

Editorial Comments:

Comment 1: "Please take this opportunity to thoroughly proofread the manuscript to ensure that there are no spelling or grammatical errors."

[Response 1:](#) We have proofread the article. We have flagged all changes noted in this letter in blue ink in the text of the revised document.

Comment 2: "Textual Overlap: Significant portions show significant overlap with previously published work. Please re-write the text indicated in red in the attached document to avoid this overlap."

[Response 2:](#) We have rewritten these sections of red text.

Comment 3: "Please include an ethics statement before your numbered protocol steps indicating that the protocol follows the guidelines of your institutions human research ethics committee".

[Response 3:](#) We now include an ethics statement from Bilkent University, where the research was originally conducted. Please note that this is not our current research institute, Brunel University London, where the video will be filmed.

Comment 4: "Protocol Language:

1) Please ensure that ALL text in the protocol section is written in the imperative voice/tense as if you are telling someone how to do the technique (i.e. "Do this", "Measure that" etc.) Any text that cannot be written in the imperative tense may be added as a "Note", however, notes should be used sparingly and actions should be described in the imperative tense wherever possible. Some examples that are NOT in imperative voice: 2.1.1., 2.1.2, 7.1, 8.1.

2) Every main step should have at least 1-2 substeps under it (please edit steps 5, 6)."

[Response 4:](#) We now ensure all text is in imperative tense, and that there are at least 1-2 sub-steps under each main step.

Comment 5: "Protocol Detail: Please note that your protocol will be used to generate the script for the video, and must contain everything that you would like shown in the video. Please add more specific details (e.g. button clicks for software actions, numerical values for settings, etc) to your protocol steps. There should be enough detail in each step to supplement the actions seen in the video so that viewers can easily replicate the protocol."

[Response 5:](#) We have given all details of button presses (numbers on the keyboard and space bar presses), and detailed all general actions regarding the stimulus presentation and eye tracking software, equipment, and numeric settings. We note that the particular settings for the eye tracking recording system will be dependent on the manufacturer's recommendations.

Comment 6: *“Protocol Highlight: Please highlight ~2.5 pages or less of text (which includes headings and spaces) in yellow, to identify which steps should be visualized to tell the most cohesive story of your protocol steps. Please see JoVE’s instructions for authors for more clarification. Remember that the non-highlighted protocol steps will remain in the manuscript and therefore will still be available to the reader.*

- 1) *The highlighted steps should form a cohesive narrative, that is, there must be a logical flow from one highlighted step to the next.*
- 2) *Please highlight complete sentences (not parts of sentences). Include sub-headings and spaces when calculating the final highlighted length.*
- 3) *Notes cannot be filmed and should be excluded from highlighting.*
- 4) *Please bear in mind that software steps without a graphical user interface/calculations/ command line scripting (such as steps 2-2.1.2, 3-6, 10-10.4.2) cannot be filmed.*
- 5) *Please ensure that the manuscript title best reflects the filmable content (i.e. the portions you highlight).”*

[Response 6:](#) *We have now highlighted the steps of the protocol to be filmed.*

Comment 7: *“Discussion: JoVE articles are focused on the methods and the protocol, thus the discussion should be similarly focused. Please ensure that the discussion covers the following in detail and in paragraph form (3-6 paragraphs):*

- 1) *modifications and troubleshooting,*
- 2) *limitations of the technique,*
- 3) *significance with respect to existing methods,*
- 4) *future applications and*
- 5) *critical steps within the protocol. “*

[Response 7:](#) *The discussion covers each of these points.*

Comment 8: *“Figure/Table Legends: Please expand the legends to adequately describe the figures/tables. Each figure or table must have an accompanying legend including a short title, followed by a short description of each panel and/or a general description.”*

[Response 8:](#) *The figures each have a short title and description.*

Comment 9: *“Commercial Language: JoVE is unable to publish manuscripts containing commercial sounding language, including trademark or registered trademark symbols (TM/R) and the mention of company brand names before an instrument or reagent. Examples of commercial sounding language in your manuscript are Matlab®.*

- 1) *Please use MS Word’s find function (Ctrl+F), to locate and replace all commercial sounding language in your manuscript with generic names that are not company-specific. All commercial products should be*

sufficiently referenced in the table of materials/reagents. You may use the generic term followed by “(see table of materials)” to draw the readers’ attention to specific commercial names.”

[Response 9:](#) We have removed any commercial language.

Comment 10: “Table of Materials: Please revise the table of the essential supplies, reagents, and equipment. The table should include the name, company, and catalog number of all relevant materials/software in separate columns in an xls/xlsx file. Please include items such as software used, eye-tracking equipment.

- Please define all abbreviations at first use.*
- If your figures and tables are original and not published previously or you have already obtained figure permissions, please ignore this comment. If you are re-using figures from a previous publication, you must obtain explicit permission to re-use the figure from the previous publisher (this can be in the form of a letter from an editor or a link to the editorial policies that allows you to re-publish the figure). Please upload the text of the re-print permission (may be copied and pasted from an email/website) as a Word document to the Editorial Manager site in the "Supplemental files (as requested by JoVE)" section. Please also cite the figure appropriately in the figure legend, i.e. "This figure has been modified from [citation]."*

[Response 10:](#) We are unsure how to proceed. The protocol will be filmed in a different laboratory than the where the study was originally conducted. Should we include the specifics of the software and hardware that we will use, or that we previously used? For example, we will use a different eye tracking system and different versions of stimulus presentation software to film the video than we did to conduct the original research. However, until a filming date is known, we will not know such specifics because we need to book one of three eye tracking systems, each using slightly different software, depending on which is available on that date at our current university.

Reviewer #1:

Comment 1: “-2.1.1. "... with the same number of circles per group (e.g., two groups of 10 circles each, and five groups of four circles 110 each)." That doesn't seem right: 10 circles and 4 circles is not 'the same number of circles per group.'"

[Response 1:](#) We have reworded this sentence to clarify that we mean the circles should be equally divided into groups (e.g., 4 groups of 5 circles in each of these 4 groups, instead of 4 groups with 3 circles in one group, 5 circles in the second group, 6 circles in the third group, and 2 circles in the fourth group).

Comment 2: “The authors have not taken into account the difference in luminance between the various colors used, which may introduce error variance in the pupil data. Have they considered using equiluminant colors (e.g. Teufel colors)? Is it

possible that attention to one particular color influences pupil size depending on the luminance of that color? Or are those potential confounds negligible compared to the main effects of task and number of teams?"

[Response 2:](#) We have clarified that randomization of team colors on each trial ensures there are no luminance confounds while maintaining more “real-world” circumstances in section 3.2.

[Comment 3:](#) “Under ‘representative results’ the authors describe inferential statistics, which suggests that they actually tested a number of subjects. But information about those subject is missing.”

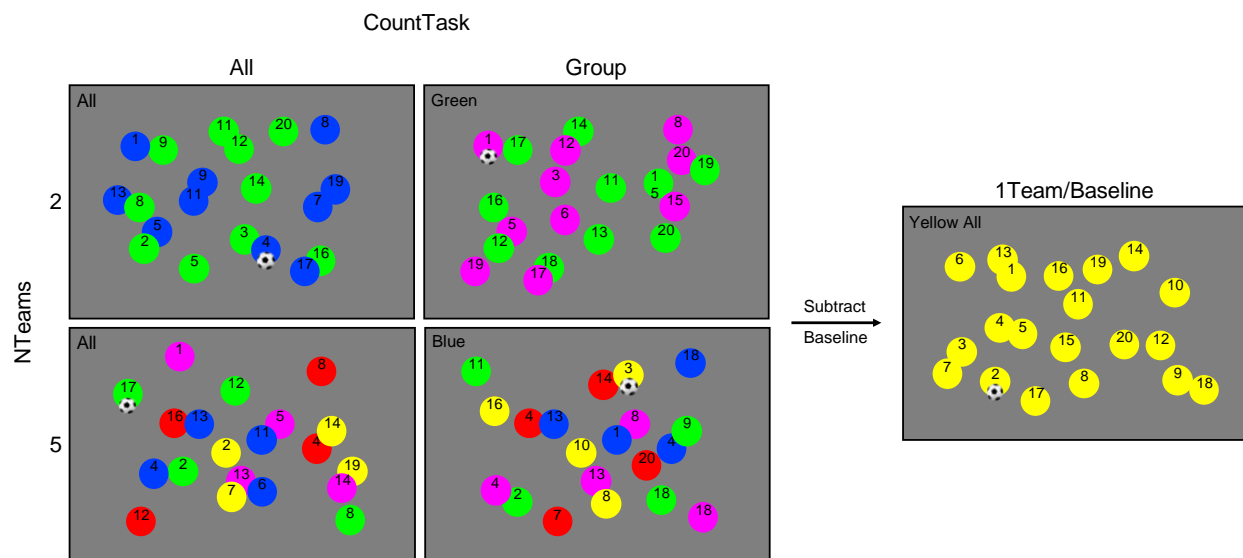
[Response 3:](#) We now include a short description of the participants tested in the original study from which the current protocol is taken.

[Comment 4:](#) “Line 280: “.., as compared the five teams of four 281 players”. ‘the’ should be ‘to’

[Response 4:](#) Corrected

[Comment 5:](#) “I could not find Figure 1, the design matrix”

[Response 5:](#) Perhaps the Figure 1 was not available in the version of the manuscript sent to Reviewers? We have appended it here:



Reviewer #2:

[Concern 1:](#) “It is true that many papers nowadays assume some well-established theory or other as starting points for the investigations they describe - a trend strengthened by the ‘new wave’ of replication-based studies - and that many researchers tend to lose sight of core issues in scientific research (which is

ultimately meant to advance the general body of knowledge). However, the authors should do a better job at explaining exactly what phenomenon they are illustrating by distinguishing the motivation of their approach from its relevance, and by detailing its consequences. A naïve reader might be led to believe that the authors advocate a revolutionary approach to Experimental Psychology.”

Response 1: We reworded portions of the manuscript to better convey the motivation and relevance of our approach. In short, we were motivated by the observation that different colored jerseys in soccer matches seemed to afford the viewer some differential and potentially task-dependent benefits in tracking the interactions between players. However, we could not understand this effect in terms of any available theories of perceptual organization. In fact, as we now discuss, the existing MOT literature suggests that grouping may even *impair* observers’ abilities to track players’ interactions. Therefore, we adopted an abductive approach by forming a more concrete hypothesis based on our observations.

Concern 2. *“Do the authors imply that there is a dearth of new theories available to cover the whole range of observable phenomena and call for new theories to be built based on empirical observations, or do they simply claim that hypothesis-testing need not happen within an already available theoretical framework, thereby advocating a return to the roots of scientific investigation (they mention the work of Gestalt psychologists)? The authors need to explain the difference between theory and hypothesis.”*

Response 2: We have now clarified in the introduction and conclusion of the manuscript that we are advocating for a return to the roots of scientific investigation in the same spirit as Gestalt Psychologists, such that hypothesis testing does not necessarily need to happen within an already established theoretical framework.

Concern 3. *“The authors claim that “existing theories could not explain our observations” (p2, line 71). However, links can still be established between their empirical observation and several already available theoretical principles. In vision research, multiple-object-tracking MOT studies have demonstrated that the number of tracked objects is no longer at issue as long as they are part of the same group. Gestalt principles themselves partly explain the authors’ empirical hypothesis. In memory research, mnemonic strategies include ‘chunking’ and ‘grouping’, which help people better keep track of concepts in working memory. In brief, I don’t feel like there is a scientific void that would need to be filled, but rather dots to be connected and better use to be made of several theoretical principles out there to fully explain the empirical observation the authors discuss.”*

Response 3: Although we had already conducted an intense search of the visual perception literature to find any existing theories that could account for our observations when preparing the manuscript from which the present methodology is taken, we again searched specifically within the MOT literature to find studies

that have demonstrated that the number of tracked objects is not a factor when objects are part of the same group. On the contrary, we could find no such study, but we now reference additional MOT studies suggesting that when objects are part of the same group, tracking is impaired (e.g., Erlikhman, et al., 2013; Scholl, et al., 2001). We do ask that the Reviewer please disclose any particular study or set of studies referencing such MOT effects, as we would need to revise the current manuscript as well as perhaps publish a corrigendum to the already published manuscript from which the present methodology is taken. We agree that Gestalt principles and chunking are somehow a partial explanation for our observations, but it was not clear how either could lead to better performance. As we note in the Introduction, "...it is not always possible to deduce specific ideas from general principles when the goal is to understand these general principles."