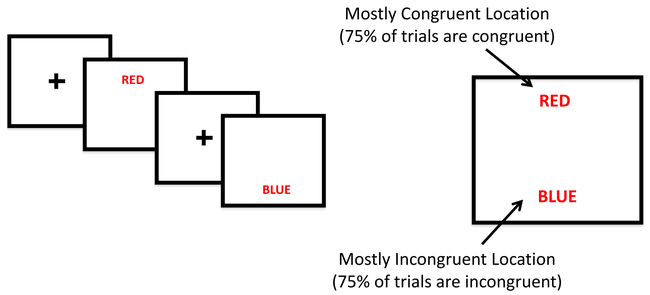
Can race serve as a context in context-driven attentional control?

Thomas G. Hutcheon, Marco Caliandro, Gloria Tucker, Mingxi Wang, & Ivy Wu
Bard College, Annandale-On-Hudson, New York

Context-Driven Attentional Control

The location-based context specific proportion congruent (CSPC) effect refers to the reduction in the size of the congruency effect at a location with a high proportion of incongruent trials relative to a location with a high proportion of congruent trials (Crump, Gong, & Milliken, 2006).



Mean Response Time (ms)

	Trial Type			
Location Proportion Congruent	Congruent	Incongruent	Congruency Effect	**CSPC Effect**
Mostly Congruent	659	796	137	**28**
Mostly Incongruent	664	773	109	

Data from Hutcheon & Zion (in revision)

This location-based CSPC effect has been taken as evidence for **context-driven attentional control**. Specifically, the efficiency of attention varies as a function of stimulus experience across context (location) (Bugg & Crump, 2012). This results contrasts with predictions of classic models of attentional control that assume attentional performance is relatively stable within individuals over the course a task (Miller & Cohen, 2001).

More recently context-driven attentional control has been extend beyond the dimension of location to social categories such as gender. For example, a CSPC effect was found when the proportion of congruent and incongruent trials varied as a function of perceived gender of a face (Cañadas et al., 2013; Hutcheon, in press).

Mostly Congruent Gender
(75% of trials are congruent in context of a male face)
Relatively large congruency effect

Mostly Incongruent Gender
(75% of trials are congruent in context of a male face)
Relatively small congruency effect

In this way, perceived gender may serve as a context for context-driven attentional control. In the current series of experiments, we tested whether perceived race of a face could perform a similar function.

Experiments 1, 2, and 3

For all 3 experiments reported here, online participants were recruited through Prolific™ and completed the experiments on their home computers. All faces were selected from the Chicago Face Database (Ma et al., 2015).

In **Experiment 1**, we asked whether the size of the congruency effect would be reduced for faces of the mostly incongruent race compared to the mostly congruent race? Further, would this generalize to exemplars of the same race that were equally likely to occur with a congruent or incongruent stimulus.

Stimulus Frequencies in Experiment 1

			Word			
Race Proportion Congruent	Face Type	Color	Blue	Green	Red	Yellow
Mostly Congruent	Inducer	Blue	9	1	1	1
		Green	1	9	1	1
		Red	1	1	9	1
		Yellow	1	1	1	9
	Diagnostic	Blue	6	2	2	2
		Green	2	6	2	2
		Red	2	2	6	2
		Yellow	2	2	2	6
Mostly Incongruent	Inducer	Blue	3	3	3	3
		Green	3	3	3	3
		Red	3	3	3	3
		Yellow	3	3	3	3
	Diagnostic	Blue	6	2	2	2
		Green	2	6	2	2
		Red	2	2	6	2
		Yellow	2	2	2	6

Mean Response Time (ms) in Experiment 1 (N = 56)

		Trial Type			
Face Type	Race Proportion Congruent	Congruent	Incongruent	Congruency Effect	CSPC Effect
Inducer	Mostly Congruent	777 (18)	943 (21)	166	11
	Mostly Incongruent	787 (21)	942 (20)	155	
Diagnostic	Mostly Congruent	778 (18)	949 (24)	171	4
	Mostly Incongruent	785 (19)	952 (22)	155	

Values in parentheses indicate standard error of the mean.

A numerical, but not statistically significant CSPC effect was observed for both inducer (η^2 = 0.026) and diagnostic stimuli ((η^2 = 0.002) . To follow up on the null finding, we ran **Experiment 2** using the same design but without including diagnostic stimuli.

Stimulus Frequencies in Experiment 2

		Word			
Race Proportion Congruent	Color	Blue	Green	Red	Yellow
Mostly Congruent	Blue	18	3	3	3
	Green	3	18	3	3
	Red	3	3	18	3
	Yellow	3	3	3	18
Mostly Incongruent	Blue	6	6	6	6
	Green	6	6	6	6
	Red	6	6	6	6
	Yellow	6	6	6	6

Mean Response Time (ms) in Experiment 2 (N = 59)

	Trial Type			
Race Proportion Congruent	Congruent	Incongruent	Congruency Effect	CSPC Effect
Mostly Congruent	689 (16)	795 (18)	106	7
Mostly Incongruent	694 (16)	793 (19)	99	

Values in parentheses indicate standard error of the mean.

For a second consecutive experiment, we find a numerical but not statistically significant CSPC effect (η^2 = 0.013) when perceived race of a face served as context. We ran **Experiment 3** with 1 face from each race, a design that is more in line with research that has studied the location-based CSPC effect.

Stimulus Frequencies in Experiment 3

		Word			
Race Proportion Congruent	Color	Blue	Green	Red	Yellow
Mostly Congruent	Blue	18	3	3	3
	Green	3	18	3	3
	Red	3	3	18	3
	Yellow	3	3	3	18
Mostly Incongruent	Blue	6	6	6	6
	Green	6	6	6	6
	Red	6	6	6	6
	Yellow	6	6	6	6

Mean Response Time (ms) in Experiment 3 (N = 62)

	Trial Type			
Race Proportion Congruent	Congruent	Incongruent	Congruency Effect	CSPC Effect
Mostly Congruent	700 (15)	813 (17)	113	8
Mostly Incongruent	705 (15)	810 (18)	105	

Values in parentheses indicate standard error of the mean.

For a third consecutive experiment, we find a numerical but not statistically significant CSPC effect (η^2 = 0.029).

Conclusions and Future Directions

The results of the current series of experiments suggest that the perceived race of a face does not serve as a context for context-driven attentional control. Future work is needed to test whether instructions to attend to the face impact theses results (e.g. Cañadas et al., 2013).

This results suggests that perceived race of a face plays no role in the organization of attentional information in this task. Future studies are required to confirm these interpretations and to extend the to faces of a larger set of races

This represents an important area of research as the extent to which race serves to trigger different attentional settings could have an real-world implications for how individuals process and respond to information from faces of different races

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For more information, please contact Tom Hutcheon (thutcheo@bard.edu).