent form was directly sent to the parents by the school, with an information letter, and the signed consent form was returned to the school where members of the research team recuperated it. Parents recruited outside of the participating schools received this material directly from the research team and returned the signed consent form to the researchers using a reply-paid envelope.

The consent procedure granted the researchers access to school records, including youth's most recent level of intellectual functioning (only youth with an official school-based ID classification were recruited). The Wechsler (2003) Intelligence Scale for Children – Fourth Edition (WISC-IV) was the IQ test most frequently used by the schools in both countries. When the last IQ assessment in the school records was older than four years, a new IQ assessment was conducted by a registered psychologist using the WISC-IV, the Wechsler Adult Intelligence Scale-IV, or the Leiter international performance scale-revised (Roid & Miller, 1997), depending on age and verbal ability.

Participating youth were met at their school (or at a time and location most convenient for the parents for participants recruited outside of schools) by members of the research team or trained research assistants who explained the goals and procedures of the study, as well as youth's right not to participate or to withdraw from the study without any consequences. Thus, youth were asked to actively and voluntarily consent to participate. Using sample questions for each questionnaire section, research assistants explained how to use the response scales (all involving graphical displays and pictograms).

Testing was realized in small groups including up to 8 youth with mild level of ID or including 1 or 2 youth with moderate levels of ID. A read-aloud assisted procedure was utilized to maximize understanding, and youth were encouraged to ask questions. Sometimes, despite the available support, youth remained unable to understand an item. In these instances, they were instructed to select the "do not understand the statement" option. Those responses (0.6% to 2.9%; M=1.20%) were treated as missing values.

Measures

Youth's Characteristics. Information about youth's age (i.e., determined based on date of birth), sex, and ID level were obtained from school records. Information about involvement in sport practice outside of the school context were obtained directly from the participants (i.e., "*Do you practice sport when you are not at school (for example, in the evenings or on weekends?)*"; If yes, "*Last week, which days did you practice sport?*"). Youth's height was measured using a stadiometer (Tanita HR200), and their weight was measured using a scale (Tanita BF-350). These measures were then used to calculate their BMI [Weight/(Height²)].

Task and Ego Orientation. The procedures used to develop the TEOSQ-ID are reported in section S1 in the online supplements. The resulting questionnaire includes 12 items (one item was deleted as a result of the pilot studies described in the online supplements) measuring task (7 items) and ego orientation (5 items). Youth were asked to indicate their degree of agreement with each item using a five-point graphical response scale ranging from "No, I totally disagree" (associated with a very unhappy face) to "Yes, I totally agree" (associated with a very happy face). The items and response scales of the TEOSQ-ID are presented in Appendix A (the complete questionnaire is available upon request from the corresponding author).

Perceived Physical Abilities. Youth's perceptions of their physical abilities were measured using the relevant subscale from the Self-Description Questionnaire I – Individual Administration for youth with ID (SDQ-IA-ID; Marsh et al., 2006). The perceived physical abilities subscale from this measure includes eight items (e.g., "I like to run and play hard", "I have strong muscles"). For purposes of this study, the original response scale (i.e., "No, always" to "Yes, always") was replaced by a six-point graphical response scale (i.e., "No, I totally disagree" associated with a very unhappy face to "Yes, I totally agree" associated with a very happy face).

Data Analysis

Analyses were conducted using Mplus 8.4 (Muthén & Muthén, 2019) robust maximum likelihood estimator, and full-information maximum likelihood to handle the limited amount of missing data (Time 1: 1.16%-4.62%, $M = 2.72\%$; Time 2: 1.28%-2.13%, $M = 1.52\%$). First, a solution matching the *a priori* factor structure of the TEOSQ-ID was estimated among the total sample using a confirmatory factor analytic (CFA) model. This solution was then estimated separately for English-Australian and French-Canadian participants. This solution assumed that responses to the TEOSQ-ID would be explained by two correlated factors, that error terms would be uncorrelated, and that no-cross-loading would be required. In all models, the scale of the factor was set using the standardized factor approach, allowing us to freely estimate all factor loadings and items intercepts. The composite reliability of TEOSQ-ID latent factors was estimated using McDonald's (1970) omega (ω). Model fit was assessed using the (e.g., Hu & Bentler, 1999; Marsh et al., 2005): Comparative fit index, Tucker-Lewis index, and the root mean square error of approximation. CFI and TLI values ≥.90 or >.95 and RMSEA values ≤.08 or <.06 respectively indicated acceptable and excellent fit.

Second, the measurement invariance of participants' responses to the TEOSQ-ID was tested across subsamples of English-Australian and French-Canadian participants to verify the linguistic equivalence of both version of the questionnaire in the following sequence (Millsap, 2011): (a) configural invariance; (b) weak invariance (loadings); (c) strong invariance (intercepts); (d) strict invariance (uniquenesses); (e) invariance of latent variances and covariances; and (f) invariance of the latent means. Model comparisons (i.e., with each model contrasted to the previous one) relied on changes (∆) in CFI, TLI and RMSEA. Invariance was supported when ∆CFI-∆TLI were ≤ .01 and ∆RMSEA were ≤. 015 (Chen, 2007; Cheung & Rensvold, 2002).

Third, a hybrid multiple indicators multiple causes (MIMIC) multiple-group model (Morin et al. (2018) was used to examine (a) the associations between predictors [i.e., age, BMI, ID level (mild coded 0 and moderate coded 1), sex (girls coded 0 and boys coded 1), and frequency of sport involvement]

and TEOSQ-ID latent factors; (b) probable DIF, that is the direct association between the predictors and TEOSQ-ID item responses over and above the associations of the predictors with the TEOSQ-ID latent factors; and (c) the invariance of these associations across the English-Australian and French-Canadian participants. These models were developed from the most invariant multiple-group model identified in the second stage, to which the predictors were included.

These models were estimated in the following sequence (Marsh et al., 2013; Morin et al., 2013): (a) null effects model (the paths from the predictors to the TEOSQ-ID latent factors and item responses were constrained to be zero); (b) saturated model (the paths from the predictors to the TEOSQ-ID item responses were freely estimated, while the paths from the predictors to TEOSQ-ID latent factors were constrained to be zero); and (c) factors-only model (the paths from the predictors to the TEOSQ-ID latent factors were freely estimated, while the paths from the predictors to TEOSQ-ID item responses were constrained to be zero). To facilitate interpretations, age, BMI, and the frequency of sport involvement were standardized prior to the analyses. A substantial improvement in model fit (ΔCFIs-TLIs > .01 and ΔRMSEAs >. 015) in the factors-only and saturated models relative to the null effects model provides support for an association between TEOSQ-ID item responses and the predictors. However, an improvement in model fit for the saturated model relative to the factors-only model indicates DIF (Morin et al., 2018). These models were first examined with all relations freely estimated across the English-Australian and French-Canadian subsamples. Then, the most appropriate model was retained and compared to an alternative model in which all relations were constrained to be equal (invariant) across both subsamples.

Fourth, we assessed the convergent validity of the TEOSQ-ID latent factors in relation to the self-reported measure of perceived physical abilities of the SDQ-IA-ID (specified as one latent factor). Fifth, a final set of analyses was then conducted to assess the longitudinal measurement invariance of the TEOSQ-ID over time following procedures identical to those described above for tests of linguistic invariance (Millsap, 2011). The most invariant model was then used to obtain estimates of one-year test-retest stability for each latent factor.

Results

Factor Validity and Reliability of the TEOSQ-ID

The goodness-of-fit of the a priori CFA representation of responses to the TEOSQ-ID are presented in Table 1 (models 1-1 to 1-3). These results supported the adequacy of this solution in the overall sample, as well as in the English-Australian and French-Canadian subsamples. The standardized parameter estimates of this solution estimated among the overall sample are reported on Table 2, whereas those obtained in the two linguistic subsamples are reported in Tables S1 and S2 of the online supplements. These results revealed that all factor loadings are acceptable (overall sample: $M_\lambda = .717$; English-Australian: $M_\lambda = .711$; French-Canadian: $M_\lambda = .710$), that the composite reliability of both factors is satisfactory (overall sample: $M_\omega = .793$; English-Australian: $M_\omega = .846$; French-Canadian: $M_\omega = .848$), and that the latent correlation between the two factors is significant, positive and moderately high (overall sample: $r = .679$; English-Australian: $r = .667$; French-Canadian: $r = .633$) across all samples.

Measurement Invariance Across Linguistic Versions

The goodness-of-fit statistics of the linguistic measurement invariance models are reported in Table 1 (models 2-1 to 2-7). These results supported the configural, weak, and strict invariance of the TEOSQ-ID measurement model across linguistic versions, as well as the invariance of the latent variances and covariances estimated as part of this model. However, these results also revealed a lack of strong invariance of the items intercepts. A detailed examination of the parameter estimates from the previous solution (i.e., weak invariance) and of the modification indices associated with the failed solution of strong invariance, suggest that this lack of strong invariance might be limited to one item (EGO3: "Others mess up but I do not"). As a result, a model of partial strong invariance, in which equality constraints were relaxed on this intercept, was supported by the data. The results from this solution suggest that score (intercept) on this item tended to be higher among French-Canadian participants than among English-Australian participants with similar levels on the ego orientation factor. Finally, the results also revealed the presence of latent mean differences (i.e., a lack of latent mean invariance) across samples. More precisely, these results showed that English-Australian participants tended to present significantly lower latent means on the ego (-.530, p < .001) and task (-.442, p < .001) orientation factors than their French-Canadian counterparts.

DIF and Latent Mean Differences

The results from the hybrid MIMIC models are reported in Table 1. These models were estimated starting from the most invariant measurement model (model 2-6: invariance of latent variances-covariances). These results showed that both the saturated (model 3-2) and factors-only models (model 3-3) resulted in a substantial improvement in model fit relative to the null effects model (model 3-1). These results show that age, BMI, ID level, sex, and the frequency of sport involvement are significantly associated with youth's responses on the TEOSQ-ID. Moreover, the fit of the factors-only model was resulted in a similar model fit than the saturated model ($\Delta R\chi^2 = 95.27$, df = 100, p > .05, ΔCFI = -.009, ΔTLI = +.048, ΔRMSEA = -.013), revealing a lack of DIF as a function of age, BMI, ID level, sex, and frequency of sport involvement. Starting from the factors-only model, the last model (model 3-4) resulted in a negligible decrease in model fit, thus supporting the equivalence of the associations between the latent TEOSQ-ID factors and youth's age, BMI, ID level, sex, or frequency of sport involvement across both linguistic subsamples.

The results from this final model (model 3-4) are reported in Table 3. These results indicate that: (a) youth with higher BMI (compared to those with lower BMIs) tended to present higher levels of ego motivational orientation; and (b) youth with moderate levels of ID (compared to those with mild levels of ID), as well as those more frequently involved in sport (compared to those involved less frequently in sport) tended to present higher levels of ego and task motivational orientations.

Convergent Validity

As shown in Table 1 (model 1-4), the structural equation model, including the latent TEOSQ-ID factors and the latent perceived physical abilities factor, resulted in an acceptable level of fit to the data. The composite reliability of the perceived physical abilities scale ($\omega = .877$) was satisfactory. The results reveal that the ego (.556, $p < .001$) and task (.523, $p < .001$) orientation factors of the TEOSQ-ID factors are significantly and positively related to youth's perceived physical abilities.

Measurement Invariance over Time and Test-Retest Stability

The goodness-of-fit statistics of the models used to test the longitudinal invariance of the measurement models are reported in Table 1 (models 4-1 to 4-6)[1]. The results from these models support the complete measurement invariance of the TEOSQ-ID factors over time. The results from the most invariant of these models (i.e., latent mean invariance) revealed a one-year test-retest correlation of .697 for the ego orientation factor, and of .622 for the task orientation factor.

<div align="center">Discussion</div>

The primary goal of this study was to examine the psychometric properties of a new version of the TEOSQ adapted for youth with ID, the TEOSQ-ID. The results supported the factor validity and reliability of the *a priori* two-factor structure of the TEOSQ-ID among the current sample of youth with ID, as well as in the English-Australian and French-Canadian subsamples. This study is the first to confirm that the two-factor structure of scores obtained on the TEOSQ-ID by youth with ID is the same as that found when using the TEOSQ among typically developing youth (e.g., Ahmed et al., 2017; Castillo et al., 2010). The findings thus offer a new robust self-report instrument to strengthen future research methodology among youth with ID which is currently characterized by the reliance on a limited number of quantitative measures of incomplete, or undocumented reliability and/or validity. This comment applies both to previous studies relying on the TEOSQ specifically (Hutzler et al., 2013; Panagiotis & Ioannia, 2011), as well as to research relying on other motivational scales (e.g., Požeriene et al, 2008). In fact, the only information currently available on the psychometric properties of scores obtained on the TEOSQ among samples of youth with ID (n = 63) is limited to reliability information obtained in a very small sample of Special Olympians who completed a Hebrew adaptation of this instrument (e.g., Hutzler et al., 2013). The present study thus adds to this research area by providing equivalent English and French versions of a version of the TEOSQ formally adapted and piloted among a much larger sample of youth with ID, and to provide reliability and validity information supporting the use of this TEOSQ-ID.

It is important to note that the latent correlation observed between the ego and task orientation factors of the TEOSQ-ID was positive, moderately high, and comparably higher than that those typically reported among typically developing populations (e.g., Duda & Nicholls, 1992; Castillo et al.,

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[1] Time 2 parameter estimates are reported in parentheses in Table 2 and are virtually identical to Time 1 estimates.

2010). In fact, previous studies conducted among typically developing populations have already suggested that both types of goals or motivational approaches can co-exist for a subset of students (Wang et al., 2016a, 2016b). The present results suggest that this co-occurrence might be more frequent among youth with ID. More precisely, our results tentatively propose that for youth with ID higher levels of mastery motivation are more likely to be associated with higher levels of performance motivation than for typically developing youth. Perhaps, for youth with ID, a sense of mastery in sport tends to be perceived as more reliant on feedback from the environment about one's performance. The close association between the two factors should be noted in interventions that seek to increase task motivation to increase effort, application, and persistence in physical activity.

The results generally supported the equivalence of whole measurement structure of this instrument across linguistic version, but revealed that one item intercept (EGO3: "Others mess up but I do not", allowed to differ across samples in the model of partial strong invariance) performed differently across samples. In this regard, the results suggest that scores on this item tended to be higher among French-Canadian participants than English-Australian participants characterized by similar levels on the ego orientation factor. Research and practical applications relying on scale scores might thus consider removing this item from the calculation of total scores on this factor when their goal is to contrast English- and French-speaking youth with ID, or simply to rely on latent variable methodologies (such as those used in the present study) to control for this slight lack of measurement invariance (e.g., Byrne et al., 1989; Millsap, 2011). Alternatively, other approaches might be used, within latent variable framework, to achieve an approximate level of measurement invariance sufficient to conduct group comparisons in small (e.g., Muthén, & Asparouhov, 2013) or large and diversified (e.g., Marsh et al., 2018) samples. However, with this sole exception, the results provided strong support to the linguistic equivalence of both versions of the TEOSQ-ID, thus adding to research conducted among typically developing populations which has already demonstrated the robustness of this instrument to cross-linguistic adaptations (e.g., Benar et al., 2014; Clancy et al., 2017; Ma & Monsma, 2016; Tomczak et al., 2020; Wakayama et al., 2002).

Our results also revealed latent mean differences across samples, suggesting that English-Australian participants tended to present lower scores on both factors of the TEOSQ relative to their French-Canadian counterparts. It is interesting to note that similar differences were previously reported between Spanish and Portuguese typically developing adolescents (Castillo et al., 2010), suggesting that the TEOSQ-ID was able to preserve the sensitivity of the original TEOSQ to cross-cultural mean-level differences. Unfortunately, our results do not allow us to distinguish whether the source of these differences can be clearly attributed to the linguistic version of the questionnaires, or the use of samples recruited within different countries (i.e., Australia and Canada) with their own cultural norms in regard to sport and educational practices and customs around public endorsement of one's abilities (e.g., the Tall Poppy Syndrome in Australia which leads to self-deprecating reports). Clearly, future research will be needed to better disentangle these two possibilities (for example by contrasting English- and French-speaking Canadian youth with ID).

An examination of the presence of DIF and latent mean differences (and their invariance across linguistic versions) on the TEOSQ-ID as a function of youth's characteristics (i.e., age, BMI, ID level, sex, and frequency of sport involvement) revealed a lack of DIF as a function of youth's age, BMI, ID level, sex, and frequency of sport involvement. Therefore, manifest or latent scores on the TEOSQ-ID factors can be used with confidence to compare youth with ID as function of their age, BMI, ID level, sex, and frequency of sport involvement. These results thus add to accumulating evidence indicating that the TEOSQ can be used to conduct unbiased comparisons as a function of youth age or sex (Chi & Duda, 1995; Fuzhong et al., 1996), suggesting that this conclusion extends to samples of youth with ID, as well as to their BMI, ID level and frequency of sport involvement.

In addition, these analyses revealed meaningful latent mean level differences were observed on the TEOSQ-ID factors in relation to BMI, ID level, and frequency of sport involvement. More precisely, our results indicated that: (a) youth with higher BMI (compared to those with lower BMIs) tended to present higher levels of ego motivational orientation; and (b) youth with moderate levels of ID (compared to those with mild levels of ID), as well as those more frequently involved in sport (compared to those involved less frequently in sport) tended to present higher levels of ego and task motivational orientations. These results match those typically reported among samples of typically developing youth (e.g., Azeem & Antony, 2018; Mishra & Acharya, 2017), as well as one previous report showing that

sport involvement tended to be associated with higher levels on both factors among youth with ID (Panagiotis & Ioannia, 2011). However, this study is the first to systematically investigate the role of these motivational factors among youth with ID in relation to their participation in physical activity and should thus be replicated in future research designed to uncover the mechanism involved in these associations. Finally, no latent mean level differences were found for age or sex, which is consistent with previous results reported by Shapiro (2003) and Požeriene et al. (2008) among Special Olympians. An examination of the convergent validity of the adapted version of the TEOSQ-ID in relation to a measure of perceived physical abilities demonstrated that both TEOSQ-ID factors were significantly and positively related to youth's perceived physical abilities. This finding is consistent with those reported by Panagiotis and Agaliotis' (2011) among a sample of 50 adolescents with ID.

Finally, the results supported the full invariance of the factor structure of the TEOSQ-ID over a one-year interval and revealed moderate levels of test-retest stability for both the task and ego orientation factors over a one-year period. These results are particularly interesting as they revealed a higher level of test-retest stability among the current sample of youth with ID than that typically reported among typically developing samples over a shorter time span (e.g., Clancy et al., 2017). This observation suggests that motivational orientations might be slightly more stable over time among samples of youth with ID, an interpretation that seems to be supported by previous reports of relatively high levels of test-retest reliability when other measures of sport motivation are considered over a shorter time span among youth with ID (Požeriene et al., 2008; Shapiro, 2013). Yet, the moderate rate of stability observed in the present study highlights the need to incorporate measures of TEOSQ-ID at least once a year in the context of longitudinal studies to best capture these variations.

Despite its strengths, the present study has limitations that should be considered when interpreting the results. First, the TEOSQ-ID was validated using a single sample of English-Australian and French-Canadian youth with ID. It thus remains unknown whether these results would generalize to other samples of youth with ID from other cultural or linguistic backgrounds. As such, future studies may seek to investigate the replicability of our results within more diversified samples of youth with ID. Second, tests of the convergent validity of TEOSQ-ID scores were limited. More specifically, additional analyses remain to be conducted in relation to objective measures of physical fitness and the nature and intensity of participation in physical activity. Furthermore, future longitudinal research should also investigate the predictive validity of these scores in relation to developmental outcomes measured at a later point in time. Third, although this study reported evidence of test-retest stability of the scores obtained on the TEOSQ-ID over a one-year interval, evidence regarding the test-retest reliability of these scores over a shorter time period (1 week or 2 weeks) remains lacking and should be investigated in future studies.

In conclusion, the present results extend both the methodological and substantive knowledge of goal orientation for physical activity for youth with ID. The TEOSQ-ID is confirmed as a valid and reliable measure to accurately capture the goal orientation in physical activities among youth with ID. The TEOSQ-ID can reliably and validly be used to capture these goal orientations among English- and French-speaking boys and girls with mild and moderate levels of ID, irrespective of their age, BMI, and frequency of involvement in physical activities. Furthermore, the study is the first of its kind to provide insight into the role of age, sex, BMI, ID level, and frequency of involvement in sport with regard to self-reported levels of goal orientations for youth with ID. With motivational elements cast as key influential factors driving physical activity for this largely sedentary group of youth, and the failure of previous research to reliably and validly capture their self-perceptions (Everett, 2020), the TEOSQ-ID presents as a promising tool to advance theory, research, and practice.

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Table 1

Goodness-of-Fit Statistics of Confirmatory Factors Analyses (CFA) for the TEOSQ-ID

Models	Nº	Description	Rχ²(df)	CFI	TLI	RMSEA	RMSEA 90% CI	CM	ΔRχ² (df)	ΔCFI	ΔTLI	ΔRMSEA
Measurement model	1-1	CFA - Total sample	84.696(53)*	.967	.958	.042	.024-.058	-	-	-	-	-
	1-2	CFA – French-Canadian	80.370(53)*	.929	.911	.067	.034-.095	-	-	-	-	-
	1-3	CFA – English-Australian	92.983(53)*	.936	.921	.057	.037-.076	-	-	-	-	-
	1-4	Convergent validity	269.885(167)*	.946	.939	.042	.032-.051	-	-	-	-	-
MI: Language	2-1	Configural invariance	175.134(106)*	.934	.917	.061	.045-.077	-	-	-	-	-
	2-2	Weak (λs) invariance	190.828(116)*	.928	.918	.061	.045-.076	2-1	15.78(10)	-.006	+.001	.000
	2-3	Strong (λs, τs) invariance	212.392(126)*	.917	.913	.063	.048-.077	2-2	24.01(10)*	-.011	-.005	+.002
	2-4	Partial strong invariance	204.478(125)*	.924	.919	.061	.045-.075	2-2	13.11(9)	-.004	+.001	.000
	2-5	Strict (λs, τs, δs) invariance	222.689(137)*	.918	.921	.060	.045-.074	2-4	18.81(12)	-.006	+.002	-.001
	2-6	Latent variances-covariances (λs, τs, δs, ξs/φs) invariance	221.937(140)*	.921	.926	.058	.043-.072	2-5	0.13(3)	+.003	+.005	-.002
	2-7	Latent means (λs, τs, δs, ξs/φs, ηs) invariance	234.548(142)*	.911	.917	.061	.047-.075	2-6	15.46(2)*	-.010	-.009	+.003
DIF: Age, BMI, ID-level, sex, and FSI	3-1	Null effects	418.801(260)*	.887	.890	.058	.048-.068	-	-	-	-	-
	3-2	Saturated	247.255(140)*	.924	.862	.065	.052-.078	3-1	161.18(120)*	+.037	-.028	+.007
	3-3	Factors-only	359.731(240)*	.915	.910	.052	.041-.063	3-1	68.84(20)*	+.028	+.020	-.006
	3-4	Factors-only (invariance)	372.212(250)*	.913	.912	.052	.041-.063	3-3	11.49(10)	-.002	+.002	.000
MI: time	4-1	Configural invariance	337.342(234)*	.955	.947	.035	.026-.043	-	-	-	-	-
	4-2	λs invariance	353.220(244)*	.952	.946	.035	.027-.043	4-1	15.70(10)	-.003	-.001	.000
	4-3	λs, τs invariance	367.758(254)*	.950	.946	.035	.027-.043	4-2	14.57(10)	-.002	.000	.000
	4-4	λs, τs, δs invariance	392.253(266)*	.945	.943	.036	.028-.044	4-3	21.85(12)	-.005	-.003	+.001
	4-5	λs, τs, δs, ξs/φs invariance	398.812(269)*	.943	.942	.037	.029-.044	4-4	6.45(3)	-.002	-.001	+.001
	4-6	λs, τs, δs, ξs/φs, ηs invariance	399.761(271)*	.944	.943	.036	.028-.044	4-5	0.14(2)	+.001	+.001	-.001

Notes. *p ≤ .01; Rχ² = robust chi-square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval of the RMSEA; Δ = change from previous model; ΔRχ² = robust chi-square difference tests (calculated from loglikelihoods for greater precision); MI = measurement invariance; λ = loading; τ = intercept; δ = uniqueness; ξ = variance; φ = covariance; η = factor mean; DIF = differential item functioning; BMI = body-mass index; ID = intellectual disability; FSI = frequency of sport involvement.

Table 2

Standardized Parameters Estimates from the Confirmatory Factor Model of the TEOSQ-ID in

the Overall Sample

Items	EGO (λ)	TASK (λ)	δ
EGO1	.652(.613)		.575(.624)
EGO2	.641(.652)		.589(.575)
EGO3	.581(.516)		.662(.734)
EGO4	.695(.686)		.518(.529)
EGO5	.750(.823)		.437(.323)
TASK1		.721(.842)	.481(.291)
TASK2		.733(.777)	.462(.396)
TASK3		.817(.740)	.333(.452)
TASK4		.770(.720)	.407(.482)
TASK5		.752(.753)	.435(.432)
TASK6		.746(.863)	.444(.256)
TASK7		.742(.788)	.449(.379)
ω	.798(.795)	.903(.918)	
Latent Factor Correlations			
EGO	-		
TASK	.679(.771)	-	

Notes. λ = factor loadings; δ = Uniquenesses; EGO = ego orientation; TASK = task orientation; ω = McDonald's omega coefficient of composite reliability; All parameters are statistically significant ($p \leq .01$); Time 1 λ and ω are reported first, Time 2 λ and ω are reported second in parenthesis.

Table 3

Relations between the TEOSQ-ID Latent Factors and the Predictors

	b(SE)	β (French-Canadian)	β (English-Australian)
		Linguistic versions	
Age			
EGO	-.089(.072)	-.082	-.082
TASK	.090(.057)	.085	.086
Body Mass-Index			
EGO	.124(.057)*	.115*	.114*
TASK	.038(.052)	.036	.036
Intellectual Disability Level			
EGO	.695(.143)**	.300**	.315**
TASK	.422(.129)**	.186**	.198**
Sex			
EGO	.233(.131)	.108	.101
TASK	-.011(.129)	-.005	-.005
Frequency of Sport Involvement			
EGO	.200(.069)**	.185**	.184**
TASK	.237(.064)**	.224**	.226**

Notes. * $p \leq .05$; ** $p \leq .01$; b = unstandardized regression coefficient taken from the factors-only model (3-4) invariant across linguistic versions; SE = standard error of the coefficient; β = sample-specific standardized regression coefficient (although some of the relations are invariant across linguistic versions, the standardized coefficients may still show some variation as a function of within-samples estimates of variability). EGO = ego orientation; TASK = task orientation; Because age, body-mass index, and frequency of sport involvement were standardized prior to these analyses and that the TEOSQ-ID factors are estimated based on a model of latent variance-covariance invariance in which all latent factors have a SD of 1, all unstandardized coefficients can be directly interpreted is SD units.

Appendix A

Items and Answer Scales of the English and French Versions of the TEOSQ-ID

N°	Scales	English items	French items
		In sport, I am the most proud of myself when…	En sport, je suis le(la) plus content(e) de moi quand …
1	EGO1	I am the only one who can do things correctly.	Je suis le(la) seul(e) à arriver à faire les choses comme il faut.
2	TASK1	I learn to do new things.	J'apprends à faire de nouvelles choses.
3	EGO2	I am better than my friends.	Je suis meilleur(e) que mes ami(e)s.
4	TASK2	I learn something that is fun.	J'apprends des choses qui sont le fun.
5	EGO3	Others mess up but I do not.	Je ne fais pas d'erreurs comme les autres.
6	TASK3	I learn a new skill by working hard.	J'apprends de nouvelles choses parce que je travaille fort.
7	TASK4	I work really hard.	Je travaille très fort.
8	EGO4	I score the most points or goals in a game.	Je fais le plus de buts ou de points dans une partie.
9	TASK5	What I learn makes me want to practice more.	Ce que j'apprends me donner envie de pratiquer plus.
10	EGO5	I am the best.	Je suis le(la) meilleure(e).
11	TASK6	I learn something that makes me feel good.	J'apprends de nouvelles choses et j'aime ça.
12	TASK7	I do my very best.	Je fais de mon mieux.

Answer scales

Online Supplements for:

The Task and Ego Orientation in Sport Questionnaire adapted for Youth with Intellectual

Disabilities (TEOSQ-ID)

S1. *Scale development*

Table S1. *Standardized Parameters Estimates from the Confirmatory Factor Model of the TEOSQ-ID in the French-Canadian Version*

Table S2. *Standardized Parameters Estimates from the Confirmatory Factor Model of the TEOSQ-ID in the English-Australian Version*

S1. Scale Development

Objectives

The first objective of these pilot studies was to examine the appropriateness of the format and clarity of the original version of the Task and Ego Orientation in Sport Questionnaire (TEOSQ) for use among youth with intellectual disabilities (ID). Following this initial verification, the TEOSQ was adapted to increase its clarity and ease of application based on recommendations related to the use of self-report questionnaires among people with ID (Finlay & Lyons, 2001, 2002). Then, this adaptation was translated into French. This preliminary adaptation was then tested among a first sample of youth with ID, which led to further adaptations. The final adaptation was then tested again among a second sample of youth with ID.

Method

Participants and Procedures

A sample of 34 youth (35% girls; 13 to 21 years) with mild to moderate-severe ID participated, including 14 French-speaking Canadians and 20 English-speaking Australians. A first subsample of 18 youth ($N = 8$ in Canada and 10 in Australia) was solicited to assess the format and clarity of a preliminary adaptation of the TEOSQ-ID. A second subsample of 16 youth ($N = 6$ in Canada and 10 in Australia) was solicited to evaluate the format and clarify of the final adapted version of the TEOSQ-ID. The procedures used in these pilot studies were identical to those used in the main study, and received approval from the same research ethics committees. However, in this pilot process, the TEOSQ-ID was administered individually, at school, by trained research assistants using a read-aloud assisted procedure to maximize youth's understanding and to facilitate discussion. This administration was mainly focused on assessing the level of understanding of the youth and the ease with which they could respond to the items.

Measures

First, the appropriateness of the format and clarity of the items was assessed by members of the research team familiar with the use of self-report questionnaires among youth with ID. Sentences or words that were deemed to be problematic were then maximally simplified or modified while retaining the original meaning.

Second, the format and clarity of the original five-point Likert answer scale (i.e., "Strongly disagree" to "Strongly agree") was deemed to be inappropriate by members of the research team familiar with the use of self-report questionnaires among students with ID. This response scale was thus replaced by a Likert-style graphical response scale (i.e., "Totally disagree" associated with a very unhappy face to "Totally agree" associated with a very happy face). The graphical response scale was developed based on the Wong–Baker facial pain rating scale (Wong & Baker 1988). Moreover, a "do not understand the statement" option was added to the answer scale for situations in which respondents remained unable to understand the item.

Once this process was completed, the adapted English version of the TEOSQ-ID was translated into French by two members of the research team. This preliminary French version was then back translated into English by two other bilingual members of the research team and compared with the English version. Discrepancies were resolved by adapting the French items. During this process, decisions were taken and discussed by the research team members in committee until a consensus was reached. Additionally, this process was also conducted in collaboration with school personnel (i.e., teachers, psychologists, and physical educators) familiar with students with ID.

Results

The responses provided by the first subsample of youth revealed that some words used in some of the items were hard to understand for youth with ID (more specifically by those with more severe levels of ID). Moreover, one negatively worded item from the ego scale (i.e., original formulation: "the others can't do as well as me") was not understood by three quarters of the youth with ID. Finally, although the new rating scale was well understood by the participants, some did not use the Likert terms and rather responded by a simpler "no" or "yes" to the items. As a result, the problematic items were reformulated and further simplified using suggestions provided by the research assistants involved in the first pilot study. Then, the negatively worded item was deleted as reformulating it positively would have created a redundancy with the third item (i.e., original formulation: "I can do better than my friends"). Additionally, to further increase the clarity of the items and responses scales, words from all

items were associated with pictograms (presented above the words) and the different anchor points of the scales were revised (in italic and underlined), respectively ("*No, I* totally disagree", "*No, I* disagree", "*Sometimes yes/no*", "*Yes, I* agree", and "*Yes, I* totally agree"). Finally, a template including graphical displays and pictograms was developed to explain to the youth how to use the answer scale. The final version of the TEOSQ-ID was re-tested among the second subsample of youth with ID. Results supported the adequacy of both linguistic versions of the TEOSQ-ID and their suitability for use as self-report instruments among youth with ID.

References

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Table S1

Standardized Parameters Estimates from the Confirmatory Factor Model of the TEOSQ-ID in the

French-Canadian Version

Items	EGO (λ)	TASK (λ)	δ
EGO1	.528		.721
EGO2	.526		.723
EGO3	.797		.365
EGO4	.694		.519
EGO5	.756		.429
TASK1		.627	.607
TASK2		.747	.442
TASK3		.802	.357
TASK4		.767	.412
TASK5		.783	.387
TASK6		.679	.539
TASK7		.811	.342
ω	.798	.898	
Latent Factor Correlations			
EGO	-		
TASK	.633	-	

Notes. λ = factor loadings; δ = Uniquenesses; EGO = ego orientation; TASK = task orientation; ω = McDonald's omega coefficient of composite reliability; All parameters are statistically significant ($p \leq .01$).

Table S2

Standardized Parameters Estimates from the Confirmatory Factor Model of the TEOSQ-ID in the

English-Australian Version

Items	EGO (λ)	TASK (λ)	δ
EGO1	.700		.509
EGO2	.696		.515
EGO3	.452		.796
EGO4	.659		.565
EGO5	.748		.441
TASK1		.786	.383
TASK2		.706	.501
TASK3		.817	.333
TASK4		.783	.387
TASK5		.736	.458
TASK6		.757	.426
TASK7		.688	.527
ω	.789	.902	
Latent Factor Correlations			
EGO	-		
TASK	.667	-	

Notes. λ = factor loadings; δ = Uniquenesses; EGO = ego orientation; TASK = task orientation; ω = McDonald's omega coefficient of composite reliability; All parameters are statistically significant ($p \leq .01$).