Social Psychology of Visual Perception

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About the Editors

Emily Balcetis is an Assistant Professor of Psychology at New York University. She received her Ph.D. in 2006 from Cornell University in Social and Personality Psychology. Her research provides a comprehensive examination of the pervasiveness of motivational biases in visual perception and decision-making, exploring both conscious and unconconscious effects using a balance between traditional and novel techniques, paradigms, and approaches.

Her research has been recognized by the Society for Experimental and Social Psychology 2007 dissertation of the year award, a highly selective and esteemed honor, and the Cornell Clark Teaching Award in part for her involvement of undergraduate students in the research process. In addition, her research has been appreciated and supported by the popular media as it has received attention in *Science*, *ScienCentral*, *APS Observer*, *Skeptical Inquirer*, *National Public Radio*, *Time* magazine, and many major news outlets. In addition, she has received funding from organizations to continue her research from a variety of funding agencies.

G. Daniel Lassiter is Professor of Psychology at Ohio University and a fellow of the Association for Psychological Science. He received his Ph.D. in 1984 from the University of Virginia and held positions at Northwestern University and the University of Florida before arriving at Ohio University in 1987. For more than 25 years, he has conducted research on perceptual mechanisms in social judgment and decision-making. His systematic investigations of the way observers perceptually organize continuous streams of behavior into discrete, discriminable, describable actions has provided fundamental insights about the nature and comprehension of social action and interaction.

A related, but more applied, program of scholarship aimed at examining the effect of presentation format on how mock jurors evaluate confession evidence has influenced national policy in New Zealand and earned Dr. Lassiter the 2010 Award for Distinguished Contributions to Research in Public Policy from the American Psychological Association. Both lines of Dr. Lassiter's research have been supported by funds from the National Science Foundation and together have resulted in more than 75 scientific publications. He is the editor of *Interrogations, Confessions, and Entrapment* (2004); co-editor of *Police Interrogations and False Confessions: Current Research, Practice, and Policy Recommendations*

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Foreword: A New Look at the "New Look"

JEROME BRUNER

This book is dedicated to reexamining the nature and determinants of perception – classic issues. For how best to conceive of perception is still not a settled matter, despite its long history. What we do know for sure, though, is that how we conceive of perception will inevitably affect how we go about investigating its nature.

I have been asked to provide some introductory remarks, principally by way of historical background, though such is scarcely necessary, for the authors of individual chapters are plainly mindful of such background. I thought, rather, that I might concentrate on what launched perceptual research into what came to be called the "New Look" – nearly a half-century ago.

Perhaps the dominant approach to the study of perceiving before then might best be called "psychophysical parallelism." Its main effort was to establish parallels between the subjective, experiential phenomena of perceiving and the processes (in the brain, or wherever) that produce those phenomena. Perceptual *Gestalten*, for example, should require physical Gestalten at the input side, presumably in the brain. Perception in these terms was the conversion of physical input into somehow isomorphic subjectivity. So, to take an example, a just noticeable difference in the subjective appearance of any physical input (a "jnd," so-called), should be produced by a *constant* fraction of change in physical input – the so-called Weber Fraction (Boring, 1950). A psychic *jnd*, in a word, is produced by a constant fraction of change in physical input – an elegant psychophysical parallel! Or indeed, as Koehler argued in his rather obscure William James Lectures (1938), a subjective Gestalt should somehow "represent" a physical Gestalt in the brain and not just a scattering of sensory activity.

But, alas, neither Weber's Fraction nor Gestalt isomorphism stood up to close inspection. Subjective experience, alas, does not "parallel" the neural pattern produced by physical input in any usefully predictable way. Nor did any of those "classic" parallelist approaches come near to dealing with the real-life, dynamic qualities of perception – its patent "quest for meaning" with its striking selectivity.

So alternative theoretical models were sought that dealt with the motivated "leap beyond the information given" that characterizes perception. What rules guided this leap? Associationism was one answer proposed. In its account, subjective experience reflects the history of past inputs to the sensory system and the links

in those inputs in time, space, quality, and effect. That is to say, subjective experience achieves its order by virtue of stimulus inputs having definable relations to each other in the past. The world of experience, on this account, is organized principally to reflect how the input elements of the physical world had impinged on the sensory world of the beholder in the past and with what effect. The relationship between present and past inputs became the principal determinant of perceptual organization (and of mental life generally). Present subjective experience, in a word, is a reflection of one's history of past exposure to the world, how one had experienced it before.

The principal weakness (indeed, the fatal weakness) of associationism is that its principal explanatory approach is so loosely conceived (and so poorly defined) as to be virtually useless in any save a metaphoric sense. And even worse, it leaves so little room for the innovative side of mental life.

I want to consider now a radically different approach to "real-life" perception. Let me call it "activist phenomenology." For such a phenomenology, mental or subjective experience is conceived of as organized in support of our "ordinary," intention-driven activity. It asks how our intentions and our goal-directed actions shape how we perceive the world. Its approach, as it were, is more top-down than bottom-up, in contrast with association theories. Intention, expectancy, one's history of striving now come to play a central role in the selectivity of perception. Sensory input matters, of course, but its representation in experience is controlled by higher order processes. Concepts like "set," priming, and *Einstellung* now come to play a more central role in the organization of perception.

I'm sure it was the tradition of activist phenomenology that produced what, nearly a half-century ago, was dubbed the "New Look" in perception research. In its view, perceptual experience was not governed exclusively either by bottom-up *autochthonous* factors, such as Gestalt rules of figure-ground formation, or by rules of association. One also had to take into account such top-down *behavioral* factors as need, value, anticipation, even certain general factors: anxiety, frustration, and the like. One's cultural shaping, consequently, would also affect how one perceived the world. For, after all, our culture also shaped our beliefs, needs, and anticipations. So activist perceptual theory also seeks to take account of a perceiver's past history within a particular culture, for that too matters in shaping expectancies and the like.

But note that cultures do *not* affect all their members in identical ways, so one must be mindful not only of intercultural but of intracultural differences. Bare comparisons of one culture with another do not suffice.

So let me offer some examples to make all this clearer. I shall lean heavily upon the research of our group at Harvard in those early days of the New Look – particularly from the late 1940s to the 1960s. And perhaps it's best to start with some rather obvious findings.

Take, for example, the amount of exposure time required for recognizing printed words that vary in their frequency of appearance in standard English text. The procedure was straightforward enough. Each word is presented successively

at increasing exposure times in a tachistiscope, a gadget for presenting visual displays at varyingly brief intervals ranging from thousandths to hundredths of a second. As for any word's frequency of occurrence in standard English text, fortunately we knew a lot about it thanks to the well known Thorndike-Lorge frequency counts of ordinary English prose texts.

It was soon evident that the more frequently a word appears in ordinary print, the shorter the exposure required for it to be recognized when presented tachistiscopically. For some reason (still not clear to me!) this finding was taken to be obvious or self-evident – attributable to "habit" or some such seemingly simple process. But to our Harvard group at that time, this "frequency effect" suggested that there must be some sort of ordering of hypotheses about what to expect when exposed to the world of words.

Those early findings, indeed, led us to propose what later came to be called the "hypothesis theory of perception." That is to say, one's expectations about likelihood of occurrence of a stimulus affected how much input was necessary to recognize it: the stronger the expectation, the less extended the input needed for its recognition.

And indeed, further work suggested that this rule extended beyond sheer word frequency. It even held for the orthographic structure of language, for spelling or letter sequence. Indeed, George Miller, Leo Postman, and I devised an experiment (1954) in which we presented subjects with letter strings that were varying approximations to English spelling. Zero-order approximations were constructed by choosing each successive letter at random from a standard text and stringing them into eight-letter sequences. First-order approximations were constructed by choosing an initial letter at random, then selecting the letter following it in standard text, then choosing the letter following that one in standard text. A second-order approximation was constructed by choosing the letter in standard text that followed a preceding *pair* of letters selected in that way. By the time one got to fourth-order approximations to English – where each letter was chosen by dint of its following the preceding four letters in a standard text – one got very close to English might-have-beens: almost English nonsense strings like VERNALIT, MOSSIANT, POKERSON.

Needless to say, the higher the order of approximation of a word to English, the less tachistiscopic exposure was needed to recognize it. Indeed, perceptual readiness seemed tuned not only to the likelihood of occurrence of *words* but also to their orthography – micro as well as macro.

But that's only part of the story, the non-controversial part. Now let me go on to some more controversial studies from that early New Look period. The first, again, concerns the time required to recognize tachistiscopically presented words. This time we, Leo Postman and I (1947), presented our subjects with mid-frequency English words, including among them some that were rather obscene or, at least, "crude" for an experiment in a university lab – among them *hymen*, *penis*, *whore*, and the like.

The results surprised us. Obscene words were recognized by some subjects *more* rapidly and by other subjects more slowly than everyday ones. To make sense of this anomalous finding, we invoked a distinction between perceptual "vigilance"

and perceptual "defense." Vigilance is elevated sensitivity to irregularities in the world around us, to the unexpected or tabooed: hypersensitivity to violations of the ordinary. Defense, on the other hand, is avoidance of the unexpected or of the tabooed, marked either by a tendency to conventionalize or to avoid the unexpected or the offensive. The findings, indeed, suggested that there might even be some psychoanalytic mechanisms operative in perception – not a welcome idea among some of our experimentalist colleagues.

But indeed, other tachistiscopic studies then in progress or soon to follow seemed to confirm this suspicion. Work then in progress on the perception of incongruities (Bruner & Postman, 1949) provided some interesting hints. Let me say a word about this work. We created perceptual incongruities by fashioning stimuli that, by any standards, so violated ordinary expectancies (or probabilities) as literally to seem incongruous. We could compare across subjects the difference in recognition time between ordinary pictures and incongruous ones as well as the difference in approach. In one such pair, to provide some detail, the normal version was a fairly close-up photograph of an Olympic athlete throwing the discus, while the incongruous version had the discus-thrower holding a bass viola tucked under his free arm. The congruous–incongruous pairs, I must confess, were weird fun to design – a bit like making up absurd jokes! I should also mention, though it is surely obvious, that individual subjects in the experiment were presented *either* a congruous or an incongruous picture, never both.

Needless to say, the incongruous one in each pair took far longer to identify correctly. But interestingly, its recognition was often accompanied by amused but astonished surprise – what we came jokingly to call the "Jesus Christ!" reaction, as in "Jesus Christ, that discus thrower's holding on to a cello with his free arm!" And just as an aside, there were some subjects (they were virtually all Harvard undergraduates, by the way) who, virtually from the initial highest speed presentation of incongruous pictures, would make remarks like "Hey, there's something crazy about that picture, but I can't make out what it is." Were they the hypervigilant ones?

Perception, indeed, is psychological. It serves more needs than simply representing the world out there. And yet, and yet . . .! It *also* serves that representational function. It is multi-purpose. It is surely *not* a simple or unilinear process!

Let me turn finally to the perceptual management of sensory attributes such as apparent size, color, shape. I say "management" rather than "representation" for good reason. For perception serves not only to *represent* but to highlight, to dim down, to exaggerate features of the world in useful and sometimes in panic-stricken ways. Again, I want to go back to an early experiment of the "New Look" days, one that I did jointly with a Radcliffe tutee of mine, Cecile Goodman, who submitted it for her honors thesis (Bruner & Goodman, 1947). It had to do with what we called in those days the "accentuation" of significant perceptual features – in this case, the apparent size of coins of different value. The idea came to me while reading Egon Brunswik (1934) on perceptual tuning, his argument being that perception highlighted life-critical aspects of particular sensory inputs. I also happened to be immersed in Faulkner novels at the time, and in one of them

some kid has just been given a quarter for helping out with some chores. He clutches the coin in his pocket and feels it grow in his hand. It reminded me, I must confess, of an odd thought I'd had as a young teenager: that half-dollar coins didn't seem as large as they did when I was a little kid – or perhaps *weren't* as large.

So we did an experiment, Cecile and I, on the apparent size of coins (Bruner & Goodman, 1947). A subject was to reproduce the size of a coin held in his hand by adjusting an elegant but simple apparatus on whose front end a circle of light could be varied in size by turning a knob. Our subjects, we decided, should be kids, well-off ones (mostly children of Harvard faculty) and poor ones from a run-down section of Cambridge on the "other side" of Central Square.

And sure enough, the more valuable the coin, the more was its size overestimated – except for the dime, whose size is almost always underestimated, at least by Americans. And to our surprise and delight, this value–size effect was the more striking among the poor kids than the well-off ones.

But why did this little experiment so catch the public imagination? It even made the daily papers – I can't recall now whether in the *New York Times* or the *Boston Globe*. I confess embarrassment not having mentioned William Faulkner in that Bruner–Goodman article, by the way, but citing novelists in the pages of professional psychology journals was just not done in those days.

Anyway, there were lots of attempts around the country to replicate those findings – or better, really, to disprove them. Some succeeded, some didn't. For me too! I found you could reproduce those findings, provided you didn't create too stern and "serious" an atmosphere in the experimental situation. Create a vigilance-evoking emphasis on "size judgment" and the effect disappears. Indeed, judgments of sensory attributes are notoriously situation-dependent and bedevilled by set – back to those famous *Einstellung* effects of our nineteenth-century forebears.

That Bruner–Goodman experiment certainly strengthened my convictions about the broader instrumental nature of perception. And let it be said as well that it reinforced my conviction that one does well to read literary geniuses like William Faulkner for hints as well as for enjoyment!

Let me close now – though I have not said a single word about the chapters that follow in this book. Nor can I do so, for circumstances and deadlines have interfered irreversibly and I have only been able to scan them. Yet they plainly represent for me what is a next phase in the seemingly endless history of perception. My fellow authors simply take it for granted that perception serves a core function in our adjustment to our culture, to our needs, and to the demands of our inevitably conflicted lives. And the task they set themselves is to explore how this all works.

My aim in this foreword has been to set the stage, the *historical* stage. And that is just as well, for I no longer work on perception in the usual sense of that word. Nonetheless, perception is, as it were, inescapable. In more recent years, for example, I have been principally involved in trying to understand how the human condition affects and is affected by our system of law. My teaching at the New York

University School of Law centers around this theme. Believe me when I say that perception is central to any system of law, and not simply because it is so crucial to what we call the rules of evidence. In the deepest sense, our view of perception affects our conception of the real and how we come to our convictions about what is to be taken as reality. My views on these matters are developed at some length in two fairly recent books – Amsterdam and Bruner's *Minding the Law* (2000) and my own *Making Stories: Law, Literature, Life* (2002).

I welcome the present book. Indeed, I look forward to reading it more closely now that the pressure of deadlines is past. And I shall get my law students to read it as well.

I am deeply honored to have had a part in it.

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Contents

Introduction

EMILY BALCETIS and G. DANIEL LASSITER

Before and since Diderot and D'Alembert sat down over coffee during the eighteenth-century Enlightenment in Paris' Café Procope to create the *Encyclopédie*, scholars of all types have debated how people achieve "true" knowledge. A recurring question for philosophers and scientists alike is how people can and do gain a complete understanding of the world and all its components. That is, whether done through passionate exchanges in erudite salons, empirical observations in public gathering spaces, trolling Google's internet webpages, or the like, the objective was and is to discover how people achieve an accurate, reliable, and fixed knowledge of the outside world. Inherent in such musings is the notion there is an objective reality or concrete, singular way in which to comprehend the world. And with enough effort, people can come to know it.

We disagree. We, the contributors to this volume, put forth the premise that people's understanding of the world is in fact highly, if not exclusively, subjective. We question whether people do achieve a true, accurate, and veridical understanding of the world. Instead, we suggest that even at one of the most basic, fundamental levels people do not maintain a purely objective sense of reality. In particular, the fundamental way in which people literally see – that is, visually perceive – their surroundings can be characterized as "distorted." Although people think they see their outside world as it really is with a full understanding of all it has to offer, the main implication of this volume is instead that what people think they see is in fact something of a misrepresentation of reality.

The primary goal of this volume is to present an overview of the diverse ways in which social, personality, cognitive, and neuroscience psychologists are currently exploring the science of visual perception. While many would tacitly assume that perceptions are veridical representations of reality, research conducted by the contributors to this volume contests this supposition. The contributors discuss their recent contributions to the debate centering on the veridicality of visual experiences. These contributors were selected for their diverse approaches to this emerging discipline that combines the interests of social, personality, and cognitive psychology among other disciplines and interests. While the approaches may