"Snakes and ladders" articles

List of the articles described in detail below:

Bellacosa Marotti, R., Pavan, A., & Casco, C. (2012). The integration of straight contours (snakes and ladders): The role of spatial arrangement, spatial frequency and spatial phase. Vision Research, 71, 44–52. doi:10.1016/j.visres.2012.07.021

Bex, P. J., Simmers, A. J., & Dakin, S. C. (2001). Snakes and ladders: the role of temporal modulation in visual contour integration. Vision Research, 41(27), 3775–3782.

Chakravarthi, R., & Pelli, D. G. (2011). The same binding in contour integration and crowding. Journal of Vision, 11(8), 10. doi:10.1167/11.8.10

Dakin, S. C., & Baruch, N. J. (2009). Context influences contour integration. Journal of Vision, 9(2), 13.1–13. doi:10.1167/9.2.13

Gheorghiu, E., & Kingdom, F. A. A. (2011). Spatial properties of texture-surround suppression of contour-shape coding. Journal of Vision, 11(11), 1038–1038. doi:10.1167/11.11.1038

Gheorghiu, E., & Kingdom, F. A. A. (2012). Local and global components of texture-surround suppression of contour-shape coding. Journal of Vision, 12(6), 20. doi:10.1167/12.6.20

Hess-OxfordHandbookChapter-2013.pdf. (n.d.). Retrieved from http://www.fss.uu.nl/psn/web/people/personal/dumoulin/PDFs/Hess-OxfordHandbookChapter-2013.pdf

May, K. A., & Hess, R. F. (2006). Snakes are as fast as ladders: Evidence against the hypothesis that contrast facilitation mediates contour detection. Journal of Vision, 6(6), 337–337. doi:10.1167/6.6.337

May, K. A., & Hess, R. F. (2007a). Dynamics of snakes and ladders. Journal of Vision, 7(12), 13.1–9. doi:10.1167/7.12.13

May, K. A., & Hess, R. F. (2007b). Ladder contours are undetectable in the periphery: a crowding effect? Journal of Vision, 7(13), 9.1–15. doi:10.1167/7.13.9

May, K. A., & Hess, R. F. (2008). Effects of element separation and carrier wavelength on detection of snakes and ladders: implications for models of contour integration. Journal of Vision, 8(13), 4.1–23. doi:10.1167/8.13.4

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Slide 1 - 201209_ECVP_VancleefKathleen.pdf. (n.d.). Retrieved from http://www.gestaltrevision.be/posters/2012/201209_ECVP_VancleefKathleen.pdf

Vancleef, K., & Wagemans, J. (2013). Component processes in contour integration: a direct comparison between snakes and ladders in a detection and a shape discrimination task. Vision Research, 92, 39–46. doi:10.1016/j.visres.2013.09.003

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rel=“stylesheet” type=“text/css” media=“screen,projection” href=“zotero:report/detail_screen.css”/> <link rel=“stylesheet” type=“text/css” media=“print” href=“zotero:report/detail_print.css”/> </head> <body> <ul class=“report combineChildItems”> <li id=“i20703” class=“item journalArticle”> <h2>The integration of straight contours (snakes and ladders): The role of spatial arrangement, spatial frequency and spatial phase</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class=“author”>Author</th> <td>Rosilari Bellacosa Marotti</td> </tr> <tr> <th class=“author”>Author</th> <td>Andrea Pavan</td> </tr> <tr> <th class=“author”>Author</th> <td>Clara Casco</td> </tr> <tr> <th>Volume</th> <td>71</td> </tr> <tr> <th>Pages</th> <td>44-52</td> </tr> <tr> <th>Publication</th> <td>Vision research</td> </tr> <tr> <th>ISSN</th> <td>1878-5646</td> </tr> <tr> <th>Date</th> <td>Oct 15, 2012</td> </tr> <tr> <th>Extra</th> <td>PMID: 22902640</td> </tr> <tr> <th>Journal Abbr</th> <td>Vision Res.</td> </tr> <tr> <th>DOI</th> <td>10.1016/j.visres.2012.07.021</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>In the present study we addressed the issue of whether the Gestalt principle of grouping by similarity (iso-orientation) subtends extraction of straight contours made up of disconnected, iso-oriented Gabor elements, whether collinear (snakes) or parallel (ladders). To prevent the use of the most obvious grouping principle of good continuation, which allows us to perceive the relation between local and global orientation along the contour, we manipulated the spatial arrangement of randomly oriented Gabors in the background: they were positioned on an ordered grid, and grouped on the basis of good continuation, or randomly positioned and not grouped. Grid-positioned backgrounds exert a suppressive contextual influence on detection of good continuation along the contour path. Results obtained in a two-interval forced choice task showed that the orderly-positioned background did not completely prevent detection of snakes and ladders. Detection of snakes was hampered at low spatial frequency whereas detection of ladders was improved by the randomly-positioned background at high spatial frequency. These contextual influences support the suggestion that both iso-orientation and good continuation rules are employed by the association field underlying the binding of straight contours. In addition, they are not compatible with integration of snakes and ladders elements within a single receptive field. In support of this suggestion we found that phase constancy within contour elements (as opposed to phase randomization) improved snake detectability at low spatial frequency, and, unexpectedly, impaired ladder detectability at high spatial frequency. This suggests that a low-level mechanism based on the balance between excitatory and inhibitory lateral interactions at a first stage may account for the detection of both straight contours.</td> </tr> <tr> <th>Short Title</th> <td>The integration of straight contours (snakes and ladders)</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class=“tags”>Tags:</h3> <ul class=“tags”> Form Perception Humans Models, Psychological Orientation Pattern Recognition, Visual Photic Stimulation Psychophysics <h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20704”>PubMed entry   <li id=“i20715” class=“item journalArticle”> <h2>Snakes and ladders: the role of temporal modulation in visual contour integration</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class=“author”>Author</th> <td>P J Bex</td> </tr> <tr> <th class=“author”>Author</th> <td>A J Simmers</td> </tr> <tr> <th class=“author”>Author</th> <td>S C Dakin</td> </tr> <tr> <th>Volume</th> <td>41</td> </tr> <tr> <th>Issue</th> <td>27</td> </tr> <tr> <th>Pages</th> <td>3775-3782</td> </tr> <tr> <th>Publication</th> <td>Vision research</td> </tr> <tr> <th>ISSN</th> <td>0042-6989</td> </tr> <tr> <th>Date</th> <td>Dec 2001</td> </tr> <tr> <th>Extra</th> <td>PMID: 11712989</td> </tr> <tr> <th>Journal Abbr</th> <td>Vision Res.</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI

PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>We investigated temporal aspects of the cortical mechanisms supporting visual contour integration by measuring observers' efficiency at detecting fragmented contours, composed of Gabor micropatterns, embedded in a field of distractor elements. Gabors consisted of a static Gaussian enveloping a sinusoidal carrier which was temporally modulated by motion or counter-phase flicker. The elements forming the path could be oriented either parallel ('snakes') or perpendicular to the contour orientation ('ladders'). Sensitivity to contour structure (estimated by measuring the maximum tolerable element orientation jitter supporting contour detection) was increased when the elements were drifting or flickering. Snakes were more detectable than ladders under all conditions. The increase in sensitivity conferred by drifting carriers was present even when the elements in the same stimulus were drifting at a range of speeds spanning almost three octaves. These results lend further support to the notion that the contour integration system receives separate transient and sustained input.</td> </tr> <tr> <th>Short Title</th> <td>Snakes and ladders</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class="tags">Tags:</h3> <ul class="tags"> Discrimination (Psychology) Female Humans Male Motion Perception Pattern Recognition, Visual Perceptual Masking Photic Stimulation Psychophysics Rotation <h3 class="attachments">Attachments</h3> <ul class="attachments"> <li id="i20716">PubMed entry   <li id="i20720" class="item journalArticle"> <h2>The same binding in contour integration and crowding</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class="author">Author</th> <td>Ramakrishna Chakravarthi</td> </tr> <tr> <th class="author">Author</th> <td>Denis G. Pelli</td> </tr> <tr> <th>URL</th> <td>http://www.journalofvision.org/content/11/8/10</td> </tr> <tr> <th>Volume</th> <td>11</td> </tr> <tr> <th>Issue</th> <td>8</td> </tr> <tr> <th>Pages</th> <td>10</td> </tr> <tr> <th>Publication</th> <td>Journal of Vision</td> </tr> <tr> <th>ISSN</th> <td>, 1534-7362</td> </tr> <tr> <th>Date</th> <td>07/14/2011</td> </tr> <tr> <th>Extra</th> <td>PMID: 21757504</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/11.8.10</td> </tr> <tr> <th>Accessed</th> <td>Tuesday, March 18, 2014 10:07:39 AM</td> </tr> <tr> <th>Library Catalog</th> <td>jov.highwire.org</td> </tr> <tr> <th>Language</th> <td>en</td> </tr> <tr> <th>Abstract</th> <td>Binding of features helps object recognition in contour integration but hinders it in crowding. In contour integration, aligned adjacent objects group together to form a path. In crowding, flanking objects make the target unidentifiable. However, to date, the two tasks have only been studied separately. K. A. May and R. F. Hess (2007) suggested that the same binding mediates both tasks. To test this idea, we ask observers to perform two different tasks with the same stimulus. We present oriented grating patches that form a "snake letter" in the periphery. Observers report either the identity of the whole letter (contour integration task) or the phase of one of the grating patches (crowding task). We manipulate the strength of binding between gratings by varying the alignment between them, i.e., the Gestalt goodness of continuation, measured as "wiggle." We find that better alignment strengthens binding, which improves contour integration and worsens crowding. Observers show equal sensitivity to alignment in these two very different tasks, suggesting that the same binding mechanism underlies both phenomena. It has been claimed that grouping among flankers reduces their crowding of the target. Instead, we find that these published cases of weak crowding are due to weak binding resulting from target–flanker misalignment. We conclude that crowding is mediated solely by the grouping of flankers with the target and is independent of grouping among flankers.</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:07:39 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:07:39 AM</td> </tr> </table><h3 class="tags">Tags:</h3> <ul class="tags">

alignment binding contour integration Crowding Gestalt Good continuation Grouping object recognition snake letter wiggle <h3 class="attachments">Attachments</h3> <ul class="attachments"> <li id="i20722">PubMed entry <li id="i20721">Snapshot   <li id="i20707" class="item journalArticle"> <h2>Context influences contour integration</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class="author">Author</th> <td>Steven C Dakin</td> </tr> <tr> <th class="author">Author</th> <td>Nina J Baruch</td> </tr> <tr> <th>Volume</th> <td>9</td> </tr> <tr> <th>Issue</th> <td>2</td> </tr> <tr> <th>Pages</th> <td>13.1-13</td> </tr> <tr> <th>Publication</th> <td>Journal of vision</td> </tr> <tr> <th>ISSN</th> <td>1534-7362</td> </tr> <tr> <th>Date</th> <td>2009</td> </tr> <tr> <th>Extra</th> <td>PMID: 19271923</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/9.2.13</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>Much research over the last decade has examined how the brain links local activity within primary visual cortex to signal the presence of extended global structure. Here we bring together two themes within this area by addressing how the immediate context that features arise in influences how they are integrated into contours. Specifically, observers were required to detect and discriminate the shape of contours that were surrounded by elements with a fixed orientation offset compared to contour elements. By comparing performance with contours made of elements oriented either near parallel ("snakes") or near perpendicular ("ladders") to the contour orientation, we were able to isolate the effect of orientation contrast on observers' ability to perform our task with near-collinear contour structure. We report both substantial facilitation of contour integration in the presence of near-perpendicular surrounds and inhibition in the presence of near-parallel surrounds. These results are consistent with known orientation dependence of suppressive surround interactions in the primary visual cortex and suggest that the "rules of association" for contour integration must incorporate the influence of local orientation context. Specifically we show that our results are consistent with contour integration relying on an opponent-orientation energy response from a bank of first-stage oriented filters.</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class="tags">Tags:</h3> <ul class="tags"> Discrimination (Psychology) Form Perception Humans Models, Psychological Orientation Psychophysics Sensory Thresholds Time Factors Visual Cortex Visual Fields Visual Perception <h3 class="attachments">Attachments</h3> <ul class="attachments"> <li id="i20708">PubMed entry   <li id="i20705" class="item journalArticle"> <h2>Local and global components of texture-surround suppression of contour-shape coding</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class="author">Author</th> <td>Elena Gheorghiu</td> </tr> <tr> <th class="author">Author</th> <td>Frederick A A Kingdom</td> </tr> <tr> <th>Volume</th> <td>12</td> </tr> <tr> <th>Issue</th> <td>6</td> </tr> <tr> <th>Pages</th> <td>20</td> </tr> <tr> <th>Publication</th> <td>Journal of vision</td> </tr> <tr> <th>ISSN</th> <td>1534-7362</td> </tr> <tr> <th>Date</th> <td>2012</td> </tr> <tr> <th>Extra</th> <td>PMID: 22707427</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/12.6.20</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>Evidence that contour-shapes and texture-shapes are processed by different mechanisms included the finding that contour-shape aftereffects are reduced when the adaptation stimulus is a texture made of contours rather than a single contour. This phenomenon has been termed texture-surround suppression of contour-shape, or TSSCS.

How does TSSCS operate and over what spatial extent? We measured the postadaptation shift in the apparent shape frequency of a single sinusoidal-shaped contour as a function of the number of contours in the adaptor stimulus. Contours were Gabor strings in which the Gabor orientations were either tangential (snakes) or orthogonal (ladders) to the path of the contour. We found that for extended surrounds, the aftereffect was strongly reduced when the surround contours were the same as the central adaptor contour, but not when the Gabors making up the surround contours were opposite-in-orientation to those of the central adaptor. For near surrounds, the aftereffect in a snake contour was unaffected by same-orientation but strongly suppressed by opposite-orientation surrounds, whereas the aftereffect for a ladder-contour was suppressed equally by both same- and opposite-orientation near surrounds. Finally, the strength of surround suppression decreased gradually with increasing spatial separation between center and surround. These results indicate that there are two components to texture-surround suppression in our shape aftereffect: one that is sensitive to opposite-orientation texture surrounds, operates locally, and disrupts contour-processing; the other that is sensitive to same-orientation texture surrounds, is spatially extended, and prevents the shape of the contour from being processed as a contour. We also demonstrate that the observed shape aftereffects are not due to changes in the apparent shape-frequency of the adaptors or the precision with which their shape-frequency is encoded, indicating that TSSCS is not an instance of crowding.</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class="tags">Tags:</h3> <ul class="tags"> Adaptation, Physiological Contrast Sensitivity Figural Aftereffect Form Perception Humans Orientation Photic Stimulation <h3 class="attachments">Attachments</h3> <ul class="attachments"> <li id="i20706">PubMed entry   <li id="i20723" class="item journalArticle"> <h2>Spatial properties of texture-surround suppression of contour-shape coding</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class="author">Author</th> <td>Elena Gheorghiu</td> </tr> <tr> <th class="author">Author</th> <td>Frederick A. A. Kingdom</td> </tr> <tr> <th>URL</th> <td>http://www.journalofvision.org/content/11/11/1038</td> </tr> <tr> <th>Volume</th> <td>11</td> </tr> <tr> <th>Issue</th> <td>11</td> </tr> <tr> <th>Pages</th> <td>1038-1038</td> </tr> <tr> <th>Publication</th> <td>Journal of Vision</td> </tr> <tr> <th>ISSN</th> <td>, 1534-7362</td> </tr> <tr> <th>Date</th> <td>09/23/2011</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/11.11.1038</td> </tr> <tr> <th>Accessed</th> <td>Tuesday, March 18, 2014 10:07:59 AM</td> </tr> <tr> <th>Library Catalog</th> <td>www.journalofvision.org</td> </tr> <tr> <th>Language</th> <td>en</td> </tr> <tr> <th>Abstract</th> <td>Aim. Although evidence suggests that contour-shapes and texture-shapes are processed by different mechanisms, they nevertheless interact in an important way. Specifically, textures can inhibit the processing of the shapes of contours they surround; this is termed 'texture-surround suppression of contour-shape'. How does this suppression operate and what is its spatial extent? Method. Subjects adapted to pairs of sinusoidal-shaped textures or of single contours that differed in shape frequency, and the resulting shift in the apparent shape-frequency of single-contour test pairs was measured. All contours consisted of strings of Gabor microelements that were oriented either parallel ('snakes') or perpendicular ('ladders') to the path of the contour. The texture adaptors consisted of a central contour and a surround made of a series of contours arranged in parallel. We varied (i) the number of contours in the surround-texture and (ii) the orientation of Gabors in the texture-surround relative to the central-contour. Results. We found that (i) for extended texture-surrounds, the coding of snake contour-shapes is strongly suppressed by snake surrounds, and ladder contours by ladder surrounds, but the suppression is much reduced if the center and surround contours are of opposite type. (ii) Both snake and ladder surrounds with 7 contours or less have the same suppressive effect on a ladder contour. (iii) Near ladder-surrounds suppress the coding of snake contour-shapes more than do near snake-surrounds. Conclusion. There are two components to texture-surround suppression: one operates locally, is broadband in orientation and disrupts contour-linking, the other is spatially extended and prevents the shape of the contour from being processed as a contour.</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:07:59 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:07:59 AM</td> </tr> </table><h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20724”>Snapshot   <li id=“i20709” class=“item journalArticle”> <h2>Effects of element separation and carrier wavelength on detection of snakes and ladders: implications for models of contour integration</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class=“author”>Author</th> <td>Keith A May</td> </tr> <tr> <th class=“author”>Author</th> <td>Robert F Hess</td> </tr> <tr> <th>Volume</th> <td>8</td> </tr> <tr> <th>Issue</th> <td>13</td> </tr> <tr> <th>Pages</th> <td>4.1-23</td> </tr> <tr> <th>Publication</th> <td>Journal of vision</td> </tr> <tr> <th>ISSN</th> <td>1534-7362</td> </tr> <tr> <th>Date</th> <td>2008</td> </tr> <tr> <th>Extra</th> <td>PMID: 19146334</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/8.13.4</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>In this paper, we examine the mechanisms underlying the perceptual integration of two types of contour: snakes (composed of Gabor elements parallel to the path of the contour) and ladders (with elements perpendicular to the path). We varied the element separation and carrier wavelength. Increasing the element separation impaired detection of snakes but did not affect ladders; at high separations, snakes and ladders were closely matched in difficulty. One subject showed no effect of carrier wavelength, and the other showed a decline in performance as the wavelength increased. We discuss how these results might be accommodated by association field models. We also present a new model in which the linkage results from overlap in the filter responses to adjacent elements. We show that, if 1st-order filters are used, the model's performance on widely spaced snake contours deteriorates greatly as the carrier wavelength of the elements decreases, in contrast to our psychophysical results. To integrate widely spaced contours with short carrier wavelengths, the model requires a 2nd-order process, in which a nonlinearity intervenes between small-scale 1st-stage filters and large-scale 2nd-stage filters. This model detects snakes when the 1st and 2nd stage filters have the same orientation, and detects ladders when they are orthogonal.</td> </tr> <tr> <th>Short Title</th> <td>Effects of element separation and carrier wavelength on detection of snakes and ladders</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class=“tags”>Tags:</h3> <ul class=“tags”> Discrimination (Psychology) Form Perception Humans Male Models, Psychological Photic Stimulation Space Perception <h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20710”>PubMed entry   <li id=“i20711” class=“item journalArticle”> <h2>Dynamics of snakes and ladders</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class=“author”>Author</th> <td>Keith A May</td> </tr> <tr> <th class=“author”>Author</th> <td>Robert F Hess</td> </tr> <tr> <th>Volume</th> <td>7</td> </tr> <tr> <th>Issue</th> <td>12</td> </tr> <tr> <th>Pages</th> <td>13.1-9</td> </tr> <tr> <th>Publication</th> <td>Journal of vision</td> </tr> <tr> <th>ISSN</th> <td>1534-7362</td> </tr> <tr> <th>Date</th> <td>2007</td> </tr> <tr> <th>Extra</th> <td>PMID: 17997655</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/7.12.13</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>D. J. Field, A. Hayes, and R. F. Hess (1993) introduced two types of stimulus to study the perceptual integration of contours. Both types of stimulus consist of a smooth path of spatially separate elements, embedded in a field of randomly oriented elements. In one type of stimulus ("snakes"), the elements form tangents to the path of the contour; in the other type ("ladders"), the elements are orthogonal to the path. Little is currently known about the relative integration speeds of these two types of contour. We investigated this issue by temporally modulating the orientations of the contour elements. Our results suggest that snakes and ladders are integrated at similar speeds.</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class="tags">Tags:</h3> <ul class="tags"> Adult Female Form Perception Humans Male Orientation Perceptual Masking Photic Stimulation Psychometrics Time Factors <h3 class="attachments">Attachments</h3> <ul class="attachments"> <li id="i20712">PubMed entry   <li id="i20713" class="item journalArticle"> <h2>Ladder contours are undetectable in the periphery: a crowding effect?</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class="author">Author</th> <td>Keith A May</td> </tr> <tr> <th class="author">Author</th> <td>Robert F Hess</td> </tr> <tr> <th>Volume</th> <td>7</td> </tr> <tr> <th>Issue</th> <td>13</td> </tr> <tr> <th>Pages</th> <td>9.1-15</td> </tr> <tr> <th>Publication</th> <td>Journal of vision</td> </tr> <tr> <th>ISSN</th> <td>1534-7362</td> </tr> <tr> <th>Date</th> <td>2007</td> </tr> <tr> <th>Extra</th> <td>PMID: 17997637</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/7.13.9</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>We studied the perceptual integration of contours consisting of Gabor elements positioned along a smooth path, embedded among distractor elements. Contour elements either formed tangents to the path ("snakes") or were perpendicular to it ("ladders"). Perfectly straight snakes and ladders were easily detected in the fovea but, at an eccentricity of 6 degrees , only the snakes were detectable. The disproportionate impairment of peripheral ladder detection remained when we brought foveal performance away from ceiling by jittering the orientations of the elements. We propose that the failure to detect peripheral ladders is a form of crowding, the phenomenon observed when identification of peripherally located letters is disrupted by flanking letters. D. G. Pelli, M. Palomares, and N. J. Majaj (2004) outlined a model in which simple feature detectors are followed by integration fields, which are involved in tasks, such as letter identification, that require the outputs of several detectors. They proposed that crowding occurs because small integration fields are absent from the periphery, leading to inappropriate feature integration by large peripheral integration fields. We argue that the "association field," which has been proposed to mediate contour integration (D. J. Field, A. Hayes, & R. F. Hess, 1993), is a type of integration field. Our data are explained by an elaboration of Pelli et al.'s model, in which weak ladder integration competes with strong snake integration. In the fovea, the association fields were small, and the model integrated snakes and ladders with little interference. In the periphery, the association fields were large, and integration of ladders was severely disrupted by interference from spurious snake contours. In contrast, the model easily detected snake contours in the periphery. In a further demonstration of the possible link between contour integration and crowding, we ran our contour integration model on groups of three-letter stimuli made from short line segments. Our model showed several key properties of crowding: The critical spacing for crowding to occur was independent of the size of the target letter, scaled with eccentricity, and was greater on the peripheral side of the target.</td> </tr> <tr> <th>Short Title</th> <td>Ladder contours are undetectable in the periphery</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class="tags">Tags:</h3> <ul class="tags"> Adult Algorithms

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Computer Simulation Form Perception Fovea Centralis Humans Male Models, Biological Orientation Perceptual Masking Photic Stimulation Psychophysics <h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20714”>PubMed entry   <li id=“i20727” class=“item journalArticle”> <h2>Snakes are as fast as ladders: Evidence against the hypothesis that contrast facilitation mediates contour detection</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class=“author”>Author</th> <td>Keith A. May</td> </tr> <tr> <th class=“author”>Author</th> <td>Robert F. Hess</td> </tr> <tr> <th>URL</th> <td>http://www.journalofvision.org/content/6/6/337</td> </tr> <tr> <th>Volume</th> <td>6</td> </tr> <tr> <th>Issue</th> <td>6</td> </tr> <tr> <th>Pages</th> <td>337-337</td> </tr> <tr> <th>Publication</th> <td>Journal of Vision</td> </tr> <tr> <th>ISSN</th> <td>, 1534-7362</td> </tr> <tr> <th>Date</th> <td>06/01/2006</td> </tr> <tr> <th>Journal Abbr</th> <td>J Vis</td> </tr> <tr> <th>DOI</th> <td>10.1167/6.6.337</td> </tr> <tr> <th>Accessed</th> <td>Tuesday, March 18, 2014 10:08:51 AM</td> </tr> <tr> <th>Library Catalog</th> <td>www.journalofvision.org</td> </tr> <tr> <th>Language</th> <td>en</td> </tr> <tr> <th>Abstract</th> <td>It is easy to detect a “snake” consisting of spatially separated, collinear elements, embedded in a field of randomly oriented elements (Field, Hayes & Hess, 1993, Vision Research, 33, 173–193). Performance is poor when elements are oriented 45 degrees to the contour, but improves when elements are orthogonal to the contour (“ladders”) (Ledgeway, Hess & Geisler, 2005, Vision Research, 45, 2511–2522). Contour detection has been related to the phenomenon of contrast facilitation, whereby the contrast threshold for detection of an element is reduced when it is flanked by other elements: many models assume that contours are detected through the modulation of neuronal activity by the facilitatory signals that underlie contrast facilitation. If this were the case, one would expect contour detection to show similar temporal properties to contrast facilitation. Cass & Spehar (2005, Vision Research, 45, 3060–3073) used a psychophysical procedure to estimate the speed of propagation of contrast facilitation signals; their results suggest that the facilitatory signals from collinear flankers propagate much more slowly than those from non-collinear flankers. We investigated the effect of temporally modulating the orientation of contour elements from collinear to diagonal, or from orthogonal to diagonal. If contour detection and contrast facilitation are mediated by the same mechanisms, then the integration of snake contours should be much slower, and should be disrupted at much lower temporal frequencies, than the integration of ladder contours. We found identical temporal properties for both contour types, suggesting that contour integration is mediated by different mechanisms from contrast facilitation.</td> </tr> <tr> <th>Short Title</th> <td>Snakes are as fast as ladders</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:08:51 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:08:51 AM</td> </tr> </table><h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20728”>Snapshot   <li id=“i20701” class=“item journalArticle”> <h2>Component processes in contour integration: a direct comparison between snakes and ladders in a detection and a shape discrimination task</h2> <table> <tr> <th>Type</th> <td>Journal Article</td> </tr> <tr> <th class=“author”>Author</th> <td>Kathleen Vancleef</td> </tr> <tr> <th class=“author”>Author</th> <td>Johan Wagemans</td> </tr> <tr> <th>Volume</th> <td>92</td> </tr> <tr> <th>Pages</th> <td>39-46</td> </tr> <tr> <th>Publication</th> <td>Vision research</td> </tr> <tr> <th>ISSN</th> <td>1878-5646</td> </tr> <tr> <th>Date</th> <td>Nov 2013</td> </tr> <tr> <th>Extra</th> <td>PMID: 24051198</td> </tr> <tr> <th>Journal Abbr</th> <td>Vision Res.</td> </tr> <tr> <th>DOI</th> <td>10.1016/j.visres.2013.09.003</td> </tr> <tr> <th>Library Catalog</th> <td>NCBI PubMed</td> </tr> <tr> <th>Language</th> <td>eng</td> </tr> <tr> <th>Abstract</th> <td>In contour*

integration, a relevant question is whether snakes and ladders are processed similarly. Higher presentation time thresholds for ladders in detection tasks indicate this is not the case. However, in a detection task only processing differences at the level of element linking and possibly contour localization might be picked up, while differences at the shape encoding level cannot be noticed. In this study, we make a direct comparison of detection and shape discrimination tasks to investigate if processing differences in the visual system between snakes and ladders are limited to contour detection or extend to higher level contour processing, like shape encoding. Stimuli consisted of elements that were oriented collinearly (snakes) or orthogonally (ladders) to the contour path and were surrounded by randomly oriented background elements. In two tasks, six experienced subjects either detected the contour when presented with a contour and a completely random stimulus or performed a shape discrimination task when presented with two contours with different curvature. Presentation time was varied in 9 steps between 8 and 492 ms. By applying a generalized linear mixed model we found that differences in snake and ladder processing are not limited to a detection stage but are also apparent at a shape encoding stage.</td> </tr> <tr> <th>Short Title</th> <td>Component processes in contour integration</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:00:56 AM</td> </tr> </table><h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20702”>PubMed entry   <li id=“i20719” class=“item attachment”> <h2>Hess-OxfordHandbookChapter-2013.pdf</h2> <table> <tr> <th>Type</th> <td>Attachment</td> </tr> <tr> <th>URL</th> <td>http://www.fss.uu.nl/psn/web/people/personal/dumoulin/PDFs/Hess-OxfordHandbookChapter-2013.pdf</td> </tr> <tr> <th>Accessed</th> <td>Tuesday, March 18, 2014 10:06:24 AM</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:06:24 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:06:28 AM</td> </tr> </table> <li id=“i20725” class=“item webpage”> <h2>Perception ECVP abstract</h2> <table> <tr> <th>Type</th> <td>Web Page</td> </tr> <tr> <th>URL</th> <td>http://www.perceptionweb.com/abstract.cgi?id=v110126</td> </tr> <tr> <th>Accessed</th> <td>Tuesday, March 18, 2014 10:08:35 AM</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:08:35 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:08:35 AM</td> </tr> </table><h3 class=“attachments”>Attachments</h3> <ul class=“attachments”> <li id=“i20726”>Perception ECVP abstract   <li id=“i20729” class=“item attachment”> <h2>Slide 1 - 201209_ECVP_VancleefKathleen.pdf</h2> <table> <tr> <th>Type</th> <td>Attachment</td> </tr> <tr> <th>URL</th> <td>http://www.gestaltrevision.be/posters/2012/201209_ECVP_VancleefKathleen.pdf</td> </tr> <tr> <th>Accessed</th> <td>Tuesday, March 18, 2014 10:09:05 AM</td> </tr> <tr> <th>Date Added</th> <td>Tuesday, March 18, 2014 10:09:05 AM</td> </tr> <tr> <th>Modified</th> <td>Tuesday, March 18, 2014 10:09:08 AM</td> </tr> </table> </body> </html>