Evidence from both behavioral & neuroscience research demonstrates temporal and spatial “rules” that determine the likelihood and the RTs slower for events in less frequent modalities.

Substitution:

Modality appropriateness:

Modality shifting effect:

Benefits of Multimodal Displays

- Increased bandwidth - increase in the amount of information that can be transmitted over a fixed time period.
- Cross-modal integration - combining information from multiple sensory channels.
- Reduced cognitive load - making decisions faster, e.g., RTs.

Multimodal display research covers:

- Often developed in a trial and error manner.
- Don’t consider basic mechanisms of human multisensory integration and cross-modal attention.
- Evidence between stimulus in one sensory channel (e.g., comparable detection thresholds) is newly established prior to a study.
- Performance measures not always directly compared among all possible combinations of unimodal, bimodal, and trimodal displays.
- Clear inferences about relative multisensory benefits can be problematic.

Examples of Applied Studies of Multimodal Displays

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