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Adaptation of the Sport Motivation Scale in Flemish-speaking athletes with and without intellectual disabilities

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Abstract: Motivation is essential for adopting and maintaining active lifestyles. This study aims to adapt an instrument that comprehensively screens the degree and type of motivation in Flemish speaking athletes with intellectual disabilities (ID). A translated (SMS-FL), a modified (SMS-FL-ID), and a condensed (SMS-FL-ID-short) version of the Sport Motivation Scale (SMS) (Pelletier et al., 1995) were created. The 7-factor structure of each scale was examined by an exploratory factor analysis in a sample of athletes without ID (n = 230) and athletes with ID (n = 96). The results confirmed preliminary acceptance of the SMS-FL development. However, two psychometric issues were found in the subscales 'instrinsic motivation to accomplish' and 'identified regulation' extrinsic motivation. These psychometric issues were addressed in future revisions to strengthen the scale. The SMS-FL-ID was developed to the specific characteristics of people with ID. Furthermore, it appears the SMS-FL-ID instrument is too long for this population. However, a 12-item SMS-FL-ID-short version proved preliminary acceptable psychometric properties. The short version is recommended for future use in Flemish athletes with ID. Overall, this study serves as a basis for further research to strengthen the scale in order to assess motivational profiles in individuals with ID.

Keywords: intellectual impairment; sport psychology; validity

Introduction

According to the American Association on Intellectual and Developmental Disabilities (AAIDD, 2021), people with intellectual disabilities (ID) represent about 1% of the total population, and ID is characterized by significant limitations in intellectual functioning (IQ ≤ 75) and adaptive behaviour, both manifested before the age of 22. People with ID are less involved in physical activity and sport compared to peers without disabilities (Einarsson et al., 2016), making them at risk for health conditions related to a sedentary lifestyle such as obesity, diabetes, cancers, and metabolic syndrome (Bartlo & Klein, 2011).

Motivation is a crucial process, the nature, and quality of which will determine whether a person will get involved in sport; as well as for becoming a successful athlete. Motivation is fundamental in providing individuals a reason for adopting a particular behaviour such as physical activity or sport (Frielink et al., 2017) as well as plays an essential role in maintaining and guiding that behaviour, potentially towards elite performance. The self-determination theory (SDT), which is based on a humanistic approach, developed by Ryan and Deci (2000) provides a theoretical framework for the study of motivated behaviour. The crucial aspect within the SDT is the satisfaction of the three basic needs; competence, relatedness, and self-determination (also called autonomy) of every human being as the

basic requirements to function optimally (Ryan & Deci, 2000). According to the SDT, a person is self-determined when they can act according to their interests, needs and values (Emond Pelletier & Joussemet, 2017). Self-determination is only achieved when a person has the feeling of being in control of one's own actions (internal; e.g., avoid feeling ashamed), as opposed to your actions being controlled by other forces (external; e.g., rewards or punishments). The SDT places different types of motivation (i.e., intrinsic motivation [IM], extrinsic motivation [EM] and amotivation [AM]) along a continuum of autonomy. When translating this continuum to the field of sport, the most optimal motivational profile would be the IM, i.e., to be active because it is naturally satisfying, since this seems to result in a more consistent and prolonged engagement (Larson & Rusk, 2011). Ultimately, performance would be enhanced as a consequence of the motivational pattern. The least autonomous type of motivation, also in sport, would be AM which corresponds to perceptions of incompetence, lack of control and unintended action (Ryan & Deci, 2000). In between IM and AM, EM is placed when the goal is not the pleasure of the activity itself, but to gain something by participating (Ryan & Deci, 2000). The SDT differentiates four subtypes of EM, categorized from least to most autonomous into 'external regulation' (e.g., taking action to receive a reward), 'introjected regulation' (e.g., taking action to avoid feeling ashamed), 'identified regulation' (e.g., taking action because you consider it valuable), and 'integrated regulation' (e.g., taking actions which fully correspond to your own beliefs) (Ryan et al., 2009). It is important to stimulate autonomous motivation because it can positively predict outcomes such as quality of behaviour, quality of learning, motivational persistence, and well-being (Markland et al., 2005). The SDT has also been used to study the motivational profiles of individuals with ID. More specifically, evidence for the universality of the four subtypes of extrinsic motivation across populations with ID was provided by Frielink and colleagues, 2017. Factors that enhanced autonomy, competence, and relatedness, such as friendship and choice, were linked to motivation in exercise programs for participants with ID (Farrell et al., 2004).

Although people with ID are often perceived as less motivated, being mostly extrinsically motivated (Požėrienė et al., 2018), and more passive (Emond Pelletier & Joussemet, 2017), there is no clear insight in the mechanisms underlying this observed behaviour. The American Association on Intellectual and Developmental Disabilities (AAIDD, 2010) considers self-determination as a central objective in people with ID, which might contribute to their altered motivational profile. However, in the review by Hutzler and Korsensky (2010), no studies were reported, whereby increased self-determination or empowerment were related to motivational correlates of physical activity for persons with ID. This was probably because only two of the studies included in the review were based on SDT theory. In later work, Hutzler and colleagues (2013) assessed motivation in Israeli Special Olympic athletes, using an adapted version (4 subscales, 16 items) of the original Sport Motivation Scale (SMS; 7 subscales, 28 items), which was developed by Pelletier and colleagues (1995) based on the fundamental principles of the SDT and frequently used as a valid and reliable self-reported questionnaire to assess sport motivation in people without ID (Clancy et al., 2017). The participants with ID in that study (Hutzler et al., 2013) scored significantly higher than those without ID on most motivational scales, and they increased their external motivation with increasing age, whereas the opposite was found in people without ID. The participants with ID were also more reactive towards integrated external regulation. However, the psychometric properties of the adapted SMS were not supported for all subscales in their study (Hutzler et al., 2013).

Additionally, a full-length questionnaire could be rather long for the target population, who typically have high levels of inattention (Deutsch et al., 2008; McClain et al., 2017); a

short version might be more feasible. Short versions of the SMS exist for populations without disabilities, such as the SMS-6 (Mallett et al., 2007) and the SMS-II (Pelletier et al., 2013). However, in contrast to what is known about the assessment of sport motivation in people without disabilities across different age groups and different athletic abilities, it is unclear whether the SMS can be used among people with ID, and if not, which modified version would be an appropriate alternative.

Therefore, the purpose of this study is twofold. The first aim is to evaluate the validity and reliability of the translated and modified versions of the SMS for their use in a Flemish population without ID (i.e., SMS-FL) and with ID (i.e., SMS-FL-ID). Since the questionnaire might be rather long for the Flemish population with ID, who might run the risk of concentration loss, the second aim is to investigate the validity of a shortened version of the SMS-FL-ID.

Materials and Methods

Participants

Participants were recruited by visiting sport clubs or events affiliated with the official disability sport federations in Belgium or by contacting Belgian sport clubs (through personal contacts and social media). Selection was based on the following inclusion criteria: (1) participants were identified by their coaches as athletes having the diagnosis of ID; moreover, the diagnosis was verified by means of self-report and by questioning their previous and current education level; (2) they practiced regularly sports (at least weakly) for an entire year; (3) they were able to participate in self-report assessment (i.e., adequate verbal skills); and (4) they were at least 14 years old. Participants were excluded when they were not able to communicate verbally in everyday situations, or when the ID diagnosis was not clear (e.g., according to their self-reported education level).

Measures

Demographics

A questionnaire was created to retrieve demographic information from the participants, including gender, date of birth, sport involvement (i.e., frequency, intensity, and competitive versus recreational level) and education history. Athletes with ID completed the questionnaire verbally with help of their coach and the test evaluator.

Translated (SMS-FL) and modified (SMS-FL-ID) version of the SMS

Participants' sport motivation was evaluated on a 7-point Likert scale by using a translated version of the original 28-item SMS (Pelletier et al., 1995). A back-translation process was used by means of four independent translators (translation of the scale can be found in Appendix A).

There were two modifications for the use in the target population of athletes with ID. Firstly, although the original questions were preserved, if necessary, two standardised simplified alternatives were additionally developed to every question to enhance comprehensibility (Finlay & Lyons, 2001; Perkins, 2007; Perry, 2004; Van Biesen et al., 2021). Similar work is created for easy-to-read language, however, we chose the term easier-to-understand because the items were read by the evaluator (see procedure section), not by the participant with ID. Easier-to-understand have standardised explanations in simple wording.

Secondly, a pictorial representation scale based on a 7-point Likert scale (Figure 1) was additionally created to make the response options less abstract (Finlay & Lyons, 2001; Perry, 2004; Van Biesen et al., 2021). Moreover, to verify the feasibility and clarity of all the translated items and the pictorial representation scale for response selection, a pilot study

with five athletes with ID was carried out. As a result, a final version of the SMS-FL-ID was developed. This procedure has been carried out in other studies on athletes with ID (e.g., Van Biesen et al., 2021).

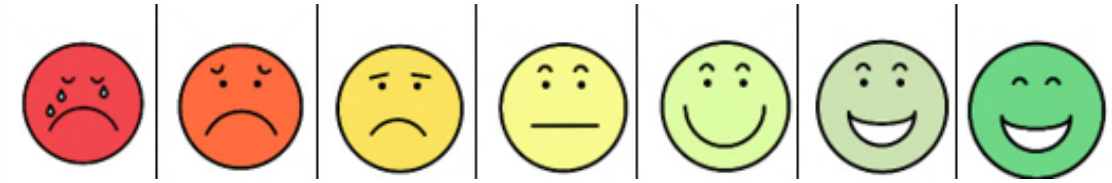

Figure 1. Pictorial representation scale, based on a 7-point Likert scale, for response selection modified for people with ID.

Condensed (SMS-FL-ID-short) version of the SMS for athletes with ID

An anticipated disadvantage to the SMS-FL-ID might be its length (i.e., 28-item scale). Consequently, a condensed version was created (SMS-FL-ID-short) as it might be more feasible for this population, who usually experience concentration loss. The short version was developed by selecting two items, with the highest factor loadings, that represented each form of motivation, resulting in a 14-item questionnaire (see Appendix B). This decision was made following the consensus of a group of (four) experts in the field. The same seven forms of motivation, as used in the SMS, were included. Selection of the items were based on the factor loadings of the factor analysis performed on the SMS-FL-ID.

Procedure

An electronic self-reported survey, feasible for the use on smartphones and tablets, was created for the study, which included the demographic questionnaire and the developed scales (i.e., the SMS-FL for the athletes without ID, and the SMS-FL-ID for the athletes with ID). Data from the participants were retrieved differently for both groups. The group of participants without ID fulfilled the questionnaires independently online; therefore, their survey included an informed consent for study participation permission and identity protection that was required to be agreed upon before gaining access to the questionnaires. In addition, parental or legal guardian consent was required for juvenile athletes.

Individual face-to-face interviews were organised to collect the data from the group of participants with ID. All participants with ID provided informed written consent prior to participation in the study. Moreover, parental or legal guardian consent was required for juvenile athletes with ID. The evaluator read all the items to the participant with ID. Only when a participant did not understand the original question, the standardised simplified alternatives were used for clarification. Participants with ID provided their responses by using the seven-point Likert pictorial representation scale, which were immediately completed online by the evaluator. In case of a technical problem, a paper copy was used. These hard copies were then completed electronically by the evaluator. This study received approval from the Ethical Committee of the KU Leuven attending to the guidelines for ethics in exercise science research (Shephard, 2002) and the Helsinki Declaration ethical guidelines (World Medical Association, 2013).

Statistical analyses

The internal consistency of the SMS was investigated by Cronbach alpha (α). The values of α were interpreted as poor (<.6), moderate (.6-.7), good (.7-.8), very good (.8-.9), and excellent (>.9) (Joseph & Arthor, 2007). The analyses were conducted separately on the group of athletes with ID and the group of athletes without ID. Bartlett's sphericity test (Bartlett, 1954) was used to ensure that the correlation matrix was not random and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) was required to

be above a minimum of .50. After confirming that the correlation matrix was factorable for each group, exploratory factor analyses were performed in order to test the newly developed SMS-FL and SMS-FL-ID scales, using a fixed number of factors (i.e., seven, as there are seven subscales of motivation in the SDT continuum). One independent variable was defined, i.e., impairment (with or without ID); not having ID was used as the selection variable for the analysis of the SMS-FL scale, and having ID for the SMS-FL-ID. The percentage of total variance that could be explained by the fixed number of components (i.e., seven) was determined by this analysis. Statistical analyses were conducted with IBM SPSS Statistics software (version 25).

Results

The total sample consisted of 326 participants, who were all members of a sport club or regularly practising organised sport activities, from here on referred to as the athletes. The subsample of 96 athletes with ID (56 males, 40 females), ranged between 14 and 61 years of age (M = 26.7, SD = 10.1). A subsample of 230 athletes without ID (96 males, 134 females), who met the same age and frequency of participation criteria as outlined for participants with ID were between 15 and 47 years of age (M = 22.5, SD = 4.7). Further demographic information from the participants in both groups is provided in Table 1.

Table 1. Descriptive information of both groups.

Note: Age in years. ID = intellectual disability.

Demographics	Athletes with ID			Athletes without ID		
	Males	Females	Total	Males	Females	Total
Total (*n*)	56	40	96	96	134	230
Age (*M*)	25.9	27.9	26.7	22.6	22.5	22.5
Age (*SD*)	10.4	9.6	10.1	5.4	4.2	4.7
Basketball	6	1	7	8	10	18
Tennis	13	9	22	17	17	34
Badminton	15	13	28	5	2	7
Swimming	3	7	10	2	9	11
Athletics	5	3	8	9	7	16
Other sports	14	7	21	55	89	144

Factor analysis of the SMS-FL and SMS-FL-ID

Cronbach's α for all subscales of the SMS-FL were as follows: .83 for 'IM to know'; .81 for 'IM to accomplish'; .75 for 'IM to experience stimulation'; .64 for 'identified' EM; .64 for 'introjected' EM; .62 for 'external regulation' EM; and .71 for AM. The average Cronbach α over the subscales was .71. An initial examination of Bartlett's sphericity test of the item response correlation matrix, $\chi^2 = 2652$, $p < .001$, and the KMO measure of sampling adequacy with a value of .87, supported the undertaking of a factor analysis. A direct oblimin rotation of a principal components exploratory factor analysis confirmed a seven-factor solution using conventional criterion (Eigenvalue >1). Seven components were extracted, which explained 62.3% of the variance. The rotated factor matrices are shown in Table 2. Factor loadings show how much a factor defines a variable, where loadings close to 1 or -1 indicate that the factor strongly explains the variable and loadings close to zero indicate a weak influence on the variable. Moreover, the analysis can reveal a cross-loading when a variable has high or significant loadings on more than one factor (Minitab 18 Support, 2019).

As a result, a cross-loading, as "measured by the ratio of loadings being greater than 75%" (Samuels, 2017, p.1), hinders those factors to be distinct and to represent separate concepts.

As it can be seen from Table 2, the factors AM, 'external regulation' EM, 'introjected' EM and 'IM to know' loaded well on their corresponding component (i.e., > .50 or > -.50). Three out of four items of 'IM to experience stimulation' factor also loaded well. However, not all factor loadings were > .50 or > -.50. For instance, all the items for 'IM to accomplish' loaded poorly on their corresponding factor. There were cross-loading issues between 'IM to accomplish' items, 'IM to know' and 'IM to experience stimulation', demonstrating an overlap of items on more than one factor (see the rows for TA-IM factor loadings in Table 2). Similarly, two items for 'identified regulation' EM showed low loadings on their corresponding factor, having their highest factor loadings for the subscale 'IM to know'. Moreover, question 11 showed an overlap between the different IM subscales (i.e., factor loadings: .58 for 'to know' IM; -.38 for 'to accomplish' IM; and .49 for 'to experience stimulation' IM).

Table 2. Factor loadings for principal components factor analysis with direct oblimin rotation of items of the SMS-FL.

Items	TK-IM	TA-IM	TES-IM	Ident-EM	Intr-EM	ER-EM	AM
TK-IM Q2	.74	-.13	.34	.37	-.06	.14	-.03
TK-IM Q4	.82	-.12	.26	.22	-.19	.18	-.05
TK-IM Q23	.76	.04	.44	.29	-.15	.23	-.01
TK-IM Q27	.76	.27	.44	.35	-.16	.34	-.09
TA-IM Q8	.78	-.08	.51	.24	-.27	.31	-.24
TA-IM Q12	.71	-.17	.50	.11	-.45	.27	-.14
TA-IM Q15	.66	.23	.49	.18	-.36	.39	-.17
TA-IM Q20	.69	.31	.31	.18	-.21	.36	-.08
TES-IM Q1	.43	.28	.49	.47	-.14	.15	-.07
TES-IM Q13	.43	.00	.84	.19	-.16	.17	-.17
TES-IM Q18	.37	-.04	.82	.17	-.13	.17	-.11
TES-IM Q25	.43	.07	.84	.18	-.16	.13	-.16
Ident-EM Q7	.41	-.17	.17	.75	-.13	.28	.01
Ident-EM Q11	.58	-.38	.49	.23	-.32	.34	.01
Ident-EM Q17	.70	-.20	.32	.31	-.29	.24	.03
Ident-EM Q24	.18	.05	.13	.86	-.19	.22	.03
Intr-EM Q9	.22	-.36	.10	.09	-.53	.40	-.03
Intr-EM Q14	.13	-.01	.22	.05	-.81	.16	-.04
Intr-EM Q21	.28	-.22	.13	.15	-.66	.11	-.09
Intr-EM Q26	.26	.12	.09	.27	-.63	.26	.09
ER-EM Q6	.24	-.22	-.15	.23	-.42	.53	.20
ER-EM Q10	.33	-.00	.39	.32	-.08	.73	.08
ER-EM Q16	.16	.04	-.14	-.08	-.57	.61	.21
ER-EM Q22	.29	-.01	.16	.29	-.18	.87	.00
AM Q3	-.20	.31	-.16	-.07	.15	.03	.67
AM Q5	-.05	-.22	-.15	.03	-.03	-.03	.79
AM Q19	-.10	.38	-.15	-.08	.00	-.04	.64
AM Q28	.11	-.16	-.04	.12	-.07	.28	.70

Note. Salient factor loadings > (-).50. IM = Intrinsic motivation. EM = Extrinsic motivation. AM = Amotivation. Q = number of question. TK = To know. TA = To accomplish. TES = To experience stimulation. Ident = Identified. Intr = Introjected. ER = External regulation.

Cronbach's α for all subscales of the SMS-FL-ID were as follows: .59 for 'IM to know'; .66 for 'IM to accomplish'; .63 for 'IM to experience stimulation'; .65 for 'identified' EM; .39 for 'introjected' EM; .82 for 'external regulation' EM; and .63 for AM. The average Cronbach α over the subscales was .62. An initial examination of Bartlett's sphericity test of the item response correlation matrix, $\chi^2 = 892$, $p < .001$, and the KMO measure of sampling adequacy

with a value of .70, supported the undertaking of a factor analysis. A direct oblimin rotation of a principal components exploratory factor analysis was performed, using a fixed number of factors (i.e., seven). Seven components were extracted which explained 57.9 % of the variance. The rotated factor matrices are in Table 3. Only the factors corresponding to the least autonomous forms of motivation ('external regulation' subscale of EM and AM) and two factors corresponding to IM ('IM to experience stimulation' and 'IM to accomplish') had high loadings on the three or four items. Some items proved to be problematic, since they did not seem to have as good loading on the motivational component as they were supposed to. The factor corresponding to 'IM to know' had only two items with a sufficiently high loading. The factors introjected and identified EM only had sufficiently high loading on the motivational component for one of the four corresponding items. These results, together with the length of the scale for a population with ID, supported the development of the 14-item SMS-FL-ID-short.

Table 3. Factor loadings for principal components factor analysis with direct oblimin rotation of items of the SMS-FL-ID.

Items	TK-IM	TA-IM	TES-IM	Ident-EM	Intr-EM	ER-EM	AM
TK-IM Q2	.58	-.12	.20	.28	.19	.41	.22
TK-IM Q4	.82	-.21	.06	.02	-.05	.06	.04
TK-IM Q23	.15	-.62	.37	.15	.00	.15	-.10
TK-IM Q27	.03	-.58	.41	.40	-.01	.17	.06
TA-IM Q8	.22	-.59	.27	.36	.21	.09	-.37
TA-IM Q12	.18	-.22	.75	.15	.10	.07	-.03
TA-IM Q15	.18	-.51	.46	.22	.16	.47	-.07
TA-IM Q20	.25	-.77	.11	.10	-.10	.03	.00
TES-IM Q1	-.01	-.39	.04	.56	.12	.33	.08
TES-IM Q13	.07	-.27	.72	.13	-.04	.11	-.00
TES-IM Q18	.23	-.28	.58	.16	.23	.25	.16
TES-IM Q25	.38	-.49	.52	.04	-.02	.14	.35
Ident-EM Q7	.31	.13	.52	.19	.09	.50	-.06
Ident-EM Q11	.43	-.19	.13	.79	.08	.15	-.01
Ident-EM Q17	.60	-.09	.41	.36	.04	.17	-.09
Ident-EM Q24	.40	.02	.52	.38	-.13	.37	-.20
Intr-EM Q9	.10	-.11	.38	.75	.08	.31	-.09
Intr-EM Q14	.06	-.03	.06	.35	.68	.15	.20
Intr-EM Q21	-.01	.05	.00	.07	.34	-.33	.57
Intr-EM Q26	-.06	.23	.02	.10	.44	.39	.16
ER-EM Q6	.07	-.19	.26	.37	-.07	.80	.04
ER-EM Q10	.05	-.21	.13	.54	-.00	.62	.20
ER-EM Q16	.30	-.04	.08	.25	.15	.79	.09
ER-EM Q22	.24	-.12	.29	.16	.18	.79	.26
AM Q3	-.01	-.03	-.04	.28	-.67	.05	.35
AM Q5	.02	-.05	-.05	.06	.07	.16	.68
AM Q19	-.13	.22	-.24	-.01	-.32	.20	.51
AM Q28	.12	.05	.17	-.05	-.05	.14	.65

Note. Salient factor loadings > (-).50. IM = Intrinsic motivation. EM = Extrinsic motivation. AM = Amotivation. Q = number of question. TK = To know. TA = To accomplish. TES = To experience stimulation. Ident = Identified. Intr = Introjected. ER = External regulation.

Factor analysis of the SMS-FL-ID-short

The items with the highest factor loadings were selected to develop a condensed version of the SMS-FL-ID, that consisted of 14 items (Cronbach's α = .68), with two items per subscale. An initial examination of Bartlett's sphericity test of the item response correlation matrix, $\chi^2 = 230$, $p < .001$, and the KMO measure of sampling adequacy with a value of .66, supported the undertaking of a factor analysis. A direct oblimin rotation of a principal

components exploratory factor analysis was conducted, using a fixed number of factors (i.e., seven). Seven components were extracted which explained 73.6% of the variance. The rotated factor matrices are shown in Table 4. Overall, the condensed version had stronger factor loadings compared to the SMS-FL-ID (Table 4). Furthermore, the resulting factor loadings for the three different versions were set side by side in Appendix A, Table A1.

Table 4. Factor loadings for principal components factor analysis with direct oblimin rotation of items of the SMS-FL-ID-short.

Items	TK-IM	TA-IM	TES-IM	Ident-EM	Intr-EM	ER-EM	AM
TK-IM Q1	.62	.17	-.41	-.01	.19	.43	.25
TK-IM Q2	.87	.15	-.06	.19	-.01	.05	.04
TA-IM Q5	.06	.82	-.15	.24	.22	.14	-.19
TA-IM Q11	.16	.86	-.04	.11	-.06	.00	.09
TES-IM Q7	-.23	.37	-.64	.50	-.06	.05	.11
TES-IM Q10	.20	.08	-.83	.07	.19	.18	.10
Ident-EM Q6	.42	.32	.05	.52	.56	.21	-.01
Ident-EM Q12	.14	.20	-.18	.82	.14	.34	-.05
Intr-EM Q8	-.02	.04	-.19	.00	.87	.18	.09
Intr-EM Q13	-.18	-.07	.01	-.35	.42	.60	.08
ER-EM Q4	.09	.15	-.17	.37	.00	.79	.17
ER-EM Q9	.27	.10	-.14	.17	.23	.79	.10
AM Q3	.04	.07	.10	-.11	.12	.21	.82
AM Q14	.10	-.15	-.31	.02	-.01	.03	.80

Note. Salient factor loadings > (-).50. IM = Intrinsic motivation. EM = Extrinsic motivation. AM = Amotivation. Q = number of question. TK = To know. TA = To accomplish. TES = To experience stimulation. Ident = Identified. Intr = Introjected. ER = External regulation.

Discussion

The purpose of this study was to create a valid and feasible scale to assess the motivational profiles of Flemish athletic adolescents and adults with and without ID. The result of this process is the translated SMS-FL for individuals without ID, and the adapted SMS-FL-ID and the SMS-FL-ID-short versions for individuals with ID. However, the condensed version SMS-FL-ID-short should be preferred in individuals with ID, since it proved to be more feasible and valid than the SMS-FL-ID. Furthermore, results from this first assessment revealed the strengths and limitations of the scales on its present form, allowing future studies to reinforce them.

Assessing the construct validity of the SMS-FL

The psychometric properties of the SMS-FL were assessed to determine the viability of this translated version for a Flemish-speaking population of athletes without ID. The theoretical structure of seven motivational factors as found in the original SMS from Pelletier et al. (1995) was attained also in the present study. According to Joseph and Arthor (2007) the values of Cronbach's α for these seven factors ranged from moderate (i.e., .62 for 'external regulation' EM) to very good (i.e., .83 for 'IM to know'), with a good average score over the subscales (i.e., .71). The EM factors were the ones that revealed the lowest α values, though they can be interpreted with a moderate or acceptable level of reliability (Griethuijsen et al., 2015; Joseph & Arthor, 2007). Each of these seven motivation factors is represented by four items, and the majority of the items proved to have acceptable to high loadings on their corresponding factor, meaning that they effectively measure the intended form of motivation. However, two psychometric issues, that have also been reported by previous studies, were identified.

Firstly, the items developed to measure 'IM to accomplish' did not load well on their corresponding factor but loaded better on the other subtypes of IM (i.e., 'IM to know').

Although the applied translation process followed a systematic parallel back-translation procedure, the nuance in meaning between the three subscales of IM might have been lost during the translation process. However, Mallett et al. (2007) found that some factors like 'IM to know' and 'IM to accomplish' were actually not statistically distinguishable. Their study was carried out in an English-speaking population without ID (i.e., the original language of the SMS). The inability to discriminate between the three factors of IM was identified as a key issue in their study; therefore, one single IM subscale with four items was formed, measuring the three IM forms together (Mallett et al., 2007). The procedure to merge different subscales of IM into a single general IM subscale has been carried out in other studies (Lonsdale et al., 2008; Pelletier et al., 2013). Therefore, it might not completely be a sample-specific problem. Originally, merging the three forms of IM was deemed unnecessary, since there was an interest to find out the separate role that the different IM subscales have in sport behaviour (Pelletier et al., 2013). However, based on the present findings and the remark (i.e., the inability to distinguish the three different IM subscales by their English-speaking participants without ID) by Mallett et al. (2007), the replacement of the three subscales with one general IM subscale might be beneficial.

Secondly, items 11 and 17 loaded poorly on the factor 'identified regulation' subscale of EM, being their highest factor loadings for the subscale 'IM to know'. This might be a translation issue resulting in slight differences in the meaning. Although, Mallett et al. (2007) also stated that it was hard to statistically distinguish between the factors of IM and the 'identified regulation' subscale of EM. Since it is difficult to determine definite borders to each concept on a continuum, it is possible that items 11 and 17 are verged closer to IM than the other two items. Nonetheless, acceptable to high values were found for the other factors.

Overall, the present preliminary results were found to support the construct validity of the SMS-FL, though taking with caution the issues found in the subscales 'IM to accomplish' and 'identified regulation' EM. Consequently, the use of the SMS-FL for the development of an adapted seven-factor Flemish SMS version for individuals with ID was justified. The present study intended to develop a scale, for people with and without ID, considering all seven forms of motivation from the SDT continuum (Ryan & Deci, 2000). However, further work is needed to overcome these mentioned psychometric issues, especially within the IM dimensions, and strengthen the scale. Future studies could consider a revision of the Flemish SMS to establish its psychometric properties, or to consider a six-factor or a five-factor structure approach like in the Spanish SMS-II adaptation (Viciana et al., 2017).

Development and construct validity of the SMS-FL-ID

The psychometric properties of the SMS-FL-ID were assessed to determine the viability of this adapted version for a Flemish-speaking population of athletes with ID. The seven-factor structure was supported. A moderate average Cronbach's α score over the seven factors, or subscales, of motivation was obtained (i.e., .62). However, the values of Cronbach's α for two motivational factors were poor (i.e., .59 for 'IM to know', and .39 for 'introjected' EM), four factors were moderate and just one factor had a very good value. In addition, the factor loadings were weak and more ambiguous than expected for some subscales of sport motivation. The item loading corresponded to the proposed model for the subtypes 'IM to accomplish', for the 'external regulation' subscale of EM, and for AM. For the other subscales, a factorial validity issue appeared (Martens & Webber, 2002), with some items cross-loading or not loading well onto their hypothesized factors. The factors, introjected EM and identified EM, were the most problematic, since they only had sufficiently high loading on the motivational component for one of the four corresponding items.

The reasons of the psychometric issues we encountered is not entirely clear, although there are a few potential explanatory mechanisms, mostly related to the specific characteristics of people with ID, for whom the questionnaire was developed. The translated 28 items did not differ between the SMS-FL and the SMS-FL-ID. In terms of written content, the only difference between both scales was the addition of a standardised simplified explanation or example (for the SMS-FL-ID) that was used only if the participation was ID was not able to understand the original item. These clarifications might still have been too complex or not completely compatible with the targeted type of motivation, and a revision of these explanations might be necessary. Nevertheless, participants who lacked the ability to understand the questions were excluded from the sample; however, it might still be possible that the nuances between the different motivational forms were too complex to be distinguished for some individuals with ID. This type of nuance is hard to verify.

Another problem that often occurred during the survey completion, was the loss of concentration, due to the relative length of the questionnaire. The number of items (n=28) is feasible for athletes without ID; when they can easily understand the questions, and automatically respond. For athletes with ID, the modifications in terms of additional explanations and examples resulted in a longer evaluation time. Lengthy measurement tools can be problematic for individuals with ID, since they typically have elevated levels of inattention (Deutsch et al., 2008; McClain et al., 2017). Such a problem was considered from the beginning; therefore, a condensed version was also created (SMS-FL-ID-short) as it could be a more feasible measurement tool for this population.

Assessing the construct validity of the SMS-FL-ID-short

The 14-item SMS-FL-ID-short version seemed to be a valid alternative to the SMS-FL-ID. For individuals without ID, existing literature reveals that some short versions of psychometrically sound questionnaires prove to be quicker and easier to administer compared to their associated original versions, such as the Shortened Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). A reduction in length of the scale was a recurrent element in existing revisions of the SMS (Mallett et al., 2007; Pelletier et al. 2013). For individuals with ID, Hutzler et al. (2013) also used a shortened version to assess sport motivation in Israeli athletes with ID that participate in Special Olympics.

In the present study, preliminary acceptable psychometric values were found for the SMS-FL-ID-short. A greater feasibility and construct validity were revealed compared to the 28-item SMS-FL-ID. Furthermore, the condensed version also included the same seven subscales of motivation. Based on previous literature (Deutsch et al., 2008; McClain et al., 2017) and current findings, a condensed version seems more appropriate for this population. Nevertheless, there were still cross-loading issues for the items 6 and 13 in the current study. These items correspond to the 'identified' and 'introjected' subscales of EM respectively. Previous studies that assessed the revised six-factor 18-item SMS-II (Pelletier et al., 2013) in different languages, though on populations without ID, also revealed problematic factor loadings in these two EM dimensions; moreover, there were problematic factor loadings in the 'external regulation' EM (Li et al., 2018; Nascimento et al., 2014; Pelletier et al., 2013; Viciana et al., 2017). The short version that was created in the present study was a seven-factor 14-item version adapted for a population with ID, resulting in a different scale, language, and population, compared to these previous studies. However, it seems that also people without ID might have problems to understand the nuances between the different motivational dimensions and these issues might not be fully attributable to the intellectual capacity of people with ID. Considering that the English, Portuguese, Chinese and Spanish versions for people without ID (Li et al., 2018; Nascimento et al., 2014; Pelletier et al., 2013; Viciana et al., 2017) encountered similar issues in relation to certain subscales of EM, it

might be interesting to revise the formulation of these items, in order to assess if language is constraining their comprehension. The original SMS was developed by Pelletier et al. (1995) almost three decades ago and language, as a social construct, might have evolved since then (Steels, 2017). Furthermore, in the present study, the original SMS was used to develop a scale with a seven-factor structure for both athletes with and without ID, in order to fully comply with the SDT continuum (Ryan & Deci, 2000). However, considering the particularities of athletes with ID and the present results, further approaches could contemplate a revision of the scale with less factors.

Limitations

This was the first study focusing on the adaptation of a Flemish version of the SMS to assess sport motivation of people with ID. However, it has some limitations that should be considered and might serve as a basis for future studies.

A population with various degrees of intellectual impairment was included. This is a strength in terms of representative of the sample; although the lack of specific information about each participant's impairment, the possible accompanying impairments or comorbidities, such as autistic-like behaviour (Van Biesen et al., 2016), or their impact was a disadvantage. The large inter-individual variability within the population with ID needs to be considered in such research. Part of the variance might be caused by additional factors that could not be systematically eliminated in this study. Considering the goal and the scope of this study, we decided not to include additional IQ testing, although it would have added more objectivity in describing the sample.

The two groups were not perfectly matched. There were more participants in the group of participants without ID, because the participants with ID were harder to reach and required a greater time investment to interview. Furthermore, the environmental interviewing circumstances varied in both groups. A one-on-one interview was necessary for the athletes with ID. This process was very time-consuming and not vital for the group of participants without ID, whose participants filled out the questionnaire without supervision. Moreover, athletes with ID were always interviewed in a training or competitive environment where other athletes, their coach, and sometimes family members were near them. Environmental and social factors can influence motivation, goal orientation, or participation in sports (Bortoli et al., 2011; Hutzler & Korsensky, 2010; Smith et al., 2006). Furthermore, environment influences the three basic psychological needs (SDT), which successively influence motivation (Markland et al., 2005). For this reason, these environmental differences cannot be excluded as an explanation for the difference in results.

There were more women than men in the group of participants without ID, although it is not described uniformly in literature how gender and sports motivation are related (Hutzler et al., 2013; Fortier et al., 1995; Hanrahan & Cerin, 2009). A larger variety of sports was practiced by the group of participants without ID; however, all sports practiced by athletes with ID were also practiced in the group of participants without ID. Age was also significantly different in both groups. These elements (gender, age, practiced sports) cannot be excluded as possible influencers. It would be interesting to examine in future studies the effect these variables might have on motivation.

Finally, the original SMS has its own limitations which have an impact on the development of adapted survey versions: (1) exclusion of integrated regulation, i.e., the most self-determining form of EM (Ryan & Deci, 2000); (2) lack of factorial validity (Martens & Webber, 2002; Reimer et al., 2002); and (3) the overall length of the scale (Pelletier et al., 2013). Nevertheless, given the outcome of the critical discussion of the six self-reported motivation questionnaires reviewed by Clancy et al. (2017), the SMS was selected as the most suitable scale for the present study, since (1) the different types of motivation are measured

multi-dimensionally, which is important because each type of motivation leads to different outcomes in sports performance (Mallett et al., 2007); (2) the SMS is a widely-used instrument in the field of sport; (3) the SMS is the most cited in general research on motivation assessment; and (4) sufficient levels of validity and reliability are reported (Pelletier et al., 1995).

There are other revised versions in the literature for populations without disabilities, such as the SMS-6 (Mallet et al., 2007) and the SMS-II (Pelletier et al., 2013), that were not selected for the present study. Construct validation is not a process that can be completed in a single study (Marsh & Jackson, 1999) and there were not sufficient studies following the one carried by Mallet et al. (2007), as a result, the SMS-6 was not considered. Although, Pelletier et al. (2013) supported the validity of the revised SMS-II, it was also not selected for the present study. As yet, there is not enough research that further examines the SMS-II, whereas there are numerous follow-up studies after the original SMS that successfully validate the SMS for various populations (Pelletier et al., 2013).

Conclusions

The purpose of this study was to obtain a valid, reliable, and feasible questionnaire to assess sport motivation in Flemish-speaking athletes with and without ID. Moreover, it was intended that the scales were able assess the seven forms of motivation as in the original SMS (Pelletier et al., 1995). The SMS from Pelletier et al. (1995) was translated into Flemish (SMS-FL) and revealed a preliminary acceptance. Most subscales revealed adequate psychometric properties, except for certain dimensions related to 'IM to accomplish' and 'identified regulation' EM. The adapted SMS-FL-ID version for individuals with ID revealed certain psychometric issues, since some items did not load well on the motivational component they were expected to. Moreover, an anticipated disadvantage to the SMS-FL-ID was its length (28-item), because individuals with ID typically have elevated levels of inattention (McClain et al., 2017). Therefore, items with the highest factor loadings were selected in order to create a condensed version with 14 items (i.e., SMS-FL-ID-short), which demonstrated to be more feasible and valid than the SMS-FL-ID. A seven-factor structure was found for all the scales. There were promising initial results from the SMS-FL for the development of a scale that measures motivation in a population of Flemish-speaking recreational athletes. However, the SMS-FL is not ready for its use at the present time, since the encountered psychometric issues hinder its validity. Nevertheless, further studies that address the above-mentioned limitations (i.e., heterogeneity of participants' impairment; diverse environmental interviewing circumstances; differences between both groups in terms of gender, age, practiced sports, and the number of participants; and the use of the original SMS with seven subscales of motivation) might serve to strengthen the psychometric properties of both scales (i.e., SMS-FL and SMS-FL-ID-short).

Perspectives

People with ID are substantially less physically active compared to people without disabilities (Dairo et al., 2016; Robertson et al., 2018) and motivation is a critical determinant of sport behaviour (Frielink et al., 2017). Moreover, researchers have suggested that the cognitive deficit that is present on individuals with ID might contribute to their lack of motivation to maintain athletic activity or an exercise routine for sufficient periods of time (e.g., Fernhall et al., 1989; Fernhall et al., 1988). Therefore, a valid and feasible measure for understanding the motivational profiles of athletes with ID can be useful for coaches that work with them, for maintaining such behaviour and potentially enhancing their performance. Nevertheless, further research is needed to broaden the understanding of the influence of motivation on sport performance in athletes with ID. Further research on

motivational profiles in individuals with ID, might also improve risk factor identification and better target physical activity promotion in this population (Dairo et al., 2016). Finally, according to the factor loadings identified in the present study, we recommend using a shortened 14-item questionnaire, that includes the same seven subscales of motivation with two items per subscale.

Supplementary Materials: See Appendix A and Appendix B.

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Appendix A

Table A1. Factor loadings for principal components factor analysis with direct oblimin rotation of items of the three developed scales.

Items		SMS-FL	SMS-FL-ID	SMS-FL-ID-short
To Know-IM	Q2.Voor het plezier dat ik beleef aan het meer te weten komen over de sport die ik beoefen. [For the pleasure it gives me to know more about the sport that I practice]	.74	.58	.62
	Q4.Voor het plezier dat ik beleef aan het ontdekken van nieuwe dingen tijdens de training. [For the pleasure of discovering new training techniques]	.82	.82	.87
	Q23.Voor het plezier dat ik beleef tijdens de training aan het leren van dingen die ik nooit eerder heb geprobeerd. [For the pleasure that I feel while learning training techniques that I have never tried before]	.76	.15	NA
	Q27.Voor het plezier dat ik beleef aan het ontdekken van nieuwe strategieën om beter te presteren. [For the pleasure of discovering new performance strategies]	.76	.03	NA
To Accomplish-IM	Q8.Omdat ik veel persoonlijke voldoening haal uit het onder de knie krijgen van bepaalde, moeilijke dingen tijdens de training. [Because I feel a lot of personal satisfaction while mastering certain difficult training technique]	-.08	-.59	.82
	Q20.Voor het plezier dat ik beleef aan het uitvoeren van moeilijke bewegingen. [For the pleasure that I feel while executing certain difficult movements]	.31	-.77	.86
	Q15.Voor de voldoening die ik ervaar bij het perfectioneren van mijn vaardigheden. [For the satisfaction I experience while I am perfecting my abilities]	.23	-.51	NA
	Q12.Voor het plezier dat ik beleef als ik mijn zwakke punten kan verbeteren. [For the pleasure I feel while improving some of my weak points]	-.17	-.22	NA
To Experience Stimulation-IM	Q13.Voor de opwinding die ik voel als ik helemaal opga in een activiteit. [For the excitement I feel when I am really involved in the activity]	.84	.72	-.64
	Q18.Voor de intense emoties die ik voel bij het beoefenen van een sport die ik leuk vind. [For the intense emotions that I feel while I am doing a sport that I like]	.82	.58	-.83
	Q1.Voor het plezier dat ik heb bij het beleven van spannende ervaringen. [For the pleasure I feel in living exciting experiences]	.49	.04	NA

Items		SMS-FL	SMS-FL-ID	SMS-FL-ID-short
	Q25.Omdat ik houd van het gevoel om helemaal op te gaan in de activiteit. [Because I like the feeling of being totally immersed in the activity]	.84	.52	NA
Identified-EM	Q11.Omdat het een van de beste manieren is die ik gekozen heb om andere aspecten van mezelf te ontwikkelen. [Because it is one of the best ways I have chosen to develop other aspects of myself]	.23	.79	.52
	Q24.Omdat het een van de beste manieren is om goede relaties te onderhouden met mijn vrienden. [Because it is one of the best ways to maintain good relationships with my friends]	.86	.38	.82
	Q7.Omdat het volgens mij een van de beste manieren is om mensen te ontmoeten. [Because, in my opinion, it is one of the best ways to meet people]	.75	.19	NA
	Q17.Omdat het een goede manier is om veel dingen te leren die nuttig kunnen zijn in andere domeinen van mijn leven. [Because it is a good way to learn lots of things which could be useful to me in other areas of my life]	.31	.36	NA
Introjected-EM	Q14.Omdat ik aan sport moet doen om mezelf goed te voelen. [Because I must do sports to feel good about myself]	-.81	.68	.87
	Q26.Omdat ik regelmatig aan sport moet doen. [Because I must do sports regularly]	-.63	.44	.42
	Q9.Omdat het noodzakelijk is om aan sport te doen als je in vorm wil zijn. [Because it is absolutely necessary to do sports if one wants to be in shape]	-.53	.08	NA
	Q21.Omdat ik me slecht zou voelen als ik geen tijd zou nemen om te sporten. [Because I would feel bad if I was not taking time to do it]	-.66	.34	NA
External Regulation-EM	Q6.Omdat het ervoor zorgt dat de mensen die ik ken op een goede manier naar me kijken. [Because it allows me to be well regarded by people that I know]	.53	.80	.79
	Q16.Omdat mensen rondom mij het belangrijk vinden om in vorm te zijn. [Because people around me think it is important to be in shape]	.61	.79	.79
	Q10.Voor het prestige dat je hebt als atleet. [For the prestige of being an athlete]	.73	.62	NA
	Q22.Om aan anderen te tonen hoe goed ik ben in deze sport. [To show others how good I am at my sport]	.87	.79	NA
Amotivation	Q5.Ik weet het niet meer; Ik heb het gevoel dat ik niet succesvol kan zijn in deze sport. [I don't know anymore; I have the impression that I am incapable of succeeding in this sport]	.79	.68	.82
	Q28.Ik vraag het me vaak af; het lijkt alsof ik mijn vooropgestelde doelen niet kan bereiken. [I often ask myself; I can't seem to achieve the goals that I set for myself]	.70	.65	.80
	Q3.Ik had vroeger goede redenen om aan sport te doen, maar nu vraag ik me af of ik ermee moet doorgaan. [I used to have good reasons for doing sports, but now I am asking myself if I should continue doing it]	.67	.35	NA
	Q19.Het is me niet langer duidelijk; ik denk eigenlijk niet dat sport mijn ding is. [It is not clear to me anymore; I don't really think my place is in sport]	.64	.51	NA

Note. Items are written in Flemish and represent the developed translated version of the original 28-item SMS (Pelletier et al., 1995), the original English-items are written in brackets. The seven different dimensions

(subscales) of motivation are written in English. IM = Intrinsic motivation. Q = number of question. EM = Extrinsic motivation. NA = Not applicable. For the SMS-FL only cases without ID were used in this analysis. For the SMS-FL-ID and the SMS-FL-ID-short only data from participants with ID were used for the analysis.

Appendix B

Table B1. Condensed (SMS-FL-ID-short) 14-item version of the SMS for athletes with ID.

1. Voor het plezier dat ik beleef aan het meer te weten komen over de sport die ik beoefen. [For the pleasure it gives me to know more about the sport that I practice] *Ik vind het leuk om meer te weten over mijn sport. [I like to have more knowledge about my sport]*
2. Voor het plezier dat ik beleef aan het ontdekken van nieuwe dingen tijdens de training. [For the pleasure of discovering new training techniques] *Bijvoorbeeld: leren hoe ik moet dribbelen met de bal, leren hoe ik een goal/punt kan maken, leren hoe ik een goede pas kan geven. [For example, learning how to dribble the ball, learn how to score a goal/point, learn how I can give a good pass]*
3. Ik weet het niet meer; Ik heb het gevoel dat ik niet succesvol kan zijn in deze sport. [I don't know anymore; I have the impression that I am incapable of succeeding in this sport] *Ik denk dat ik niet goed kan zijn in deze sport. [I think I will never be good in this sport]* *Bijvoorbeeld: Winnen, veel punten maken, snel lopen. [For example: good enough to win, to make a lot of points, to run fast]*
4. Omdat het ervoor zorgt dat de mensen die ik ken op een goede manier naar me kijken. [Because it allows me to be well regarded by people that I know]
5. Omdat ik veel persoonlijke voldoening haal uit het onder de knie krijgen van bepaalde, moeilijke dingen tijdens de training. [Because I feel a lot of personal satisfaction while mastering certain difficult training technique] *Ik voel me goed wanneer ik… Bijvoorbeeld: een goede opslag leer doen bij (tafel)tennis of badminton. Een moeilijke pas leer geven. [I feel good when… for example: when I learn how to perform a successful service in (table)tennis or badminton. Learn how to give a good pass]*
6. Omdat het een van de beste manieren is die ik gekozen heb om andere aspecten van mezelf te ontwikkelen. [Because it is one of the best ways I have chosen to develop other aspects of myself] *Ik vind dit de beste manier om mezelf te ontwikkelen op andere vlakken. Bijvoorbeeld: Door in een team te spelen, heb ik leren samenwerken met anderen. [I think this is the best way to develop in other fields. For example: by playing in a team, I learnt how to collaborate with others].*
7. Voor de opwinding die ik voel als ik helemaal opga in een activiteit. [For the excitement I feel when I am really involved in the activity] *Als ik aan het sporten ben, denk ik alleen aan het sporten, en aan niets anders, en daar word ik blij van. [When I practice sports, I can only think of doing those sports. I do not have to think about something else and that makes me happy]*
8. Omdat ik aan sport moet doen om mezelf goed te voelen. [Because I must do sports to feel good about myself] *Omdat ik aan sport moet doen om blij te zijn. Ik heb het gevoel dat ik sport nodig heb om mezelf goed te voelen. [Because I have to do sports to be happy. I feel that I need the sports to feel good about myself]*
9. Omdat mensen rondom mij het belangrijk vinden om in vorm te zijn. [Because people around me think it is important to be in shape] *Bijvoorbeeld: een goede conditie hebben, goed getraind zijn, een mooi lichaam hebben …[For example: being physically fit, being well-trained, having a well-shaped body]*
10. Voor de intense emoties die ik voel bij het beoefenen van een sport die ik leuk vind. [For the intense emotions that I feel while I am doing a sport that I like] *Bijvoorbeeld: Ik ben heel blij en trots wanneer ik een punt maak/goal scoor. [For example: I am very happy and proud when I score a point or a goal]*

11. Voor het plezier dat ik beleef aan het uitvoeren van moeilijke bewegingen. [For the pleasure that I feel while executing certain difficult movements] *Bijvoorbeeld: een pas geven bij voetbal, een smash bij badminton, een achterwaartse koprol bij turnen. [For example: give a pass in soccer, doing a smash in badminton, backwards head roll in gymnastics]*
12. Omdat het een van de beste manieren is om goede relaties te onderhouden met mijn vrienden. [Because it is one of the best ways to maintain good relationships with my friends] *Door te sporten kan ik goed bevriend blijven met mijn vrienden.[Practicing sports helps me to remain good friends with my friends]* *Bijvoorbeeld: omdat je ze veel ziet, je samen plezier kan maken tijdens het sporten. [For example: because you see your friends more often, you can make fun together while doing sports]*
13. Omdat ik regelmatig aan sport moet doen. [Because I must do sports regularly] *Omdat ik vaak aan sport moet doen van andere mensen.[Because other people force me to practice sports regularly]*
14. Ik vraag het me vaak af; het lijkt alsof ik mijn vooropgestelde doelen niet kan bereiken. [I often ask myself; I can't seem to achieve the goals that I set for myself] *Ik kan iets niet altijd doen zoals ik het zou willen. [I am not always able to perform things like I have in mind]* *Bijvoorbeeld: ik wil wel graag een goede sporter zijn, maar het lukt met niet. [For example: I would like to become a good athlete, but it is not possible for me to do that]*

Note. Items are written in Flemish and represent the developed translated version of the original 28-item SMS (Pelletier et al., 1995), the original English-items are written in brackets. Standardised simplified alternatives (i.e., easier-to-understand standardised explanations) to increase comprehensibility are in italics; an English translation is also provided in brackets. Athletes with ID scored the items on a seven-point pictorial representation scale.