

## The role of Petter's rule in explaining illusory contours and neon color spreading

Liliana Albertazzi<sup>1</sup>, and Baingio Pinna<sup>2</sup>

<sup>1</sup> Department of Cognitive Sciences and Education, University of Trento, Italy

<sup>2</sup> Department of Sciences of Languages. University of Sassari, Italy

Petter's figures (Petter, 1956) concern all the conditions where a chromatic or black homogeneous irregular pattern is perceived as made up of independent surfaces separated in depth and delineated by illusory contours in the area of apparent intersection and stratification. Petter suggested that the perceived stratification occurs according to a general rule stating that the surface with the shorter contours, placed in the region where the surfaces look superimposed, has a greater probability of appearing in front of the other surface. The main purpose of this work is to study psychophysically whether Petter's rule may have a bearing on illusory contour formation or neon color spreading. The aim of the experiment was to obtain a quantitative study of the role of Petter's rule under dynamic conditions on three kinds of stimuli: Petter's figures, illusory contours and neon color spreading. The results clearly demonstrate the basic role played by Petter's ratio in influencing presence/absence, strength and depth organization of the component parts of Petter's figures, illusory contours and neon color spreading. We suggested that Petter's rule is a contour formation rule due to global boundary contour interactions determining the depth organization of the visual components. This rule derives from the formation of two different kinds of contours, modal and amodal, linked together by the dynamics of filling-in of contour gaps. The results are interpreted in terms of Grossberg's FAÇADE model (Grossberg & Mingolla, 1985a, 1985b).

Supported by Fondo d'Ateneo (ex 60%) and Alexander von Humboldt Foundation (to BP).