

PSI 428
Attentional Processes

Automaticity, Effort and Control

Learning Objectives

- Automatic vs. Controlled Distinction
- Evidence of automaticity in Search tasks and memory loads
- Automaticity as the lack of voluntary control

What is automaticity?

What is automaticity?



4

Bilişsel Kontrol



5

What is automaticity?

- Well-practiced mental operations performed more quickly and accurately
- They also undergo qualitative changes
- Controlled and automatic mental operations are qualitatively different!

What is automaticity?

- Automatic mental operations no longer impose capacity demands
- There would be no interference with secondary tasks



What is automaticity?

- Automatic mental operations are not subject to voluntary control
- Appropriate inputs are present, processing commences and runs to completion whether or not the individual intends or desires this.

BU CÜMLEYİ OKUMAYIN

NO LEER ESTA FRASE

What is automaticity?

- Automatic mental operations function without awareness
- Automatic mental operations require little or no mental effort

Learning Objectives

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- Evidence of automaticity in Search tasks and memory loads
- Automaticity as the lack of voluntary control

Shiffrin & Schneider (1977).

- Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological review*, 84(2), 127.

Search Tasks

- Search tasks require controlled mental operations
- Irrespective of the mechanism (serial or limited capacity parallel, or parallel) search tasks require capacity demands

Memory Set in A Search Task

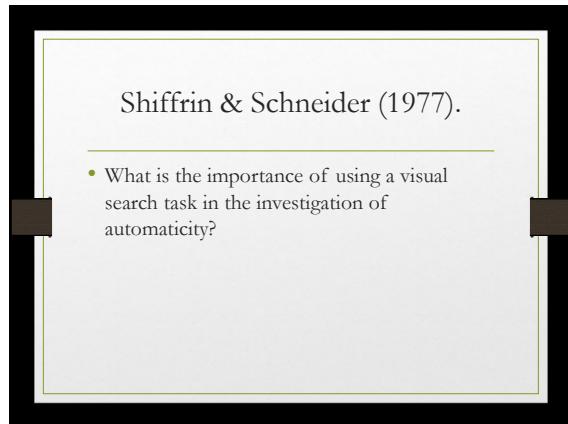
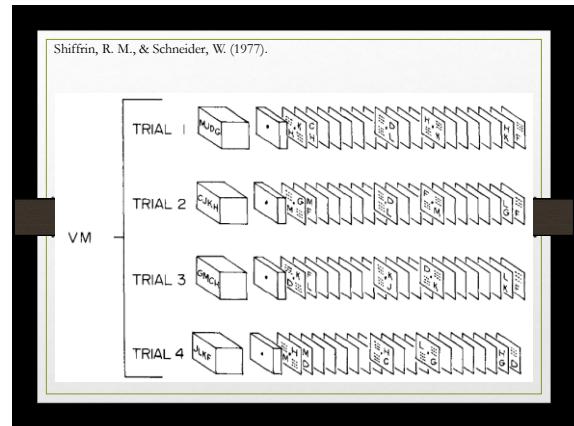
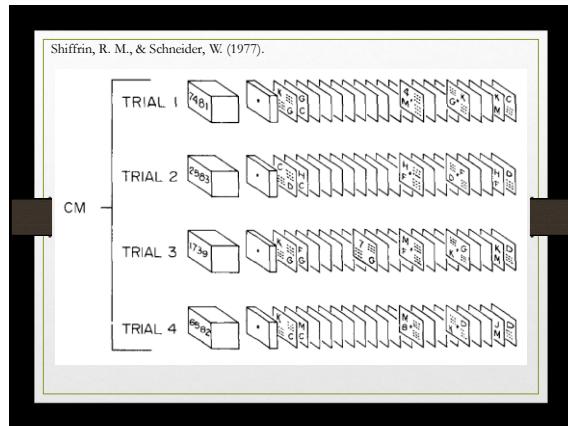
S R N B

Target Set in A Search Task

T	R	N	[-]
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Target Set in A Search Task

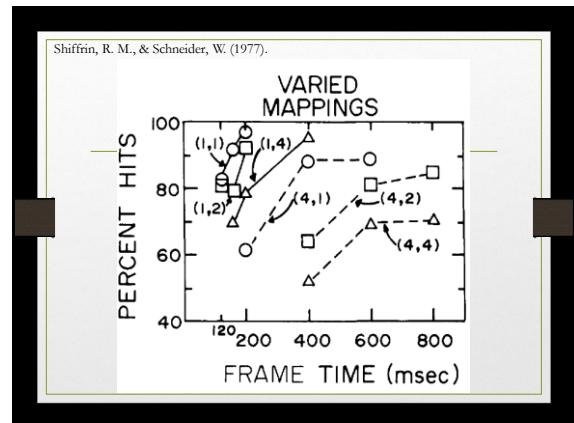
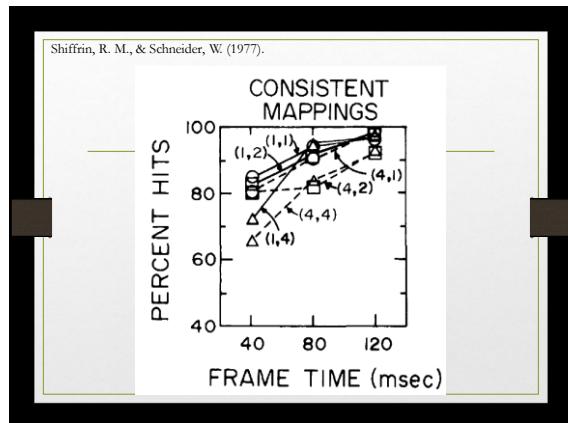
[-]	R	N	B
Z			[-]

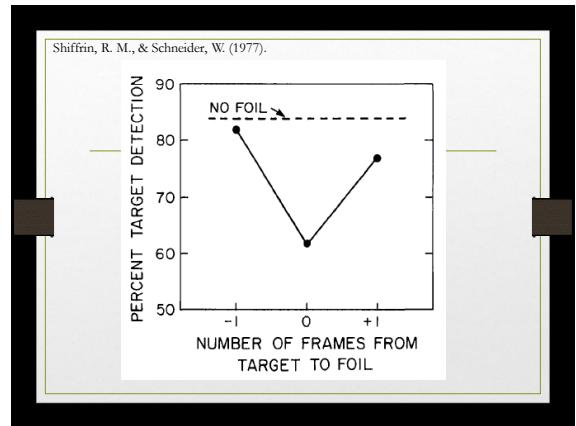
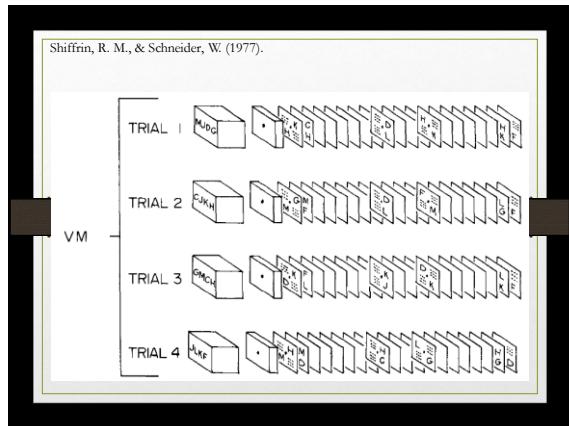
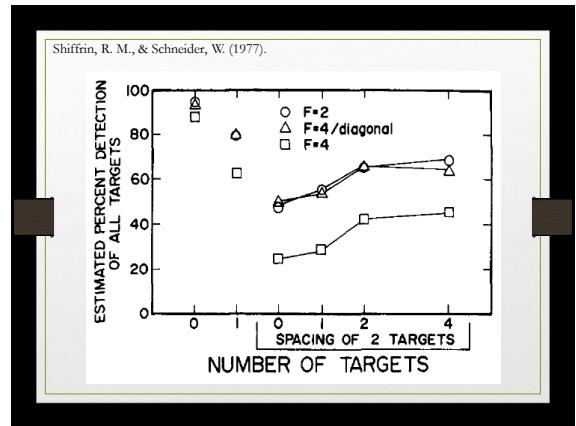
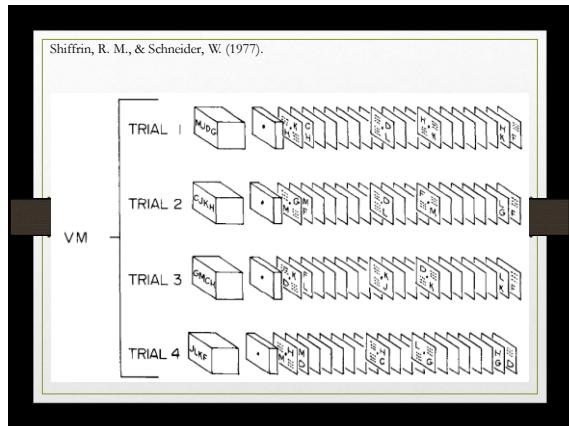


Shiffrin, R. M., & Schneider, W. (1977).

Table 1
Examples of CM and VM Trials for Four Successive Trials

Trial	Memory set	Distractor set	Target
Consistent mapping (CM)			
1	7481	KGJCM	4
2	2583	CHFLD	none
3	1739	KGFDM	7
4	6582	CMJKD	8
Varied mapping (VM)			
1	MJDG	CFHKL	D
2	CJKH	LGFDFM	none
3	GMCH	DLFKJ	none
4	JLKF	CDGHM	L



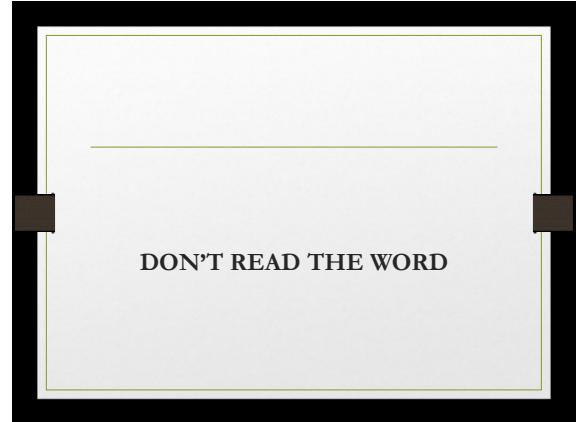
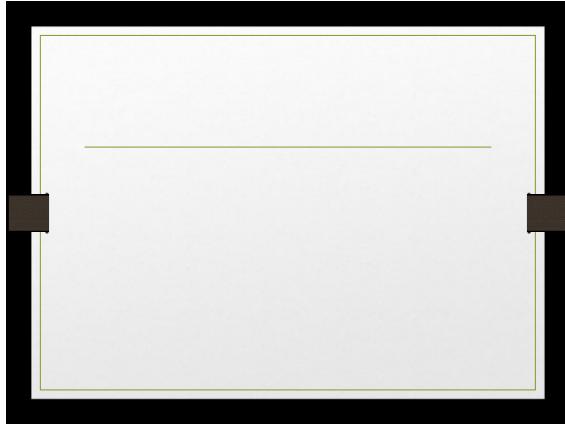


Learning Objectives

- Automatic vs. Controlled Distinction
- Evidence of automaticity in Search tasks and memory loads
- Automaticity as the lack of voluntary control

The Lack of Voluntary Control

- «Highly practiced mental operations can be triggered by a mere presence of an appropriate input.»



Stroop, J.R. (1935). "Studies of interference in serial verbal reactions." *Journal of Experimental Psychology*, 18, 643-662.

Stroop Experiment The Classic Study

- Classic Presentation Stroop Test Cards
- Name the color

Red	Yellow	Blue	Yellow
Black	Green	Black	Red
Blue	Blue	Yellow	Green
Yellow	Black	Red	Blue
Green	Red	Green	Black

Stroop Experiment The Classic Study

- Classic Presentation Stroop Test Cards
- Name the color

Red	Yellow	Blue	Yellow
Black	Green	Black	Red
Blue	Blue	Yellow	Green
Yellow	Black	Red	Blue
Green	Red	Green	Black

Subject	Experimental Words in Color	Colored Squares
SNO1	72	76
SNO2	93	70
SNO3	108	76
SNO4	138	69
SNO5	97	64
SNO6	107	56
SNO7	130	66
SNO8	75	61
SNO9	156	63
SNO10	85	56
SNO11	91	68
SNO12	103	78
SNO13	81	57
SNO14	106	55

Stroop Experiment The Classic Study

- MacLeod (1991) Table 2

Table 2
Experiment 2: Mean Times (in Seconds with Standard Deviations [SD]) for Naming Ink Colors in the Experimental Condition (Incompatible Color Words) and in the Control Condition (Solid Color Squares)

Experiment	Sample size	Experimental: words in color		Control: squares in color	
		M	SD	M	SD
Stroop (1935b)	100	110.3	18.8	63.3	10.8
MacLeod (1986)	40	102.27	18.06	59.76	8.09

Stroop Stimuli

- Instruction: Name the color
- Congruent stimulus



Stroop Stimuli

- Instruction: Name the color
- Incongruent stimulus



Stroop Stimuli

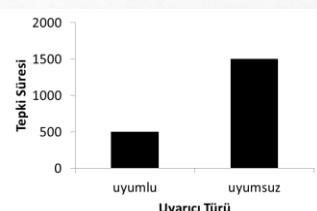
- Instruction: Name the color
- Neutral stimulus



Stroop Stimuli

		RENK BOYUTU			
		mavi	sarı	yeşil	pembe
KELİME BOYUTU	MAVİ	30	10	10	10
	SARI	10	30	10	10
	YEŞİL	10	10	30	10
	PEMBE	10	10	10	30

- Stroop Experiment



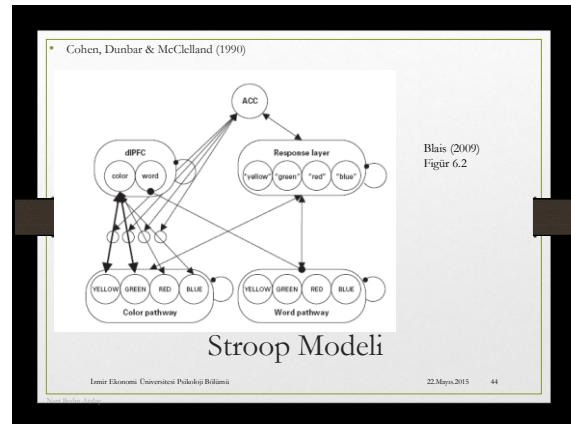
A Typical Result

Stroop Effect

- Word reading is an automatic process
 - It is over-learned
 - It lacks voluntary control
- Color naming is a controlled process
- Stroop effect shows the interaction between automatic and controlled processes

Stroop Effect

- Color word is read automatically
- Therefore, it activates a color concept
- It matches or mismatches with the ink color
- One cannot turn-off word reading machinery



ÇÖĞÜNLÜKTA UYUMLU LİSTESİ

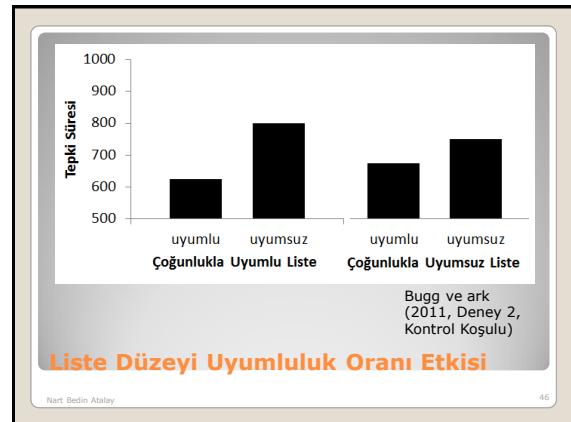
mavi	kırmızı
mavi	kırmızı
mavi	kırmızı
yeşil	siyah
yeşil	siyah
yeşil	siyah
mavi	kırmızı
yeşil	siyah

ÇÖĞÜNLÜKTA UYUMSUZ LİSTESİ

mavi	kırmızı
yeşil	siyah
mavi	kırmızı
mavi	kırmızı
mavi	kırmızı
yeşil	siyah
yeşil	siyah
yeşil	siyah

Liste Düzeyi Uyumluluk Oranı Etkisi

Nart Bedin Ataley 45



• Açıklama:

- Katılımcılar liste boyunca bir bilişsel kontrol strateji uygularlar.
- Strateji kelime okumanın rengi söyleme üzerindeki etkisini belirler.
- Bu strateji her iki listede farklıdır.
- Seçici dikkatin kontrolü her iki listede farklıdır.

Liste Düzeyi Uyumluluk Oranı Etkisi

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