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Understanding learning from the perspective of developmental dynamics: Rhythmics and the Table of the Development of psychological Functions – two complementary ways of working

Translated by: Hannes Taljaard

The Table of the Development of psychological Functions was first published in the research report *Rhythmik als Movens der Entwicklung der psychische Funktionen*[1] (Garnitschnig, Karl & Neira Zugasti, Helga, Vienna 2006) and in the DVD (incl. CD-Rom) *Entwicklung beobachten, erkennen und unterstützen am Beispiel der rhythmisch-musikalischen Erziehung*[2] (Neira Zugasti, Helga & Garnitschnig, Karl, Vienna 2008). An updated version of the table with additional explanations will be presented in 2021. Presentations of the two theoretical bases, i.e. the Theory of psychological Operations (Theorie der psychischen Operationen, TPO) and Rhythmics, as well as of the detailed handling of the 'Developmental Grid' (incl. video) can be found in the two publications mentioned above and under the link: https://www.mdw.ac.at/mrm/mbe/inklusions-und-heilpaedagogik-diversitaet/entwicklungsraster-tpo/.

In the following pages, only a short version is presented in order to introduce the table of the development of psychological functions, and the ways it can be used.

Theory of psychological Operations (TPO)

The theory of psychological operations (TPO ©Karl Garnitschnig, based on findings by Piaget, Ciompi, Kephard, and others) starts from a concept of learning that places the exchange with and the appropriation of the world at the centre. It shows that we acquire the world as a whole with all its contents (in exchange with the natural and social environment) through psychological operations, operations that are the structural elements of the following eight psychological functions: **Moving**, **Sensing and Perceiving**, **Thinking** (or forming meanings), **Speaking** (and communicating), **Feeling or social-emotional acting**, **Intenting**, **Intuiting** (or creative acting) and **Remembering or memorising**. These psychological functions thus constitute the developmental potential of humans.

Each function manifests itself in a sequence of action steps (operations) that are activated in every learning process. The operations describe developmental steps in which learning can be experienced, observed and named as an active, holistic and meaningful appropriation of the world.

The TPO attempts to capture the development of psychological functions as precisely as possible in their developmental-psychological sequences. This is done at least precisely enough so that the development of a person from the beginning to formal maturity can be

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[1] Rhythmics as Movens for the Development of psychological operations
[2] Observing, recognising and supporting development – Rhythmics (Rhythmic-musical Education) as an example

described exactly via the individual elements. The focus falls not on the learning content, but on the operations through which content is acquired. This is the actual meaning of 'learning to learn', because the fundamental question is, which psychological operations have to be activated in each case in order for us to be able to acquire certain contents, to grasp and to understand them? Or, to put it another way: which contents, learning opportunities and learning situations are suitable and will render possible the design of learning processes that are conducive to development?

Table of the development of psychological functions – the 'Developmental Grid'

The development of the eight functions occurs in a complex interplay and the individual steps of actions (operations) through which a person gradually develops from the sensory level to the formal level follow a developmental logic. The shape of this development is determined by the individual possibilities of the specific person, as well as by external influences and conditions. The sequence of the individual steps corresponds to the developmental logic, which is why information regarding age is of secondary relevance.

The terms and theoretical explanations of the table of psychological functions present an approach that aims to make it possible to analyse and document complex, observed actions. In contrast to most content-oriented development plans, this approach not only enables us to make observations that are oriented toward developmental dynamics, but also to grasp patterns of action, their interrelationships and their differentiation, by means of the overview, as well as by means of the cross-connections between psychological functions and operations revealed by the grid. This makes it possible to precisely analyse those individual steps that a person actualises in a certain situation or through a certain learning and development offer.

The items in the table are the result of an attempt to list neither too many detailed steps of actions (in order to keep the table manageable as an observation tool), nor too few (so that the observed learning situations remain extensively describable). Structuring observations by means of the Developmental Grid makes it clear how many abilities are activated at the same time and which interactions become apparent. Through precise observation it becomes possible to recognise skills that are not challenged enough, and also to precisely discover and name those skills that are blocked or that are not completely stabilised. Based on these findings, successive tasks can be created in such ways that they are precisely adapted to the individual developmental dynamics. The Table of the Development of psychological Functions thus enables us to not only make detailed observations, but also to analyse in detail tasks based on psychological operations. The Developmental Grid is thus also a helpful didactic tool for the differentiated design of learning situations in heterogeneous, inclusive groups.

Developmental observation and task analysis

For pedagogical work, orientation according to the Table of the Development of psychological Functions means the following:

- Through the broad overview, it quickly becomes clear to educators that in every action, no matter how simple it may seem, a multitude of small steps are activated, and that each of these steps says in itself something about the child's abilities: *taking action is learning, is a complex, intermodal act*.

- We only talk about abilities, because no person works with his/her deficits. Every person uses abilities to solve a problem: *abilities are the basis for learning*. This viewpoint supports individualised pedagogical work.

- The grid is an aid for observation and documentation. It is not used for interpretation, evaluation or testing, but for describing: *quality, not quantity*.

- The current situation is recorded as a statement about this child in this situation and under these specific conditions. For strong and more meaningful data, observations over a longer period of time are necessary in order to gain valid and valuable insights into changes in development: *Process orientation, not outcome orientation*.

- Each child is related to itself, to its earlier or subsequent possibilities for action, and is not regarded as an object within standardised developmental guidelines: *the Learner is the Subject*.

Conclusion

Both Rhythmics (Rhythmic-Musical Education) and the Theory of psychological Operations (TPO) place the development of the personality of the human being in all functional areas in the centre. Thus, the two ways of working are complementary: a holistic-oriented observation, analysis and documentation tool as a theoretical framework for a pedagogical-artistic practice that also addresses all functional areas – a good combination for child-oriented, developmental learning!

Table of the Development of psychological Functions– TPO 2006/2020

Translated by: Hannes Taljaard

Development Stage	A – Moving	B – Sensing, Perceiving	C – Thinking	D – Speaking, Communicating
	Modalities *Pulsing, breathing, sucking, swallowing, stretching, bending, kicking, grasping, holding, pulling, stretching, turning, springing, swimming, crawling, sealing, sitting, straightening up, climbing, walking, jumping*	*Modalities* *Smelling, hearing, tasting, touching, seeing, feeling pain/warmth, feeling space/position, balance, sense of body, feeling rhythm/harmony, flow of energy, feeling*	*Modalities* *digital, analytical, logigal Thinking* *analogue, holistic, synthetic Thinking*	*Modalities* *Swallowing, babbling, laughing, crying, making sounds, gestures, symbolizing through facial expressions/gestures*
Sensomotoric Stage egocentric assumption of roles	1. Moving as reflex, moving intuitively 2. Activating and practising reflexes 3. Actively repeating events caused by chance 4. Differentiating movements 5. Coordinating movements 6. Moving spontaneously and autonomously 7. Coordinating movement and perception 8. Moving smoothly, fluently 9. Mobility 10. Automating movements 11. Combining movements 12. Movement that is perceptually triggered/controlled 13. Integrating movements that are perceived (e.g. acoustically, visually) into one's own movement 14. Maintaining balance 15. Crossing the centre line/vertical axis	1. Perception bound to appearance (to the moment) 2. Perception of wholes 3. Cross-modal perception 4. Perception is centred on only one characteristic (a single property) 5. Subdividing perceptions (impressions) 6. Intermodal perception 7. Integrating perceptions from different senses (sensory modalities) 8. Form/shape perception without paying attention to details	1. Forming sensorimotor schemata 2. Generalizing, differentiating 3. Permanence of the person 4. Size and shape constancy 5. Combining two sensorimotor schemata in such a way that a new action is created 6. Distinguishing between self/object/action 7. Purposeful/intentional action 8. Object permanence 9. Combination of several schemata 10. Means-purpose combination of sensorimotor schemata	1. Communicating by screaming, cooing, babbling 2. Making sounds independent of screaming, breathing, swallowing, squeaking 3. Social smile 4. Attentively following gestures, noises, sounds 5. Grasping the mood of auditory, visual... stimuli. 6. Imitating sounds 7. Vocalizing sounds related to mood 8. Responding with sounds; reacting to sounds, noises 9. Babbling syllables; imitating sounds, speech melody and rhythms 10. Differentiating syllables according to phrase length and pitch 11. Expressing desires through sounds 12. Repeating syllables 13. Repeating words 14. One-word utterances as a wish

				15. Naming people, things, actions
				16. Communicating through facial expressions, gestures, sounds
				17. One-word utterances: nouns, verbs particles, adverbs, demonstrative pronouns
				18. Communicating about an object

Development Stage	A – Moving	B – Sensing, Perceiving	C – Thinking	D – Speaking, Communicating
symbolic/ preconceptual Thinking	16. Experiencing individual movement sequences as a complete action 17. Acquisition of increasingly complex movement sequences 18. Automation of movement sequences 19. Being agile/skilful 20. Translating given and imagined ideas into movement 21. Executing and varying movements according to tempo, force, tension 22. Integrating individual movement sequences into different actions 23. Developing laterality/sidedness	9. Linking/coordinating two characteristics 10. Body awareness 11. Building up a body schema 12. Spatial perception 13. Perception of position in space 14. Isolating and refining perceptions 15. Sequencing perceptions 16. Reacting in a coordinated manner to external stimuli	11. Internalization of sensorimotor schemata 12. Imaginative inner representation of pictorial symbols 13. Topological order: adjacent, separated, included, enclosed 14. Sorting according to different characteristics 15. Comprehending opposites 16. Assessing according to essential/unessential characteristics 17. Symbolic action 18. Solving problems through experimentation 19. Imagining objects 20. Using symbols 21. Comparing objects/events according to several characteristics 22. Intentional causal thinking	19. Naming external conditions 20. Naming internal states 21. Person-bound speaking 22. Speech that is oriented towards persons and objects 23. Intentional communication 24. Free play accompanied with sounds and linguistic symbols 25. Translating what is given and presented into facial expressions/gestures 26. Two-word sentences 27. Detection of acoustic shapes (motifs) 28. Using articles, possessive pronouns 29. Three-word sentences uninflected 30. Inflected sentences with multiple words 31. Using plurals 32. Translating knowledge of grammar and syntax into spontaneous speech 33. Fragmentary narration 34. Understanding instructions accompanied by actions 35. Why questions

Development Stage	A – Moving	B – Sensing, Perceiving	C – Thinking	D – Speaking, Communicating
Visual Thinking subjective assumption of roles	24. Isolating and further refining movements 25. Refining coordination 26. Consciously controlling complex movements 27. Self-regulating through movement, breathing 28. Reacting suitably fast 29. Dispensing and directing force 30. Awareness of posture and balance	17. Further refinement and isolation of perceptions 18. Understanding vivid relationships of a system in their context 19. Observing entities that remain the same regardless of the number of features 20. Understanding wholes 21. Temporal succession 22. Serial perception	23. Grasping the functional dependence of two characteristics 24. Associative/transitive thinking: Combining things that belong together connect/recognizing the same features from different perspectives 25. Comprehending (Euclidean) shapes: straight line, circle, angle, square, triangle 26. Understanding transformation 27. Invariance of quantity/number 28. Reversibility 29. Setting goals for which there are several possible solutions 30. Awareness of reality	36. Talking to others in egocentric (person-centred) terms 37. Talking to others, partly understanding them, partly responding to them 38. Narrating experiences in a spontaneous form/using different means of expression 39. Speaking/expressing related to an object or action 40. Communicating one's own thoughts objectively 41. Framing one's opinion 42. Increase in utterances oriented towards the interlocutor

Development Stage	A – Moving	B – Sensing, Perceiving	C – Thinking	D – Speaking, Communicating
Concrete Operations self-reflective assumption of roles	31. Building up muscle tone in a well-directed manner 32. Reflecting on movements 33. Experience postures/movements of self and others as expressions of self 34. Awareness of posture and balance 35. Translating body feelings and body consciousness in movements 36. Mental representations of movement sequences 37. Combining movement sequences freely to form Gestalts 38. Awareness of movement	23. Perceiving own time 24. Inner representation of perceptions 25. Imaginative inner representation of internal and external perceptions 26. Perception of time 27. Well-directed refinement and isolation of perceptions	31. Sequences: spatial and temporal 32. Grasping size ratios 33. Number concept 34. Invariance of substance/mass 35. Invariance of weight 36. Ordering pictorially represented objects and situations 37. Quantities and order relations 38. Possessing a comprehensive causality schema 39. Developing strategies 40. Formation of internal, reversible action schemata 41. Combining operations variably	43. Forming sentences in the passive voice 44. Narration that takes sequences of events into account 45. Rhythmic, structured speaking 46. Conversing with others, fully responsive to them 47. Following the ideas of others 48. Describing situations in context 49. Observing temporal order in narration/expression 50. Accurately portraying a story

Development Stage	A – Moving	B – Sensing, Perceiving	C – Thinking	D – Speaking, Communicating
formal Operations mutual assumption of roles	39. mental representation of sequences of movements 40. Freely combining movement sequences into larger presentations 41. Being aware of movement	28. Inner representation even of complex perceptions 29. Purely imaginative representation of internal and external perceptions	42. Invariance of volume 43. Forming a universal classification schema 44. Networked thinking 45. Operating with operations 46. Abductive reasoning 47. Hypothetical-deductive thinking/concluding from assumptions 48. Dialectical thinking 49. Identifying and evaluating several solutions according to quality criteria 50. Systematic testing of potential causes under controlled conditions 51. Reflecting on the cognitive process 52. Understanding of history 53. Overall understanding of life 54. Overall understanding of the world	51. Understanding instructions without accompanying actions 52. Dealing creatively with language/expression also in formal terms 53. Reflective and grammatically correct speech 54. Reflective use of language/speech and expressive forms to achieve the intended effect

Development Stage	E – Feeling, Social-emotional Acting	F – Intenting	G – Intuiting	H – Remembering, Memorising
	Modalities *To love - to hate, to feel security - to be afraid, to be happy - to grieve, to be open - to be depressed, to be closed, to be interested/curious, to be surprised, to feel disgusted, to be angry, to feel guilty*	*Modalities* *Follow instinctual impulses, be attentive, turn to one another, strive*	*Modalities* *Fantasizing, divergent thinking, free association, constructive thinking, analog thinking, creative thinking, inventing/designing ideas, developing new things, opening up to ideas*	*Modalities* *Repeat, remember, memorize*
Sensomotoric Stage egocentric assumption roles	1. Feelings triggered by (bodily) sensations and perceptions 2. Engaging persons with libidinous energy 3. Social smile 4. Direct adoption of behavioural patterns 5. Reacting, imitating 6. Feeling secure, primary trust 7. Participating, leaning towards an attachment figure 8. Seeking contact/recognition 9. Devoting oneself 10. Adopting the feelings of others 11. Perceiving the affective climate between other people	1. Distinguishing inside from outside 2. Turning away from what is unpleasant 3. Giving varied signals by differentiated crying 4. Turning towards people/retreating from people 5. Turning to oneself 6. Turning toward objects 7. Imitating 8. Seeking out new situations 9. Attention controlled by people/objects 10. Acting according to own needs 11. Making requests 12. Perceiving oneself as the originator of actions	1. Adapting (reflex) movements to circumstances 2. Following inner impulses 3. Giving immediate expression to an inner experience 4. Having an inner representation of a person 5. Having an inner representation of individual objects/processes 6. Combining images 7. Discovering new means through active experimentation	1. Recognising a stimulus, or static objects and their features - first minutes, then hours and then days later 2. Remembering one's immediate attachment figures 3. Expecting something 4. Facial recognition 5. Direct imitation 6. Searching for hidden objects 7. Deferred imitation

Development Stage	E – Feeling, Social-emotional Acting	F – Intenting	G – Intuiting	H – Remembering, Memorising
symbolic/ preconceptual Thinking	12. First detachment 13. Ego formation 14. Establishing a relationship in order to satisfy own needs 15. Having expectations 16. Anticipating the expectations of others 17. Internalizing an image of other persons 18. Affective representation of things and situations 19. Partially adopting the perspectives of relationship partners	13. Inwardly imitating the actions of others 14. Acting even against the will of attachment persons 15. Fantasy and role-playing games, expressive games 16. Awareness of one's own independent ego 17. Following processes with full attention 18. Carrying out processes with full attention 19. Being prepared to actively engage with physical contact	8. Becoming involved with new means 9. Creative acts of invention, e.g. word creations 10. Having hunches about how processes might work 11. Allowing variations in giving shape 12. Giving shape to ideas with the help of various means 13. Inventing rules that are bound to given contents 14. Acting by trying out	8. Mechanical repetition of single movements/words 9. Extending the time between the presentation of a stimulus and its recognition 10. Representing information symbolically 11. Adding existing knowledge in order to interpret presented material 12. Remembering several features over a longer period of time

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Development Stage	E – Feeling, Social-emotional Acting	F – Intenting	G – Intuiting	H – Remembering, Memorising
visual Thinking subjektive assumption	20. Putting oneself in the place of another person 21. Bearing the absence of an attachment person 22. Enduring frustration and fear 23. Stable feeling of unity - self-limits 24. Perceiving/expressing feelings 25. Showing affection 26. Empathising with someone 27. Following rules to the letter 28. Fitting into the community 29. Integrating oneself in a group process 30. Postponing one's wishes 31. Asserting themselves in the face of external demands 32. Assuming responsibility 33. Being aware of one's position in the group 34. Emotional grasp of psycho-physical states	20. Assessing/asserting oneself 21. Valuing oneself 22. Implementing plans, deciding 23. Completing a task 24. Recognizing boundaries 25. Expanding boundaries 26. Filling space 27. Creating space for oneself 28. Structuring time 29. Representing/expressing oneself 30. Self-regulating psycho-physical states of tension 31. Taking responsibility for oneself 32. Balancing, rhythmicising 33. Respecting a stable feeling of unity - self-boundaries 34. Full attention 35. Seeing oneself as the point of reference for one's actions	15. Developing new ideas via free associations 16. Actively implementing variations in shaping 17. Combining several activities in variable ways 18. Forming chains of associations	13. Remembering people 14. Recognising and intuiting the amount of information as a difficulty in memory tasks 15. Be aware of the differences in memory tasks 16. Comprehending the sources of memory

Development Stage	E – Feeling, Social-emotional Acting	F – Intenting	G – Intuiting	H – Remembering, Memorising
concrete Operations self-reflective assumption of roles	35. Feeling a sense of belonging 36. Taking/filling one's position in a group 37. Adopting perspectives of others without reservation 38. Relating to others 39. Caring for others, accompanying them 40. Forming rules 41. Collaborating 42. Internalising rules 43. Listening empathically to others 44. Affective comprehension of bodily states 45. Conscious use of affective body states 46. Voluntary use of affects	36. Identifying with a >hero< 37. Structuring oneself 38. Giving space to others 39. Taking responsibility for oneself and for others	19. Freely inventing rules belonging to a system 20. Conscious, free fluctuation of ideas 21. Expressing an inner experience 22. Expressing an inner experience through media 23. Recognising relations of elements as a whole 24. Re-varying elements of a whole 25. Establishing new, previously unknown relationships between elements and wholes	17. Remembering also executed or imagined (complex) events 18. Ordering/sorting content by categories in order to remember things better 19. Fill memory gaps through rational reconstruction in order to be able to remember something better 20. Using mnemonic strategies

Development Stage	E – Feeling, Social-emotional Acting	F – Intenting	G – Intuiting	H – Remembering, Memorising
formal Operations mutual assumption or roles	47. Experiencing unity within oneself 48. Recognising/respecting each other 49. Recognising oneself as an equal 50. Forming an identity through one's own value system, one's own meaning 51. Showing solidarity 52. Being fair, in the ways that everyone needs it 53. Forming universal ideas about how people can live together in good ways 54. Being aware of the basis of evaluation within oneself 55. Living intimacy 56. Universal love	40. Actualising oneself fully 41. Evaluating one's own actions on one's own initiative 42. Acting in a self-determined way according to principles	26. Making oneself consciously empty to allow for new ideas 27. Intuitively creating potentially universal connections 28. Constructively implementing ideas and concepts	21. Fine-tuning mnemonic strategies 22. Modified/selective repetition

Bibliography: The Developmental Grid, the Theory of Psychological Operations and the Research Project in 2006

Garnitschnig, Karl & Neira Zugasti, Helga (2006): *Rhythmik als Movens der Entwicklung der psychischen Funktionen. Forschungsprojekt des Instituts für Musik und Bewegung sowie Musiktherapie der Universität für Musik und darstellende Kunst Wien und des Instituts für Bildungswissenschaft der Universität Wien.*
In: Neira Zugasti, Helga & Garnitschnig, Karl (2008): *Entwicklung beobachten, erkennen und unterstützen am Beispiel der rhythmisch-musikalischen Erziehung.* Reg. Nr. 12348. DVD mit Begleitmaterial. BMUKK Bundesministerium für Unterricht, Kunst und Kultur, Abt.7 – Medienservice 2008. CD-Rom.
https://www.mdw.ac.at/mrm/mbe/inklusions-und-heilpaedagogik-diversitaet/entwicklungsraster-tpo/ (15.01.2023)

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Explanations of Items from the Table of psychological Functions

Translated by: Hannes Taljaard

A - Moving

1. Moving as reflex, moving intuitively: *the person reacts to external stimuli through reflexes or acquired behavioural patterns*
2. Activating and practising reflexes: *the associated movements are transformed into voluntary movements through the repeated actuation of reflexes*
3. Actively repeating events caused by chance: *when the child receives stimuli from outside, it spontaneously imitates simple movements*
4. Differentiating movements: *movements from the disordered mass of movements are stabilized and adapted to the characteristics of the situation*
5. Coordinating movements: *different movements are connected*
6. Moving spontaneously and autonomously: *the control of movements becomes increasingly conscious*
7. Coordinating movement and perception: *movements and perceptions are linked with each other in a well-directed manner*
8. Moving smoothly, fluently: *the muscles work in complete coordination with feedback regarding movements*
9. Mobility: *to exhaust the range of motion through ongoing practice*
10. Automating movements: *to stabilise movements in such a way that they are controlled automatically*
11. Combining movements: *to connect simple basic movement patterns with each other*
12. Movement that is perceptually triggered/controlled: *the person actualises a movement that was triggered by a perception*
13. Integrating movements that are perceived (e.g. acoustically, visually) into one's own movement: *movements that are offered and then perceived through the senses are executed as one's own movement and are further differentiated through this*
14. Maintaining balance: *to balance one's entire body with the force of gravity from free sitting*
15. Crossing the centre line/vertical axis
16. Experiencing individual movement sequences as a complete action: *movement sequences previously considered as isolated are now perceived as a holistic action*
17. Acquisition of increasingly complex movement sequences: *through repetition, movements and movement combinations are combined with each other to form movement Gestalts (or presentations)*
18. Automation of movement sequences: *longer, closed movement processes run in such a way that they are automatic*
19. Being agile/skilful: *to be able to flexibly implement and convert the movement possibilities acquired so far*
20. Translating given and imagined ideas into movement: *to find one's own expression for external and internal movement images*
21. Executing and varying movements according to tempo, force, tension: *to flexibly adjust tempo, force, and tension according to own intentions to move or according to instructions*

22. Integrating individual movement sequences into different actions: *to present actions on the basis of acquired movement complexes*
23. Developing laterality/sidedness: *to prefer to act with one side of the body*
24. Isolating and further refining movements: *to increasingly differentiate fine motor skills in all areas of movement*
25. Refining coordination: *the refinement of the coordination of movements can only be recorded through observations over a longer period of time*
26. Consciously controlling complex movements: *to actualise movements in a targeted manner according to requirements*
27. Self-regulating through movement, breathing: *to balance inner states of tension through movement/breathing*
28. Reacting suitably fast: *to react immediately and appropriately to external and internal circumstances*
29. Dispensing and directing force: *to consciously control the intensity of movements*
30. Awareness of posture and balance: *the information necessary for the execution of the movement is stored (e.g. direction, use of force,...); independent control of success and failure is possible*
31. Building up muscle tone in a well-directed manner: *to intensify from an inner drive the increase in muscle tension through movements*
32. Reflecting on movements: *to have an inner representation of the movement(s) that are being performed as a condition to consciously vary or change movements during the sequence*
33. Experience postures/movements of self and others as expressions of self: *to understand what self and others express through movement*
34. Awareness of posture and balance: *to have alert awareness of posture and balance in unison with the execution of movement*
35. Translating body feelings and body consciousness in movements: *to be able to actualise body feelings and body awareness in movements*
36. Mental representations of movement sequences: *to represent movement sequences in their overall structure purely from the imagination*
37. Combining movement sequences freely to form Gestalts: *to realise complex movement shapes purely from the imagination (create choreography)*
38. Awareness of movement: *to form alert and clear inner representations of posture and balance in unison with the execution of movement; something new can be imagined and/or created through conscious control of the body*

B - Sensing, Perceiving

1. Perception bound to appearance (to the moment): *impressions are only received from the momentary environment*
2. Perception of wholes: *undifferentiated grasping of objects (e.g. persons, objects, spatial impressions,...); wholes (overall impression) take precedence over differentiated impressions*
3. Cross-modal perception: *perceptions from two senses can be combined (e.g. eye-hand coordination, hand-mouth coordination,...)*
4. Perception is centred on only one characteristic (a single property): *one can only operate with a single property, e.g. only the height of a glass with water is observed, not also its width at the same time*
5. Subdividing perceptions (impressions): *to grasp several characteristics within an overall impression*

6. Intermodal perception: *perceptions from several senses are combined (e.g. catching a ball: seeing, hearing, touching, proprioception)*
7. Integrating perceptions from different senses (sensory modalities): *to synthesise a complex inner representation from different stimuli*
8. Form/shape perception without paying attention to details: *to grasp a whole as such from various related characteristics*
9. Linking/coordinating two characteristics: *to understand clearly that two characteristics influence each other*
10. Body awareness: *to experience one's own body as a whole and feeling closeness and distance to one's body*
11. Building up a body schema: *to experience the individual body parts in their relationship to each other*
12. Spatial perception: *to grasp space in its dimensions*
13. Perception of position in space: *to perceive oneself in space*
14. Isolating and refining perceptions
15. Sequencing perceptions: *to capture sequences of actions in terms of their sections*
16. Reacting in a coordinated manner to external stimuli: *to control one's own reactions in a targeted manner via perceptions*
17. Further refinement and isolation of perceptions: *perceptions allow for a high degree of differentiation in terms of content and sensitivity; this takes place over long periods of time.*
18. Understanding vivid relationships of a system in their context: *to perceive sensory impressions as belonging together and depending on each other*
19. Observing entities that remain the same regardless of the number of features: *to observe something as such regardless of how many features are presented*
20. Understanding wholes: *to understand how features belong together*
21. Temporal succession: *to record events in their chronological order*
22. Serial perception: *to grasp repeating structures of events and things*
23. Perceiving own time: *subjective perception of the duration of own actions*
24. Inner representation of perceptions: *inner representation is open, whereas imaginative representation (nr. 25) is concrete. The point is that one can detach oneself from external perceptions and represent them without a real perception*
25. Imaginative inner representation of internal and external perceptions: *to be able to imagine and represent internal and external perceptions independently of a situation*
26. Perception of time: *to relate the temporal dimension of processes to each other and to objective time*
27. Well-directed refinement and isolation of perceptions: *perceptual ability increases in intensity through practice. Thus, one can choose an object, e.g. an orange, and feel its peel, smell nuances of scent, pursue nuances of taste, etc.*
28. Inner representation even of complex perceptions
29. Purely imaginative representation of internal and external perceptions: *to create new internal images; one can then also imagine something that one will probably never get to experience; for example, a kernel of wheat softens, forms a shoot, becomes a stalk and forms an ear – you can then also see this as a metaphor and analogy in general for dying and living*

C - Thinking[1]

1. Forming sensorimotor schemata[2]: *to grasp individual shapes through the senses*
2. Generalizing, differentiating: *one schema is transferred to another (e.g.: the child sucks on everything), to grasp differences*
3. Permanence of the person: *to recognise a person as the same*
4. Size and shape constancy: *to recognise sizes and shapes as constant*
5. Combining two sensorimotor schemata in such a way that a new action is created: e.*g. grasping and bringing to the mouth becomes: eating*
6. Distinguishing between self/object/action: *to distinguish inside and outside*
7. Purposeful/intentional action: *to achieve an effect through action connected with intention; action not planned but determined by the goal*
8. Object permanence: *an object persists even if it is not visible*
9. Combination of several schemata
10. Means-purpose combination of sensorimotor schemata: *a schema is used as a means to achieve an effect*
11. Internalization of sensorimotor schemata: *they are present as internal images and can be reactivated regardless of the situation.*
12. Imaginative inner representation of pictorial symbols: *to understand symbols as generalized carriers of meaning*
13. Topological order: adjacent, separated, included, enclosed: *to grasp the spatial relationships between objects*
14. Sorting according to different characteristics: *to recognise one or more characteristics as a commonality; applying own or foreign categories of ordering*
15. Comprehending opposites: *to grasp the connection between opposing properties*
16. Assessing according to essential/unessential characteristics: *to understand the characteristics that are essential to a thing; grasping defining properties*
17. Symbolic action: *to pretend*
18. Solving problems through experimentation
19. Imagining objects: *to have an inner image of given things*
20. Using symbols: *to assign meaning to words, signs and things*
21. Comparing objects/events according to several characteristics: *to highlight similarities and differences*
22. Intentional causal thinking: *in order to reach a certain goal, connections are made between one's own intention (purpose) and the way to reach the goal*
23. Grasping the functional dependence of two characteristics: *to understand that characteristics are related, and how*
24. Associative/transitive thinking: combining things that belong together connect/recognizing the same features from different perspectives: *to see changing appearances of a fact/process/object in context (e.g. caterpillar – pupa – butterfly; recognizing a mountain from different directions,...)*
25. Comprehending (Euclidean) shapes: straight line, circle, angle, square, triangle
26. Understanding transformation: *to be able to understand different manifestations as belonging to the same sequence*
27. Invariance of quantity/number: *to consider the quantity of elements as the same despite their different form or arrangement*

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1   Feedback - circular processes
2   Sensorimotor schema: a sensory impression is combined with movement reactions, it is looped as a >pattern< and stabilized by repetition

28. Reversibility: *to carry out processes forward and backward; the entire process must be retrievable*
29. Setting goals for which there are several possible solutions
30. Awareness of reality: *to act in accordance with the situation*
31. Sequences: spatial and temporal: *to understand sequences in their spatial and temporal contexts*
32. Grasping size ratios
33. Number concept: *to grasp numbers in their order and magnitude*
34. Invariance of substance/mass
35. Invariance of weight
36. Ordering pictorially represented objects and situations
37. Quantities and order relations: *to grasp internal relations of quantities and orders*
38. Possessing a comprehensive causality schema: *to use cause-and-effect relationships as an explanation schema*
39. Developing strategies
40. Formation of internal, reversible action schemata: *to imaginatively represent the reversibility of real actions and processes*
41. Combining operations variably: *to combine units of action from the imagination as desired*
42. Invariance of volume: *a quantity (e.g. volume, weight,...) can be recognized as the same despite different forms (e.g. the same amount of water in different vessels)*
43. Forming a universal classification schema: *to order all one's knowledge about the world*
44. Networked thinking: *you do not only create a link between two contexts, but also between three, four and more; for example, you can create a mind map in which many concepts are linked together*
45. Operating with operations: *a simple example is addition: if you know that 2+3=5, you know that 3+2=5. You have the operation in reverse. But you can also combine different operations: addition and multiplication. If you want to show someone recognition, you can do it in different ways. Another example: you can play with words, express something differently, and so on.*
46. Abductive reasoning: *abduction is the third form of reasoning: induction is the conclusion from the individual to the general; deduction is the conclusion from the general to the particular. Abduction is the starting point of a thinking process. An unknown phenomenon is observed and one looks for a rule or hypothesis that could explain it, which is then tested. In this sense, abduction is at the beginning of all knowledge. It is a creative design of hypotheses.*
47. Hypothetical-deductive thinking/concluding from assumptions: *to make an assumption or several assumptions and to conclude from them how something could be. Assuming we want to arrive at a better society, we have to introduce different structures and take different measures, in terms of the characteristics of a good society.*
48. Dialectical thinking: *to bring opposites (ideas, events) into a context; leading/connecting opposing ideas/convictions to a common idea (e.g. creating a common set of rules for the class community from different behaviours and ideas)*
49. Identifying and evaluating several solutions according to quality criteria
50. Systematic testing of potential causes under controlled conditions: *to create framework conditions that are reviewed according to their impact*
51. Reflecting on the cognitive process
52. Understanding of history: *to put motives of past events and actions into a present reference*
53. Overall understanding of life
54. Overall understanding of the world

D - Speaking, Communicating

1. Communicating by screaming, cooing, babbling
2. Making sounds independent of screaming, breathing, swallowing, squeaking
3. Social smile
4. Attentively following gestures, noises, sounds
5. Grasping the mood of auditory, visual,... stimuli.[3]
6. Imitating sounds
7. Vocalizing sounds related to mood
8. Responding with sounds; reacting to sounds, noises
9. Babbling syllables; imitating sounds, speech melody and rhythms
10. Differentiating syllables according to phrase length and pitch
11. Expressing desires through sounds
12. Repeating syllables
13. Repeating words
14. One-word utterances as a wish
15. Naming people, things, actions
16. Communicating through facial expressions, gestures, sounds
17. One-word utterances: nouns, verbs, particles, adverbs, demonstrative prnouns
18. Communicating about an object: *to enter into verbal/non-verbal exchange with others by means of an object*
19. Naming external conditions
20. Naming internal states
21. Person-bound speaking: *the subject is absorbed in the speaking; the subject is what he or she says; the person understands him- or herself as separate from the experience about which he or she is speaking*
22. Speech that is oriented towards persons and objects
23. Intentional communication: *to connect an intention with verbal/nonverbal expressions*
24. Free play accompanied with sounds and linguistic symbols
25. Translating what is given and presented into facial expressions/gestures
26. Two-word sentences
27. Detection of acoustic shapes (motifs)
28. Using articles, possessive pronouns
29. Three-word sentences uninflected
30. Inflected sentences with multiple words
31. Using plurals
32. Translating knowledge of grammar and syntax into spontaneous speech
33. Fragmentary narration: *to express sequences, phrases, building blocks of sound*
34. Understanding instructions accompanied by actions
35. Why questions
36. Talking to others in egocentric (person-centred) terms
37. Talking to others, partly understanding them, partly responding to them
38. Narrating experiences in a spontaneous form/using different means of expression
39. Speaking/expressing related to an object or action: *bound to a situational context*
40. Communicating one's own thoughts objectively: *the person understands him/herself as separate from the experience through which she/he expresses herself/himself.*

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[3] Communication in the broadest sense understood as a means of expression (facial expressions, gestures, touch, noises, sounds,...)

41. Framing one's opinion
42. Increase in utterances oriented towards the interlocutor
43. Forming sentences in the passive voice
44. Narration that takes sequences of events into account
45. Rhythmic, structured speaking: *to be able to express shapes*
46. Conversing with others, fully responsive to them
47. Following the ideas of others
48. Describing situations in context: *to express through different means*
49. Observing temporal order in narration/expression
50. Accurately portraying a story
51. Understanding instructions without accompanying actions
52. Dealing creatively with language/expression also in formal terms: *The form in which one expresses something relates to the shaping of language: does one express something in a short, or humorous, or pointed way, or through a long narrative, etc.*
53. Reflective and grammatically correct speech: *also refers to the reflection of different expressions*
54. Reflective use of language/speech and expressive forms to achieve the intended effect

E - Feeling, Social-emotional Acting

1. Feelings triggered by (bodily) sensations and perceptions: *this refers to both the body and the environment*
2. Engaging persons with libidinous energy: *emotional relations to persons are formed, attachment figures become significant for the child*
3. Social smile
4. Direct adoption of behavioural patterns: *from attachment figures without delay*
5. Reacting, imitating: *already happens with a time delay*
6. Feeling secure, primary trust: *is not directly observable, but can be inferred through many behaviours of the child, such as: acts on its own; does not cry when the attachment figure moves away; turns freely to people and things*
7. Participating, leaning towards an attachment figure
8. Seeking contact/recognition
9. Devoting oneself: *to devote oneself unreservedly to a person or a thing*
10. Adopting the feelings of others: *the mood of others triggers the same expression in oneself*
11. Perceiving the affective climate between other people: *the child detects moods between people*
12. First detachment: *the child begins to feel as its own person and to act on its own initiative in an expanding environment*
13. Ego formation: *the child speaks of itself in the first person (no longer in the 3rd person)*
14. Establishing a relationship in order to satisfy own needs
15. Having expectations: *the child develops ideas that its needs will be met in in a certain way; it reacts of its own accord if this does not happen*
16. Anticipating the expectations of others: *the child also grasps the expectations of others*
17. Internalizing an image of other persons: *children adjust specifically to different persons; an attachment figure is already represented inwardly in a certain way*
18. Affective representation of things and situations: *things and situations are emotionally anchored and are correspondingly expressed emotionally; affect is understood here as the emotional sensation associated with everything*

19. Partially adopting the perspectives of relationship partners: *the inner reference system of other people, their way of interpreting the world, can be grasped emotionally only in parts*
20. Putting oneself in the place of another person: *to want to take an active part in the inner world of a person, while still referring strongly to oneself*
21. Bearing the absence of an attachment person
22. Enduring frustration and fear: *to trust oneself to come to a solution in situations that trigger fear or frustration*
23. Stable feeling of unity – self-limits: *the child has a clear sense of itself, is centred in itself and knows on its own how far it can get involved in situations and how far it can rely on itself*
24. Perceiving/expressing feelings
25. Showing affection
26. Empathising with someone: *to understand another person's inner world*
27. Following rules to the letter
28. Fitting into the community: *the child is able to accept the order of the community*
29. Integrating oneself in a group process: *to see through group processes and act accordingly*
30. Postponing one's wishes
31. Asserting themselves in the face of external demands: *children are often expected to do a lot that they don't actually want to do. Can they defend themselves against this?*
32. Assuming responsibility
33. Being aware of one's position in the group: *to grasp one's place in the group*
34. Emotional grasp of psycho-physical states: *to grasp one's own states and those of others and the corresponding emotional values; noticing different feelings*
35. Feeling a sense of belonging
36. Taking/filling one's position in a group
37. Adopting perspectives of others without reservation: *to fully understand perspectives of others*
38. Relating to others
39. Caring for others, accompanying them
40. Forming rules: *to invent arrangements and agreements yourself in the current context*
41. Collaborating
42. Internalising rules: *a person knows the meaning of a rule, applies it appropriately and acts accordingly*
43. Listening empathically to others
44. Affective comprehension of bodily states: *to grasp bodily states and understand their emotional value*
45. Conscious use of affective body states. *one is angry, furious, sad ... and still exaggerates the body feeling*
46. Voluntary use of affects: *one feels affects so precisely that one can also portray them (scenically). In contrast to nr. 45, one has detached oneself from bodily feeling and can play with it.*
47. Experiencing unity within oneself: *to feel one's own actions and experiences within oneself and thus being an actor and observer at the same time; to experience oneself in a balanced relationship between one's own expectations and external demands*
48. Recognising/respecting each other
49. Recognising oneself as an equal
50. Forming an identity through one's own value system, one's own meaning: *to act so clearly from within oneself that it becomes clear that the person is acting from his or her own values, stands by his or her own value system and represents it to the outside world*

51. Showing solidarity
52. Being fair, in the ways that everyone needs it: *not merely the same for everyone, but also taking into account the individual needs of people*
53. Forming universal ideas about how people can live together in good ways
54. Being aware of the basis of evaluation within oneself: *to grasp precisely how in one's actions, one's own evaluations are observed against external expectations*
55. Living intimacy: *to express oneself freely, openly and without reservation to another person whom one loves and trusts*
56. universal love: *love that includes everything; feeling all-connectedness and experiencing it as happiness*

F – Intenting

1. Distinguishing inside from outside: *even the embryo distinguishes stimuli from within and senses resistance from without; experiences of resistance are the motor for perception*
2. Turning away from what is unpleasant
3. Giving varied signals by differentiated crying
4. Turning towards people/retreating from people
5. Turning to oneself: *a child deals with its own actions and modulates them.*
6. Turning toward objects
7. Imitating: *the volitional aspect of imitation is meant here; imitation is connected with the will for self-development*
8. Seeking out new situations: *the child not only deals more intensively with new situations, but also actively tries to create situations with new stimuli*
9. Attention controlled by people/objects: *the child is interested in people and objects and becomes involved with them*
10. Acting according to own needs
11. Making requests
12. Perceiving oneself as the originator of actions: *the child realises that it is making a difference with its own initiative*
13. Inwardly imitating the actions of others: *the child internally imitates external processes; this is the condition for subsequent internally controlled actions, and can only be recognised through micro-movements of the musculature (especially facial expressions), through interested observation and in connection with further developmental steps*
14. Acting even against the will of attachment persons
15. Fantasy and role-playing games, expressive games
16. Awareness of one's own independent ego: *when the person speaks of him/herself as I, he/she detaches him/herself from the environment and gains independence*
17. Following processes with full attention: *to succeed in staying with a process and not being distracted by other impressions*
18. Carrying out processes with full attention: *to remain in the process while carrying out an activity*
19. Being prepared to actively engage with physical contact
20. Assessing/asserting oneself
21. Valuing oneself: *to appreciate one's being and existence*
22. Implementing plans, deciding: *the volitional aspect of deciding rather than the content aspect is emphasized*
23. Completing a task: *is only observable when the end of a task is optional*

24. Recognizing boundaries: *How far do I pay attention to the reality of others? How far is the reality of others included in one's own actions?*
25. Expanding boundaries: *to constantly explore one's own possibilities; seizing further possibilities of one's own range of action*
26. Filling space: *to exhaust the available possibilities for action; a child does not allow itself to be constrained by others, it follows its own dynamic*
27. Creating space for oneself: *to actively seek out opportunities; to activate one's repertoire of actions in the face of resistance*
28. Structuring time: *to have your own access to the temporal realisation of a process*
29. Representing/expressing oneself: *to have the courage to put one's ideas and perceptions into practice (in front of oneself and others)*
30. Self-regulating psycho-physical states of tension: *to find ways to compensate for internal or external pressure (through movement, facial expressions, speech ...)*
31. Taking responsibility for oneself: *to take responsibility for one's own actions*
32. Balancing, rhythmicising: *to repeat sequences in the same or similar way with the willingness to shape them oneself; to actively synchronise own time and group time according to one's own initiative*
33. Respecting a stable feeling of unity – self-boundaries: *if people can experience themselves as themselves and understand themselves as coherent in themselves, the readiness develops to respect others and to adapt own actions to others*
34. Full attention: *to centre oneself inwardly and consciously grasping the resonance of processes*
35. Seeing oneself as the point of reference for one*'s* actions: *to decide from within oneself and take into account the consequences of one's actions, thus maintaining one's own point of view*
36. Identifying with a >hero< : *to feel that a role model is authoritative for oneself*
37. Structuring oneself: *to organise and direct one's own actions*
38. Giving space to others: *to see oneself as a whole in a larger whole and therefore to withdraw oneself so far that others can also realize their possibilities*
39. Taking responsibility for oneself and for others
40. Actualising oneself fully: *to make the most of one's possibilities in a situation*
41. Evaluating one's own actions on one's own initiative
42. Acting in a self-determined way according to principles: *one gains universally valid criteria for one's decisions*

G – Intuiting

1. Adapting (reflex) movements to circumstances: *to change movements through feedback*
2. Following inner impulses: *to express without recognizable cause from the outside*
3. Giving immediate expression to an inner experience: *to express feelings and volitions spontaneously*
4. Having an inner representation of a person: *observable in the consistent way in which a child interacts with a person*
5. Having an inner representation of individual objects/processes
6. Combining images: *combinations of images autogenerate themselves and show themselves in new behaviours*
7. Discovering new means through active experimentation: *only becomes apparent in the process*
8. Becoming involved with new means: *to be inwardly free to assimilate impulses*
9. Creative acts of invention, e.g. word creations: *immediately reshaping of impressions*

10. Having hunches about how processes might work: *spontaneous foreknowledge, noticeable in the directionality of attention in the process*
11. Allowing variations in giving shape
12. Giving shape to ideas with the help of various means: *to allow influences and inspirations to come into being as if by themselves*
13. Inventing rules that are bound to given contents: *the emergence of regularities from that which is experienced*
14. Acting by trying out: *to be open-minded in your actions*
15. Developing new ideas via free associations
16. Actively implementing variations in shaping: *to allow variations of shaping to emerge in the process*
17. Combining several activities in variable ways: *to allow, to let happen, so that something new can emerge from different processes*
18. Forming chains of associations: *to combine complexes of thoughts and ideas to form something new*
19. Freely inventing rules belonging to a system: *e.g. to vary tasks according to the group's capacity (the system: the group; the rule: adapt to the group's capacity)*
20. Conscious, free fluctuation of ideas: *to play with one's ideas, to evoke them again and again and to try them out*
21. Expressing an inner experience: *spontaneous facial expressions, gestures, voice, etc.*
22. Expressing an inner experience through media: *to search for means of expression to represent inner experience*
23. Recognising relations of elements as a whole: *to recognise different details of wholes (e.g. a situation, a picture,...) in their relationship (relation) to each other*
24. Re-varying elements of a whole: *in such a way that a whole emerges again from it*
25. Establishing new, previously unknown relationships between elements and wholes
26. Making oneself consciously empty to allow for new ideas: *like in meditation*
27. Intuitively creating potentially universal connections: *to succeed in creating a worldview or a view of people, in which more or less everything is connected with everything*
28. Constructively implementing ideas and concepts: *to combine ideas into sensible, realisable concepts*

H – Remembering, Memorising

1. Recognising a stimulus, or static objects and their features – first minutes, then hours and then days later
2. Remembering one's immediate attachment figures
3. Expecting something: *to expect the return of inner images*
4. Facial recognition
5. Direct imitation: *the role model is present*
6. Searching for hidden objects
7. Deferred imitation: *something is imitated directly and imitation even succeeds with a time delay*
8. Mechanical repetition of single movements/words
9. Extending the time between the presentation of a stimulus and its recognition: *initially, the child can respond to presented stimuli only immediately. Later, the child can also respond to a presented stimulus with a time delay. (time data)*
10. Representing information symbolically: *to represent symbolically things that are remembered, e.g. when a child treats a piece of fur like a cat, a dog or any other living creature*

11. Adding existing knowledge in order to interpret presented material
12. Remembering several features over a longer period of time: *(exact times)*
13. Remembering people: *(before?)*
14. Recognising and intuiting the amount of information as a difficulty in memory tasks
15. Be aware of the differences in memory tasks: *e.g. to recall something, to recognize; to report something freely without a clue*
16. Comprehending the sources of memory: *to be able to give information about where a memory comes from*
17. Remembering also executed or imagined (complex) events
18. Ordering/sorting content by categories in order to remember things better
19. Fill memory gaps through rational reconstruction in order to be able to remember something better: *if you want to remember what the façade of a house looks like, it makes sense to ask yourself how many windows a house could have to the left and right of the front door, and then on the first floor*
20. Using mnemonic strategies
21. Fine-tuning mnemonic strategies: *to refine strategies according to mnemonic content*
22. Modified/selective repetition: *you combine several related details into units, then it is easier to remember, you can reconstruct the details from the units. With very large memory fields, one could also say that one remembers only the essential things.*

Literature reference to the TPO developmental grid and the research project from 2006:

Garnitschnig, Karl & Neira Zugasti, Helga (2006): *Rhythmik als Movens der Entwicklung der psychischen Funktionen. Research project of the Institute for Music and Movement and Music Therapy of the University of Music and Performing Arts Vienna and the Institute for Educational Science of the University of Vienna.*
In: Neira Zugasti, Helga & Garnitschnig, Karl (2008): *Entwicklung beobachten, erkennen und unterstützen am Beispiel der rhythmisch-musikalischen Erziehung.* Reg. no. 12348. DVD with accompanying material. BMUKK Federal Ministry for Education, Arts and Culture, Dept.7 - Media Service 2008. CD-Rom.

https://www.mdw.ac.at/mrm/mbe/inklusions-und-heilpaedagogik-diversitaet/entwicklungsraster-tpo/