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ERRATUM

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Some algebraic relations between involutions, convolutions and correlations, with applications to holographic memories

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I noticed a transposition error in the definition of $a\#b$ in Eq. (2.4) that invalidates some of the derivations on p. 369 and, in particular, the resulting summaries in Table 1. Equation (2.4) should have read

$$a\#b = a^*Sb \tag{2.4}$$

and, consequently, the matrix representation, Eq. (3.8),

$$a\#b = [a]Sb. \tag{3.8}$$

The transpose of the resulting numerical vector in Eq. (3.9) is (2, 7, 13, 5). Equations (2.7)–(2.8) should be disregarded. The corrected Cayley tables for * , #, and the involution S, are given in Table 1.

The two main results of the paper remain intact:

1. Replacement of the correlation # by S and * greatly simplifies derivations, since it restores commutativity and associativity, and
2. Deconvolution with g-inverses rather than correlation leads to a possibly preferable alternative memory model, given in Eq. (6.1), that avoids some of the shortcoming of the traditional convolution/correlation paradigm.

Table 1 Cayley tables for *, #, and S in $\langle H, \#, ^*, S\rangle$ (row element first factor)

* -> #					# --> *				
*	a	b	Sa	Sb	#	a	b	Sa	Sb
a	$a\#Sa$ $b\#Sa$	$a\#Sb$	$a\#a$	$a\#b$	a	a^*Sa	a^*Sb	a^*a	a^*b
b	$b\#Sa$	$b\#Sb$	$b\#a$	$b\#b$	b	b^*Sa	b^*Sb	b^*a	b^*b
Sa	$a\#a$	$b\#a$	$Sa\#a$	$Sa\#b$ $Sb\#a$	Sa	$S(a^*a)$	$S(a^*b)$	a^*Sa	Sa^*b
Sb	$a\#b$	$b\#b$	$Sb\#a$	$Sb\#b$ $Sa\#b$	Sb	$S(b^*a)$	$S(b^*b)$	Sb^*a	b^*Sb

Application to convolution memories: learning:memory trace a^*b. Recall with cue c: $c\#(a^*b) = c^*S(a^*b) = Sa^*Sb^*c$. If $a = c$ is used as cue and happens to be "perfectly noiselike" ($a\#a = a^*Sa = u$), then $c\#(a^*b) = a^*S(a^*Sb) = (a^*Sa)^*SSb = u^*b = b$, so that, in this case, b is perfectly recalled

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