QUALITATIVE ANALYSES OF A FUNDAMENTAL MOTOR SKILL ACROSS THE LIFESPAN: LINKING PRACTICE AND THEORY

Submitted by

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LIST OF PUBLICATIONS

Parts of this Thesis appear are published in the following:

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Haynes, J., Miller, J., Callingham, R., & Pegg, J. (2005). *Applying Item Response Modelling to confirm the underlying construct of a new process instrument in Gymnastics*. Refereed paper presented, and published by the Australian Association for Research in Education (AARE). Sydney. NSW. Paper №: HAY 05720.

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ABSTRACT

This study is an investigation of the sensorimotor mode of learning. This is facilitated by observations of individuals across a 44 year age range, performing the fundamental motor skill of the forward roll. This fundamental motor skill was selected because it has already been partially validated for developmental sequences.

The participants comprised 28 males and 89 females. The cohorts were: children (*n*=48); young adults (*n*=24); and, older adults (*n*=45). All participants (*N*=117) were video taped whilst performing the forward roll. In addition, the adults were interviewed about their performance.

The performances of all participants were analysed initially by comparing them to an "ideal". Following this analysis, nine participants were selected for further analysis, on the basis of their representative age group – children, young adults and older adults, as well as the quality of their performance – low, medium or high. The purpose of this approach was to assess whether three currently used instruments, each representing an alternative assessment perspective, could provide an accurate measure of quality when applied to the nine performances. In so doing, a movement domain specific comparison of the performances for the fundamental movement skill was provided. The results of this analysis showed that the instruments did not accurately assess the quality of the performance of the forward roll across the lifespan.

A new instrument was developed from a fine-grained analysis of all participants' performances that addressed the identified deficiencies. This instrument was termed the Model for Assessing Movement Quality of the Forward Roll (MAMQ:FR). It was based upon incremental observational components, which were termed indicators and descriptors. These indicators and descriptors were applied to three hypothetical sequences within the forward roll – the beginning, bridging and end.

The partial credit form of Rasch modelling, involving the *Quest* statistical package was applied to the data to determine the veracity of the underlying construct of the MAMQ:FR. The application of *Quest* to the data confirmed that the MAMQ:FR utilised a single underlying construct, that is, the quality of movement. An innovative addition to the statistical analysis was the presentation of the item fit map in pictorial format, whilst still accurately demonstrating the step difficulty and level of quality for a particular movement.

A comparative analysis and an interpretation of the performance indicator data for the forward roll, for all cohorts was also undertaken. The resulting analysis presented in both tabulated and graphical format demonstrated that the observable components for the forward roll were similar for children, young adults and older adults.

Based on the acceptable levels of the fit statistics, the SOLO theoretical paradigm was applied to the MAMQ:FR framework. This step was undertaken by using the three identified sequences within the forward roll and the indicators and descriptors of the MAMQ:FR. As a result the SOLO cycles and levels were identified and described for each sequence of the forward roll. In addition, further analysis using a SOLO Observation Checklist (SOC) indicated that cycles and levels could be applied to the skill using a whole body approach. The implications of this investigation include the first exploration of the cycles of learning in the sensorimotor mode of learning, within the SOLO model. This finding has implications for how the assessment of learning is approached in the movement domain and provides a bridge between the cognitive modes of learning and those of skilled human movement across the lifespan.