

## MEASUREMENT PROPERTIES OF THE FRENCH-CANADIAN VERSION OF THE WHEELCHAIR SKILLS TEST: PRELIMINARY RESULTS

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### Abstract

The Wheelchair Skills Program (WSP) is an integrated system to evaluate and train a wide range of manual wheelchair skills. It is increasingly used in clinics and for research purposes. Until recently, it was only available in English. In this paper, preliminary results regarding reliability and validity of the French-Canadian version are presented. Results should help to improve the wheelchair-provision process, provide a protocol for testing and training Francophone wheelchair users, and support the dissemination of the WSP in Francophone countries.

### Background

A principal justification for providing assistive technology devices to people with disabilities is to improve their quality of life and their social participation [1,2]. Objective interventions methods are needed to achieve this goal in the field of wheeled mobility. Over the last 12 years, the Wheelchair Research Team at Dalhousie University (Halifax, Nova Scotia, Canada) has developed a Wheelchair Skills Program (WSP) ([www.wheelchairskillsprogram.ca](http://www.wheelchairskillsprogram.ca)). The WSP is an integrated system increasingly used in clinics and for research purposes. This testing and training program includes the Wheelchair Skills Test (WST) [3], the questionnaire version of the WST (WST-Q) [4], and the Wheelchair Skills Training Program (WSTP). It allows one to test with a 2-point scale (pass or fail) and train a total of 57 representative skills objectively, simply and inexpensively.

The WSP was, until recently, only available in English. There are over 80 million people worldwide for whom French is their mother tongue. French is a language used in more than 50 countries, throughout North America (eg. Canada), Europe (eg. France, Belgium), Africa (eg. Senegal, Maroc), Asia (eg. Vietnam, Laos), and the Caribbean (eg. Haiti). Our research team has translated the WSP (Version 3.2) into French-Canadian (freely available at [www.wheelchairskillsprogram.ca/fre/](http://www.wheelchairskillsprogram.ca/fre/)) using as a methodological basis the guidelines usually applied to the translation and trans-cultural adaptation of questionnaires [8,9]. A series of iterative steps that meet language, clinical, scientific and socio-cultural objectives were applied to produce Canadian-French versions of the WSP (WSP-F), i.e. the WST-F, WST-Q-F and WSTP-F [10].

## Objectives

The overall objective of the project is to develop and validate a French-Canadian version of the WSP that is as equivalent as possible to the English version and that respects relevant socio-cultural perspectives. This includes establishing the measurement properties of the WSP-F and demonstrating its efficacy. In this paper, we present the method used to achieve these goals and preliminary results regarding the measurement properties of the WST-F and WST-Q-F.

## Methodology

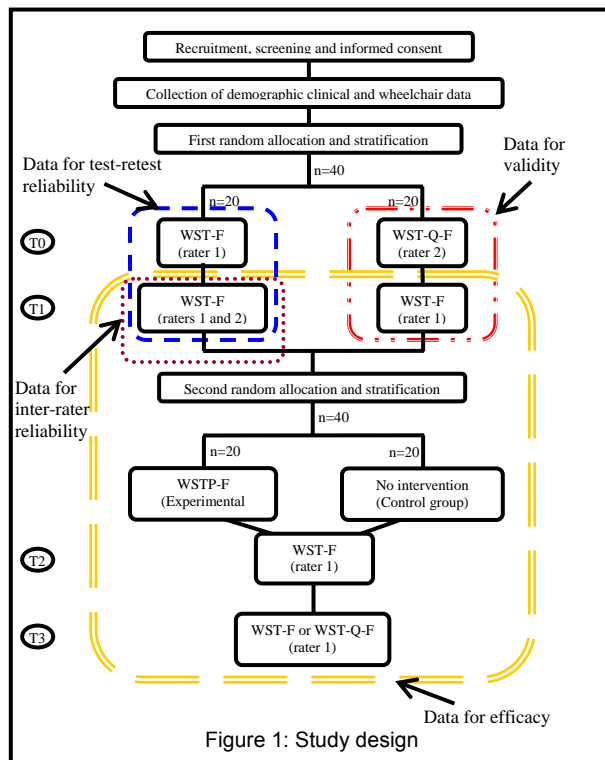


Figure 1: Study design

To address our goals, a randomized controlled trial (RCT) (August 2006 to March 2007) involving 40 Francophone wheelchair users will be achieved. Half of the participant sample (n=20) will be trained with the WSTP-F protocol and the regular wheelchair training provided in the participating facilities, and the other half (n=20) will receive only the regular wheelchair training provided in the participating facilities (in Montréal: *Institut universitaire de gériatrie de Montréal* [IUGM], *Institut de réadaptation de Montréal* [IRM], *Centre de réadaptation Lucie-Bruneau* [CRLB], and in Halifax: Nova Scotia Rehabilitation Centre [NSRC]). All subjects are to be evaluated at the IUGM or at the NSRC sites, where the standardized WST-F testing environments are built. All participants will undergo data acquisition at T0, T1, T2 and T3. There will be 2-7 days between T0 and T1, 2-4 weeks between T1 and T2, and 3 months between T2 and T3. Figure 1 summarizes the design of the overall study.

Prior to the RCT, pretests were conducted with four wheelchair users to evaluate the feasibility

of data acquisition, and testing and training procedures. Pretests were also useful to obtain feedback from wheelchair users, and from clinician trainers and testers/raters to allow refinements to the experimental version of the WSP-F. Pretest data acquisitions correspond to T0 and T1. Participants were thus assessed twice, 4-6 days apart. At T0, they were assessed by one rater only. At T1, they were assessed simultaneously by 2 different raters. Because the sample size is small to date (n=4), only descriptive analyses are presented in this paper.

## Results

Figure 2 shows some examples of the testing setup at the Research Centre of the IUGM. Some demographic data and wheelchair-related experience of the 4 wheelchair users who completed the pretests are shown in Table 1. Test-retest (data from rater 1) and inter-rater (data from T1) reliability of the WST-F are reported in Tables 2 and 3 using the Total Percentage Scores. Data with asterisks in Tables 2 and 3 differentiate data obtained from the WST-Q-F from data obtained with the WST-F. WST-Q-F and WST-F scores provide an indication of the concurrent validity between the questionnaire and the objective test.

**Discussion and Conclusions**

Preliminary results suggest good test-retest and inter-rater reliability of the WST-F Total Percentage Scores. The differences are less than 10% between scores from T0 and T1 for test-retest reliability and less than 5% between the two raters for inter-rater reliability. Participant 3 had a higher score at T1 (+9.1%), which may be explained by the effect of concomitant training at the rehabilitation centre (IRM) between T0 and T1. This participant was the only one to receive wheelchair skills training between T0 and T1 by his occupational therapist. Based on results from participants 3 and 4, WST-F and WST-Q-F, appear to provide similar results, thus supporting their concurrent validity. The experimental protocol was well tolerated by wheelchair users. These preliminary findings are consistent with the measurement-property studies of the English version of the WST [3,4].

To improve the wheelchair-provision process, the research evidence suggests that it is important for clinicians to document their interventions and the efficacy thereof. The WSP-F provides French-Canadian testing and training protocols for Francophone wheelchair users and should help the research team to internationalize the WSP in French-speaking countries.



*Increased Rolling Resistance – Gravel (skill #36)*



*Inclines – 7.5°, Wheelie Forward Descent (skill #42)*



*Wheelies on Level Terrain – Turn in Place (skills #52 and #53)*

Figure 2: Some examples of skills evaluation setup (Research Centre, IUGM)

Characteristics	Value
Age (years)	
Range	25-70
Mean±SD	49±19
Gender	
Male	3
Female	1
Diagnostic group	
Amputation (unilateral)	1
Amputation (bilateral)	1
Spinal Cord Injury	2
Wheelchair propulsion method	
2 hands	3
2 hands and 1 foot	1
Wheelchair experience (months)	
Range	2-12
Mean±SD	6±4
Frequency of wheelchair use	
>8 hours/day	1
4-8 hours/day	3

Table 1: Participant Characteristics.

Participant	T0	T1	Difference
1	55	57	+3.6%
2	92	92	0.0%
3	66*	72	+9.1%
4	75*	78	+4.0%
Mean±SD	72±16	75±15	+3.3±4.3%

Table 2: Test-retest WST-F Total Percentage Scores.

Participant	Rater 1	Rater 2	Difference
1	57	57	0.0%
2	92	92	0.0%
3	72	72	0.0%
4	78	80	+2.6%
Mean±SD	75±15	75±15	+0.7±1.3%

Table 3: Inter-rater WST-F Total Percentage Scores.

## **References**

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## **Speaker Bio**

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