

# JOURNAL OF SPORT & EXERCISE PSYCHOLOGY

## NASPSA 2015 Conference Abstracts

} HUMAN KINETICS

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**Postural sway of sitting infants on solid and foam surfaces while engaged in concurrent tasks**

Arnold, Amanda J.; Harris, Rachel C.; Liddy, Josh J.; Claxton, Laura J.; Purdue University

Independently sitting infants alter sway based on concurrent task demands. Infants reduce sway to better interact with a toy held in their hand (Claxton et al., 2014), and to better focus on a small image viewed on a monitor (Claxton et al., 2013). Because these tasks likely have different attentional demands, the current study investigated whether holding a toy or looking at a toy would result in a greater reduction of sway in an easy postural task (sitting on a solid surface) and a difficult postural task (sitting on a foam surface). Eight independently sitting infants ( $M_{age} = 7$  months; 21 days; range = 6; 21–8; 4; 6 boys) participated. While sitting on each surface, the experimenter showed the infant a toy for 2–3 s and then gave it to them. Sway area (SA) and sway velocity (V) were calculated from the CoP data (120 Hz) and compared using repeated-measures ANOVAs. SA had main effects for surface and task. Infants had a moderately smaller SA when sitting on the solid surface ( $M = 859 \text{ mm}^2$ ,  $SD = 184$ ) versus the foam surface ( $M = 1443 \text{ mm}^2$ ,  $SD = 242$ );  $F(1,7) = 5.10$ ,  $p = 0.058$ . Infants had a smaller SA when looking at the toy ( $M = 727 \text{ mm}^2$ ,  $SD = 86$ ) versus holding the toy ( $M = 1574 \text{ mm}^2$ ,  $SD = 290$ );  $F(1,7) = 11.00$ ,  $p < 0.05$ . For V, there was a moderate interaction effect,  $F(1,7) = 5.19$ ,  $p = 0.057$ . For the solid surface, no difference existed in V when infants looked at ( $M = 93 \text{ mm/s}$ ,  $SD = 25$ ) or held the toy ( $M = 99 \text{ mm/s}$ ,  $SD = 25$ );  $t(7) = 0.62$ ,  $p = 0.56$  (paired-samples  $t$  test). However, for the foam surface, V was significantly faster when infants held ( $M = 144 \text{ mm/s}$ ,  $SD = 39$ ) versus looked at the toy ( $M = 104 \text{ mm/s}$ ,  $SD = 21$ );  $t(7) = 2.70$ ,  $p < 0.05$ . Overall, type of concurrent task and difficulty of postural task both impacted postural sway. Looking at the toy held by the experimenter lead to a greater reduction in sway. The more challenging postural task of sitting on foam lead to a greater velocity of sway when holding the toy as compared to looking at the toy. Results from this study demonstrate that a concurrent task with solely visual demands leads to a greater reduction in sway, even when the postural demands of the task increase.

**A needs assessment of the fundamental motor skills of urban and rural children in Indonesia**

Bakhtiar, Syahrial, State University of Padang; Famelia, Ruri, Goodway, Jacqueline D., Ohio State University; Kiram, Yanuar, State University of Padang

The World Health Organization's (WHO) "Global Recommendations on Physical Activity for Health" (WHO, 2011) identified the importance of preventing chronic disease through promoting physical activity at a population level, specifically in developing countries such as Indonesia. Indonesia has joined the ranks of the top-10 most obese countries in the world. As obesity rates in Indonesia have escalated, the little data that is available shows time spent in physical activity has been replaced by screen time, especially in urban areas (Collins, Pakiz, & Rock, 2008; Roemling & Qaim, 2012). Both the Indonesian government and the WHO have identified the importance of developing policies and strategies to promote physical activity and motor competence in Indonesian children (Goodway, Famelia, & Bakhtiar, 2014; Roemling & Qaim, 2012; WHO, 2012). Yet little to no data exists in Indonesia to guide such policies. Recognizing that fundamental motor skill (FMS) competence is an important predictor of physical activity, this study was a first step in guiding policy decisions. The purpose of the study was to examine the FMSs of Indonesian boys ( $n = 335$ ) and girls ( $n = 385$ ) from West Sumatera aged 6.08 to 10.92 years, along with potential gender differences. Furthermore, to investigate differences in FMS by geographic location (rural,  $n = 349$ ; and urban,  $n = 371$ ). All children were tested on TGMD-2 by trained evaluators. A 2 Gender (boys, girls)  $\times$  2 Geographic Location (rural, urban) MANOVA on object control (OC) and locomotor standard scores (SS) revealed significant main effects for Gender ( $F(2,715) = 16.43$ ,  $p < .001$ ;  $\eta^2 = .04$ ) and Geographic Location ( $F(2,715) = 3.74$ ,  $p < .05$ ;  $\eta^2 = .01$ ) with no significant interaction. Univariate tests for locomotor SS showed there was a significant main effect for Gender ( $p < .001$ ) and Geographic Location ( $p < .05$ ). For OC SS there was only a significant effect for Gender ( $p < .001$ ). In all cases, girls outperformed boys on FMS. These data will serve to inform policy development and professional practice in Indonesia.

**Explicit motivations modify occupational handling strategies and postures**

Bandaralage, Harsha; Gonzalez, Claudia; Tata, Matthew; Doan, Jon; University of Lethbridge

Handling is a functional skill that can be performed through alternative movement combinations depending on an individual's physical and cognitive states. State modifications may have opportunity to change behaviors, including potentially injurious occupational work practices. In this experiment, we studied the differences in handling and posture amongst individuals given various cognitive states, and eye tracking was used to confirm a relationship between visual attraction and ergonomic behaviors. Participants ( $N = 31$ ; 16F) were equipped with a pair of Mobile Eye – XG eye tracking glasses (ASL, Bedford, MA USA). Subjects stood in front of a horizontally positioned suitcase that was vertically adjusted to 53% of their height, and featured three handles: one at the front, and one on each lateral end. Participants were randomly presented with one of three scripts (positive, negative, neutral) which would hypothetically induce different suitcase handling behaviors. Participants' handling techniques and motivation factors (MF) were recorded alongside the eye tracking data. The motivation scale (–5 to +5) results indicated a high MF for the positive group (4.1) while negative and neutral groups had MFs of (–0.4) and (2.4) respectively. In terms of handling techniques, the positive group favored single hand handling (90% of trials) while the negative and the neutral groups preferred handling with two hands (73% and 63% of trials respectively). An attraction index (AI) that identifies the strength of eye fixations [ $\# \times$  duration (seconds)  $\times$  target proximity (pixels)] for each handle was developed. The front handle had the highest AI (4.0) for the positive group, whereas the left handle (1.9) and the right handle (1.4) had the highest AIs for negative and the neutral groups respectively. When carrying out an occupational task, the goal is to perform the task most efficiently, without compromising on the safety factor. Our results suggest that appropriate motivation conducive to a positive cognitive state may encourage safer ergonomics and decrease handling related injuries. *NSERC Discovery Grant*

## A Needs Assessment of the Fundamental Motor Skills of Urban and Rural Children in Indonesia

Syahrial Bakhtiar<sup>1</sup>, Ruri Famelia<sup>1,2</sup>, Jacqueline D. Goodway<sup>2</sup>, & Yanuar Kiram<sup>1</sup>

*1 Faculty of Sport Sciences, State University of Padang, West Sumatera, Indonesia*

*2 Kinesiology: Physical Education, Department of Human Sciences, The Ohio State University, Columbus OH, USA*

### Introduction

Indonesia is the 4th most populous country in the world with a population of 252.8 million, 30% of which is under 15 years of age (UNESCO, 2005). More recently people have moved to urban areas and 53% of the population now live in cities (Oberman et.al., 2012). However, most poor people still live in rural areas. Such urbanization presents many challenges for people as their diet, physical activity (PA) levels, and consequently body composition change. As a result, **Indonesia has just joined the ranks of the top 10 most obese countries in the world** (OECD, 2014). Although childhood obesity and inactivity are a newly identified problem in Indonesia, recent statistics on the prevalence of overweight and obesity have increased two-fold in Indonesia in a short period of time (Julia, Prawirohartono, Suriono, & Delemarre-van, 2008). Over 43 million people in Indonesia are identified as being overweight (Roemling & Qaim, 2012).

Table 1. Obesity Rate of Indonesian Children in 2007

Age	< 5 Years	6-14 years	15 years	>15 years
Rate	12%	10%	19%	14%
Adapted from "Obesity trends and determinants in Indonesia", by Roemling, C., & Qaim, M., 2012, <i>Appetite</i> , 58, 3, 1005-13				

**In many cases time spent in physical activity has been replaced by screen time, such as TV, computer and video games** (Collins, Pakiz, & Rock, 2008; Roemling & Qaim, 2012).

West Sumatera is one of 33 provinces in Indonesia and also experiencing significant urbanization. There is currently **no evidence whether children in rural areas face the same challenges as urban children**. In a report by the WHO (2012) focused on prioritizing population-based action for childhood obesity, the WHO suggested that member states need to "*identify potential solutions*" and "*develop strategies*" that have promise and the possibility of wide-scale impact. However, **Indonesia does not currently have national PA guidelines, and the severity of their obesity and inactivity problem is just being noticed**.

A conceptual model proposed by Stodden, et. al., (2008) suggests that motor competence (MC) is an essential element underlying the physical activity behavior of children. Considering this model, it is important to understand the degree of MC of Indonesian children before developing a national guideline of PA for children and developing national physical education (PE) curriculum for elementary school. Therefore, **this study was the first step in providing baseline information for**

**West Sumateran children** in order to make regional policies for PA and the development of PA and motor skill programs for children that will enhance their health.

## Objectives

1. To examine the motor competence (MC) of Indonesian boys ( $n=335$ ) and girls ( $n=385$ ) from West Sumatera aged 6.08 to 10.92 years, along with potential gender differences.
2. To investigate differences in MC by geographic location (rural,  $n=349$ ; and urban,  $n=371$ ).

## Participants and Settings

Participants consisted of elementary students from West Sumatera aged 6 to 11 years who lived in and urban areas.

**Table 2. Participants Description**

	Urban	Rural	Total
Boys	153	182	335
Girls	218	167	385
Total	371	349	720

## Data Analysis

A 2 Gender (boys, girls) X 2 Geographic Location (rural, urban) MANOVA on object control (OC) and locomotor (Loc) standard scores (SS) with  $\alpha = .05$  was conducted.

## Instruments

Motor Competence was measured by using the Test of Gross Motor Development-2 (TGMD-2) (Ulrich, 2000) with two subscales consisting of six locomotor (Loc) skills (run, gallop, hop, leap, jump, and slide) and six object control (OC) skills (throw, catch, kick, bounce, strike and roll). Each child performed 2 trials of the 12 skills and was coded live on the behavioral/performance criteria for each skill. A standard score was calculated from the raw score for each subscale (range 0-48). Two coders were trained before collecting the data by coding children performing the TGMD-2 until they had 90% inter-rater reliability agreement.

## Results

Table 3 shows the means and standard deviations for Loc and OC standard scores. Using USA norms, Table 3 shows that all participants were *delayed* in both Loc and OC skills.

**Table 3. Descriptive Statistics of Variables**

	Location	Gender	Mean	Percentile	SD
Loc-SS	Rural	Girl	9.19	<1	3.54
		Boy	8.51	<1	3.56
		Total	8.83	<1	3.56
	Urban	Girl	8.89	<1	3.44
		Boy	7.41	<1	3.67
		Total	8.28	<1	3.60
	Total	Girl	9.02	<1	3.48
		Boy	8.00	<1	3.64
		Total	8.55	<1	3.59
OC-SS	Rural	Girl	9.27	<1	3.75
		Boy	7.76	<1	3.88
		Total	8.48	<1	3.89
	Urban	Girl	9.06	<1	3.27
		Boy	7.52	<1	3.60
		Total	8.42	<1	3.49
	Total	Girl	9.15	<1	3.48
		Boy	7.64	<1	3.75
		Total	8.45	<1	3.68

Table 4 shows that there were significant main effects for Geographic Location ( $F(2,715)=3.74, p<.05; \eta^2=.01$ ), and Gender ( $F(2,715)=16.43, p<.001; \eta^2=.04$ ) with no significant interaction.

**Table 4. Multivariate Tests**

Effect	Wilks' Lambda	F	Hypothesis df	Error df	Sig.	$\eta^2$
Location	.99	3.74	2	715	.024	.01
Gender	.96	16.43	2	715	<.001	.04
Location*Gender	.99	1.608	2	715	.201	.00

Univariate tests in Table 5 show that for Loc there was a significant main effect for Gender ( $p<.001$ ) and Geographic Location ( $p<.05$ ). That is, the Loc skills of girls were significantly higher than boys. Additionally, the Loc skills of children in rural areas were significantly higher than children in urban areas. For OC there was only a significant effect for Gender ( $p<.001$ ), in which the OC skills of girls were significantly better than boys.

**Table 5. Tests of Between-Subjects Effects**

Source	Dependent Variable	F	Sig.	Observed Power
Location	Loc-SS*	6.90	.01	.75
	OC-SS	.69	.41	.13
Gender	Loc-SS*	16.70	<.001	.98
	OC-SS*	31.62	<.001	1.00
Location * Gender	Loc-SS	2.28	.13	.32
	OC-SS	.00	.97	.06

## Implications

Findings depict that immediate action is needed in Indonesia to improve children's motor competence. Indonesia needs to develop national guidelines for PA for children and review PE curriculum in primary schools and preschools to help children develop MC and be physically active. Specific strategies need to be identified for urban centers and city planners need to begin to consider parks where children can be active in their neighborhoods. The government also needs to consider its budget for sport development as almost all money goes to the identification and training of elite athletes. Free government community programs need to be developed in order to promote population-based PA, specifically for children.

## Future Research

Much research is needed in Indonesia as there is little to no data to underpin the development of national policy guidelines and PE curricula. A large-scale study across islands, the ethnic groups that make up the Indonesian population, and urban and rural environments is needed. This proposed study should not only collect measures of MC but also the other variables in the Stodden et al. model such as PA levels, physical fitness and perceived motor competence.

## Limitations

A major limitation of this work was the fact that children were live-coded completing the TGMD-2. Due to fiscal constraints it was not possible to videotape the children. Future research needs to videotape performance of the TGMD-2 and conduct inter and intra-rater reliability.

## Discussions

### *Gender Differences in Motor Competence*

This study found that **girls significantly outperformed boys for both Loc and OC skills. This finding is in contrast to the findings in the USA**, in which boys had significantly better OC skills than girls, and there were no significant differences in Loc skills between boys and girls (Goodway, Robinson & Crowe, 2010; Seefeldt & Haubenstricker, 1982). There is currently no Indonesian data to situate the present findings within a broader literature as this is the first study of its kind in Indonesia. Local researchers in Indonesia suggest that boys spend a lot more time in screen time than girls. Culturally, screen time such as video games seems to be more desirable and acceptable for boys rather than girls, while girls tend to play more physically with their peers, such as jump rope, and hide and seek. Future research is needed to gain a better explanation of these findings.

### **Urban Versus Rural Differences in Motor Competence**

Interestingly, the findings from this study reveal that **Loc skills of children in rural areas were significantly better than children in urban areas**. It may be that the rural environment provided greater opportunities for children to be physically active than the urban environment. Additionally, many children in rural areas are engaged in active transport (walking) to school, getting water from the community well, and provisions from the local market as well as helping their parents in fields (e.g. rice paddies). The lack of significance in OC skills may be attributed to the fact that children in these rural areas were typically very poor, and researchers commented that they did not have access to bats and balls with which to play.

### **Children's Motor Competence in West Sumatera**

Table 3 shows that boys and girls in rural and urban area were very delayed in their Loc and OC skills using a USA normative sample. Although it is questionable about the relevance of the USA norms to this population, the raw scores do show that Indonesian children demonstrated few of the criterion for proficient fundamental motor skill performance. Given the conceptual model by Stodden et.al. (2008) and the current body of evidence on the importance of MC in later PA (Barnett, et.al., 2008), we are concerned about the PA levels of these children and their future weight status.

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## NASPSPA 2015 Conference Abstracts

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