Global and local processing in a Navon matching task
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Introduction
Studies examining global and local visual processing often make use of global shapes consisting of smaller local shapes (also known as Navon stimuli). Commonly, these stimuli are presented in isolation and participants are asked to respond or ignore shapes on the global or local level (e.g., Lachmann et al., 2014). We here report the results of an experiment in which participants were presented with two compound shapes simultaneously and were asked to either match these on a global and local level. The same task has been used in a priming study of compound face and word processing (Ventura et al., under review).

Methods
Participants were presented with pairs of Navon stimuli and asked to indicate whether the presented shapes were the same or different on a global level (large shapes) or a local level (small shapes). * 24 participants, naive to the aim of the study
* 4 blocks of 90 to 100 trials each, randomly selected from the 256 possible stimulus combinations, so that ‘same’ and ‘different’ responses were equally often required both on a global and a local level
* 2 blocks with a ‘global’ and 2 blocks with a ‘local’ matching instruction
* Order of instruction and key used for ‘same’ and ‘different’ response counterbalanced across participants
* 4 shapes: diamonds (Dd), circles (Cc), triangles (Tt), squares (Qq), resulting in a total of 16 overall shape combinations and 15 congruency conditions

Results - Average reaction times
- Global matching (light green bars) faster than local matching (dark green bars)
- Differences between the shapes (diamonds, circles, triangles or squares) or response type (same or different) less clear

Results - Linear model
- Significant effects of Instruction (global faster than local matching), global congruency (globally congruent faster), response type (same response faster) and local congruency (locally congruent faster)

Conclusions
- By turning the Navon task into a same-different task, many combinations of stimulus congruencies (within and across stimuli) are created
- Participants more quickly decide on the global shape of the stimuli, in agreement with the global precedence effect for the single stimulus Navon task
- Response times are also faster for globally congruent shapes, same responses, and locally congruent shapes
- A process model will be needed to fully understand the effects of between-shape and within-shape congruency, instruction and response type on processing times
- The same-different task presented here may help the understanding of local processing of faces in autism, or learning to read (letter by letter or words as a whole)