Tuning into Tasks: A Musician's Guide to Task Analysis for Healthy Playing

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INTRODUCTION

- Instrumental musicmaking is a complex task that often involves preparation and dynamic analysis by performers and educators
- Lack of awareness around the relationships between physical body, instrument, and musical results can negatively impact performance and health outcomes

Occupational Therapy

- "Occupational therapy promotes health, wellbeing, and quality of life by supporting access to, initiation of, and sustained participation in the things that clients want and need to do in their daily life, with the people and in the places that they want to participate in these occupations"[1]
- Occupations are "any goal-directed use of time" , which includes musicmaking[2]

Task Analysis

- Task analysis is the process of breaking down a task to identify its component parts within context
- Occupational therapists use task analysis to help better understand the tasks that people engage in, and how those tasks may be modified for the person to better engage in the task

METHODS

Adaptation of task analysis form[3] developed from the Occupational Therapy Practice Framework and the CMOP-E (see QR code below)

Task analyses completed analysing the first two measures of Bach's Minuet in G using the adapted form (QR code A)

Perspective 1 (Music Educator / Pianist): Analysing the task itself, outside the context of a specific player

Perspective 2 (Occupational Therapist): Analysis of video[4] of Sophie playing the Minuet on YouTube (seen below)

STEPS IN ANALYSIS

1. Identify the task
2. Situate the task within a specific context, identifying the equipment required, the meaning of the task to the person, and the environment (physical, social, cultural, institutional) that the task occurs in
3. Consider each step of the task and the time to complete each step
4. Break the task apart into what is required from the person:

Mental Functions (e.g. cognitive skills, emotion, self-image, personality)

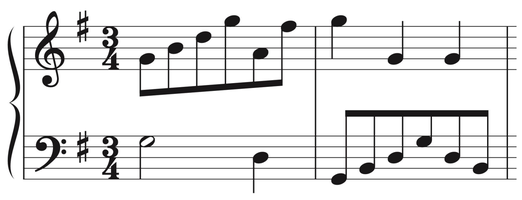
Sensory Functions (e.g. visual, hearing, vestibular, proprioceptive, interoception, pain)

Neuromusculoskeletal And Movement-Related Functions (e.g. mobility, strength, endurance, voluntary movements)

Nervous System Functions (e.g. sympathetic and parasympathetic)

Structures and Systems (e.g. joints and muscles of each part of the body and respiratory system)

EXAMPLE



Perspective 1: Music Educator / Pianist

Structure / Skill	Demand	Ways to Increase or Decrease Demand
Joints of the Shoulder Region	- Right: small extension to bring the fingers away from the fallboard between fingers 1-2, 2-3; Small flexion to bring the fingers toward the fallboard between fingers 3-5. Also small abduction/external rotation to get across distances going up (Fingers 1-2-3-5; 1-4-5), and internal rotation when coming back down (5-1) - Left: Small abduction/internal rotation to get across when moving from fingers 1-2-5 (G-D-G); then small adduction/external rotation when moving up (5-3-2-1) and small abduction/external rotation to go back down (1-2-3); Small flexion when coming out and extension when going back in.	Minimizing shoulder movements to avoid fatiguing the larger, pennate muscles. Particularly the ab/adductions should be very small (barely noticeable)
Joints of the Elbow Region	- Right: Flexion in conjunction with shoulder extension to bring the fingers out (see above); extension when going in (see above); Small forearm rotation when changing direction (5-1-4; and 5-1) in conjunction with lateral forearm movements. - Left: Flexion in conjunction with shoulder extension to bring the fingers away from fallboard (see above); extension when finger goes toward the fallboard (see above)	Using forearm rotation to make more efficient lateral movements.

Perspective 2: Occupational Therapist

Structure / Skill	Demand	Ways to Increase or Decrease Demand
Joints of the Shoulder Region	- Scapular mobility and stability (elevation, depression, retraction, and protraction) - Prolonged time in scapular protraction - Shoulder mobility and stability in minimal shoulder flexion/abduction with varying internal and external rotation (mostly internal rotation)	Adjust height of bench, adjust distance to piano, adjust postural alignment, keep elbow supported, or keep arm in line with body to minimize required scapular/shoulder mobility and stability
Joints of the Elbow Region	- Sustained forearm pronation - Sustained elbow flexion in small range centering around 90 degrees - Elbow stability and use of extensor/flexor muscles attaching at elbow	Adjust height of bench, distance to piano, or postural alignment to alter elbow flexion for comfort and increased/decreased demand on elbow flexors and extensors; elbow supported for decreased elbow flexor demand; increase shoulder flexion and abduction to minimize demand of pronation

Adapted Form

References

CONCLUSION

This project adapted occupational therapy's task analysis, which could be used by performers, educators, and clinicians looking to increase musicians' occupational participation. Our first attempt at using task analysis suggested that it could be useful both when analyzing passages that the musicians cannot easily execute, as well as those that may be producing pain or other playing-related symptoms. The adapted form can be improved in future uses by reducing its length and adapting its language to make it more accessible to musicians who have limited time and health-related education. The form may be a useful training tool for musicians and teachers to understand their musical work as a set of tasks and skills that can be broken down and adapted. After learning the framework, musicians may prefer to use it without writing on the form. Using this framework can potentially shift educational and performance practice toward an individualized, problem-solving approach and away from more traditional, prescriptive ones that are common in the classical music field. Similarly, clinicians can teach clients to use the form to help them learn and apply these practical skills in their independent work.