

On the Difficulty of Task Switching: Assessing the Role of Task-Set Inhibition

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This study assessed whether the difficulty of task switching stems from previous inhibition of the task set. A predictable sequence of univalent stimuli (affording performance of one active task) and bivalent stimuli (affording performance of two tasks) was used in two experiments. Experiment 1 used an alternating-runs paradigm (AABB) and Experiment 2 used a strictly alternating sequence (ABAB). The critical variable was whether the incentive for task-set inhibition was strong (on bivalent trials) or weak (on univalent trials). The question was whether it would be more difficult to switch to a task that previously needed to be inhibited than to a task that did not need to be inhibited. This pattern was not observed in either experiment. Thus, the data provide no evidence that task switching is difficult because of the need to overcome recent task-set inhibition.

In everyday life, people often have many different tasks pending at the same time. People can flexibly switch back and forth between these tasks even when the impetus to switch tasks is purely top-down (goal-driven), without support from any environmental stimuli. Nevertheless, people usually cannot do so without cost. Numerous studies have shown that performance slows immediately following a task switch (known as the *switch cost*, Jersild, 1927). Switch costs occur even when people know the identity of the new task in advance (e.g., Lien, Schweickert, & Proctor, 2003; Sohn & Carlson, 2000) and have ample time to prepare for the switch (e.g., Allport, Styles, & Hsieh, 1994; Meiran, 1996; Rogers & Monsell, 1995). These findings raise two important questions: What cognitive processes enable flexible task switching and why do these processes slow subsequent task performance?

Several recent studies have suggested that the cognitive processes involved in task switching include inhibition of the previous task set (Mayr & Keele, 2000; see also Hübner, Dreisbach, Haider, & Kluwe, 2003; Schuch & Koch, 2003). In Mayr and Keele (2000), participants viewed four rectangular objects that could differ on three dimensions (color, orientation, and movement). A visual word cue (“Color”, “Orientation”, or “Movement”) instructed participants to respond to the deviant object on that dimension. To look for evidence of task-set inhibition, Mayr and Keele compared ABA and CBA task sequences. They reasoned that task-set inhibition would decay over time, so a switch to Task A would be slower if that task was recently inhibited (e.g., as in

ABA) than if it was not (as in CBA). The data confirmed this prediction.

Task-set inhibition can have positive effects (facilitating an immediate switch to a new task) as well as negative effects (impeding a subsequent switch back to the inhibited task). Thus, task-set inhibition not only can explain how people successfully switch tasks, but also can explain why task switch performance is slow. Furthermore, it can explain why switch costs are much larger with *bivalent* stimuli, affording performance of two active tasks, than with *univalent* stimuli, affording performance of only one active task.

First consider bivalent stimuli. When performing a letter task (vowel/consonant) and a digit task (odd/even), for instance, participants might see both a letter and a digit on each trial. Because the stimulus display affords both tasks, there is a serious risk of performing the irrelevant task and making an error. The risk would be especially severe on task switch trials, because the irrelevant task is the one that was just performed. To prevent task perseveration errors on switch trials, one could inhibit the just-performed (now irrelevant) task. Note that although task-set inhibition would facilitate switching on the upcoming trial, it could impede switching back to that inhibited task on a future trial. Thus, inhibition can, by itself, explain why bivalent task switches (where the task is inhibited) are performed much more slowly than bivalent task repetitions (where the task is not inhibited).

Now consider univalent stimuli (e.g., when the display contains only a letter or only a digit). Because the Task A stimulus does not afford Task B, there is no risk of accidentally performing Task B and therefore little incentive to inhibit Task B (even when it was just

performed; see Fagot, 1994). The absence of inhibition could explain why people can switch between univalent tasks with very little cost (e.g., Allport et al., 1994; Jersild, 1927; Ruthruff, Remington, & Johnston, 2001; Spector & Biederman, 1976).

A key assumption of this explanation of bivalent and univalent switch costs is that task-set inhibition is applied adaptively, to prevent performance of the wrong task. Inhibition is unnecessary when it is known that the task will repeat or that the stimulus will be univalent. We also assume, following Mayr and Keele (2001), that inhibition is applied proactively, in anticipation of bivalence, although similar predictions follow if inhibition is also applied reactively, in response to bivalence. This adaptive view of task-set inhibition is simple, plausible, and consistent with previous results. At the same time, this hypothesis has not yet been rigorously tested.

The Present Study

The purpose of the present study was to evaluate the adaptive task-set inhibition hypothesis, which assumes that task switching is difficult primarily because of the need to overcome residual task-set inhibition. Mayr and Keele (2000) found that mean response time (RT) was roughly 40 ms faster on the third trial of a CBA task sequence than an ABA task sequence. They attributed this effect to the extra decay of Task A inhibition in the CBA sequence compared to the ABA sequence. These results, however, do not indicate whether or not switch costs are primarily due to task-set inhibition. On one hand, the observed effect seems small compared to the typical switch cost (~200 ms). On the other hand, it is not clear how rapidly inhibition decays over time, or even that it decays (the need to ignore the irrelevant task on intervening trials could actually *increase* inhibition; see Experiment 2 of Mayr & Keele, 2000). If both the ABA and CBA conditions have similar degrees of residual inhibition, the observed effect size would greatly underestimate the true cost of residual inhibition.

Rather than compare conditions differing only in the recency of inhibition (e.g., as in Mayr & Keele, 2000), we compared two conditions differing in the need for inhibition. Consider an ABA task sequence. After performing the first instance of Task A, there is a strong incentive to inhibit that task set when the intervening Task B stimulus is bivalent (to prevent perseveration of Task A). The need to overcome

residual inhibition would then slow the subsequent switch back to Task A, provided that the inhibition cannot be completely counteracted by top-down mechanisms and does not completely dissipate during the inter-trial-interval. In contrast, there would appear to be very little incentive to inhibit Task A when the intervening Task B stimulus is univalent and perseveration of Task A is impossible. The lack of inhibition would then facilitate the subsequent switch back to Task A.

In summary, the difficulty of switching back to Task A in an ABA sequence should depend critically on whether the *preceding* Task B stimulus display was bivalent or univalent (for a similar logic, see Allport & Wylie, 1999). Experiments 1 and 2 used different approaches to test this prediction. Note that many previous studies have manipulated univalence and bivalence, but they have generally done so between blocks, confounding current univalence/bivalence and previous univalence/bivalence (for a few exceptions, see Fagot, 1994, and Rogers & Monsell, 1985).

Experiment 1

Experiment 1 used a variant of the traditional alternating-runs paradigm (AABB). Task A was a digit task (odd vs. even) and Task B was a letter task (vowel vs. consonant), or vice versa (counterbalanced across participants). When performing Task A, the stimulus was always bivalent (a letter and a digit), but when performing Task B the stimulus was always univalent (a letter or a digit). We denote this sequence as $A_B A_B BB$ where the subscript B indicates that an irrelevant Task B stimulus was presented alongside the relevant Task A stimulus. The use of a predictable task sequence makes it easy for participants to adapt to the univalence/bivalence of the displays. To further encourage adaptation, participants were informed of this design and were given two practice blocks.

When switching from Task B to Task A_B , participants have strong incentive to inhibit Task B (to avoid task perseveration). This inhibition could produce a cost when later switching back to Task B (e.g., the third trial in the sequence $A_B A_B \underline{B} B$), even though the stimulus for Task B is univalent. In contrast, there is no incentive to inhibit Task A when switching to the univalent Task B. If Task A is not inhibited, then it should be relatively easy to switch back to Task A_B (e.g., the first trial in the sequence $\underline{A}_B A_B BB$), even though the stimulus for Task A_B is bivalent.

In summary, the strong version of the adaptive inhibition hypothesis predicts that the difficulty of switching to a task should depend critically on whether the

preceding trials were univalent or bivalent (manipulating the incentive for inhibition), not whether the current trial is univalent or bivalent. Because previous studies have generally confounded previous and current univalence/bivalence, they cannot address this issue. One notable exception is Wylie and Allport (2000, Experiment 1; also discussed in Allport & Wylie, 1999), who conducted an alternating-runs experiment with Stroop tasks (color-naming and word-naming). Interestingly, their results generally confirmed the above predictions: smaller switch costs following univalent trials than bivalent trials. These results, although suggestive, should be interpreted cautiously. One reason is that the key univalence/bivalence manipulation was between, rather than within, blocks. Another reason is that switching between asymmetric tasks may represent a special case (we will return to these issues in the General Discussion).

Method

Participants. A total of 32 undergraduates at Oregon State University participated in exchange for extra course credit. All had normal or corrected-to-normal vision.

Apparatus and stimuli. Stimuli were presented on IBM-compatible microcomputers connected to 21-in. Dell monitors. An 11.4 cm × 11.4 cm frame consisting of four boxes was presented in the screen center (see Figure 1). On each trial, stimuli (0.8 cm wide and 0.9 cm tall) appeared in one of these boxes. At an average viewing distance of 55 cm, each stimulus subtended a visual angle of $0.83^\circ \times 0.94^\circ$.

Design and procedure. On each trial, participants performed either a digit task or a letter task. For the digit task, participants pressed the “Z” key for odd digits (1, 3, 7, or 9) and the “M” key for even digits (2, 4, 6, or 8). For the letter task, participants pressed the “Z” key for consonants (G, K, M, or R) and the “M” key for vowels (A, E, I, or U). Participants pressed the

“Z” and “M” keys with their left-index and right-index fingers, respectively.

Following Rogers and Monsell (1995), the first stimulus of each block appeared in the top-left box (see Figure 1). Each subsequent stimulus appeared in the box located immediately clockwise from the previous one. Each trial started with a fixation cross, which lasted for 500 ms. After a 300 ms blank period, the stimulus appeared. After participants responded, auditory feedback (a beep on error trials, silence on correct trials) was presented for 200 ms. The fixation cross for the next trial appeared 400 ms later. Consequently, the total response-stimulus-interval was 1,400 ms.

For the top two boxes (the bivalent stimulus condition), a digit and a letter appeared simultaneously in the center of the box. As shown in Figure 1, these stimuli were presented in a horizontal row; the relative positions of the relevant and irrelevant stimuli were determined randomly. The identity of the relevant stimulus was chosen randomly, with the restriction that each category (odd, even, consonant, vowel) be used equally often within each block. The identity of the irrelevant stimulus was selected randomly, without any restriction. For the bottom two boxes (the univalent stimulus condition), a single stimulus appeared in the center of the box. For half of the participants, the top two boxes were assigned to the digit task and the bottom two boxes were assigned to the letter task (producing a task sequence of digit-digit-letter-letter...). For the other participants, the assignment was reversed.

Participants performed two practice blocks; the first contained 16 trials and the second contained 64 trials. The following 6 experimental blocks each contained 64 trials. The entire experiment lasted approximately 25 minutes. Both speed and accuracy were emphasized. After each block, participants received feedback regarding their mean RT and accuracy for that block. They were encouraged to rest before beginning the next block.

Results

We omitted from analysis any task repetition trial in which the stimulus was the same as previous stimulus, to avoid contamination of task repetition effects with stimulus repetition effects. We also omitted trials following an error. For RT analyses, we also omitted error trials. In addition, we treated RTs outside the range of 100 ms to 4,000 ms as outliers, eliminating an additional 0.2% of trials. Because task type (letter versus digit) had little effect and did not consistently interact with any other factors, it was excluded from the final analyses. Data were

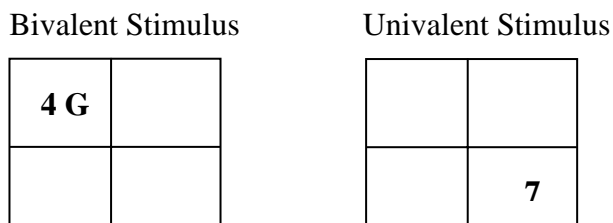


Figure 1. An example of the bivalent stimulus condition and the univalent stimulus condition used in Experiment 1

analyzed as a function of task transition (repetition versus switch) and previous trial type (univalent versus bivalent).

Table 1 shows the mean RT and proportion of error (PE) in each condition. For the RT data, there was a main effect of task transition, $F(1, 31) = 43.69$, $p < .001$, $MSE = 11,031$, reflecting an overall switch cost of 124 ms. There was also a main effect of previous trial type, $F(1, 31) = 47.04$, $p < .001$, $MSE = 9,736$; mean RT was 120 ms shorter when the previous trial was bivalent ($M = 611$ ms) than when it was univalent ($M = 731$ ms). The interaction between task transition and previous trial type was also significant, $F(1, 31) = 10.56$, $p < .01$, $MSE = 1,965$; RT switch costs were larger when the previous trial was univalent (148 ms) than when the previous trial was bivalent (98 ms).

For the PE data, there was a main effect of task transition, $F(1, 31) = 7.74$, $p < .01$, $MSE = .0010$; the switch cost on PE was .016. No other effects were significant.

Discussion

If adaptive inhibition is the primary source of switch costs, then it should be more difficult to switch back to a task when the preceding trials were bivalent (requiring inhibition) than when they were univalent (not requiring inhibition). The results actually went in the opposite direction: mean RT on switch trials was 145 ms faster ($SE = 22$ ms) following bivalent trials ($M = 660$ ms) than following univalent trials ($M = 805$ ms).

These results suggest that something other than adaptive inhibition is the primary source of switch costs (in the General Discussion we offer a few hypotheses). However, they do not necessarily indicate that switch performance is completely insensitive to whether the previous trial was univalent or bivalent (manipulating the need for inhibition). Such effects might have occurred in this experiment but were outweighed by the effects of whether the current trial was univalent or bivalent. To evaluate this possibility, Experiment 2 independently manipulated previous univalence/bivalence and current univalence/bivalence.

Experiment 2

Whereas Experiment 1 used a repeating $A_B A_B B B$ task sequence, Experiment 2 used a repeating $A_B B_A A B$ task sequence. Thus, all trials were task switch trials.

One consequence of shortening the task run length is that there was less time for inhibition to decay between instances of a task. More importantly, this design allowed us to factorially manipulate whether the current trial was univalent or bivalent and whether the previous trial was univalent or bivalent. Another methodological difference is that we counterbalanced across participants whether the top two boxes were bivalent and the bottom two univalent (as in Experiment 1) or vice versa.

According to the adaptive inhibition hypothesis, task switch responses should be relatively slow when the preceding trial is bivalent (e.g., from A_B to B_A or from B_A to A), because participants are switching to a recently inhibited task. Meanwhile, switch performance should be relatively fast when the preceding trial is univalent (e.g., from A to B or from B to A_B), because participants are switching to a task that was not recently inhibited. In other words, task-switch performance should depend strongly on whether the previous trial is univalent or bivalent, regardless of whether the current trial is univalent or bivalent.

Method

Participants. There were 36 participants, drawn from the same participant pool as in Experiment 1. None had participated in Experiment 1.

Apparatus, stimuli, and procedure. The apparatus, stimuli, and procedure were the same as in Experiment 1, except that participants always switched tasks (e.g., $A_B B_A A B \dots$). The assignment of tasks (digit vs. letter) to the top-left box was counterbalanced across participants, as was the assignment of univalence/bivalence to the top and bottom boxes.

Results

The data analysis was similar to that of Experiment 1. Application of RT cutoffs eliminated 0.3% of responses. Data were analyzed as a function of current univalence/bivalence and previous univalence/bivalence.

Table 2 shows the mean RT and PE. For the RT data, there was a main effect of current univalence/bivalence, $F(1, 35) = 215.65$, $p < .001$, $MSE = 13,776$; responses were 287 ms slower when the current trial was bivalent than when it was univalent. The effect of previous univalence/bivalence was also significant, $F(1, 35) = 17.61$, $p < .001$, $MSE = 5,162$. Contrary to the predictions of the adaptive inhibition hypothesis, however, responses were 51 ms faster ($SE = 12$ ms) when the previous trial was bivalent than when it was univalent. The interaction

between current univalence/bivalence and previous univalence/bivalence was also significant, $F(1, 35) = 16.50$, $p < .001$, $MSE = 12,048$. Follow-up data analyses revealed that previous univalence/bivalence had a significant effect when the current trial was bivalent, $F(1, 35) = 23.26$, $p < .001$, $MSE = 12,006$, but not when it was univalent, $F(1, 35) = 2.00$, $p = .1662$, $MSE = 5,204$.

For the PE data, there was only a main effect of current univalence/bivalence, $F(1, 35) = 11.78$, $p < .01$, $MSE = .0009$; PE was 0.017 higher when the current trial was bivalent than when it was univalent.

Discussion

In Experiment 2, we independently manipulated whether the current trial was univalent or bivalent and whether the previous trial was univalent or bivalent, using a repeating $A_B B_A AB$ task sequence. According to the adaptive inhibition hypothesis, task switch performance should be better when the previous trial was univalent (little incentive for inhibition) than when the previous trial was bivalent (strong incentive for inhibition). The results, however, failed to confirm this prediction. If anything, the trend went in the opposite direction.

Although we found little effect of previous univalence/bivalence, we found a very large main effect of current univalence/bivalence. In fact, RT was 287 ms longer and PE was 0.017 higher when the current trial was bivalent rather than univalent. Note that participants responded very quickly and accurately to univalent task switches even when that task was assumed to have been recently inhibited (because the previous trial was bivalent).

General Discussion

The present experiments investigated the hypothesis that switch costs occur because of the need to overcome previous inhibition. If inhibition is adaptive, people should not intentionally inhibit a task when there is no risk of a task perseveration error. This release from inhibition should benefit performance when it comes time to switch back to that task. Consequently, task switch performance should be better following univalent trials (little incentive to inhibit the irrelevant task) than following bivalent trials (strong incentive to inhibit the irrelevant task).

To evaluate these predictions, we used an $A_B A_B BB$ task sequence in Experiment 1 and an $A_B B_A AB$ task

sequence in Experiment 2. Both experiments failed to confirm the predictions. If anything, the results went in the opposite direction. Thus, we found no evidence that adaptive task-set inhibition is the primary cause of, or even contributes to, switch costs.

The present findings appear to conflict with those of Wylie and Allport (2000; Experiment 1), who had participants switch between the color-naming and word-naming versions of the Stroop task. A key finding was that the cost of switching to the word-naming task (whose stimulus was always bivalent) was greater when the stimulus for the color-naming task was bivalent (a colored word) rather than univalent (a row X's). This finding supports the hypothesis that inhibition of word-naming increases when there is a strong need for it. One plausible reconciliation, therefore, is that inhibition is applied when it is necessary to prevent a dominant task from overwhelming a weaker task (as in Wylie & Allport), but not when the active tasks are roughly equal in strength (as in our study). It may be premature, however, to conclude that inhibition took place in Wylie and Allport's (2000) study. Rather than increasing inhibition of the word-naming task in the all-bivalent blocks, participants might have increased activation of the color-naming task. This heightened activation would impede a switch back to the word-naming task, thus explaining the key result without appealing to the concept of inhibition (see also Monsell, Yeung, & Azuma, 2000). This ambiguity of interpretation stems from the fact that Wylie and Allport used only bivalent stimuli on word-naming trials; had they used univalent word-naming trials, they could potentially have deconfounded the contributions of word-naming inhibition and color-naming activation¹. This issue deserves further investigation.

Is Inhibition Triggered by Response Competition?

Goschke (2000; see also Mayr & Keele, 2000) proposed that inhibition might be more necessary when the irrelevant task suggests a response that is incongruent, rather than congruent, with the relevant-task response. Consistent with this claim, Goschke found somewhat larger switch costs following incongruent trials than congruent trials (roughly, 200 ms vs. 150 ms at the long SOA, estimating from his Figure 4.2). Note that Goschke assumed that inhibition is applied reactively, after detection of response competition. In contrast, we allow that inhibition might also be applied proactively, in anticipation of potential competition.

Nevertheless, to see if similar effects occurred in the present experiments, we measured the amount of slowing

following an incongruent bivalent stimulus compared to a congruent bivalent stimulus. Experiment 1, the slowing was -3 ms when the current trial was univalent and -1 ms when it was bivalent; neither effect was significant, $F_s(1, 31) < 1.0$. In Experiment 2, the slowing was 11 ms on univalent trials and 32 ms on bivalent trials; again, neither effect was statistically significant, $F(1, 35) < 1.0$ and $F(1, 35) = 3.29$, $p = .08$, $MSE = 11,093$, respectively. The difference in the congruence effects between the univalent trials and the bivalent trials was also not statistically significant, $F(1, 35) < 1.0$. To summarize, the amount of extra slowing following incongruent trials was negligible in three out of four comparisons. Even when a hint of slowing was observed, it is difficult to determine conclusively that it was due to heightened inhibition, rather than some other influence. For instance, incongruence on one trial might lead to more cautious responding on subsequent trials. Overall, we found little evidence that extra task-set inhibition is triggered by an incongruent irrelevant-task response.

Why Doesn't Adaptive Inhibition Lead to Switch Costs?

One straightforward explanation of these findings is that people do not inhibit task sets. In other words, task switching might be facilitated primarily by activating the relevant task set rather than by inhibiting the irrelevant task set. The residual activation of the irrelevant task on switch trials would slow performance and produce a switch cost (at least on bivalent trials).

Given the strong intuitive appeal of the concept of task-set inhibition, and previous evidence in favor of it (e.g., Hübner et al., 2003; Mayr & Keele, 2000), it is worth considering how one could reconcile this core assumption with the present findings. One possibility is that task-set inhibition occurs, and does lead to future switch costs, but it is not adaptive. People might inhibit task sets automatically, even when the immediate benefits are small and the future costs are large. Mayr and Keele (2000), for instance, suggested that task-set inhibition is controlled by “processes that are relatively impenetrable through higher-level control” (p. 22). Completely non-adaptive inhibition seems implausible, because people presumably do not inhibit tasks expected to repeat on the next trial. It is conceivable, however, that people inhibit tasks whenever a switch is expected, regardless of the relative costs and benefits. This hypothesis appears to predict slow responses on task switch trials (due to the

costs of overcoming residual inhibition) even when the current stimulus is univalent. The present data clearly disconfirmed this prediction. To explain these findings, one would need the additional (and somewhat questionable) assumption that inhibition does not impair performance with univalent stimuli.

An alternative possibility is that inhibition occurs, and is adaptive, but does not produce switch costs. For instance, top-down preparation to switch to a previously inhibited task might completely override the inhibition (although previous studies have found no evidence that increasing preparation time decreases inhibition; e.g., Goschke, 2000; Mayr & Keele, 2000). If lingering inhibition is not the cause of switch costs, then what is? One possibility is that switch costs occur because persisting activation of the irrelevant task (which Allport et al., 1994, called *task set inertia*) interferes with the execution of the relevant task. Another possibility (not necessary incompatible with the first) is that switch costs occur because people cannot completely reconfigure a new task set in advance of a stimulus (Lien, Ruthruff, Remington, & Johnston, 2005; Rogers & Monsell, 1995).

Although these alternative hypotheses can explain why we failed to find faster responses following a univalent rather than bivalent trial, none of them provide an obvious explanation of why the effect actually went in the opposite direction when the current stimulus was bivalent. At this point, we can only speculate that univalent trials cause participants to “let down their guard” somewhat, so that they expend less effort on subsequent bivalent trials.

Conclusions

As in previous studies, we found that task switch performance was very sensitive to whether the current stimulus was univalent or bivalent. However, we found that task switch performance was not sensitive to whether the previous trial was univalent or bivalent. In other words, performance of a task switch was no faster when the recent incentive to inhibit that task was low rather than high. These findings argue against the hypothesis that people inhibit tasks adaptively and that task switching is so difficult because of the need to overcome lingering inhibition. Instead, the results suggest three alternative hypotheses: (a) task-set inhibition is weak or nonexistent, (b) inhibition occurs but is not adaptive (i.e., is applied even when the cost/benefit ratio is unfavorable), or (c) inhibition occurs but can easily be removed before the task becomes relevant again. Further research is needed to test these hypotheses.

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This research was supported by funding from NASA Grant NCC 2-1325 to Mei-Ching Lien, the Oregon Space Grant Consortium Graduate Fellowship to David Kuhns, and the Human Measures and Performance Project of NASA's Airspace Systems Program. We thank Rich Carlson, Mike Wendt, Stefanie Schuch, Collin Green, and Joel Lachter for helpful comments on earlier drafts of this article. Correspondence concerning this article should be addressed to Mei-Ching Lien at Department of Psychology, Oregon State University, Corvallis, OR 97331-5303. E-mail: mei.lien@oregonstate.edu.

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Footnote

1. We thank Mike Wendt for bringing this point to our attention.

Table 1.

Mean Response Times in Milliseconds (Proportion of Errors in Parentheses) in Experiment 1 as a Function of Previous Trial Type (Univalent or Bivalent) and Task Transition (Task Repetition and Task Switch).

Previous Trial	Task Transition		<i>Average</i>
	Task Repetition	Task Switch	
Univalent	657 (.045) <u>A_BA_BBB</u>	805 (.060) <u>A_BA_BBB</u>	731 (.030)
Bivalent	562 (.046) <u>A_BA_BBB</u>	660 (.062) <u>A_BA_BBB</u>	611 (.054)

Note: The task sequence used in Experiment 1 was A_BA_BBB, where the subscript _B indicates that an irrelevant Task B stimulus was presented alongside with the relevant Task A stimulus. In each cell of the table, the relevant trial within the task sequence is bolded and underlined.

Table 2.

Mean Response Times in Milliseconds (Proportion of Errors in Parentheses) in Experiment 2 as a Function of Whether Previous Trial was Univalent or Bivalent and Whether Current Trial was Univalent or Bivalent.

Previous Trial	Current Trial		<i>Average</i>
	Univalent	Bivalent	
Univalent	721 (.039) <u>A_BB_AAB</u>	1,082 (.054) <u>A_BB_AAB</u>	902 (.047)
Bivalent	745 (.036) <u>A_BB_AAB</u>	958 (.055) <u>A_BB_AAB</u>	852 (.046)
<i>Average</i>	733 (.038)	1,020 (.055)	

Note: The task sequence used in Experiment 2 was A_BB_AAB, where the subscript indicates that a stimulus from the irrelevant task was presented alongside the relevant stimulus. In each cell of the table, the relevant trial within the task sequence is bolded and underlined.