

HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK  
HALUS PADA ANAK USIA 4 TAHUN

SKRIPSI

Diajukan untuk Memenuhi Sebagian Syarat Mendapatkan Gelar Sarjana Olahraga  
Program Studi Ilmu Keolahragaan



oleh  
Ainia Nurul Asna  
1607028

PROGRAM STUDI  
ILMU KEOLAHRAGAAN  
FAKULTAS PENDIDIKAN OLAHRAGA DAN KESEHATAN  
UNIVERSITAS PENDIDIKAN INDONESIA  
2020

HALAMAN PENGESAHAN

**AINIA NURUL ASNA**

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN  
MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

disetujui dan disahkan oleh pembimbing:

**Pembimbing I**



**Mustika Fitri, M.Pd., Ph.D**

**NIP. 19681220 199802 2 001**



**Jajat, S.Si., M.Pd**

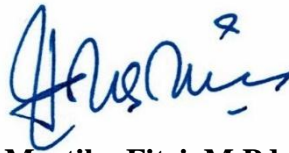
**Pembimbing II**

**Jajat, S.Si., M.Pd**

**NIPT. 9202001 19810529 101**

**Mengetahui**

**Ketua Departemen Pendidikan Kesehatan dan Rekreasi**



**Mustika Fitri, M.Pd., Ph.D**

**NIP. 19681220 199802 2 001**

## HALAMAN PERNYATAAN KEASLIAN SKRIPSI

Dengan ini saya menyatakan bahwa skripsi yang berjudul “Hubungan Fungsi Kognitif Dengan Keterampilan Motorik Halus” ini beserta keseluruhan isi skripsi ini adalah benar-benar karya saya sendiri. Saya tidak menjiplak atau mengutip dengan cara tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko/sanksi apabila dikemudian adanya pelanggaran etika keilmuan atau ada pengklaiman dari pihak lain terhadap keaslian karya saya ini.

Bandung, Agustus 2020

AINIA NURUL ASNA

**ABSTRAK**  
**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN**  
**MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

**Ainia Nurul Asna**

**NIM: 1607028**

**Dosen Pembimbing I** : **Mustika Fitri, M.Pd., Ph.D.,**

**Dosen Pembimbing II** : **Jajat, S.si., M.Pd.,**

Keterampilan motorik halus adalah salah satu komponen penting bagi anak dalam membantu mereka meningkatkan kemampuan di bidang akademik. Gangguan perkembangan motorik halus biasanya menyebabkan anak-anak mengalami kesulitan belajar. Salah satu aspek yang mempengaruhi proses perkembangan keterampilan motorik halus yaitu fungsi kognitif. Keterampilan motorik halus yang rendah pada anak usia dini disebabkan oleh kemampuan kognitif yang kurang berkembang. Tujuan penelitian ini adalah untuk menguji hubungan fungsi kognitif dengan keterampilan motorik halus pada anak usia 4 tahun. Sampel dalam penelitian ini berjumlah 49 anak yang aktif mengikuti pembelajaran di PAUD, TK dan KOBER yang ada di Kota Bandung dengan teknik pengambilan sampel menggunakan *purposive sampling*. Instrumen yang digunakan yaitu iPad dengan dua *games Go/No-Go* dan *Mr.Ant* untuk mengukur tingkat Fungsi Kognitif dan *9-hole page test* untuk mengukur tingkat keterampilan motorik halus anak. Penelitian ini dianalisis menggunakan analisis statistik non parametrik dengan uji korelasi *Kendall's tau* dengan tingkat sig. 0.05. Hasil analisis data menunjukkan bahwa X dengan Y menghasilkan sig. 0.552 > 0.05 maka H<sub>0</sub> di terima. Artinya tidak terdapat hubungan yang signifikan antara fungsi kognitif dengan keterampilan motorik halus pada anak usia 4 tahun.

Kata kunci: Fungsi Kognitif, Keterampilan Motorik Halus dan Anak Usia 4 Tahun.

Ainia Nurul Asna, 2021

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu



**ABSTRACT**  
**RELATIONSHIP BETWEEN COGNITIVE FUNCTION AND FINE**  
**MOTOR SKILLS IN 4-YEAR-OLD CHILDREN**

**Ainia Nurul Asna**

**NIM : 1607028**

**Supervisor I : Mustika Fitri, M.Pd., Ph.D.,**

**Supervisor II : Jajat, S.si., M.Pd.,**

Fine motor skills are one of the important components for children in helping them improve their abilities in academics. Impaired fine motor development usually causes children to have learning difficulties. One aspect that affects the development process of fine moral skills is cognitive function. Low fine motor skills in early childhood are caused by underdeveloped cognitive abilities. The purpose of this study was to examine the relationship between cognitive function and fine motor skills in 4-year-old children. The sample in this study amounted to 49 children who actively participate in learning in PAUD, TK and KOBER in the city of Bandung with the sampling technique using purposive sampling. The instrument used is the iPad with two Go / No-Go games and Mr. Ant to measure Cognitive Function level and 9-hole page test to measure the level of fine motor skills of children. This study was analyzed using non-parametric statistical analysis with Kendall's tau correlation test with sig level. 0.05. The results of data analysis show that X and Y produce sig. 0.552 > 0.05 then H<sub>0</sub> is accepted. This means that there is no significant relationship between cognitive function and fine motor skills in 4-Year-Old Children.

**Keywords:** Cognitive Function, Fine Motor Skills and 4-Year-Old Children.

**Ainia Nurul Asna, 2021**

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

## DAFTAR ISI

|   |                              |
|---|------------------------------|
| HALAMAN PENGESAHAN .....  | ii                           |
| HALAMAN PERNYATAAN KEASLIAN SKRIPSI.....                        | iii                          |
| KATA PENGANTAR.....   | Error! Bookmark not defined. |
| UCAPAN TERIMA KASIH .....                                       | Error! Bookmark not defined. |
| ABSTRAK .....   | 4                            |
| ABSTRACT .....  | 6                            |
| PENDAHULUAN .....   | Error! Bookmark not defined. |
| 1.1 Latar Belakang Penelitian .....                             | Error! Bookmark not defined. |
| 1.2 Rumusan Masalah Penelitian .....                            | Error! Bookmark not defined. |
| 1.3 Tujuan Penelitian .....                                     | Error! Bookmark not defined. |
| 1.4 Manfaat Penelitian.....                                     | Error! Bookmark not defined. |
| 1.5 Struktur Organisasi .....                                   | Error! Bookmark not defined. |
| BAB II.....   | Error! Bookmark not defined. |
| KAJIAN TEORI.....   | Error! Bookmark not defined. |
| 2.1 Faktor-faktor yang Mempengaruhi Perkembangan Kognitif ..... | Error! Bookmark not defined. |
| 2.1.1 Faktor Hereditas .....                                    | Error! Bookmark not defined. |
| 2.1.2 Faktor Lingkungan.....                                    | Error! Bookmark not defined. |
| 2.2 Tiga Tingkat Pemahaman Kognitif.....                        | Error! Bookmark not defined. |
| 2.3 Keterampilan Motorik Halus .....                            | Error! Bookmark not defined. |
| 2.4 Keterampilan Motorik Halus Menurut Kelompok Umur.....       | Error! Bookmark not defined. |
| 2.5 Pentingnya Keterampilan Motorik Halus.....                  | Error! Bookmark not defined. |
| 2.6 Meningkatkan Keterampilan Motorik Halus.....                | Error! Bookmark not defined. |
| 2.7 Penelitian Terdahulu Yang Relevan.....                      | Error! Bookmark not defined. |
| 2.8 Hipotesis Penelitian .....                                  | Error! Bookmark not defined. |
| BAB III .....   | Error! Bookmark not defined. |
| METODE PENELITIAN.....  | Error! Bookmark not defined. |

Ainia Nurul Asna, 2021

*HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN*

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

|                                       |                               |                              |
|---------------------------------------|-------------------------------|------------------------------|
| 3.1                                   | Desain Penelitian.....        | Error! Bookmark not defined. |
| 3.2                                   | Partisipan.....               | Error! Bookmark not defined. |
| 3.3                                   | Populasi Dan Sampel.....      | Error! Bookmark not defined. |
| 3.3.1                                 | Populasi .....                | Error! Bookmark not defined. |
| 3.3.2                                 | Sampel.....                   | Error! Bookmark not defined. |
| 3.4                                   | Instrumen Penelitian.....     | Error! Bookmark not defined. |
| 3.5                                   | Prosedur Penelitian.....      | Error! Bookmark not defined. |
| 3.6                                   | Analisis Data .....           | Error! Bookmark not defined. |
| 3.6.1                                 | Deskriptif Data .....         | Error! Bookmark not defined. |
| 3.6.2                                 | Uji Normalitas Data .....     | Error! Bookmark not defined. |
| 3.6.3                                 | Uji Koefisien Korelasi .....  | Error! Bookmark not defined. |
| BAB IV                                | .....                         | Error! Bookmark not defined. |
| TEMUAN DAN HASIL                      | .....                         | Error! Bookmark not defined. |
| 4.1                                   | Temuan Hasil Penelitian ..... | Error! Bookmark not defined. |
| 4.1.1                                 | Deskripsi Data .....          | Error! Bookmark not defined. |
| 4.1.2                                 | Uji Normalitas Data .....     | Error! Bookmark not defined. |
| 4.1.3                                 | Uji Korelasi .....            | Error! Bookmark not defined. |
| 4.2                                   | Keputusan.....                | Error! Bookmark not defined. |
| 4.3                                   | Pembahasan .....              | Error! Bookmark not defined. |
| BAB V                                 | .....                         | Error! Bookmark not defined. |
| KESIMPULAN, IMPLIKASI DAN REKOMENDASI | .....                         | Error! Bookmark not defined. |
| 5.1                                   | Kesimpulan .....              | Error! Bookmark not defined. |
| 5.2                                   | Implikasi .....               | Error! Bookmark not defined. |
| 5.3                                   | Rekomendasi.....              | Error! Bookmark not defined. |
| DAFTAR PUSTAKA                        | .....                         | i                            |
| LAMPIRAN-LAMPIRAN                     | .....                         | Error! Bookmark not defined. |



Ainia Nurul Asna, 2021

*HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN*

Universitas Pendidikan Indonesia | [repository.upi.edu](https://repository.upi.edu) | [perpustakaan.upi.edu](https://perpustakaan.upi.edu)

## DAFTAR TABEL

Tabel 3.1 Data sekolah dikota Bandung sebagai populasi ..... **Error! Bookmark not defined.**

Tabel 3.2 Sekolah-Sekolah sebagai sampel ..... **Error! Bookmark not defined.**

Tabel 4.1 Deskripsi Data ..... **Error! Bookmark not defined.**

Tabel 4.2 Uji Normalitas ..... **Error! Bookmark not defined.**

Tabel 4.3 Interpretasi Koefisien Korelasi..... **Error! Bookmark not defined.**

Tabel 4.4 Uji Korelasi..... **Error! Bookmark not defined.**

## DAFTAR GAMBAR

|  |                                     |
|--|-------------------------------------|
| Gambar 3.1 Desain Penelitian.....        | <b>Error! Bookmark not defined.</b> |
| Gambar 3.2 <i>Game Go/No-GO</i> .....    | <b>Error! Bookmark not defined.</b> |
| Gambar 3.3 <i>Game Mr. Ant</i> .....     | <b>Error! Bookmark not defined.</b> |
| Gambar 3.4 <i>9-hole Page Test</i> ..... | <b>Error! Bookmark not defined.</b> |
| Gambar 3.5 Prosedur Penelitian .....     | <b>Error! Bookmark not defined.</b> |

## DAFTAR LAMPIRAN

- Lampiran 1. Persetujuan Mengikuti Prasadang .....**Error! Bookmark not defined.**
- Lampiran 2. Formulir Persetujuan .....**Error! Bookmark not defined.**
- Lampiran 3. Surat Keputusan.....**Error! Bookmark not defined.**
- Lampiran 4. Kartu Bimbingan.....**Error! Bookmark not defined.**
- Lampiran 5. Hasil data Fungsi Kognitif dan Keterampilan Motorik Halus..... **Error!  
Bookmark not defined.**
- Lampiran 6. Hasil Analisis Data SPSS.....**Error! Bookmark not defined.**
- Lampiran 7. Dokumentasi Kegiatan .....**Error! Bookmark not defined.**

## DAFTAR PUSTAKA

- AA Hidayat. (2010). Pengantar Ilmu Kesehatan Anak untuk Pendidikan Dini.
- Barnett, L. M., Van Beurden, E., Morgan, P. J., Brooks, L. O., & Beard, J. R. (2009). Childhood motor skill proficiency as a predictor of adolescent physical activity. *Journal of Adolescent Health, 44*(3), 252–259.
- Bennett, W. J. (1987). The role of the family in the nurture and protection of the young. *American Psychologist, 42*(3), 246.
- Branta, C., Haubenstricker, J., & Seefeldt, V. (1984). Age changes in motor skills during childhood and adolescence. *Exercise and Sport Sciences Reviews, 12*, 467–520.
- Bruni, M. (2006). Fine Motor Skills for Children with Down Syndrome: A Guide for Parents and Professionals. In *Developing Fine Motor Skills* (pp. 100–103).
- Bushnell, E. W. (2016). Development and the Mind : The Potential Role of Motor Abilities as a of Aspects of Perceptual, *64*(4), 1005–1021.
- Cameron, C. E., Brock, L. L., Murrah, W. M., Bell, L. H., Worzalla, S. L., Grissmer, D., & Morrison, F. J. (2012). Fine Motor Skills and Executive Function Both Contribute to Kindergarten Achievement. *Child Development, 83*(4), 1229–1244. <https://doi.org/10.1111/j.1467-8624.2012.01768.x>
- Cantu, C. O. (2004). Toy alternatives: Crafts and fine motor development. *Exceptional Parent, 34*, 28–29.
- Carpendale, J. I., & Chandler, M. J. (1996). On the Distinction between False Belief Understanding and Subscribing to an Interpretive Theory of Mind. *Child Development, 67*(4), 1686–1706. <https://doi.org/10.1111/j.1467-8624.1996.tb01821.x>
- Cartwright, D. E. (2016). *Historical dictionary of Schopenhauer's philosophy*. Rowman & Littlefield.
- Carvell, N. . (2006). Language Enrichment Activities Program (LEAP), vol.1. In *Developing Fine Motor Skills* (pp. 100–103).
- Clements, S. D. (1966). Minimal brain dysfunction in children: Terminology and
- Ainia Nurul Asna, 2021  
**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**  
 Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

identification (NINDB Monograph No.3). In *Fine Motor Activities in Elementary School: Preliminary Findings and Provisional Implications for Children With Fine Motor Problems*.

Covey, S. R., Merrill, A. R., & Merrill, R. R. (1995). *First things first*. Simon and Schuster.

D'Anci, K. E., Constant, F., & Rosenberg, I. H. (2006). Hydration and cognitive function in children. *Nutrition Reviews*, *64*(10), 457–464.

<https://doi.org/10.1301/nr.2006.oct.457-464>

Darajat, J., & Abduljabar, B. (2014). *Aplikasi Statistika Dalam Penjas*. Bandung: CV. Bintang Warliartika.

Davis, E. E., Pitchford, N. J., & Limback, E. (2011). The interrelation between cognitive and motor development in typically developing children aged 4–11 years is underpinned by visual processing and fine manual control. *British Journal of Psychology*, *102*(3), 569–584.

Diamond, A. (2016). Close Interrelation of Motor Development and Cognitive Development and of the Cerebellum and Prefrontal Cortex Author ( s ): Adele Diamond Published by : Wiley on behalf of the Society for Research in Child Development Stable URL : [http://www.jstor.org/st.71\(1\),44-56](http://www.jstor.org/st.71(1),44-56).

Dinehart, L., & Manfra, L. (2013). Associations between low-income children's fine motor skills in preschool and academic performance in second grade. *Early Education & Development*, *24*(2), 138–161.

Egeten, E. C., Ismanto, A. Y., & Silolonga, W. (2017). Hubungan Pendidikan Anak Usia Dini (Paud) Dengan Perkembangan Kognitif Anak Usia Prasekolah Di Desa Pakuweru Kecamatan Tenga Kabupaten Minahasa Selatan. *Jurnal Keperawatan*, *5*(2).

Elida, P., & Remaja, P. P. (1991). *Perkembangan Peserta Didik*. Dirjen Dikti: Jakarta.

Erlenmeyer-Kimling, L., & Jarvik, L. F. (1963). Genetics and intelligence: A Review. *Science*, *142*(3598), 1477–1479.

<https://doi.org/10.1126/science.142.3598.1477>

Fabricius, W. V., Schwanenflugel, P. J., Kyllonen, P. C., Craig, R., Denton, S. M.,

Ainia Nurul Asna, 2021

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | [repository.upi.edu](https://repository.upi.edu) | [perpustakaan.upi.edu](https://perpustakaan.upi.edu)

- Fabricius, W. V., ... Denton, S. M. (2010). Developing Theories of the Mind : Children ' s and Adults ' Concepts of Mental Activities Published by : Blackwell Publishing on behalf of the Society for Research in Child Development Stable URL : <http://www.jstor.org/stable/1130920> Developing Theories o, 60(6), 1278–1290.
- Fathoni. (2008). Pengantar Ilmu Kesehatan Anak untuk Pendidikan Dini.
- Feys, P., Lamers, I., Francis, G., Benedict, R., Phillips, G., Larocca, N., ... Rudick, R. (2017). The Nine-Hole Peg Test as a manual dexterity performance measure for multiple sclerosis. *Multiple Sclerosis*, 23(5), 711–720. <https://doi.org/10.1177/1352458517690824>
- Flavell, J. H., & Miller, P. H. (1998). Social cognition.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education*. New York: McGraw-Hill Humanities/Social Sciences/Languages.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How To Design And Evaluate Research In Education*. (M. Ryan, Ed.). United States: The McGraw-Hill Companies.
- Gaul, D., & Issartel, J. (2016). Fine motor skill proficiency in typically developing children: On or off the maturation track? *Human Movement Science*, 46, 78–85. <https://doi.org/10.1016/j.humov.2015.12.011>
- GOPNIK, A., & WELLMAN, H. M. (1992). Why the Child's Theory of Mind Really Is a Theory. *Mind & Language*, 7(1–2), 145–171. <https://doi.org/10.1111/j.1468-0017.1992.tb00202.x>
- Grissmer, D., Grimm, K. J., Aiyer, S. M., Murrah, W. M., & Steele, J. S. (2010). Fine motor skills and early comprehension of the world: two new school readiness indicators. *Developmental Psychology*, 46(5), 1008.
- Hardy, L., King, L., Espinel, P., Cosgrove, C., & Bauman, A. (2013). *NSW schools physical activity and nutrition survey (SPANS) 2010*.
- Hardy, L. L., Reinten-Reynolds, T., Espinel, P., Zask, A., & Okely, A. D. (2012). Prevalence and correlates of low fundamental movement skill competency in children. *Pediatrics*, 130(2), e390–e398.

Ainia Nurul Asna, 2021

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | [repository.upi.edu](http://repository.upi.edu) | [perpustakaan.upi.edu](http://perpustakaan.upi.edu)

- Henderson, A., & Pehoski, C. (2005). *Hand function in the child: Foundations for remediation*. Elsevier Health Sciences.
- Hetherington, E. M., & Santrock, J. W. (2007). *Developmental & educational psychology*. McGraw-Hill.
- Hidayat, A. A. A. (2005). Pengantar ilmu keperawatan anak 1.
- Howard, S. J., & Melhuish, E. (2017). An Early Years Toolbox for Assessing Early Executive Function, Language, Self-Regulation, and Social Development: Validity, Reliability, and Preliminary Norms. *Journal of Psychoeducational Assessment*, 35(3), 255–275.  
<https://doi.org/10.1177/0734282916633009>
- James, Karin H, & Engelhardt, L. (2012). The effects of handwriting experience on functional brain development in pre-literate children. *Trends in Neuroscience and Education*, 1(1), 32–42.
- James, Karin Harman. (2010). Sensori- motor experience leads to changes in visual processing in the developing brain. *Developmental Science*, 13(2), 279–288.
- Karim, A. E. A., & Mohammed, A. H. (2015). Effectiveness of sensory integration program in motor skills in children with autism. *Egyptian Journal of Medical Human Genetics*, 16(4), 375–380.
- Khadijah. (2016). *Pengembangan Kognitif Anak Usia Dini*.  
[https://doi.org/10.1016/S0262-8856\(98\)00132-2](https://doi.org/10.1016/S0262-8856(98)00132-2)
- Lin, C.-K., Meng, L.-F., Yu, Y.-W., Chen, C.-K., & Li, K.-H. (2014). Factor analysis of the contextual fine motor questionnaire in children. *Research in Developmental Disabilities*, 35(2), 512–519.
- Locke, J. (2018). John Locke and Emergence Empiricism. *Learning Theories for Early Years Practice*, 12.
- Lubans, D. R., Morgan, P. J., Cliff, D. P., Barnett, L. M., & Okely, A. D. (2010). Fundamental movement skills in children and adolescents. *Sports Medicine*, 40(12), 1019–1035.
- Miquelote, A. F., Santos, D. C. C., Caçola, P. M., Montebelo, M. I. de L., & Gabbard, C. (2012). Effect of the home environment on motor and cognitive

Ainia Nurul Asna, 2021

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu



- behavior of infants. *Infant Behavior and Development*, 35(3), 329–334.  
<https://doi.org/10.1016/j.infbeh.2012.02.002>
- Moshman, D. (1993). Cognitive Development beyond Childhood. *Craik & Salthouse Lachman & Burack Cognition*, 2(December), 947–978. Retrieved from  
<http://digitalcommons.unl.edu/edpsychpapers%0Ahttp://digitalcommons.unl.edu/edpsychpapers/48>
- Munandar, U. (2008). Pengembangan Kreativitas Anak berbakat.
- Munsinger, H. (1978). Reply to Kamin. *Psychological Bulletin*, 85(1), 202–206.  
<https://doi.org/10.1037/0033-2909.85.1.202>
- Okely, A. D., Booth, M. L., & Patterson, J. W. (2001). Relationship of physical activity to fundamental movement skills among adolescents. *Medicine and Science in Sports and Exercise*, 33(11), 1899–1904.
- Ozmun, J. C. (1998). *Understanding motor development: Infants, children, adolescents, adults*. McGraw-hill.
- Pica, R. (2003). *Your active child: How to boost physical, emotional, and cognitive development through age-appropriate activity*. McGraw Hill Professional.
- Piek, J. P., Dawson, L., Smith, L. M., & Gasson, N. (2008). The role of early fine and gross motor development on later motor and cognitive ability. *Human Movement Science*, 27(5), 668–681.  
<https://doi.org/10.1016/j.humov.2007.11.002>
- Pillow, B. H. (2008). Development of Children's Understanding of Cognitive Activities. *The Journal of Genetic Psychology*, 169(4), 297–321.  
<https://doi.org/10.3200/GNTP.169.4.297-321>
- Pillow, B. H., & Weed, S. T. (1995). Children's understanding of biased interpretation: Generality and limitations. *British Journal of Developmental Psychology*, 13(4), 347–366. <https://doi.org/10.1111/j.2044-835x.1995.tb00685.x>
- Poole, C., Miller, S. A., & Church, E. B. (2005). Development: Ages & Stages-- Emerging Physical Skills. *Early Childhood Today*, 19(7), 22–25.

Ainia Nurul Asna, 2021

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | [repository.upi.edu](http://repository.upi.edu) | [perpustakaan.upi.edu](http://perpustakaan.upi.edu)

- Roebbers, C. M., Röthlisberger, M., Neuenschwander, R., Cimeli, P., Michel, E., & Jäger, K. (2014). The relation between cognitive and motor performance and their relevance for children's transition to school: A latent variable approach. *Human Movement Science, 33*(1), 284–297.  
<https://doi.org/10.1016/j.humov.2013.08.011>
- Roesli. (2010). Metodologi Penelitian Ilmu Keperawatan Pendekatan Praktis, Ed. Rule, A. C., & Stewart, R. A. (2002). Effects of practical life materials on kindergartners' fine motor skills. *Early Childhood Education Journal, 30*(1), 9–13.
- Schott, N., El-Rajab, I., & Klotzbier, T. (2016). Cognitive-motor interference during fine and gross motor tasks in children with Developmental Coordination Disorder (DCD). *Research in Developmental Disabilities, 57*, 136–148. <https://doi.org/10.1016/j.ridd.2016.07.003>
- Schwanenflugel, P. J., Henderson, R. L., & Fabricius, W. V. (1998). Developing organization of mental verbs and theory of mind in middle childhood: evidence from extensions. *Developmental Psychology, 34*(3), 512–524.  
<https://doi.org/10.1037/0012-1649.34.3.512>
- Schwanenflugel, Paula J, & Alexander, J. (2016). Developing Theories of Mind : Understanding Concepts and Relations between Mental Activities Author ( s ): Paula J . Schwanenflugel , William V . Fabricius and Joyce Alexander Published by : Wiley on behalf of the Society for Research in Child Development, *65*(6), 1546–1563.
- Sugiyono. (2008). *Metode penelitian pendidikan:(pendekatan kuantitatif, kualitatif dan R & D)*. Alfabeta.
- Sujiono. (2010). Menu Pembelajaran Anak Usia Dini.
- Suzanne, T. (2005). Scissors: More than a Cut Above. *School Arts: The Art Education Magazine for Teachers, 104*(5), 42.
- Syafril, S., Susanti, R., Fiah, R. El, Yaumas, E., Rahayu, T., Ishak, N. M., ... Yaumas, N. E. (2018). Four Ways of Fine Motor Skills Development in Early Childhood, (i), 1–2. Retrieved from  
[https://www.researchgate.net/publication/328954650\\_Four\\_Ways\\_of\\_Fine](https://www.researchgate.net/publication/328954650_Four_Ways_of_Fine)

Ainia Nurul Asna, 2021

**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

## Motor\_Skills\_Development\_in\_Early\_Childhood

- Tarnopol I, T. M. (1977). Brain function and reading disabilities. In *Fine Motor Activities in Elementary School: Preliminary Findings and Provisional Implications for Children With Fine Motor Problems*.
- Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2015). *Research Methods In Physical Activity*.
- Training, N. S. W. D. of E. and. (2000). Get Skilled, Get Active: a K–6 resource to support the teaching of fundamental movement skills. NSW Department of Education and Training Ryde, Australia.
- Treace, M. A., & Oberhauser, J. P. (2007). Processing of polypropylene-clay nanocomposites: Single-screw extrusion with in-line supercritical carbon dioxide feed versus twin-screw extrusion. *Journal of Applied Polymer Science*, *103*(2), 884–892. <https://doi.org/10.1002/app.25226>
- van der Fels, I. M. J., te Wierike, S. C. M., Hartman, E., Elferink-Gemser, M. T., Smith, J., & Visscher, C. (2015). The relationship between motor skills and cognitive skills in 4-16 year old typically developing children: A systematic review. *Journal of Science and Medicine in Sport*, *18*(6), 697–703. <https://doi.org/10.1016/j.jsams.2014.09.007>
- Vincer, M. J., Cake, H., Graven, M., Dodds, L., McHugh, S., & Fraboni, T. (2005). A population-based study to determine the performance of the Cognitive Adaptive Test/Clinical Linguistic and Auditory Milestone Scale to predict the Mental Developmental Index at 18 months on the Bayley Scales of Infant Development-II in very preterm infa. *Pediatrics*, *116*(6). <https://doi.org/10.1542/peds.2005-0447>
- Walkley, J., Holland, B. V, Treloar, R., & O'Connor, J. (1996). *Fundamental motor skills: A manual for classroom teachers*.
- Watson, R. (2001). *SPSS Survival Manual* by Julie Pallant, Open University Press, Buckingham, 2001, 286 pages, f16.99, ISBN 0 335 20890 8. *Journal of Advanced Nursing*, *36*(3), 478–478. <https://doi.org/10.1046/j.1365-2648.2001.2027c.x>
- Wilhelm, I., Prehn-Kristensen, A., & Born, J. (2012). Sleep-dependent memory
- Ainia Nurul Asna, 2021  
**HUBUNGAN FUNGSI KOGNITIF DENGAN KETERAMPILAN MOTORIK HALUS PADA ANAK USIA 4 TAHUN**  
 Universitas Pendidikan Indonesia | [repository.upi.edu](https://repository.upi.edu) | [perpustakaan.upi.edu](https://perpustakaan.upi.edu)

consolidation—what can be learnt from children? *Neuroscience & Biobehavioral Reviews*, 36(7), 1718–1728.

Younes, R., Rosner, B., & Webb, G. (1983). Neuroimmaturity of learning-disabled children: A controlled study. In *Fine Motor Activities in Elementary School: Preliminary Findings and Provisional Implications for Children With Fine Motor Problems* (pp. 25, 574–579).

Zimmerman, C. (2007). The development of scientific thinking skills in elementary and middle school. *Developmental Review*, 27(2), 172–223.  
<https://doi.org/10.1016/j.dr.2006.12.001>

林伸行. (2017). *Jack R. Fraenkle Norman E. Wallen. 感染症誌* (Vol. 91).