SUPPLEMENTARY MATERIALS

Experiment 2b

Experiment 2 showed a significant forward blocking effect measured with a priming test. The objective of Experiment 2b was to replicate the blocking effect in order to ensure that this was not a spurious finding while using a slightly different design (see Table S1). It also tests the generality of the effect previously found using a different design. Due to the characteristics of Experiment 2, Outcome 3 was presented more often than Outcomes 1 and 2. This might have produced by itself a repetition priming effect, speeding up responses to this word in every trial in which Outcome 3 was presented[1]. Experiment 2b used a different version of the blocking design, in which an additional control relation was included. Because of this, all the outcomes could be presented the same number of times during the priming test, preventing this kind of repetition priming.

Method

Participants

Sixty one students participated in exchange for course credit.

Design

The design used was similar to the one of Experiment 2, but an additional control relation was used (see Table S1). The presentation of J-4 and HI-4 trials in the first and second phase of training respectively ensured that the same number of control and blocking trials appeared during training. Also, during test every outcome used was presented the same number of times. Each outcome appeared as target twice, once in a consistent trial and one in an inconsistent trial (see Table 5).

Procedure

The procedure was equivalent to that of Experiment 2. Only the learning criterion was changed. Given that four relations per phase were learnt, participants had to respond correctly in 32 out of 36 consecutive trials or complete 80 trials in order to proceed from Phase 1 to Phase 2 and from Phase 2 to the test.

Results

The responses of three participants were not included in the analysis, due to lack of correct answers in one trial type, leaving a final sample of fifty eight participants. The trials within the accepted time window of 250 to 2000 ms were 95.20% of the total trials. Figure S1 represents participants' mean response times in each condition of the test. Analyses were performed as described before. There was a significant interaction between Trial Type (Consistent vs. Inconsistent) and Condition (Blocking vs. Control) [$F(1,57) = 4.298$, $p = .043$, $\eta^2 = .070$], a main effect of Trial Type [$F(1,57) = 8.121$, $p = .006$, $\eta^2 = .125$], but none of Condition [$F(1,57) < 1$].

Statistical tests for related samples showed that as expected, reaction times in Consistent Control trials were faster than Inconsistent Control trials [$t(57) = 3.283$, $p = 0.002$, $d = .431$], while there was no difference between any other pair of measures [$t(57) < 1.264$, $p > .211$].

One advantage of having target outcomes with the same frequency is that priming effects can also be calculated by holding constant the prime instead of the target. Equivalent results are found in this case. Consistent Blocking trials (B – 1 and D – 2) and Inconsistent Control trials (B – 3 and D – 4) shared the same primes, as well as Consistent Control trials (F – 3 and I – 4) and Inconsistent Blocking trials (F – 1 and I – 2). A repeated measures ANOVA was run, with two factors, Prime (B and D, or F and I) and Target (1 and 2 or 3 and 4). There was a significant interaction between the two factors [$F_{1,57} = 8.121$, $p = 0.006$, $\eta^2 =$

0.125]. Post-hoc t-tests showed that there was a significant difference in reaction times between trials with cues F and I, being faster when they had consistent targets than when they had inconsistent targets [$t(57) = 2.141$, $p = 0.037$], while there were no significant differences in trials with cues B and D [$t(57) = 1.387$, $p = 0.171$].

Discussion

As in Experiment 2, the results of Experiment 2b showed a significant blocking effect, with a facilitating effect of a consistent priming stimulus on a recognition test in a control condition but no effect in a blocking condition. Also, any effect observed here cannot be due to a potential repetition priming effect. These two experiments together show converging evidence of detection of a forward blocking effect using a priming based measure with two different designs.

Footnote

1. It must be noted that the critical comparisons made in Experiments 2 and 3 are between those trials in which the same outcome is preceded by a consistent or inconsistent cue. This way we can measure to what extent the processing of the outcome has been facilitated by the presentation of the cue. A faster reaction time in E-3 trials compared to B-3 trials would indicate that the presentation of Cue E primes Outcome 3. Then, blocking would be found if B-1 and E-1 (also D – 2 and F – 2) trials do not differ while E-3 and B-3 do differ. This is the interaction reported in Experiments 2 and 3. Therefore, if there is a speeded recognition of Outcome 3, as a result of being presented more often during the test, this would affect both kinds of trials of the Control condition, reducing their reaction times, but there is no reason to expect (as confirmed by Experiment 2b) that this effect could explain the pattern of results found. Also, it could only affect the Control condition, and could not induce the lack of priming found on the Forward Blocking condition (Experiment 2) or Backward Blocking condition (Experiment 3).

Table S1

Design of training phases in Experiment 2b

Exp. 2b	
Phase 1	Phase 2
A – 1	AB – 1
B – 2	CD – 2
G – 3	EF – 3
J – 4	HI – 4

Note. Cues are represented by letters and outcomes by numbers. Experiments 2b had a repeated forward blocking design, being the Blocked cues B and D, and their Control cues E, F, H and I.

Figure S1

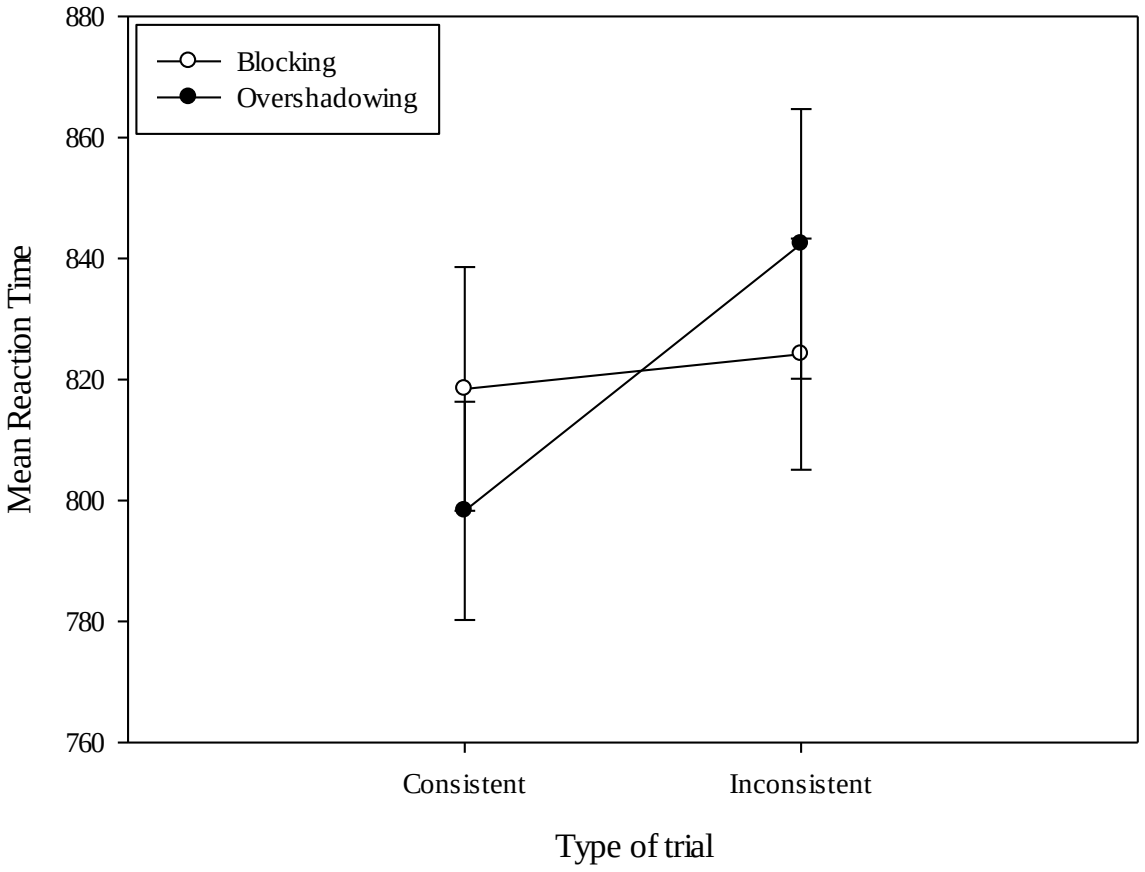

Figure S1. Mean reaction times of participants in Experiment 2b in the Forward Blocking and Control conditions (see Table 2). Error bars represent standard errors of the mean. In Consistent trials, targets were primed by its associated cue whereas in Inconsistent trials they were primed by a different Old cue.

Materials used in Experiments 1 to 4

Verbal Stimuli Employed

varices	desmayo	escozor	ceguera	migraña	insomnio	rigidez
anguila	salmón	Perdiz	nutria	halcón	gusano	búfalo
violeta	durillo	Eulalia	ciprés	naranjo	manzano	jazmín
anchoa	sorbete	Potaje	nueces	fabada	buñuelo	mostaza
visera	décimo	Estufa	cazuela	bobina	manija	rodillo
austria	suecia	polonia	noruega	bélgica	holanda	turquía

Note. Words in Spanish used as outcomes (columns 1 to 4) and additional targets (5 to 7) in each block. They are symptoms of diseases, animals, plants, foods, objects and countries, respectively.

ALIENTO	FÁBRICA	OXÍGENO	PREMIO	UMBRAL	QUÍMICA	SINGULAR
TERRAZA	EDICIÓN	VECINA	CAMPEÓN	IDIOMA	RADICAL	TEJIDO
DIBUJO	JUZGADO	AZÚCAR	BOTELLA	OFICINA	PAQUETE	HOMBRO
SÍMBOLO	INVENTO	RAPIDEZ	GIGANTE	ENVIDIA	CORONA	VIERNES
IMPACTO	OLVIDO	DISEÑO	LÁMPARA	AFICIÓN	SABIA	TÉCNICO
NOBLEZA	PORTERO	LÁSTIMA	HUELLA	ÓRBITA	VOLUMEN	ENTORNO
CAMISA	RETRATO	MINUTO	LECCIÓN	DETALLE	ORILLA	

Note. Words in Spanish used as cues.