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THEORETICAL REVIEW

High working memory capacity does not always attenuate distraction: Bayesian evidence in support of the null hypothesis

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Abstract Individual differences in working memory capacity (WMC) predict individual differences in basically all tasks that demand some form of cognitive labor, especially if the persons conducting the task are exposed to distraction. As such, tasks that measure WMC are very useful tools in individual-differences research. However, the predictive power of those tasks, combined with conventional statistical tools that cannot support the null hypothesis, also makes it difficult to study the limits of that power. In this article, we review studies that have failed to find a relationship between WMC and effects of auditory distraction on visual–verbal cognitive performance, and use meta-analytic Bayesian statistics to test the null hypothesis. The results favor the assumption that individual differences in WMC are, in fact, not (always) related to the magnitude of distraction. Implications for the nature of WMC are discussed.

Keywords Working memory capacity · Null hypothesis · Bayesian statistics · Distraction · Cognitive control

Individual differences in working memory capacity—typically assessed with so-called *complex-span* tasks that combine short-term memory processes with concurrent distractor activities—predict performance on most (if not all) cognitively challenging tasks, including reading comprehension (Daneman & Carpenter, 1980), reasoning (Copeland & Radvansky, 2004), intelligence tests (Süß, Oberauer, Wittmann, Wilhelm, & Schulze, 2002), and even moral judgments (Moore, Clark, & Kane, 2008). On the unusual occasion that a relation between working memory capacity (WMC) and task performance is not found, even when the task involves top-down cognitive control (Kane, Poole, Tuholski, & Engle, 2006), a relation is typically found when distraction is added (Poole & Kane, 2009). These observations have led to the broadly accepted view that WMC is a very general executive attention mechanism (Kane et al., 2004) that is used to resolve interference across a wide range of domains and to overcome distraction. As was stated by Randall W. Engle (2002, p. 20): “WM capacity is not directly about memory—it is about using attention to maintain or suppress information. . . . Thus, greater WM capacity also means greater ability to use attention to avoid distraction.”

The nature of the “general mechanism” that appears to be tapped by WMC tasks is still a subject of debate: For instance, according to the *focus-of-attention view*, high-WMC individuals are less susceptible to distraction because they can focus (or constrain) attention to to-be-attended targets (Heitz & Engle, 2007); according to the *inhibition view*, they are less susceptible to distraction because they have a superior inhibition capacity (Lustig, Hasher, & Zacks, 2008); and according to the *primary-and-secondary-memory view*, they are less susceptible to distraction because they manage to maintain the goal-directed task set (or task instruction) in working memory, even when challenged by stimuli that capture attention (Unsworth & Engle, 2007a). Notably, all of these views agree that high WMC should attenuate distraction. If individual differences in WMC really reflect the ability to combat distraction, then they should predict individual variation in susceptibility to

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the effects of task-irrelevant sound on visual–verbal tasks (such as recall of written prose). However, in one particular experimental setting called the *irrelevant-sound paradigm*, a relationship between WMC and the disruptive effects of sound on task performance has been elusive. In the irrelevant-sound paradigm, participants are visually presented with sequences of items, and they are requested to recall those items in the order of presentation (i.e., a serial recall task). Some sequences are presented against a background of sound (e.g., speech tokens or tones), and others are presented in silence. When sound is present, serial recall is typically impaired. This is called the *irrelevant-sound effect* (Beaman & Jones, 1997; Jones & Macken, 1993).

According to the general notion that high WMC should attenuate distraction, one would expect high-WMC individuals to be less susceptible to the irrelevant-sound effect. In this article, we review studies of the role for WMC in the irrelevant-sound paradigm and provide meta-analytic Bayesian evidence to show that high WMC, in fact, does not always attenuate distraction. Understanding the mechanisms of auditory distraction can, therefore, reveal just how general the "general mechanism" is that is tapped by WMC tasks. In particular, it can specify the conditions wherein high WMC attenuates distraction, and those conditions in which it does not.

Mechanisms of auditory distraction

We begin this discussion by characterizing two different types of effects of sound on serial recall. A continuously changing sound stream (e.g., "k l m v r q c") impairs serial short-term memory more than a less variable sound stream (e.g., "c c c c c c c"; Jones & Macken, 1993). This is called the *changing-state effect*, which has become the key empirical referent of the irrelevant-sound effect. The sound stream does not have to be continuously changing, however, to disrupt serial recall. A sound sequence within which a single sound element abruptly deviates from the rest (such as "m" in the sequence "p p p p p p m p p") is also more disruptive than a nonchanging sequence. This is called the *deviation effect* (Hughes, Vachon, & Jones, 2005, 2007). The changing-state and deviation effects are the most studied forms of auditory distraction in the context of serial recall; they both reflect change-detection mechanisms associated with auditory analysis. However, there is some tension within the literature as to whether or not the two effects share a similar mechanism of disruption.

According to a unitary account, both the changing-state effect and the deviation effect are explained by the same (attention capture) mechanism. According to this view, each item in a changing-state irrelevant sequence (e.g., "k l m v r q c") acts as a deviant, thereby repeatedly capturing attention from the focal serial-recall task (Bell, Dentale, Buchner, & Mayr, 2010; Bell, Röer, Dentale, & Buchner, 2012; Chein & Fiez, 2010; Cowan, 1995; Elliott, 2002; Weisz & Schlittmeier, 2006). Alternatively, according to the duplex account (Hughes et al., 2005, 2007; Sörqvist, 2010), the deviation effect and the changing-state effect are produced by functionally different mechanisms. The duplex account and the unitary account agree on the mechanism underpinning the deviation effect (i.e., attention capture), but the duplex account holds—in contrast to the unitary account—that the changing-state effect is caused by the involuntary processing of the order information within a changing auditory sequence that conflicts with the similar process of deliberately ordering the to-be-remembered stimuli: the process of serial rehearsal (Beaman & Jones, 1997; Hughes & Jones, 2005; Hughes et al., 2007; Jones & Macken, 1993). Therefore, the changing-state effect is produced as a consequence of the type of processing that the focal task entails—serial rehearsal—and not because the sound captures/diverts attention away from the focal task (Hughes, Hurlstone, Marsh, Vachon, & Jones, in press; Hughes et al., 2005, 2007; Sörqvist, 2010). A key finding —of particular relevance to the present report—is that if it is perceptually difficult to identify the to-be-recalled items, due to a visual-masking manipulation, the deviation effect diminishes, whereas the same manipulation does not reduce the changing-state effect (Hughes et al., in press). It appears, therefore, that greater task engagement (following perceptual masking of the to-be-recalled items) locks attention to the target materials, and consequently, the auditory deviant loses its power to divert attention away from the focal task. The changing-state effect, in contrast, is not modulated by task engagement.

The role of WMC in auditory distraction

The unitary account of auditory distraction predicts that individual differences in strategic cognitive control—synonymous with WMC—should be associated with the magnitude of *both* the changing-state effect and the deviation effect. That is, attentional capture by a single deviant, and by changing-state sound sequences, should be diminished for individuals with high WMC who can—through executive control—block attentional switches to changing irrelevant events. To date, at least nine experiments have been conducted that have tested the correlation between individual differences in complex-span task scores and individual differences in the magnitude of the irrelevant-sound/changing-state effect. Most of them have found no significant correlation (Beaman, 2004; Elliott & Briganti, 2012; Hughes et al., in press; Sörqvist, 2010), and a few of them have reported inconsistent results (Elliott & Cowan, 2005; Elliott, Barrilleaux, & Cowan, 2006). Likewise, a handful of articles have reported correlations between "simple-span task scores" (i.e., performance on short-term memory tasks that only involve recall of a list of items, in contrast to complex-span tasks that combine this short-term memory task with a second, concurrent activity) and the magnitude of the irrelevant-sound effect (Ellermeier & Zimmer, 1997; Elliott & Cowan, 2005; Macken, Phelps, & Jones, 2009; Neath, Farley, & Surprenant, 2003). None have found significant negative correlations, most reporting correlation coefficients close to zero. In marked contrast, several studies have revealed that high-WMC individuals are less susceptible to the deviation effect (Hughes et al., in press; Sörqvist, 2010) and less susceptible to auditory distraction when it is studied outside the irrelevant-sound paradigm (e.g., Conway, Cowan, & Bunting, 2001; Marsh, Sörqvist, Hodgetts, Beaman, & Jones, 2013; Sörqvist, Nöstl, & Halin, 2012).

On the basis of the foregoing discussion, it seems that high-WMC individuals, in fact, cannot withstand all types of distraction. Specifically, WMC appears to be unrelated to the irrelevant-sound/changing-state effect. This general finding is important, inasmuch as it undermines the logical assumption—in terms of the unitary account of auditory distraction—that relationships exist between WMC and both the changing-state effect and the deviation effect (Bell et al., 2010, 2012; Chein & Fiez, 2010; Cowan, 1995; Elliott, 2002; Weisz & Schlittmeier, 2006). However, the conclusion that WMC is not associated with the irrelevant-sound/changing-state effect rests on the assumption that the null hypothesis is true. This conclusion cannot be supported using conventional statistical techniques (Rouder, Speckman, Sun, Morey, & Iverson, 2009). Here, we report a Bayes factor meta-analysis (Rouder & Morey, 2011) of studies on the relationship between WMC and the irrelevant-sound/changing-state effect. Our assumption is that individual differences in working memory task scores are unrelated to the irrelevant-sound/changing-state effect. For comparison purposes, we also analyzed the relation between WMC and the deviation effect using the same Bayesian analysis technique. Support for the null hypothesis (i.e., that WMC is indeed unrelated to the magnitude of the irrelevant-sound/changing-state effect) would have implications for the nature of WMC: that is, for when high WMC does and does not attenuate distraction.

Method

We begin by reviewing our selection criteria for the inclusion of studies. We also describe how we categorized the studies on the basis of type of effect (i.e., irrelevant-sound/changing-state effect vs. deviation effect). The studies included in the meta-analysis and their characteristics can be found in Table 1.

Selection criteria of studies

Only irrelevant-sound paradigm studies were included in the meta-analysis. That is, the effect of sound was studied by requesting participants to recall—in order of presentation—visually presented items, either against a background of sound or in silence. This type of analysis also constrained selection. The relationship between WMC and the magnitude of auditory distraction had to be analyzed either by calculating the difference scores between serial recall in silence and serial recall in the sound condition, and then reporting the correlation coefficients between those difference scores and individual differences in WMC, or by conducting a corresponding regression analysis. Group comparisons, wherein participants who vary in WMC are divided into high-/low-WMC groups and the researchers analyze the interaction between group (i.e., high vs. low WMC) and sound condition (i.e., sound vs. silence), were excluded from the meta-analysis. It should be noted, though, that the extreme-group analyses have failed to find significant interactions (Beaman, 2004, Exp. 3). Furthermore, some studies have not reported the statistic of nonsignificant relationships between WMC and the irrelevant-sound/changing-state effect (e.g., Elliott & Cowan, 2005). They are hence not included in the meta-analysis, but further reinforce the null hypothesis.

The type of task used to assess WMC was also a selection criterion. The task had to belong to the family of complex-span tasks (such as operation span and reading span) or in some other way combine mnemonic and elaboration processes (such as the running memory span task, in which the participant's task is to view a sequence of items of an unknown length and to recall a set of the most recent items after list presentation, a task that requires continuous updating of the memory set). Studies of the relationship between performance on simple-span tasks and the magnitude of the irrelevant-sound/changing-state effect were not included in the meta-analysis. Finally, the scoring method of the task used to assess WMC was considered. When different scoring methods were used and reported, only one of them (the one with the single highest correlation coefficient between WMC and auditory distraction magnitude) was selected for the meta-analysis (this only concerns data from Elliott & Cowan, 2005).

Categorization of correlation coefficients based on the type of effect

In terms of the relationships between WMC and the various measures of auditory distraction magnitude, the studies were classified as studies of either the irrelevant-sound/changing-state effect or the deviation effect. A study in which the auditory distraction measure was obtained by comparing a

Table 1 Reports included in the meta-analysis and their characteristics

Report	Number	Predictor Name	Test Statistic	N	Effect	Sound
Beaman (2004)	1	OSPAN	$R^2 = .002$	38	ISE	Speech
Elliott et al. (2006)	2	OSPAN	$r = -.26$	101	ISE	Tones
	3	RunSPAN	$R^2 = .02$	101	ISE	Tones
Elliott & Briganti (2012)	4	Mixed	$R^2 = .002$	78	ISE	Speech
Elliott & Cowan (2005)	5	RSPAN	$r = -.03$	64	ISE	Speech
	6	RSPAN	$r = -.15$	64	ISE	Tones
	7	OSPAN	$r = +.57$	64	ISE	Speech
	8	OSPAN	$r = +.30$	64	ISE	Tones
Hughes et al. (in press)	9	OSPAN	$r = +.046$	31	ISE	Speech
	10	OSPAN	$r = -.38$	24	D	Speech
Sörqvist (2010)	11	OSPAN	$r = -.14$	40	ISE	Speech
	12	OSPAN	$r = +.19$	48	ISE	Tones
	13	OSPAN	$r = -.35$	40	D	Speech
	14	OSPAN	$r = -.31$	48	D	Tones

OSPAN = operation span; RunSPAN = running memory span; RSPAN = reading span; Mixed = an average score for several complex-span tasks; ISE = irrelevant-sound effect/changing-state effect; D = deviation effect

changing-state sound sequence (e.g., continuous speech or a sequence of changing tones) without oddball elements (i.e., a sound element that abruptly deviated from an otherwise unchanging sound sequence) with a nonchanging sound condition (e.g., silence, broadband noise, or a steady-state sound sequence) was classified as an irrelevant-sound/changing-state effect study. A study in which the auditory distraction measure was obtained by comparing a sound condition with an oddball sound element to a nonchanging sound condition was classified as a deviation effect study.

Results

A total of 14 correlation coefficients for the relation between WMC and auditory distraction were obtained from the literature review (Table 1). In order to do a Bayesian meta-analysis, the correlation coefficients were converted to t values. This was done by using the following formula:

$$t = [r \times \sqrt{(n-2)}]/\sqrt{(1-r^2)}$$

See Table 2 for the initial correlation coefficients and their corresponding converted t values. When the direction of the correlation coefficient was uncertain (as when the reported statistic is an R^2 value), the converted t values assumed a negative relationship (i.e., that higher WMC was associated with a smaller effect). The conclusions from control analyses assuming positive values instead were entirely consistent with those reported. A script in the R program (e.g., Ihaka & Gentleman, 1996) was used to calculate Bayes factors from the t values (Rouder & Morey, 2011). It should be noted that this transformation, from regression slopes to t values, is not unquestionable in this context. The Bayes factor is calculated by dividing the probability for the null hypothesis (H0) with the probability for the alternative (i.e., H1). If the value is less than 1, the evidence favors the alternative, and if the value is greater than 1, the evidence instead favors H0. In the context of regression slopes, H0 is, naturally, the absence of a

Table 2 Test statistics and their corresponding Bayes factors (BFs)

Number	Test Statistic	N	Converted t Value	BF
Irrelevant-Sound/Changing-State Effect				
1	$R^2 = .002$	38	−0.269	7.7
2	$r = -.26$	101	−2.679	0.4
3	$R^2 = .02$	101	−1.421	4.7
4	$R^2 = .002$	78	−0.390	10.4
5	$r = -.03$	64	−0.23633	9.9
6	$r = -.15$	64	−1.195	5.1
7	$r = +.57$	64	5.462	0.00006
8	$r = +.30$	64	2.476	0.6
9	$r = +.046$	31	0.248	7
11	$r = -.14$	40	−0.872	5.6
12	$r = +.19$	48	1.313	3.8
Deviation Effect				
10	$r = -.38$	24	−1.9269	1.2
13	$r = -.35$	40	−2.303	0.7
14	$r = -.31$	48	−2.211	0.9

When the direction of the correlation coefficient was uncertain (as when the reported statistic is an R^2 value), the converted t values assumed a negative relationship (i.e., that higher WMC would be associated with a smaller effect) relationship (i.e., $r=0$). However, the alternative slope (i.e., H1) is not equally straightforward (Rouder & Morey, 2012). As the r values were transformed to t values, we considered the alternative slope (i.e., H1) to be corresponding to a difference between two mean values (or the difference between a mean and 0). In other words, the alternative slope could assume a range of values (e.g., from $r=-.50$ to $r=-.70$); it was not a specific value.

The irrelevant-sound effect

Table 2 shows the individual Bayes factors for coefficient numbers 1–9, 11, and 12. A meta-analysis of those coefficients revealed a Bayes factor of 32 in favor of the null hypothesis. A Bayes factor of 32 indicates that the data are about 32 times as likely to have occurred under H0, as compared to H1. This is considered to be "substantial" evidence for H0 (Jeffreys, 1961). Given the contradicting evidence in the included studies, a prior of 50% was chosen, which resulted in a posterior probability of 97% for the null hypothesis. It should be noted that the support for H0 would still hold with different priors (e.g., a prior of 25% would result in a posterior probability of 91%, and a prior of 75% would result in a posterior probability of 99%). In short, there is most likely no relationship between WMC and the magnitude of the irrelevant-sound/changing-state effect.

The deviation effect

The meta-analytic Bayes factor for coefficient numbers 10, 13, and 14 (Table 2) was calculated as 0.02, which corresponds to "very strong" evidence against the null hypothesis (Jeffreys, 1961). As the Bayes factor is below 1, the odds are shifted in favor of H1. In this case, the odds for H1 should be shifted by a factor of 50 (i.e., 1/0.02). Given the strong evidence from a plethora of studies showing that WMC is linked to resilience against different forms of distraction, a prior probability for H0 of 25% was chosen. Under this prior assumption, the posterior probability of the null hypothesis approaches 0.5%. Hence, the results favor the alternative hypothesis: High-WMC individuals are less susceptible to the deviation effect.

Discussion

The results of the Bayesian meta-analysis confirmed that WMC is unrelated to the irrelevant-sound/changing-state effect. This is rather troublesome for the general assumption that high-WMC individuals are better able to use attention to avoid distraction (e.g., Engle, 2002; Kane, Bleckley, Conway, & Engle, 2001). At the very least, our findings suggest that this is an oversimplification. To reconcile the results, the concept of "attention"—in relation to WMC—has to be clarified. The auditory distraction literature can be used as a guide to this end.

The Bayesian analysis suggests that WMC is related to distraction from auditory oddballs (i.e., the deviation effect), but not to the irrelevant-sound/changing-state effect. The unitary model—which supposes that the disruption produced by a continuously changing irrelevant sequence should also be controllable—is undermined by this Bayesian analysis, which in turn supports the duplex account of auditory distraction in the context of short-term memory. There appears to be a functional difference between the two types of effects that specifies when WMC modulates distraction and when it does not (although we acknowledge that no direct statistical comparison was made here between models for the relations between WMC and the irrelevant-sound/changing-state effect and between WMC and the deviation effect; but see Sörqvist, 2010). The deviation effect is produced by an involuntary attentional switch to the deviating sound (Hughes et al., in press; Hughes et al., 2007), a reallocation of attention that presumably occurs because the deviating event could represent a potential threat. In other words, the deviating sound causes shifts in the locus of attention. The changing-state effect, in turn, is not a result of a switched locus of attention. Instead, it reflects the manifestation of a conflict between the involuntary/obligatory processing of order information within the changing irrelevant sequence—as a byproduct of the sequential streaming process (Bregman, 1990)—and the deliberate process of serially rehearsing the to-be-serially recalled material (Hughes et al., in press; Hughes et al., 2005, 2007). The irrelevant-sound/changing-state effect is, in short, a disruption of the acts of attention. In fact, serial rehearsal and attention might be considered synonymous: It is an act of attention to serially reproduce the visual–verbal sequence of to-be-recalled items. This reproduction is accomplished through evoking speech-based motor-skills, in an attempt to organize a sequential output of the to-be-recalled items that, at presentation, have been deliberately stripped of syntactic or semantic rules that can be used as cues to serial order: The resultant motor plan is one means by which the order of the items can be maintained (Hughes, Marsh, & Jones, 2009; Jones, Hughes, & Macken, 2006). As a deliberate attentional act, individuals with high WMC may be better at the serial-recall task, particularly for longer lists, without the presence of distraction (Beaman, 2004; Unsworth & Engle, 2007b), but they will be equally susceptible to the irrelevant-sound/changing-state effect. This is because the irrelevant-sound/changing-state effect appears to be an automatic, obligatory effect that cannot be attenuated by the availability of executive resources. Rather, the magnitude of this effect is (positively) related to individual differences in the perceptual ability to extract order information from sound sequences (Macken et al., 2009).

High-WMC individuals can overrule an undesired switch of the locus of attention (i.e., the deviation effect), but they cannot withstand disruption to the acts of attention when those acts are incompatible with obligatory processing of task-irrelevant stimuli (i.e., the changing-state effect). In what way is WMC related to the ability to overrule attentional capture? First, the deviation effect (and, hence, attentional capture) is eliminated when the to-be-recalled stimuli are embedded in visual noise (Hughes et al., in press). This manipulation increases task difficulty (by increasing the difficulty of identifying the to-be-remembered items), in terms of sensory encoding load. Second, the deviation effect is reduced by foreknowledge about the impending occurrence of a deviant (Hughes et al., in press): The presentation of a 100%-valid warning cue before each deviant trial eliminates the effect of the deviant. Both of those findings suggest that greater task engagement—the degree to which the locus of attention is constrained to the focal task—whether it is induced by masking the to-be-recalled items or by preparing the participant for upcoming distraction, reduces the deviant sound's capability to change the locus of attention. We believe that WMC modulates the deviation effect in a similar way. Modulation of distraction by WMC is a result of internally generated task engagement, similar to externally generated task-engagement manipulations such as masking and warnings. Through the deployment of top-down cognitive control—which can block orienting responses to the deviant—high WMC is associated with a more steadfast locus of attention. Individual differences in WMC are not associated with the magnitude of the irrelevant-sound effect (or changing-state effect) because the very (attentional) act of performing the serial-recall task leaves performance vulnerable to disruption from a sound stream that changes continuously. Therefore, providing that serial rehearsal remains the dominant strategy, distraction via the changing-state effect is inevitable and irresistible (Jones, Hughes, & Macken, 2010).

The view that acts of attention compete with shifts of attentional locus offers a far better explanation for how WMC dichotomizes the changing-state and deviation effects than does the idea that WMC predicts distractibility per se due to differences in the capacity to store to-be-recalled items within a memory space (Beaman, 2004): People who already have a high memory load (low WMC; note that here we use WMC as a proxy for load) are as distracted by changing-state sound as are those with low memory load. If anything, higher WMC is sometimes associated with a greater magnitude of the irrelevant-sound/changing-state effect (see Table 1), but the reason for this appears to be a "floor effect," wherein low-WMC individuals score relatively low on the serial-recall task in silence and with background sound, whereas high-WMC individuals get higher recall scores in the silent control condition (Elliott & Cowan, 2005). This results in a larger difference between the two conditions for high-WMC individuals. The conclusion that WMC is unrelated to disruption that emerges from the mechanism underpinning the irrelevant-sound/changing-state effect receives further support from the observations that only the changing-state effect, but not the deviation effect, appears to be susceptible to *actual* memory load. For example, the changing-state effect is more pronounced as the burden on memory increases: Changing-state sound coincident with the first four to-be-recalled items of an eight-item sequence—when the memory load is low—produces little or no disruption, as compared to when the sound is presented during the second part of the list or during a retention period—when the memory load is relatively high, due to the burden on serial rehearsal (Macken, Mosdell, & Jones, 1999). That the irrelevant-sound/changing-state effect does not differ in magnitude as a function of WMC when different list lengths are presented (Beaman, 2004) further reinforces the view that WMC—considered as being analogous to memory load, in this instance—does not modulate this effect.

The assumption that high-WMC individuals enjoy less susceptibility to distraction from having higher task engagement, and thereby overruling changes to the locus of attention, fits well with findings outside of the irrelevant-sound paradigm. For instance, task-irrelevant visual stimuli presented on a visual display capture attention to a greater degree in low-WMC individuals (Kane et al., 2001). Likewise, if the participant's own name is spoken in a to-be-ignored channel while the participant is deliberately focusing attention to another channel, the name tends to capture attention, but more so for low-WMC individuals (Conway et al., 2001). And high-WMC individuals can more effectively constrain/focus attention to specific target items, so as not to be distracted by irrelevant stimuli adjacent to the target items (Heitz & Engle, 2007). In each case, high-WMC individuals appear to be less susceptible to distraction than are their low-WMC counterparts, because of their higher task engagement (i.e., a more steadfast locus of attention).

In summary, this article has aimed to characterize the "general mechanism" that is tapped by WMC tasks and, in particular, to specify the limits of the assumption that high WMC attenuates distraction. Not all instances of change detection are controllable, and WMC—through top-down strategic cognitive/executive control—only modulates change-detection mechanisms that (typically) lead to a change of the locus of attention (Conway et al., 2001; Hughes et al., in press; Kane et al., 2001; Sörqvist, 2010). The Bayesian analysis presented here clearly shows that WMC does not modulate distraction that emerges from the mechanism underpinning the irrelevant-sound effect.

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