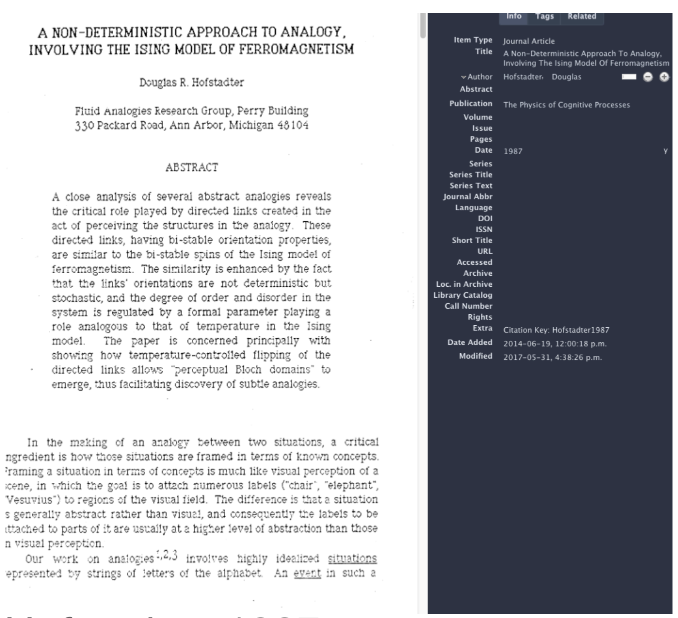
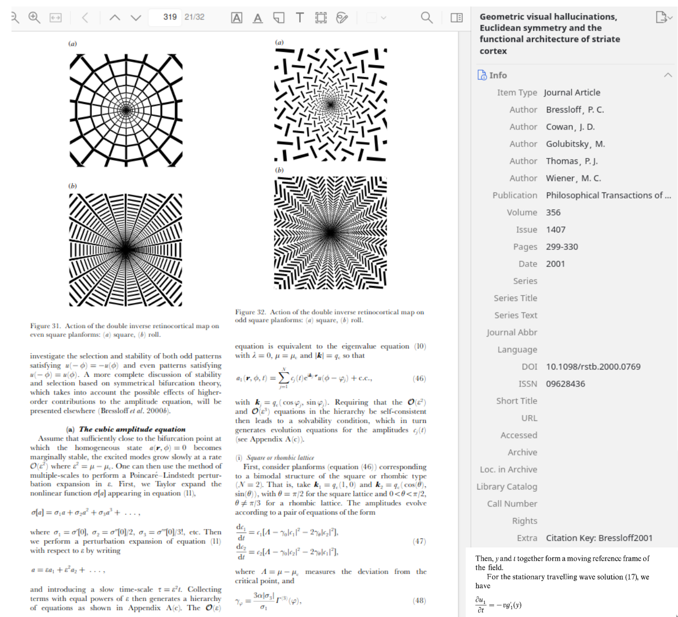
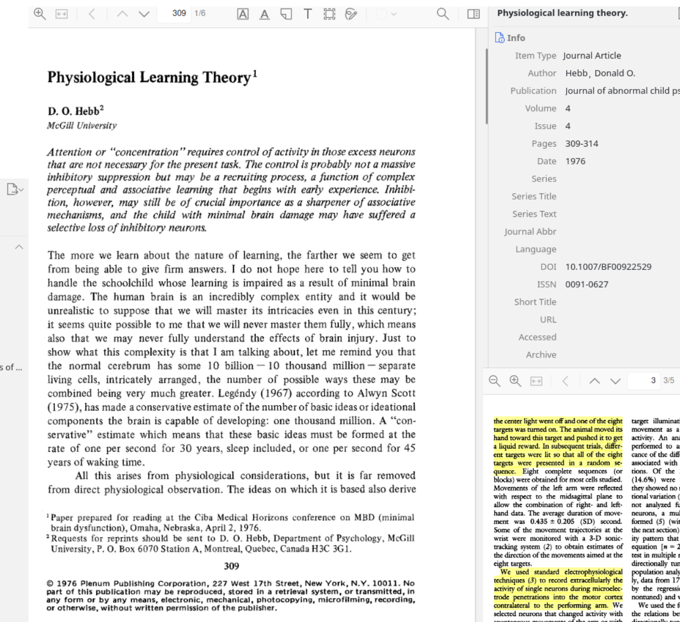
Favourite scholarly papers that I can remember, part 1-6.



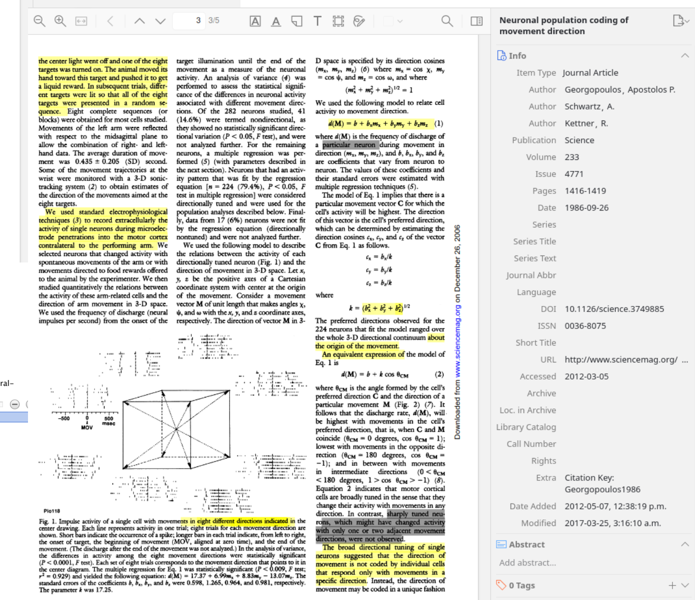
Hofstadter, 1987



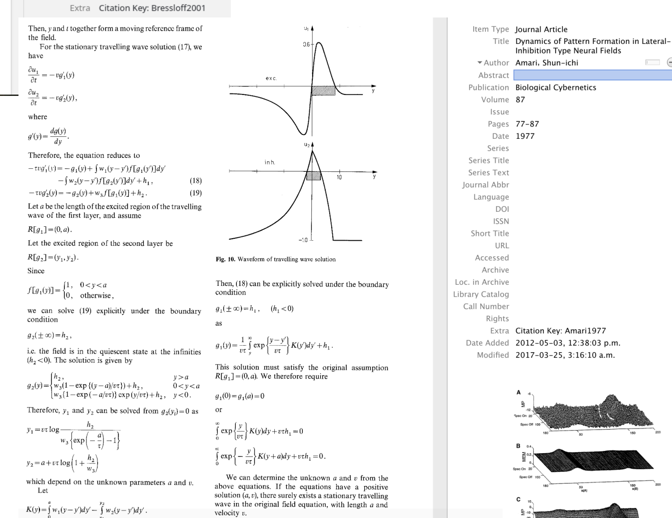
Bresloff,2001



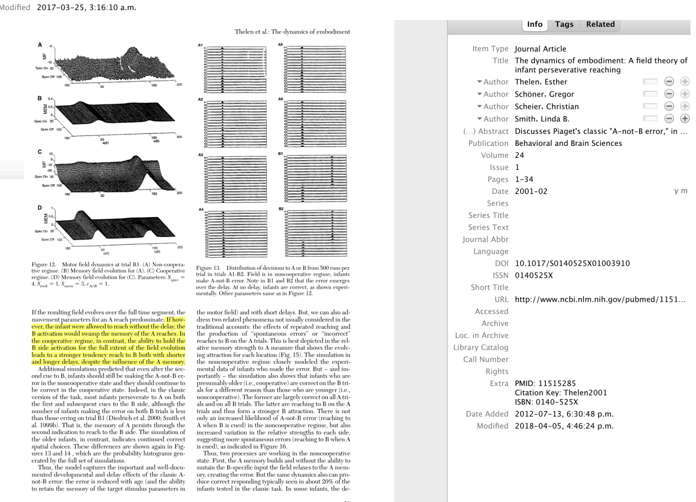
Hebb,1978



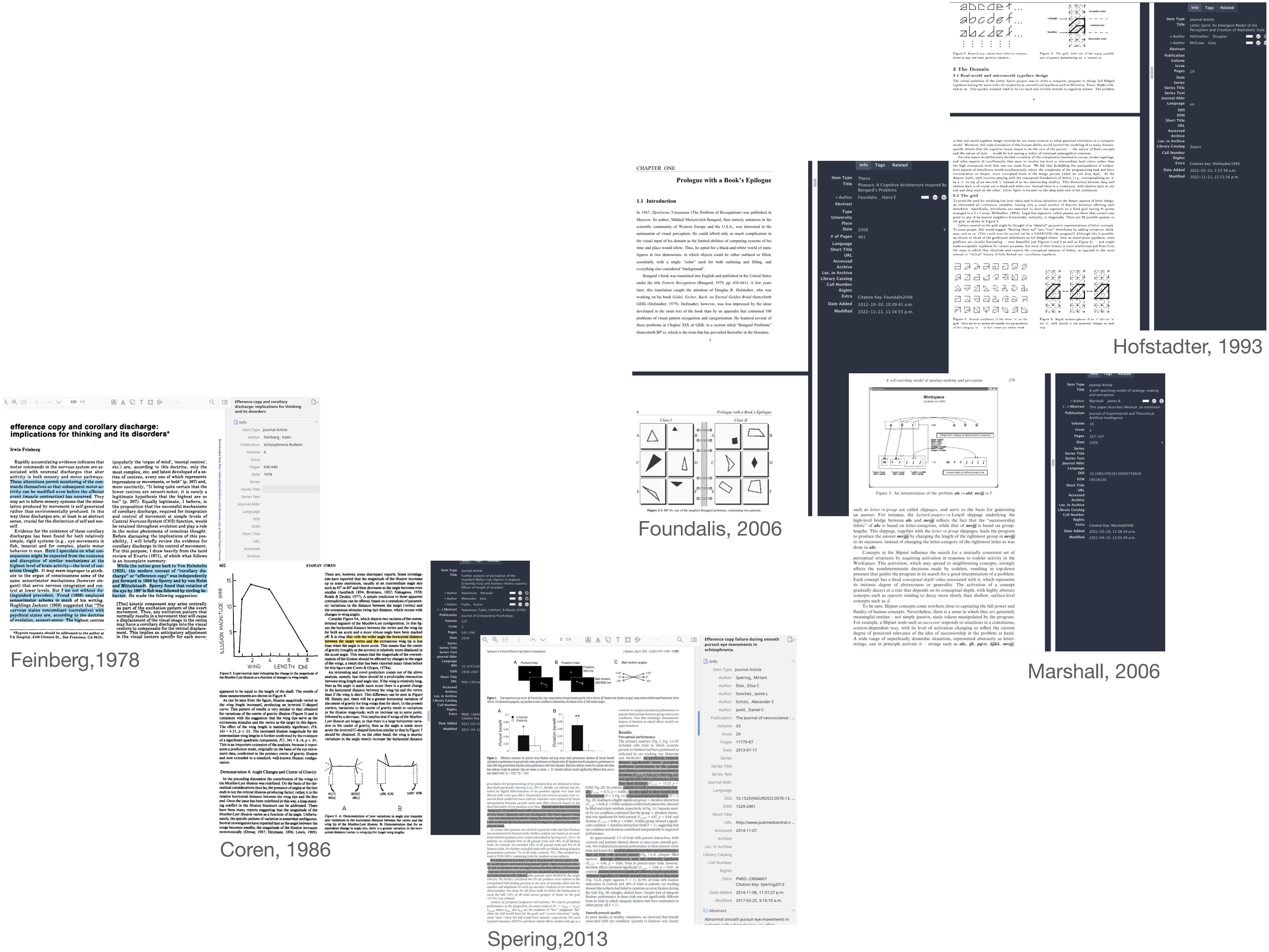
Georgopolous,1986

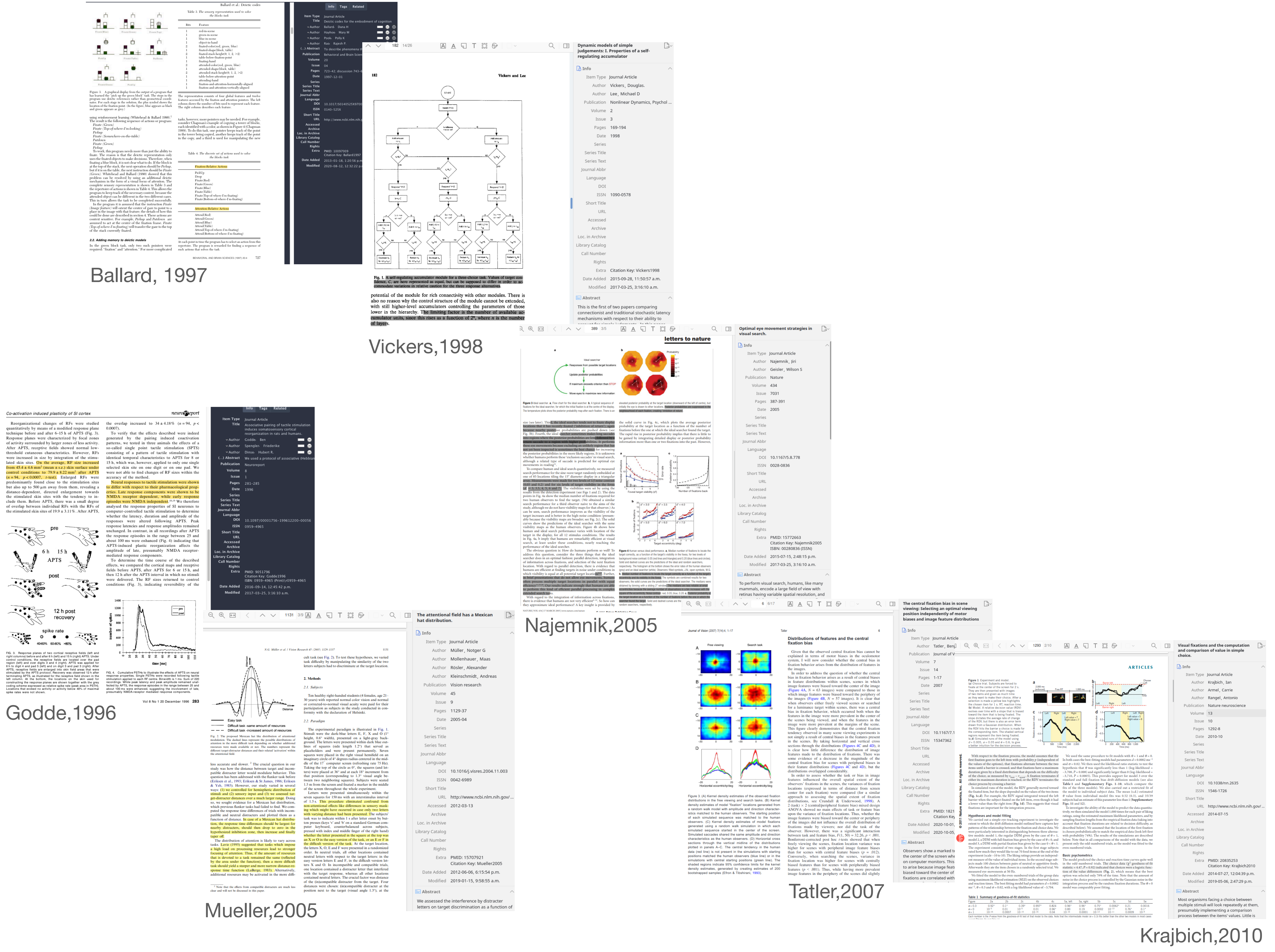


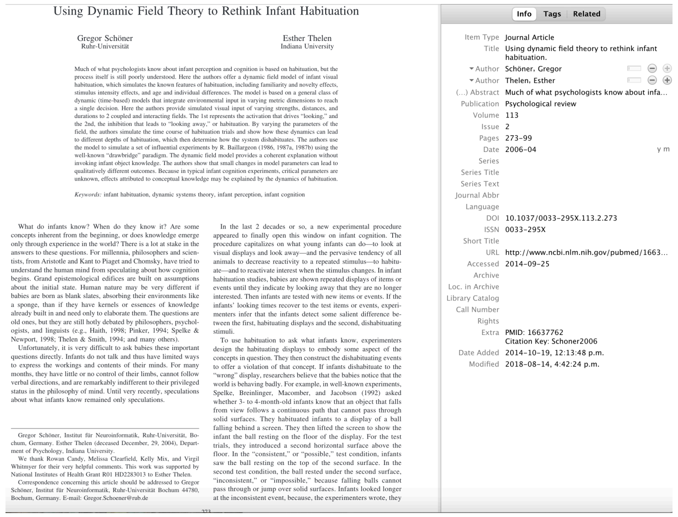
Amari,1977



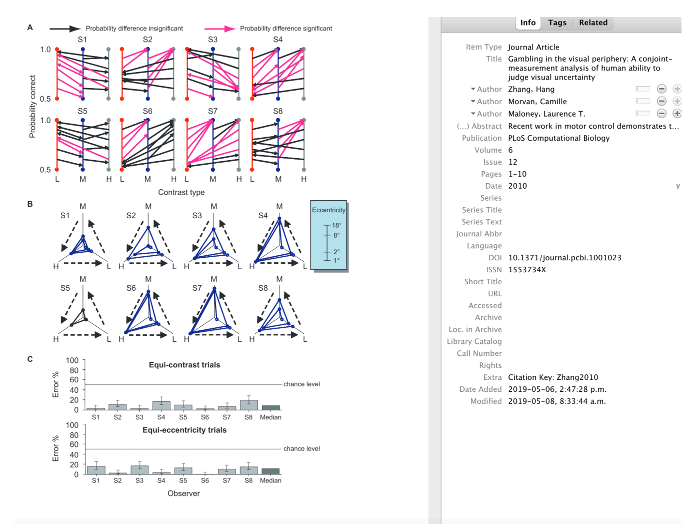
Thelen,2001


Hofstadter, 1993
Foundalis, 2006
Marshall, 2006
Feinberg,1978
Coren, 1986
Spering,2013

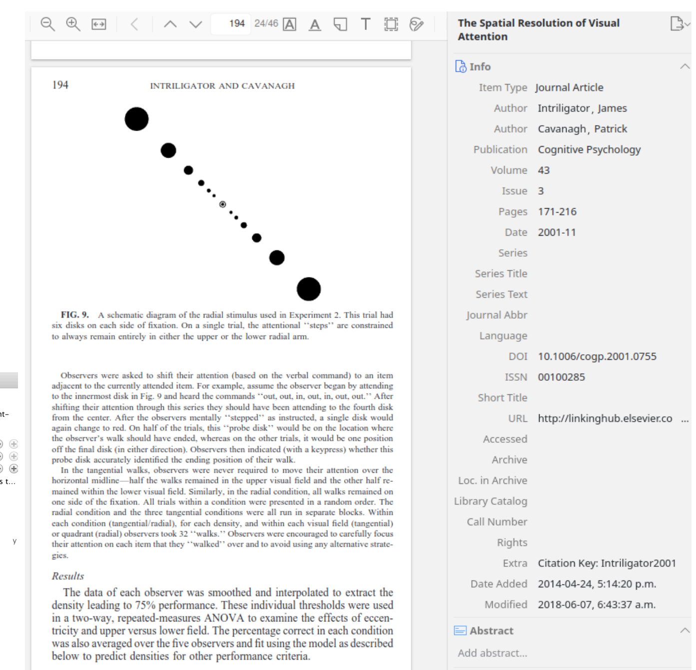

Ballard, 1997
Vickers, 1998
Najemnik, 2005
Godde, 1996
Mueller, 2005
Tatler, 2007
Krajbich, 2010



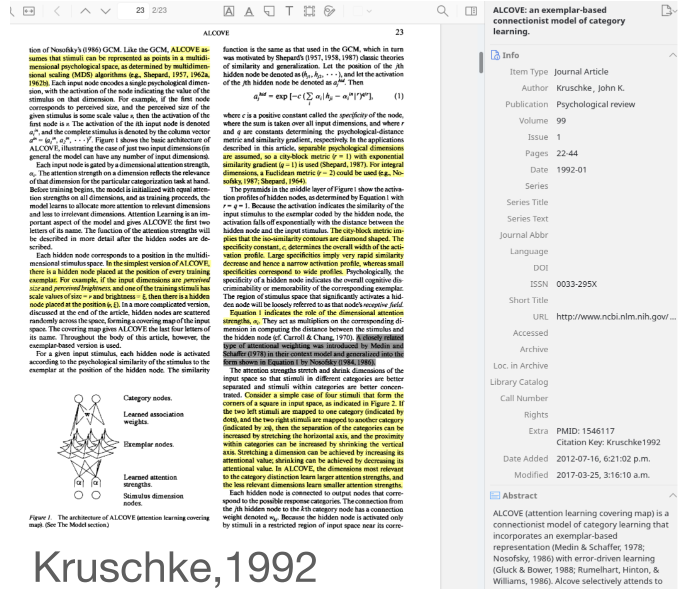
Schöner, 2006



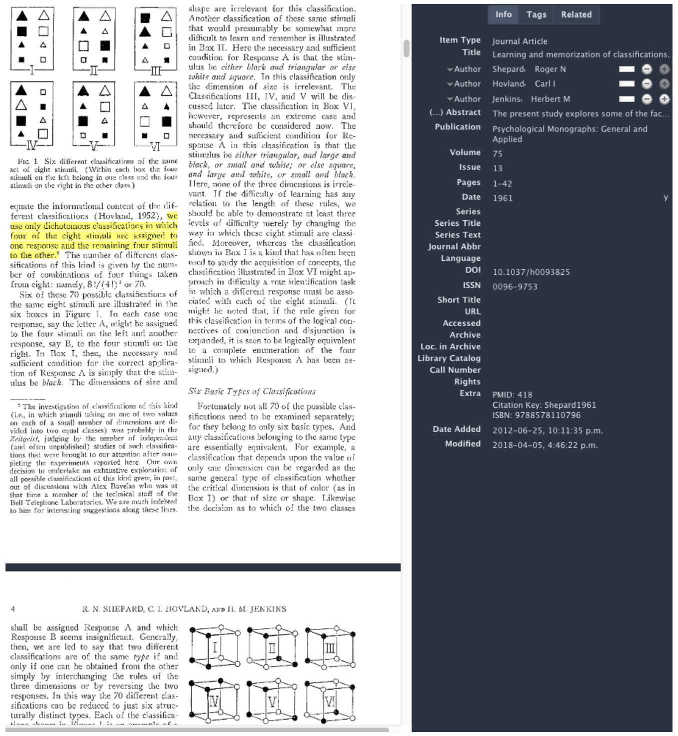
Zhang,2010



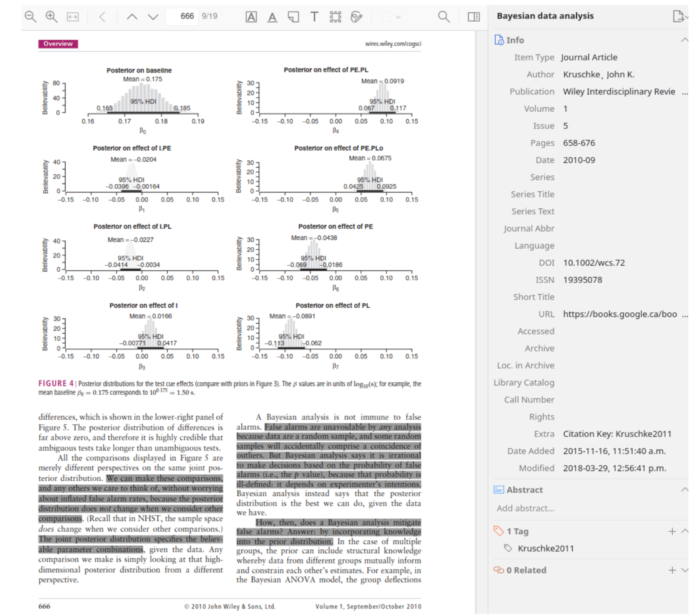
Intriligator,2001



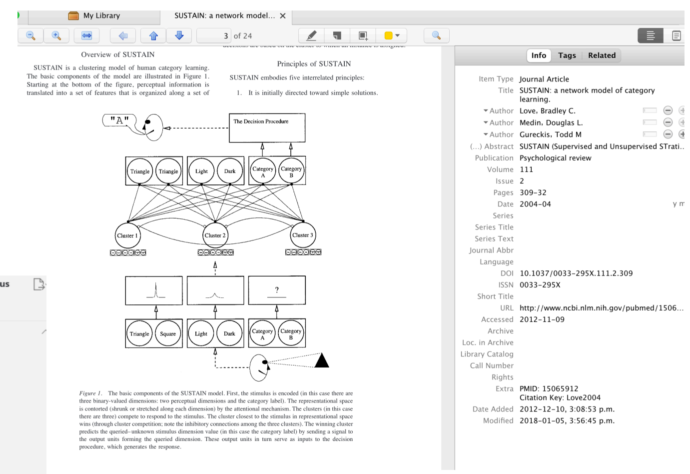
Kruschke,1992



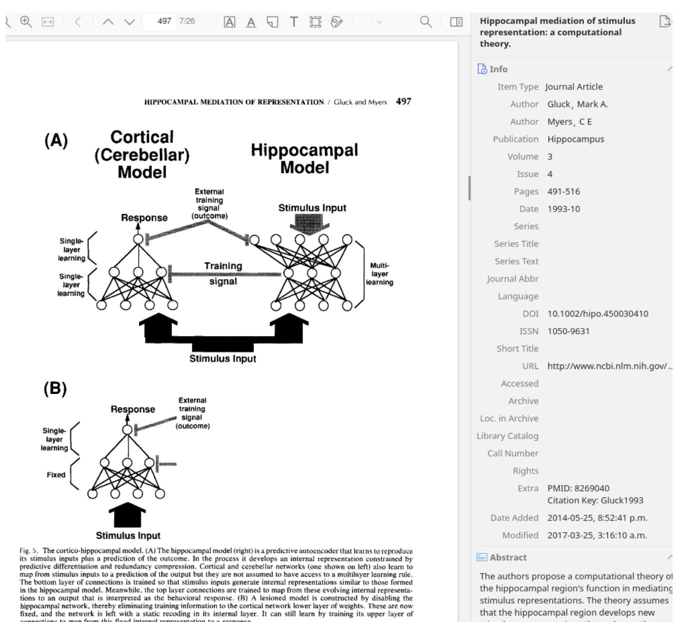
Shepard, Hovland, Jenkins, 1961



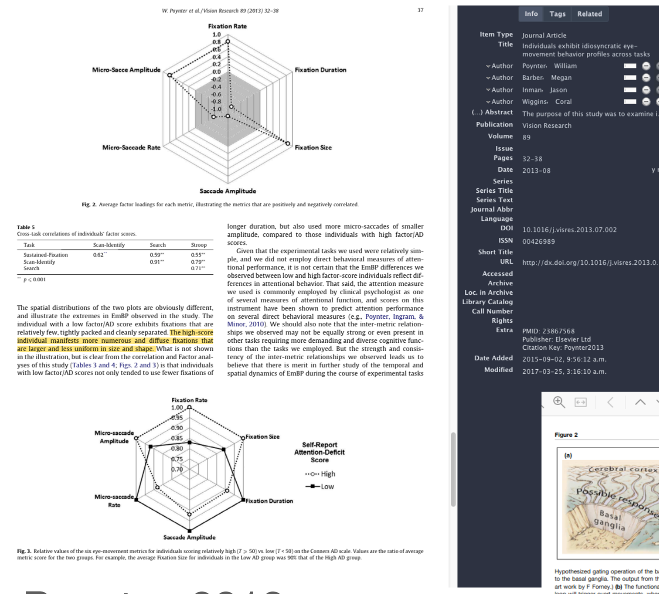
Kruschke,2010



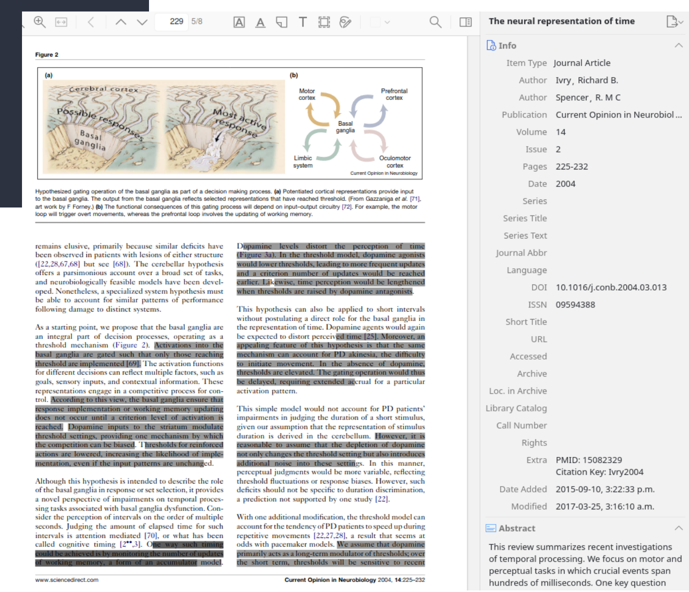
Love,2004



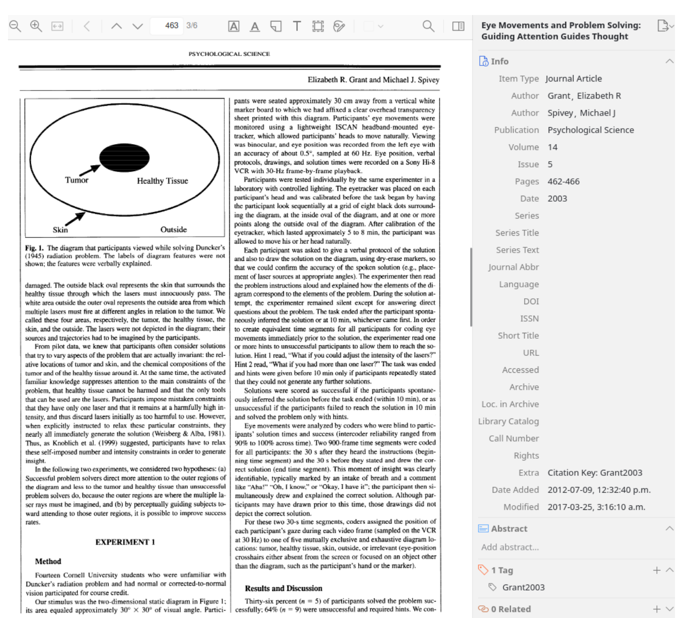
Gluck,1993



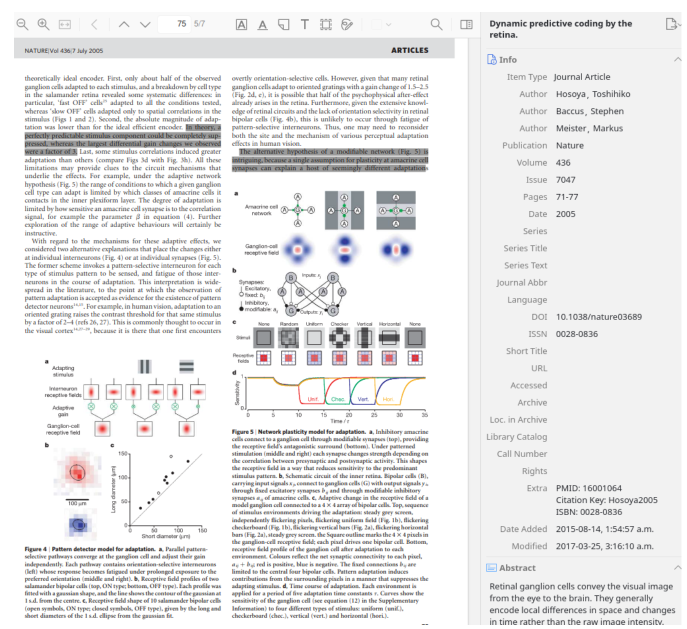
Poynter, 2013



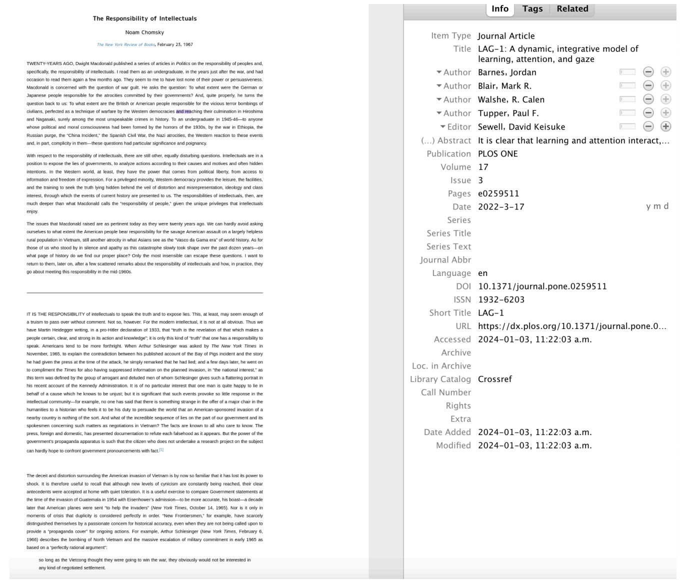
Ivry,2004



Grant,2003



Hosoya,2005


The Responsibility of Intellectuals

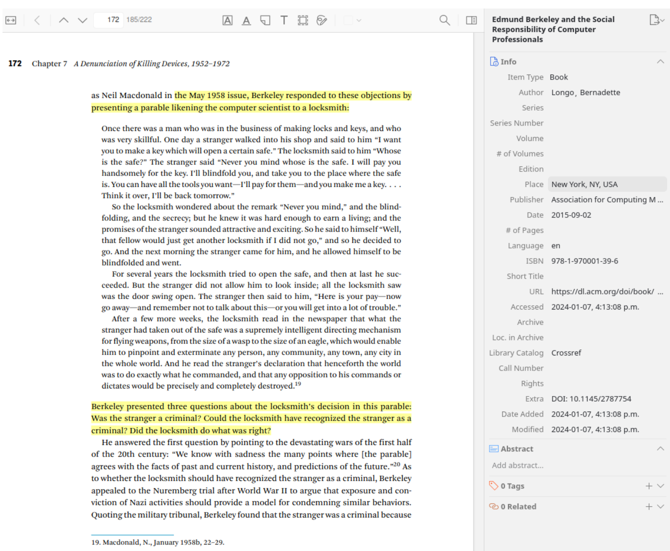
Noam Chomsky

The New York Review of Books, February 23, 1967

TWENTY-YEARS AGO, Dwight Macdonald published a series of articles in *Politics* on the responsibility of peoples and, specifically, the responsibility of intellectuals. I read them as an undergraduate, in the years just after the war, and had occasion to read them again a few months ago. They seem to me to have lost none of their power or persuasiveness. Macdonald is concerned with the question of war guilt. He asks the question: To what extent were the German or Japanese people responsible for the atrocities committed by their governments? And, quite properly, he turns the question back to us: To what extent are the British or American people responsible for the vicious terror bombings of civilians, perfected as a technique of warfare by the Western democracies and reaching their culmination in Hiroshima and Nagasaki, surely among the most unspeakable crimes in history. To an undergraduate in 1945-46—to anyone whose political and moral consciousness had been formed by the horrors of the 1930s, by the war in Ethiopia, the Russian purge, the "China Incident," the Spanish Civil War, the Nazi atrocities, the Western reaction to these events and, in part, complicity in them—these questions had particular significance and poignancy.

With respect to the responsibility of intellectuals, there are still other, equally disturbing questions. Intellectuals are in a position to expose the lies of governments, to analyze actions according to their causes and motives and often hidden intentions. In the Western world, at least, they have the power that comes from political liberty, from access to information and freedom of expression. For a privileged minority, Western democracy provides the leisure, the facilities, and the training to seek the truth lying hidden behind the veil of distortion and misrepresentation, ideology and class interest, through which the events of current history are presented to us. The responsibilities of intellectuals, then, are much deeper than what Macdonald calls the "responsibility of people," given the unique privileges that intellectuals enjoy.

Chomsky, 1967



172 Chapter 7 *A Denunciation of Killing Devices, 1952–1972*

as Neil Macdonald in the May 1958 issue, Berkeley responded to these objections by presenting a parable likening the computer scientist to a locksmith:

> Once there was a man who was in the business of making locks and keys, and who was very skillful. One day a stranger walked into his shop and said to him "I want you to make a key which will open a certain safe." The locksmith said to him "Whose is the safe?" The stranger said "Never you mind whose is the safe. I will pay you handsomely for the key. I'll blindfold you, and take you to the place where the safe is. You can have all the tools you want—I'll pay for them—and you make me a key. . . . Think it over, I'll be back tomorrow."
>
> So the locksmith wondered about the remark "Never you mind," and the blindfolding, and the secrecy; but he knew it was hard enough to earn a living; and the promises of the stranger sounded attractive and exciting. So he said to himself "Well, that fellow would just get another locksmith if I did not go," and so he decided to go. And the next morning the stranger came for him, and he allowed himself to be blindfolded and went.
>
> For several years the locksmith tried to open the safe, and then at last he succeeded. But the stranger did not allow him to look inside; all the locksmith saw was the door swing open. The stranger then said to him, "Here is your pay—now go away—and remember not to talk about this—or you will get into a lot of trouble."
>
> After a few more weeks, the locksmith read in the newspaper that what the stranger had taken out of the safe was a supremely intelligent directing mechanism for flying weapons, from the size of a wasp to the size of an eagle, which would enable him to pinpoint and exterminate any person, any community, any town, any city in the whole world. And he read the stranger's declaration that henceforth the world was to do exactly what he commanded, and that any opposition to his commands or dictates would be precisely and completely destroyed.[19]

Berkeley presented three questions about the locksmith's decision in this parable: Was the stranger a criminal? Could the locksmith have recognized the stranger as a criminal? Did the locksmith do what was right?

He answered the first question by pointing to the devastating wars of the first half of the 20th century: "We know with sadness the many points where [the parable] agrees with the facts of past and current history, and predictions of the future."[20] As to whether the locksmith should have recognized the stranger as a criminal, Berkeley appealed to the Nuremberg trial after World War II to argue that exposure and conviction of Nazi activities should provide a model for condemning similar behaviors. Quoting the military tribunal, Berkeley found that the stranger was a criminal because

19. Macdonald, N., January 1958b, 22–29.

20. Ibid.

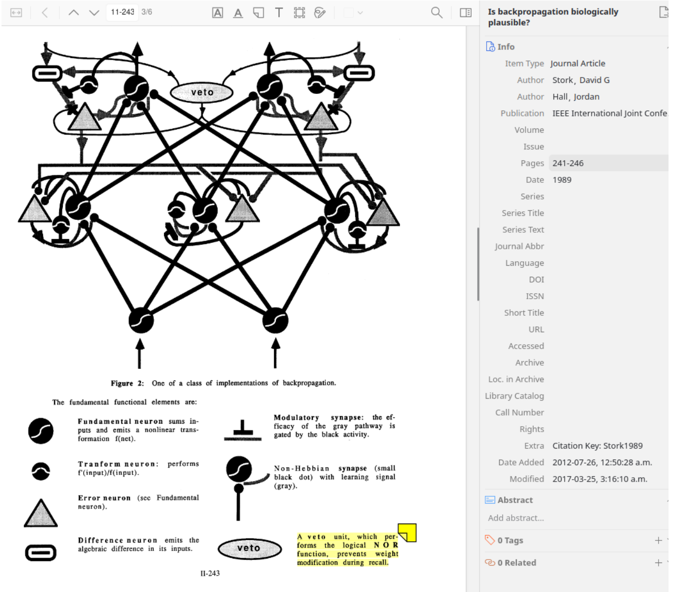
Berkeley,1958

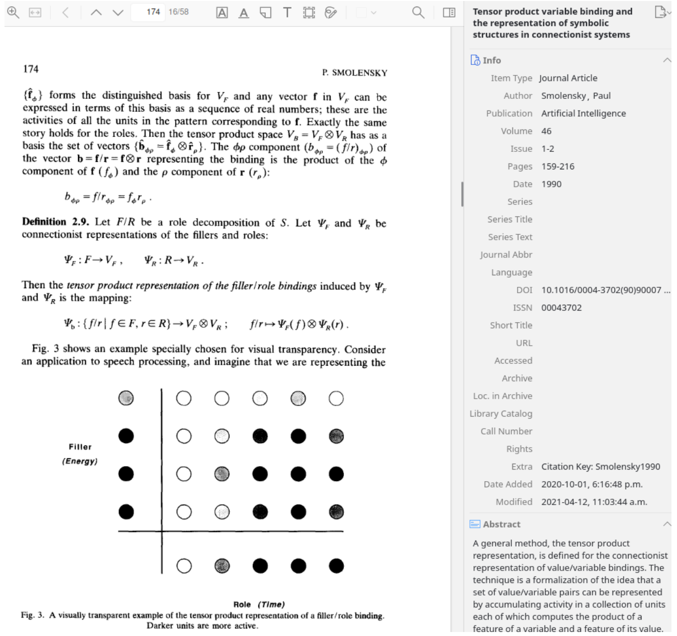
Wilson & Nisbett,19??

Stork,1989

McClelland,2006

Craig,2015
Mitkus,2017




174 P. SMOLENSKY

$\{\hat{\mathbf{f}}_\phi\}$ forms the distinguished basis for V_F and any vector $\mathbf{f}$ in V_F can be expressed in terms of this basis as a sequence of real numbers; these are the activities of all the units in the pattern corresponding to $\mathbf{f}$. Exactly the same story holds for the roles. Then the tensor product space $V_B = V_F \otimes V_R$ has as a basis the set of vectors $\{\hat{\mathbf{b}}_{\phi\rho} = \hat{\mathbf{f}}_\phi \otimes \hat{\mathbf{r}}_\rho\}$. The $\phi\rho$ component $(b_{\phi\rho} = (f/r)_{\phi\rho})$ of the vector $\mathbf{b} = \mathbf{f}/\mathbf{r} = \mathbf{f} \otimes \mathbf{r}$ representing the binding is the product of the ϕ component of $\mathbf{f}$ (f_ϕ) and the ρ component of $\mathbf{r}$ (r_ρ):

$$b_{\phi\rho} = f/r_{\phi\rho} = f_\phi r_\rho .$$

Definition 2.9. Let F/R be a role decomposition of S. Let Ψ_F and Ψ_R be connectionist representations of the fillers and roles:

$$\Psi_F : F \to V_F , \qquad \Psi_R : R \to V_R .$$

Then the *tensor product representation of the filler/role bindings* induced by Ψ_F and Ψ_R is the mapping:

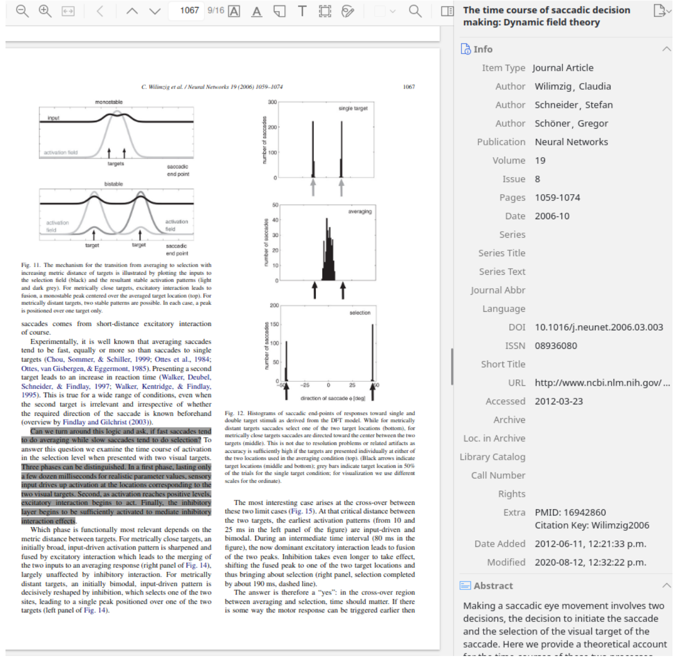
$$\Psi_b : \{f/r \mid f \in F, r \in R\} \to V_F \otimes V_R ; \qquad f/r \mapsto \Psi_F(f) \otimes \Psi_R(r) .$$

Fig. 3 shows an example specially chosen for visual transparency. Consider an application to speech processing, and imagine that we are representing the

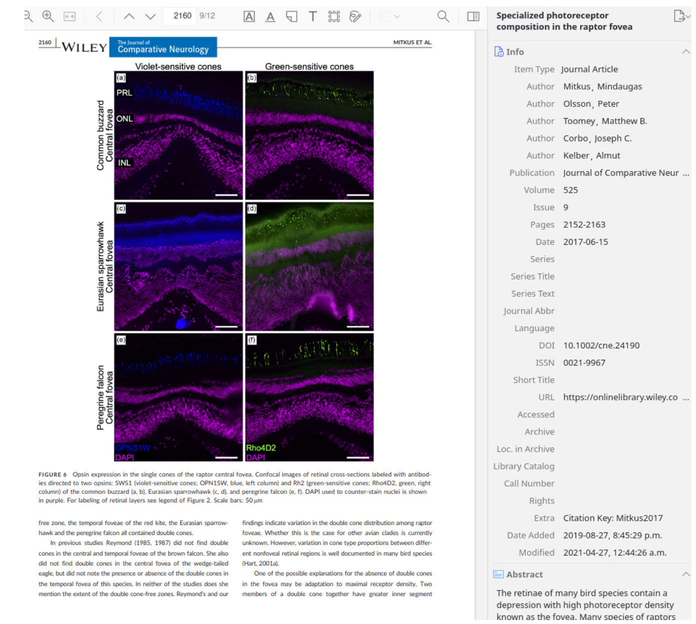
Filler (Energy)

Role (Time)

Fig. 3. A visually transparent example of the tensor product representation of a filler/role binding. Darker units are more active.



Wilimzig,2006


2160 | 9/12
Specialized photoreceptor composition in the raptor fovea
2160 WILEY The Journal of Comparative Neurology MITKUS ET AL.
Violet-sensitive cones
Green-sensitive cones
(a) (b) (c) (d) (e) (f)
PRL
ONL
INL
Common buzzard Central fovea
Eurasian sparrowhawk Central fovea
Peregrine falcon Central fovea
OPNS1W DAPI
Rho4D2 DAPI
FIGURE 6 Opsin expression in the single cones of the raptor central fovea. Confocal images of retinal cross-sections labeled with antibodies directed to two opsins: SWS1 (violet-sensitive cones; OPN1SW, blue, left column) and Rh2 (green-sensitive cones; Rho4D2, green, right column) of the common buzzard (a, b), Eurasian sparrowhawk (c, d), and peregrine falcon (e, f). DAPI used to counter-stain nuclei is shown in purple. For labeling of retinal layers see legend of Figure 2. Scale bars: 50 μm
free zone, the temporal foveae of the red kite, the Eurasian sparrowhawk and the peregrine falcon all contained double cones.
In previous studies Reymond (1985, 1987) did not find double cones in the central and temporal foveae of the brown falcon. She also did not find double cones in the central fovea of the wedge-tailed eagle, but did not note the presence or absence of the double cones in the temporal fovea of this species. In neither of the studies does she mention the extent of the double cone-free zones. Reymond's and our
findings indicate variation in the double cone distribution among raptor foveae. Whether this is the case for other avian clades is currently unknown. However, variation in cone type proportions between different nonfoveal retinal regions is well documented in many bird species (Hart, 2001a).
One of the possible explanations for the absence of double cones in the fovea may be adaptation to maximal receptor density. Two members of a double cone together have greater inner segment
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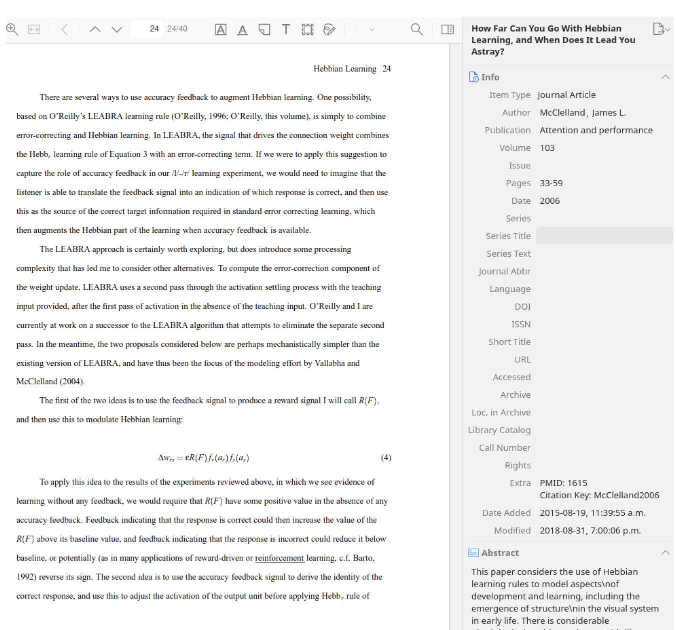
Abstract
The retinae of many bird species contain a depression with high photoreceptor density known as the fovea. Many species of raptors


24 24/40
How Far Can You Go With Hebbian Learning, and When Does It Lead You Astray?
Hebbian Learning 24
There are several ways to use accuracy feedback to augment Hebbian learning. One possibility, based on O'Reilly's LEABRA learning rule (O'Reilly, 1996; O'Reilly, this volume), is simply to combine error-correcting and Hebbian learning. In LEABRA, the signal that drives the connection weight combines the Hebb$_r$ learning rule of Equation 3 with an error-correcting term. If we were to apply this suggestion to capture the role of accuracy feedback in our /l/-/r/ learning experiment, we would need to imagine that the listener is able to translate the feedback signal into an indication of which response is correct, and then use this as the source of the correct target information required in standard error correcting learning, which then augments the Hebbian part of the learning when accuracy feedback is available.
The LEABRA approach is certainly worth exploring, but does introduce some processing complexity that has led me to consider other alternatives. To compute the error-correction component of the weight update, LEABRA uses a second pass through the activation settling process with the teaching input provided, after the first pass of activation in the absence of the teaching input. O'Reilly and I are currently at work on a successor to the LEABRA algorithm that attempts to eliminate the separate second pass. In the meantime, the two proposals considered below are perhaps mechanistically simpler than the existing version of LEABRA, and have thus been the focus of the modeling effort by Vallabha and McClelland (2004).
The first of the two ideas is to use the feedback signal to produce a reward signal I will call $R(F)$, and then use this to modulate Hebbian learning:
$\Delta w_{rs} = \varepsilon R(F) f_r(a_r) f_s(a_s)$ (4)
To apply this idea to the results of the experiments reviewed above, in which we see evidence of learning without any feedback, we would require that $R(F)$ have some positive value in the absence of any accuracy feedback. Feedback indicating that the response is correct could then increase the value of the $R(F)$ above its baseline value, and feedback indicating that the response is incorrect could reduce it below baseline, or potentially (as in many applications of reward-driven or reinforcement learning, c.f. Barto, 1992) reverse its sign. The second idea is to use the accuracy feedback signal to derive the identity of the correct response, and use this to adjust the activation of the output unit before applying Hebb$_r$ rule of
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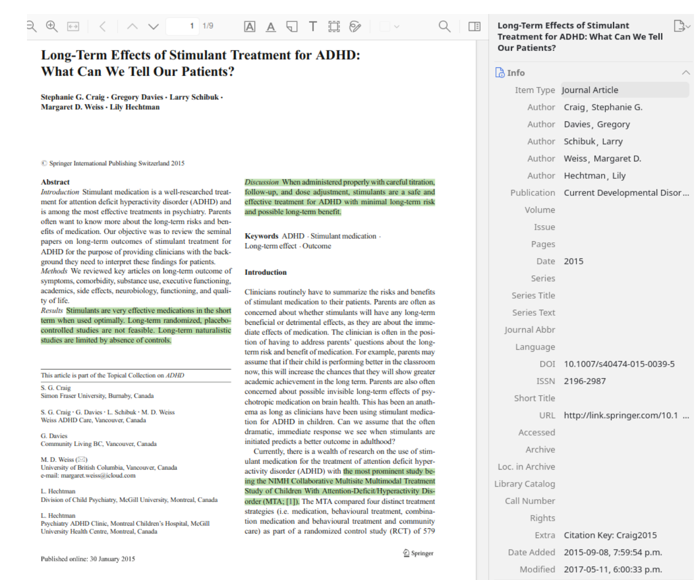
Abstract
This paper considers the use of Hebbian learning rules to model aspects\nof development and learning, including the emergence of structure\nin the visual system in early life. There is considerable physiological\nevidence that a Hebb-like


1 1/9
Long-Term Effects of Stimulant Treatment for ADHD: What Can We Tell Our Patients?
Long-Term Effects of Stimulant Treatment for ADHD: What Can We Tell Our Patients?
Stephanie G. Craig · Gregory Davies · Larry Schibuk · Margaret D. Weiss · Lily Hechtman
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Abstract
Introduction Stimulant medication is a well-researched treatment for attention deficit hyperactivity disorder (ADHD) and is among the most effective treatments in psychiatry. Parents often want to know more about the long-term risks and benefits of medication. Our objective was to review the seminal papers on long-term outcomes of stimulant treatment for ADHD for the purpose of providing clinicians with the background they need to interpret these findings for patients.
Methods We reviewed key articles on long-term outcome of symptoms, comorbidity, substance use, executive functioning, academics, side effects, neurobiology, functioning, and quality of life.
Results Stimulants are very effective medications in the short term when used optimally. Long-term randomized, placebo-controlled studies are not feasible. Long-term naturalistic studies are limited by absence of controls.
Discussion When administered properly with careful titration, follow-up, and dose adjustment, stimulants are a safe and effective treatment for ADHD with minimal long-term risk and possible long-term benefit.
Keywords ADHD · Stimulant medication · Long-term effect · Outcome
This article is part of the Topical Collection on ADHD
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Published online: 30 January 2015
Introduction
Clinicians routinely have to summarize the risks and benefits of stimulant medication to their patients. Parents are often as concerned about whether stimulants will have any long-term beneficial or detrimental effects, as they are about the immediate effects of medication. The clinician is often in the position of having to address parents' questions about the long-term risk and benefit of medication. For example, parents may assume that if their child is performing better in the classroom now, this will increase the chances that they will show greater academic achievement in the long term. Parents are also often concerned about possible invisible long-term effects of psychotropic medication on brain health. This has been an anathema as long as clinicians have been using stimulant medication for ADHD in children. Can we assume that the often dramatic, immediate response we see when stimulants are initiated predicts a better outcome in adulthood?
Currently, there is a wealth of research on the use of stimulant medication for the treatment of attention deficit hyperactivity disorder (ADHD) with the most prominent study being the NIMH Collaborative Multisite Multimodal Treatment Study of Children With Attention-Deficit/Hyperactivity Disorder (MTA; [1]). The MTA compared four distinct treatment strategies (i.e. medication, behavioural treatment, combination medication and behavioural treatment and community care) as part of a randomized control study (RCT) of 579
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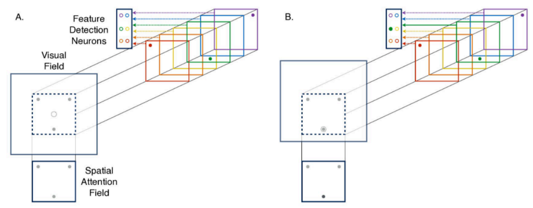
Abstract

My scholarly papers, p1



(A) LAG-1 looking between features. **(B)** LAG-1 fixating the top feature.

Fig 2. Information processing schema. Schematic of the relationships between experiment input, the Feature Detection Neurons, Visual Field, and the Spatial Attention Field. A) The fovea is indicated by the dashed grey circle in the center of the Visual Field. B) After an eye movement to the bottom middle feature, the green sensitive Feature Detector is activated and the Spatial Attention Field is boosted at its associated location. The Visual Field is coding spatial information in retinotopic coordinates while the Spatial Attention Field is coding information in spatiotopic coordinates.

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The Spatial Attention Field in LAG-1 represents changes in attentional priority to locations in a spatiotopic reference frame. The different frames of reference of the Spatial Attention Field and the Visual Field are depicted in Fig 2. Notice that there is no change in the location of features on the Spatial Attention Field between Fig 2A and 2B, despite the shifting of the bottom feature onto the fovea of the Visual Field.

Changes in activation on the Spatial Attention Field are described by similar equations as those used for the Visual Field, in Equation 13.

Saccade Motor Field. Candidate saccade target locations compete on the Saccade Motor Field [48, 49]. Unlike the Spatial Attention Field which binds a retinue of competing attentional priorities with spatial locations, the Saccade Motor Field resolves competition for attention at locations *other than* the current locus of fixation. The dynamics of this field resolves the competition between locations to be the target of the next eye movement according to Equation 17.

Saccade Timing System overview. Under normal viewing conditions, humans make about three saccades per second [77]. The period of relative spatial stability between saccades is the fixation duration. The parameterizations used in the present simulations were chosen for their rough correspondence with the normal range of saccade and fixation durations. In the model, as in the brain, the timing of an eye movement is affected by previous experience. In people, this includes factors like expected processing difficulty, but category learning experiments are designed to minimize such effects, so changes in fixation duration exhibited by LAG-1 are primarily the result of learning the relevance of different features. We have also observed fixation duration differences in LAG-1 when using it for visual search where disorganized inputs yield spatial interactions that speed or slow its saccade onset latency [40, 46, 58, 67, 78].

As the name suggests, the Saccade Timing System is the primary arbiter of decisions to release fixation and foveate a new location. The trio of neurons controlling this system are: the Gaze Change Neuron, the Fixation Neuron, and the Saccade Initiation Neuron. These model neurons have a functional correspondence with brain stem neurons referred to as: "build-up

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