

## Transfer and Retention



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Under which conditions should implicit learning processes especially advantageous?  
Name one concrete example for the composition of implicit learning processes in the context of your intended career!

- Situations in which perception and action are coupled directly (e.g. catching)
- Situations of low complexity (e.g. tactical decisions of low number of options and high salience)
- Situations in which external focus of attention is beneficial
- Training: small games, playful activities, indirect attention manipulations

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## Transfer



**Ungarian pistol shooter Karoly Takacs**  
**Member of the olympic team 1936**  
**Amputation of the right arm 1938 after accident**  
**Some month later world champion and 1948 and 1952 Olympic gold medal winner**

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### Example for a dot-test

- Time for left and right hand performance is measured (time-right hand and time left hand)
- Number of dots hit in the original ( $R_{re}$  and  $R_{li}$ )
- Performance score ( $L_{re}$  and  $L_{li}$ ) for right hand and left hand

$$L_{re} = \frac{R_{re}}{\text{time}_{re}(\text{sec})} \times 100 \quad L_{li} = \frac{R_{li}}{\text{time}_{li}(\text{sec})} \times 100$$

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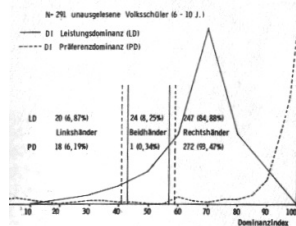
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### Example of the dot-test

From these performance scores a dominance index is derived (DI). Percentage of performance left to right of the sum performance by equation:

$$DI = \frac{L_{re}}{L_{re} + L_{li}} \times 100$$




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### Definition

„Die morphologische Seitigkeit bezeichnet das Überwiegen einer Körperhälfte, eines paarigen Organs oder Gliedes in Masse, Gewicht und Struktur. Unter funktioneller Seitigkeit versteht man, daß eine Extremität oder Seite in der Funktion bevorzugt wird.“

(Drenkow, 1960, S. 1085)

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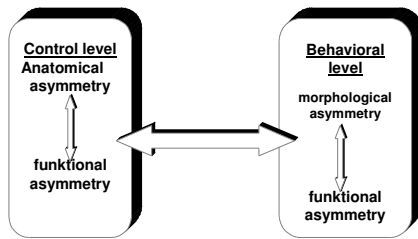
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### Aspects of handedness



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### contralateral Transfer

- Transfer can be found for functional changes by training (e.g. right-hand to left-hand transfer)
- Transfer can be found for coordination as well as strength task
- theory: general motor program exist that have the active muscles as one parameter

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### Handedness in sports

- Handedness is more or less important in different sports (e.g. cricket vs. soccer)
- Handedness can be trained to some degree

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### bilateral training

- For what?: skill learning and health
- How?: training order and duration
- Why?: increase learning

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### Why bilateral training works?

- Generalized motor program is established
- Variability of practice enhances the program
- Bilateral training increases the variable parameter selection of muscles

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### Theories of laterality

- We have different abilities for right and left hand because of specialization (to some degree also in animals)
- Laterality is also induced by the social environment (e.g. England has more left handers)
- Genetic models assume that handedness is caused by heredity

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Exercise

- Give a concrete example for bilateral training in a four week course in the context of your intended career!
- Read: Schmidt & Lee, p. 163-206

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