

# **Examining Motor Skill Intervention Effects on Motor Competence and Perceived Motor Competence between the USA and Indonesia**

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## **INTRODUCTION**

Fundamental motor skills (FMS) can be defined as sets of skills that involve basic body functions and movements (Stodden et al., 2008). FMS is made up of two sets of skills, object control and locomotor skills (Gallahue, Ozmun, & Goodway, 2012). Object control skills are the control and mastery of a specific object along with a basic movement; skills such as catching, throwing, kicking, and more can be considered object control skills (Gallahue, Ozmun, & Goodway, 2012). Locomotor skills are movements based on coordination, skills such as running, hopping, jumping, and more can be considered locomotor skills (Gallahue, Ozmun, & Goodway, 2012). These skills are the foundation of the further development of motor skill function and physical activity (Goodway, Ozmun, Dieringer, Lee, 2013). Because of this, FMS needs to be carefully development so future activity is not negatively affected. Low FMS skills in childhood can lead to a decrease in physical activity during adolescence and adulthood (Stodden & Goodway, 2007). The motor development of disadvantaged children continues to be a major problem in the physical education field (Altunsöz & Goodway, 2015).

Many studies show that disadvantaged children do not develop proper motor skills in their early years (Altunsöz & Goodway, 2015). There are many factors, such as motor competence, perceived motor skill competence, physical competence and more that causes this lack of development (Goodway & Robinson, 2009). Motor competence is the overall mastery and level an individual is in their physical activity Perceived motor competence is how an individual perceives and sees themselves in their motor skill performance (Goodway & Robinson, 2009). For example, an individual can have a low amount of motor competence, and because of this, they perceive themselves as having below average skills (Goodway & Robinson, 2009). The study shows that children who have low PMC and MC do not usually engage in physical activity (Goodway & Robinson, 2009). Gender is also one of the factors that affect motor skill development in disadvantaged children (Goodway, Robinson, & Crowe, 2010).

Studies suggest that there are no specific gender differences between children on locomotor skills (Goodway, Robinson, & Crowe, 2010). However, boys usually have significant higher object control skills than girls (Goodway, Robinson, & Crowe, 2010). All of these factors need to be considered when attempting to develop an individual's motor skills.

Many people have assumed that motor skill development is natural, when in fact, it is not (Stodden et al., 2008). It is something that needs to be carefully taught in order for proficient physical activity (Stodden et al., 2008). The Successful Kinesthetic Instruction Program is an intervention with the goal of improving the development of object control and locomotor skills in disadvantaged preschoolers (Brian, Goodway, Logan, & Sutherland, 2017). This program is specific to preschoolers and children in the United States region (Brian, Goodway, Logan, & Sutherland, 2017). Other countries, specifically Indonesia also have adopted the SKIP program into INDO-SKIP. Both programs have the same objective and principles, but different approaches. SKIP in the USA was delivered by motor development experts for shorter duration and INDO-SKIP was delivered by preschool teachers for longer duration. These different approaches could influence the results of the intervention on children outcome. Therefore, **the purpose** of this study was to determine whether or not these approaches have differences on preschoolers in the US and Indonesia on the terms of motor competence and perceived motor competence.

## **METHODS**

### **Participants & Setting**

#### **The USA:**

- Participants were 47 preschoolers aged 49 to 72 months (23 boys and 24 girls)
- Participants were from the Midwestern region of the United States
- Participants were from two classrooms from one early childhood center.
- Two graduate students were selected to teach and apply the SKIP program.

#### **Indonesia:**

- Participants were 87 children aged 4 to 6 years old (35 boys and 52 girls)
- None of the participants had documented disabilities.

- Participants were from six classrooms from two early childhood centers from urban Padang, West Sumatera, Indonesia.
- Six teachers aged 24 to 36 (all six female) with similar levels of years of teaching and degrees were selected to teach and apply the INDO-SKIP program.

## **Intervention**

The USA:

- Successful Kinesthetic Instruction for Preschoolers (SKIP) is an 8 week intervention used for US preschoolers that plans to improve the overall the basic motor skills (like catching, throwing, and kicking) in children.

Indonesia:

- Indonesia Successful Kinesthetic Instruction for Preschoolers (INDO-SKIP) intervention is a modified version of the SKIP program used for Indonesian preschoolers. It is delivered throughout an 8-week period, two 30-minute sessions each week; overall 16 sessions of INDO-SKIP throughout the intervention. It was delivered by trained preschool teachers.

## **Variables and Instrument**

1. Motor competence: Object control skill competence.

- It was measured by Test of Gross Motor Development-2 (TGMD-2): object control subscale. It measures 6 object control skills (catch, kick, throw, dribble, roll, striking), with possible total raw score ranged from 0 to 48 (Ulrich, 2000)

2. Perceived motor competence

- It was measured by two different instruments: Perceived Physical Competence subscale (PPC) of the Pictorial Scale for Perceived Competence and Social Acceptance for Young Children (Harter & Pike, 1984) and Pictorial Scale of Perceived Movement Skill Competence (PMSC) instrument (Barnett, Ridgers, Zask, & Salmon, 2015).
- PPC measures children perception on their general motor competence, such as in swinging, skipping, tying shoes, running, hopping, and climbing a monkey bar.

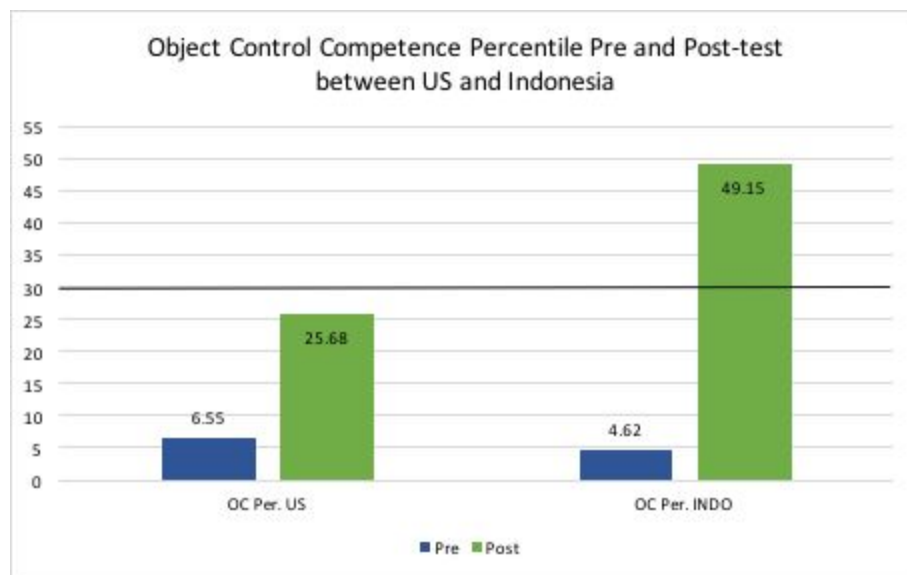
- PMSC measures children perception on their object control skills and locomotor skills.

### Data Analysis

- Descriptive analysis to describe the distribution of object control skill competence, PPC and PMSC.
- One-way repeated measures of Analysis of Variance (ANOVA) by country to examine the difference of object control skill competence improvement between USA and Indonesia
- One-way repeated measures of Multivariate Analysis of Variance (MANOVA) by country to examine the difference of PPC and PMSC improvement between USA and Indonesia.

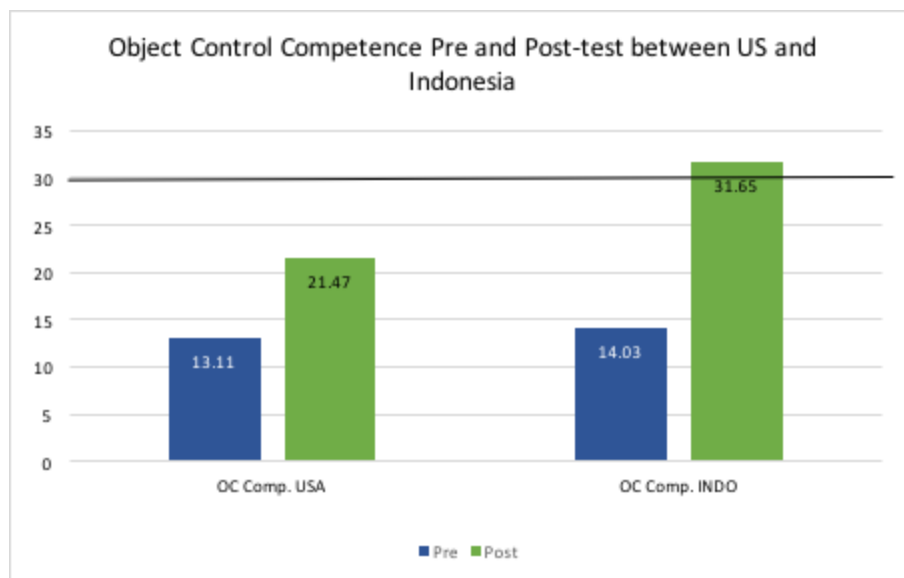
## RESULTS

### 1. Comparison of object control competence percentile between USA and Indonesia



In pretest, children in the US percentile score of object control skills in pretest was 6.55 and increased to 25.68 in posttest. This shows that participants mostly began below average and increased to average or above average. The average Indonesia percentile score of object control skills in the pretest was 4.62 and increased to 49.15 in posttest. This shows that participants mostly began below average and increased to average or above average.

## 2. Comparison of object control competence between USA and Indonesia

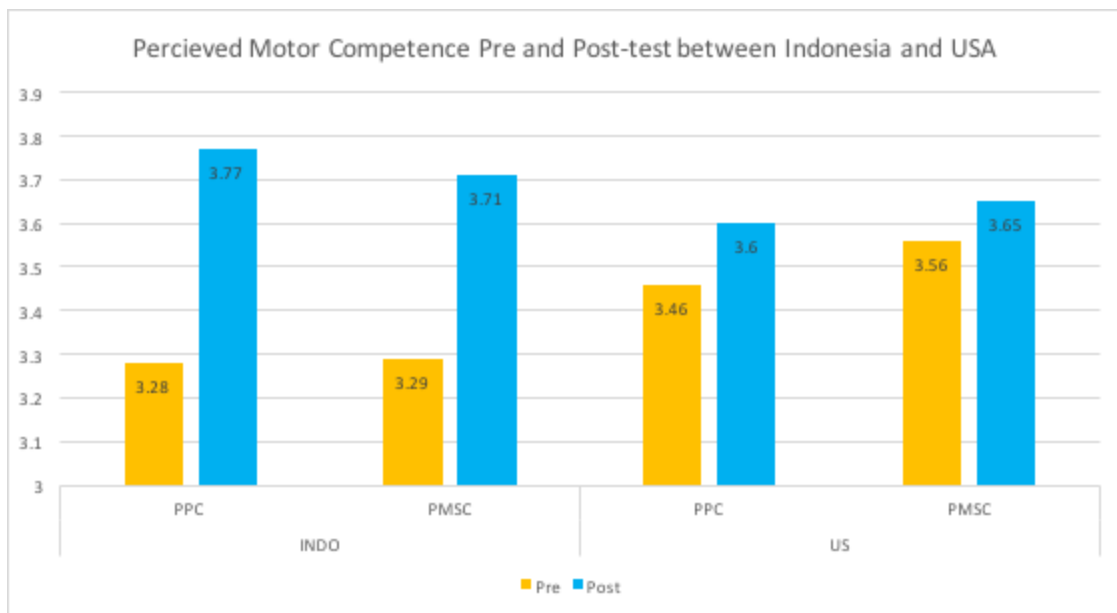


Comparing both countries, There was a significant time effect in object control skills: ( $F_{(1,113)} = 412.61, p = <.001, \eta^2 = .79$ ), which indicated that children in both countries significantly improved their object control skills from pre-to posttest.

There was a significant country effect in object control ( $F_{(1,113)} = 30.00, p = <.001, \eta^2 = .21$ ), which indicated object control skills was significantly different between American children and Indonesian children.

There was a significant interaction time x country, which indicated that Indonesian children improvement on object control skills significantly higher than American children ( $F_{(1,113)} = 52.38$ ,  $p = <.001$ ,  $\eta^2 = .32$ ).

### 3. Comparison of perceived motor competence between USA and Indonesia



One-way repeated measures MANOVA showed that there was no country effect on children perceived motor competence ( $p = .152$ ). However, there was significant time effect ( $F_{(2,114)} = 31.59, p < .001, \eta^2 = .36$ ) and there was significant interaction effect of Time x Country ( $F_{(2,114)} = 11.07, p < .001, \eta^2 = .16$ ).

Follow up analysis showed that:

For PPC:

- There was a significant time effect on PPC from pretest to posttest ( $F_{(1,115)} = 52.72, p < .001, \eta^2 = .31$ ).
- There was no significant country effect on PPC ( $p = .88$ ).
- There was a significant interaction effect of time x country ( $F_{(1,115)} = 16.01, p < .001, \eta^2 = .12$ ).
- This indicated that the improvement of PPC from pretest to posttest for Indonesian children ( $M = 3.28$  to  $M = 3.77$ ) was higher than American children ( $M = 3.56$  to  $M = 3.60$ ).

For PMSC:

- There was a significant time effect on PMSC from pretest to posttest ( $F_{(1,115)} = 33.96, p < .001, \eta^2 = .23$ ).
- There was no significant country effect on PMSC ( $p = .10$ ).
- There was a significant interaction effect of time x country ( $F_{(1,115)} = 14.80, p < .001, \eta^2 = .11$ ).
- This indicated that the improvement of PMSC from pretest to posttest for Indonesian children ( $M = 3.29$  to  $M = 3.71$ ) was higher than American children ( $M = 3.56$  to  $M = 3.65$ ).

## DISCUSSION

The motor skill interventions (SKIP/INDO-SKIP) of both Indonesia and US significantly improved children object control skills. This finding is similar with previous studies (Goodway & Branta, 2003; Goodway et al., 2003; Goodway, Robinson, & Crowe, 2010). INDO-SKIP intervention in Indonesia was able to shift children from delayed (under 30<sup>th</sup> percentile) in motor

skill competence to typical developing (above 30<sup>th</sup> percentile). However, SKIP in the US was not able to shift children from delayed to typical development status on object control skills.

Children in both country perceived themselves pretty good on their motor competence. Young children usually tend to overestimate their motor competence (Stodden et al., 2008). The SKIP/INDO-SKIP also significantly improved children perceived motor competence. Previous study (Robinson, 2011) also supported finding in this study. However, children in Indonesia also showed higher improvement on their PPC and PMSC than children in the USA.

INDO-SKIP in Indonesia was delivered by trained teachers for 16 sessions over 8 week of the intervention. It showed that teachers were able to deliver the program to increase children object control skills, PPC and PMSC significantly.

SKIP in the USA was delivered by trained graduate students for 9 session over 4 week of the intervention. It showed children significantly improved their object control skill, PPC and PMSC, but lower than Indonesian children.

Dose difference may contribute to the difference of intervention results in the US and Indonesia.

## **CONCLUSION**

- Object control skills and perceived motor competence are positively impacted by an intervention, whether it is INDO-SKIP or SKIP.
- Trained preschool teachers were able to deliver motor skill program.



- Different dose would yield different outcome on children object control skill and perceived motor competence.

## **IMPLICATION**

- Based on the successes of the INDO-SKIP program, the SKIP program should implement a more time dosage to give preschoolers more time to develop these skills. This study shows that interventions or programs, like INDO-SKIP and SKIP, should be implemented in preschools because they provide sufficient and significant results in improving and developing perceived motor competence and fundamental motor skills .

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