110 - THEORETICAL-PRATICAL VALIDATION OF GLOBAL LATERAL PREFERENCE INVENTORY FOR INFERIOR AND SUPERIOR LIMBS ANALYSIS

FERNANDO AUGUSTO VITÓRIO SEREZA
KELYN ROSINHOLI MATHIAS
TATIANE FLAVIA DE OLIVEIRA
JULIANA BAYEUX DASCAL
Univeridade Estadual de Londrina, Londrina, Paraná, Brasil
fernandosereza@yahoo.com.br

INTRODUCTION

Laterality is related to body hemispheres (right and left). Lateral preference can be understood as the frequency of using one body size (Teixeira & Paroli, 2000; Teixeira, 2006, 2007). Usually the preference lateral is diagnosed based on hand writing and/or kick leg. However there are other dimensions of the body which can diagnose lateral preference as eyes, ear and trunk preference.

There are tools that can diagnose lateral preference as Edinburg Lateral Dominancy Inventory (Oldfield, 1971) which is limited to manual dimensions. Other tool used to measure lateral preference, the Global Lateral Preference Inventory (GLPI), developed by Okazaki et al. (2010), evaluates daily tasks encompassed laterality dimensions as manuals, pedal, hearing, visuals and of the trunk.

These inventories use theoretical questions to evaluate lateral preference and take in account the person knowledge of their movements, which can be mistaken when compared to a practical situation. This study performed two experiments which has the purpose of correlate theoretical GLPI-B with practical situations (experiment 1) and theoretical GLPI-C with practical situations (experiment 2).

METHODS

EXPERIMENT 1

Fourteen individuals of both gender, aging 17 to 30 years, mean age 21,43 years (DP=2,77), at Laboratory of the Study and Research in Development and Motor Learning Group (GEPEDAM) at State University of Londrina. It was used GLPI software (Okazaki et al., 2010) in which participants answered to questions according to a stated protocol and performed the tasks in practical situations (each of one was performed 4 times and in random order). The GLPI-B is composed by 15 questions: (1) write with a pencil, (2) use a knife to cut an orange, (3) use a scissors to cut a paper, (4) brushing teeth, (5) comb your hair, (6) throwing a stone, (7) make a serve in volleyball, (8) punch with great force, (9) carrying a tray of food, (10) carrying a heavy bag, (11) grasp an object thrown with one hand, (12) playing shuttlecock (hand that counter the shuttlecock), (13) defending the goal with one hand, (14) intercept the throwing of a ball using one hand and (15) playing table-tennis (hand that hold the racket), classifying lateral preference for superior limbs (SL). For each trial proposed by the researcher it was noted with which limb the participant performed the task. When the task was performed with right limb the note was (1) and when the task was performed with the left limb the note was (0). It was verified the scores of each task and the final result was obtained through the total sum of each task plus one. The results were interpreted as: (1) always left, (2) most of the time left, (3) indifferent, (4) most of the time right, (5) always right.

After the participants performed GLPI-B in a practical manner, they answer to the questions in a portable computer (Acer, 14 inches) with the GLPI and the answers were noted. The answers for the theoretical GLPI were exported at the same manner of practical GLPI. The average values of practical GLPI were compared to the theoretical GLPI.

The statistical analyses was done with Spearman Test to verify the correlation between theoretical and practical GLPI through statistical software SPSS (17.0). The significance level adopted was $P<0,05$.

EXPERIMENT 2

For experiment 2, 18 undergraduate students of both gender with mean age of 23,16 years (DP=4,56) of State University of Londrina. The undergraduate students performed 5 tasks of GLPI-C for inferior limbs (MMII): (1) balance on one foot, (2) leg or push in forward leap, (3) kick a ball at the goal, (4) crushing an insect with one foot e (5) first foot to climb a ladder. For these tasks it was used a ball, a insect picture, the footstep of a ladder and a 14 inches Acer computer. These tasks were performed in a random order with 4 trials to ensure consistency. If the participant performed 4 trials with left side he was classified as high left-handed (1), if he performed 3 trials with left side and 1 with right side he was classified as moderate left-handed (2), if he performed 2 trials with each side he was classified as indifferent (3), if he performed 3 trials with right side and 1 with left side he was classified as moderate right-handed (4) and if he performed 4 trials with right side he was classified as high right-handed.

The participants answered to the GLPI-C software (Okazaki et al, 2010) in which there is a virtual simulation of the tasks with the following conditions: always left (1), most of the time left (2), indifferent (3), most of the time right (4), always right (5) and I don´t know (0). Accordingly to the answer, each participant was classified as in the practical GLPI-C, high left-handed (1), moderate left-handed (2), indifferent (3), moderate right-handed (4) and high right-handed (5).

For descriptive statistics of preference lateral scores it was used the mean and standard deviation and for associative statistics it was used the Spearman Correlation Test. The adopted level of significance was $P<0,05$.

RESULTS

Through the tests applied in this study to evaluate lateral preference, it can be observed that in both inventories (B and C), used in theoretical and practical manner, the participants were classified as moderate right-handed.

Related to the correlation analysis between theoretical and practical tests, the statistics analysis showed a high value of correlation ($r=0,946$, with $P<0,0001$, figure 1(a)) between theoretical GLPI-B and the tasks performed in a practical manner. In relation to the analysis of GLPI-B1, about lateral preference for closed and fine motor skills of SL, it was showed a high correlation ($r=0,701$, $P<0,005$, figure 1(b)) with the tasks made in a practical manner. For GLPI-B2, related to lateral preference for closed and global skills of SL, it was showed a high correlation ($r=0,838$, $P<0,0001$, figure 1(c)) with the tasks made in a real manner. And for GLPI-B3, related to the lateral preference for opened and global skills of SL there was a significant correlation between the tasks performed at the software with that ones performed in a practical manner ($r=0,846$, $P<0,0001$, figure 1(d)). These results indicate that GLPI-B is an optimal tool to evaluate manual lateral preference, looking to values obtained at correlations.

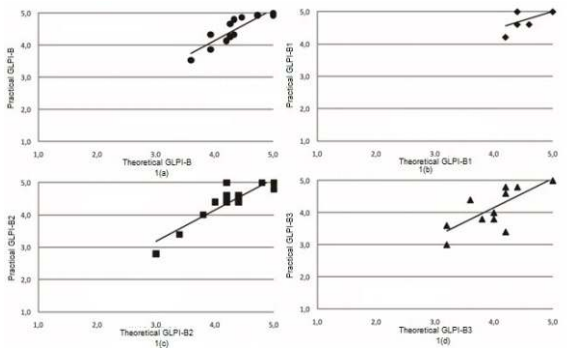

Figure 1. Correlation of theoretical and practical GLPI-B.

The scores of lateral preference of IL of theoretical GLPI-C showed a mean of 3,77 (DP=0,60) and the scores of lateral preference of the practical GLPI-C showed a mean of 3,96 (DP=0,88), showing a significant correlation (r=0,77, P<0,001).

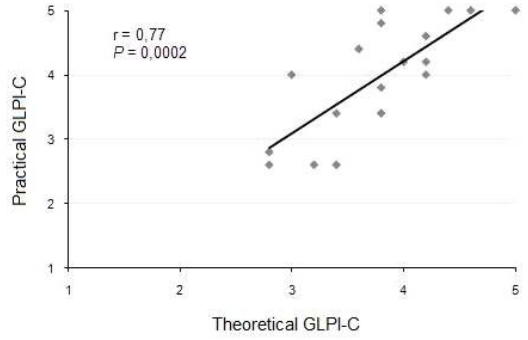

Figure 2. Correlation of theoretical and practical GLPI-C.

DISCUSSION AND CONCLUSION

One of the most used inventories to evaluate lateral preference is the Edinburg Lateral Dominance Inventory (Oldfield, 1971). However, this inventory analyzes just manual tasks. On the other hand, the GLPI used in the present study evaluate more dimensions of lateral preference (manual, pedal, hearing, viewing and about the trunk), allowing understand more components to diagnose lateral preference. Another aspect to be considered about this tool is the possibility of use it in two versions: in press (Marim & Okazaki, 2010) and in virtual environments (Okazaki et al, 2010).

There are little scientific studies that evaluate lateral preference in a practical perspective. At 2007, Teixeira evaluate the pedal preference of 5 to 10 years old boys in stabilization and mobilization tasks. He found interesting results, which motivated the investigation of this study, making an association of practical and theoretical results.

From the results obtained in this study it can be stated that GLPI-B and GLPI-C can be used to diagnose lateral preference of SL and IL, respectively. The results showed in this study demonstrated high correlation with theoretical and practical GLPI values, which endorse it as a reliable and trustworthy tool for evaluate lateral preference. We suggest, from this study, that others could be realized to test the relation of theoretical and practical GLPI between other dimensions of the inventory (trunk, vision and hearing).

REFERENCES

MARIM, E. A.; OKAZAKI, V. H. A.. **Inventário de Preferência Lateral Global** - IPLAG. In: TEIXEIRA, L.A.; CLAUDIO, A.P.K.; LIMA, A.C.; PEREIRA, C.F.; SOUZA, R.M.; FREITAS, S.L.; OKAZAKI, V.H.A.. (Org.). **Especialização em Aprendizagem Motora (v.3).** 1 ed. São Paulo: USP, 2010, v. 03, p. 32-65.

OKAZAKI, V. H. A.; MARIM, E. A.; LAFASSE, R.. IPLAG - **Inventário de Preferência Lateral Global**. 2010.

OLDFIELD, R. C. **The assessment and analysis of handedness: the Edimburg inventory. Neuropsicologia,** v. 9, p. 97-113, 1971.

TEIXEIRA, L. A.; PAROLI, R. **Assimetrias Laterais em Ações Motoras: Preferência Versus Desempenho,** Motriz, v.6 n. 1, p. 1-8, 2000.

TEIXEIRA, L.A. **Lateralidade e comportamento motor: assimetrias laterais de desempenho e transferência interlateral de aprendizagem.** São Paulo: 2001. 170p. Tese (Livre-Docência) – Escola de Educação Física e Esporte da Universidade de São Paulo.

TEIXEIRA, L. A. **Controle Motor.** Barueri, SP: Manole, 2006.

TEIXEIRA, M.C.T. **Preferência podal e assimetrias interlaterais de desempenho na tarefa de chutar em crianças.** Dissertação (mestrado) - USP, 2007.

TEIXEIRA, L. A.; TEIXEIRA, M. C. T. **Shift of Manual Preference in right-handers Following Unimanual Pactice. Brain and Cognition,** 65, p. 238-243, 2007.

Autor principal: Fernando Augusto Vitório Sereza
Endereço: Rodovia Celso Garcia Cid Pr 445 Km 380 Campus Universitário
Londrina - PR Caixa Postal: 6001 CEP: 86051-990
Fone: (43) 3371-5857 - (43) 9987-1533 -
(41) 9202-3757
e-mail: fernandosereza@yahoo.com.br

THEORETICAL-PRATICAL VALIDATION OF GLOBAL LATERAL PREFERENCE INVENTORY FOR INFERIOR AND SUPERIOR LIMBS ANALYSIS

ABSTRACT

The frequency of using one side of the body is related to lateral preference concept. The Global Lateral Preference Inventory (GLPI) is used to diagnosis the lateral preference (Okazaki et al., 2010). In this inventory there are questions related to daily tasks which encompassed superior limbs (SL) and inferior limbs (IL), trunk, hearing and vision. Despite of GLPI contributions for understanding lateral preference, there is a lack of studies that analyze the coherence between answers acquired by the questionnaire and the practice performance of these tasks. Therefore this study realized the theoretical-practical validation of GLPI-B (experiment 1) and GLPI-C (experiment 2). In experiment 1, 14 undergraduate students (mean age=21,43 years, DP=2,77) were tested and in experiment 2, 18 undergraduate students (mean age=23,16 years, DP=4,56). The participants performed the proposed tasks at GLPI-B and GLPI-C in theory and practice. Both theoretical and practical GLPI were performed with 4 trials at each task by the participants and the results were classified as high left-handed, moderated left-handed, indifferent, moderated right-handed and high right-handed. After the performance of both GLPI (theoretical and practical) a correlation analysis were made which showed r=0,946 (P<0,001) for GLPI-B and r=0,77 (P<0,001) for GLPI-C. The participants were classified as moderated right-handed in both conditions of GLPI for SL and IL. Accordingly the GLPI inventory showed to be a valid tool to analyze lateral preference.

KEY-WORDS: Inventory; laterality; lateral preference.

VALIDATION THÉORIQUE PRATIQUE DE L'INVENTAIRE DE PRÉFÉRENCE LATÉRALE GLOBALE POUR L'ANALYSE DES MEMBRES SUPÉRIEURS ET INFÉRIEURS

RÉSUMÉ

L'utilisation la plus fréquente de l'un des cotés du corps rapporte au concept de préférence latérale. L'Inventaire de Préférence Latérale Globale (IPLAG) est utilisé pour faire le diagnostic de la préférence latérale (Okazaki et al., 2010). Dans cet inventaire, il y a des questions relatives aux tâches du quotidien qui impliquent les membres supérieurs (MMSS) et inférieurs (MMII), le tronc, l'audition et la vision. En dépit des contributions de l'IPLAG pour la compréhension de la préférence latérale, sont encore nécessaires d'autres études pour analyser la cohérence entre les réponses sur le questionnaire et la réalisation pratique des tâches. Cette étude a fait la validation théorique pratique de l'IPLAG-B (expérimentation 1) et IPLAG-C (expérimentation 2). Pour l'expérimentation 1, ont participé 14 étudiants universitaires (âge moyen 21,43 ans, DP=2,77) ; pour l'expérimentation 2, ont participé 18 étudiants universitaires (âge moyen 23,16 ans, DP=4,56). Les participants ont réalisé les tâches proposées dans l'IPLAG-B e IPLAG-C, en théorie et en pratique. Dans l'IPLAG théorique aussi comme dans le pratique, les participants ont fait 4 tentatives en chaque tâche. Selon leurs réponses, ils seraient classés comme fortement gauchers, gauchers modérés, indifférents, droitiers modérés et fortement droitiers. Après la réalisation des deux IPLAGs (théorique et pratique), une analyse de corrélation a été faite et a présenté r=0,946 (P<0,001) pour l'IPLAG-B et r=0,77 (P<0,001) pour l'IPLAG-C. Les participants des deux applications de l'IPLAG ont été classés comme droitiers modérés pour MMSS, autant que pour MMII. De cette façon, l'inventaire IPLAG se présente comme un instrument valide pour l'analyse de la préférence latérale.

MOTS-CLÉS: Inventaire; Latéralité ; Préférence Latérale.

VALIDACIÓN TEÓRICO – PRÁCTICA DEL INVENTARIO DE PREFERENCIA LATERAL GLOBAL PARA ANÁLISIS DE MIEMBROS SUPERIORES E INFERIORES

El uso con más frecuencia de uno de los dos lados del cuerpo se encuentra relacionado al concepto de preferencia lateral. El Inventario de Preferencia Lateral Global (IPLAG) es utilizado para diagnosticar la preferencial lateral (Okazaki et al., 2010). En el hay cuestiones referentes a las tareas cuotidianas, a las cuales envuelven a los miembros superiores (MMSS) e inferiores (MMII): torso, audición, visión. A pesar de las contribuciones del IPLAG sobre la comprensión de la preferencia lateral, todavía son necesarios estudios que analicen la coherencia entre sus respuestas adquiridas por medio de cuestionario y de la realización práctica de las tareas. Así, este estudio ha realizado la validación teórico práctica del IPLAG-B (experimento 1) e IPLAG-C (experimento – 2). En el experimento 1 participaron 14 universitarios (edad media=21,43 años, DP=2,77) y en el experimento 2 participaron 18 universitarios (edad media=23,16 años, DP= 4,56). Los participantes realizaron las tareas propuestas en los IPLAG-B e IPLAG-C, tanto la teoría cuanto la práctica. En el IPLAG teórico y práctico, los participantes realizaron 4 intentos por tarea y de acuerdo con sus respuestas fueron clasificados como fuertemente zurdo, zurdo moderado, indiferente, moderadamente diestro y fuertemente diestro. Después de la realización de los IPLAGs (teórico y Practico) fue realizada una análisis de correlación, en la cual se ha presentado r=0,946 (P<0,001) para el IPLAG-B y r=0,77 (P<0,001) para el IPLAG-C. Los participantes en ambas condiciones de aplicación del IPLAG fueron clasificados como diestros moderados tanto para MMSS cuanto para MMII. Por lo tanto, el inventario IPLAG ha demostrado ser un instrumento valido para analizar la preferencia lateral.

PALABRAS LLAVES: Inventario; lateralidad; preferencia lateral.

VALIDAÇÃO TEÓRICO-PRÁTICA DO INVENTÁRIO DE PREFERÊNCIA LATERAL GLOBAL PARA ANÁLISE DE MEMBROS SUPERIORES E INFERIORES

A utilização de um dos lados do corpo com maior frequência está relacionada ao conceito de preferência lateral. O Inventário de Preferência Lateral Global (IPLAG) é utilizado para diagnosticar a preferência lateral (Okazaki et al., 2010). Neste inventário há questões relacionadas a tarefas do cotidiano, as quais envolvem membros superiores (MMSS) e inferiores (MMII), tronco, audição e visão. Apesar das contribuições do IPLAG para o entendimento da preferência lateral, ainda são necessários estudos que analisem a coerência entre as suas respostas realizadas por meio de questionário e a realização prática dessas tarefas. Assim, este estudo realizou a validação teórico-prática do IPLAG-B (experimento 1) e IPLAG-C (experimento 2). No experimento 1 participaram 14 universitários (idade média=21,43 anos, DP=2,77) e no experimento 2 participaram 18 universitários (idade média=23,16 anos, DP=4,56). Os participantes realizaram as tarefas propostas no IPLAG-B e IPLAG-C, tanto na teoria quanto na prática. Tanto no IPLAG teórico como no prático, os participantes realizavam 4 tentativas em cada tarefa e a partir dos resultados seriam classificados como fortemente canhotos, canhotos moderados, indiferentes, destros moderados e fortemente destros. Após a realização dos dois IPLAGs (teórico e prático), foi realizada uma análise de correlação, a qual apresentou r=0,946 (P<0,001) para o IPLAG-B e r=0,77 (P<0,001) para o IPLAG-C. Os participantes em ambas as condições de aplicação do IPLAG foram classificados como destros moderados tanto para MMSS quanto para MMII. Portanto, o inventário IPLAG demonstrou ser um instrumento válido para analisar a preferência lateral.

PALAVRAS-CHAVE: Inventário; Lateralidade; Preferência Lateral.