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2 Associationism

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6 Synonyms

7 Association psychology; Association theory

8 Definition

9 “Associationism” can refer to a well-defined historical
10 tradition or, more controversially, to a range of
11 approaches influenced by the former. The historical tradi-
12 tion, developed from the seventeenth to the nineteenth
13 century mainly by British philosophers, appealed to the
14 association of mental contents with one another to explain
15 the nature of human thought and knowledge. Current
16 forms of associationism assume that complex psycholog-
17 ical units are built from simpler elements on the basis of
18 experience and through a process (“association”) that is
19 both general across domains and structure-independent.
20 This process is typically sensitive to coincidences, correla-
21 tions, or statistical dependencies among events, and the
22 psychological units formed on its basis come to reflect
23 such dependencies.

24 Theoretical Background

25 The philosophical tradition of associationism can be
26 traced back to Aristotle, but it developed mainly from
27 the seventeenth to the nineteenth century through the
28 effort of scholars, most of them English, interested in the
29 origins and nature of human knowledge (Warren 1921).
30 Important exponents of associationism include, in histor-
31 ical order, Thomas Hobbes (1588–1679), David Hartley
32 (1705–1757), Étienne Bonnot de Condillac (1715–1780),
33 James Mill (1773–1836), Thomas Brown (1778–1820),
34 John Stuart Mill (1806–1873), Alexander Bain (1818–
35 1903), and Herbert Spencer (1820–1903). Associationism
36 also can be found in the philosophical works of John
37 Locke (1632–1704), George Berkeley (1685–1753), and
38 David Hume (1711–1776), reflecting its dual importance

for psychology and epistemology. The associationist phi- 39
losophers relied on the introspective method and the 40
phenomenological investigation of thought sequences to 41
uncover the psychological principles that might underlie 42
the latter. Most of these philosophers also speculated on 43
the nature of the physiological machinery that made asso- 44
ciation possible. All invoked associative principles (not 45
necessarily under that name) through which complex 46
mental contents could be produced out of simpler ones. 47

Beyond this shared commitment, associationist phi- 48
losophers differed among themselves in ways that antici- 49
pate current debates in behavioral and cognitive sciences. 50
Important differences concerned the scope of the associa- 51
tive process. Did it apply to rational thought, for example, 52
or only to haphazard mental sequences forged out of 53
coincidences? Did the associative process account for all 54
of psychological structure, or should it be supplemented 55
by faculties responsible for the organization of mental 56
contents? Other differences concerned the nature of the 57
elements being associated. Could they include sensory 58
presentations, feelings, or motor elements, as well as men- 59
tal contents? Could volition and motor control be built on 60
associative principles? The modes of association, simulta- 61
neous versus successive, were also the subject of contro- 62
versy. Some associationists admitted simultaneous 63
association as a genuine process so as to account for 64
perceptual organization (with different visual compo- 65
nents, for example, combined into a single scene), but 66
others emphasized the successive associations necessary 67
to produce trains of thought. The principles of similarity 68
and contrast were debated, with some associationists 69
attempting to reduce contrast to a combination of identi- 70
cal elements paired with different associates. Another 71
important debate opposed “mechanical” to “chemical” 72
conceptions of association (Warren 1921). Did the com- 73
ponents of a complex thought preserve their identity 74
through the association process, or did they merge so as 75
to produce a mental configuration irreducible to its 76
antecedents? 77

Associationism strongly influenced experimental psy- 78
chology at the end of the nineteenth century and the 79
beginning of the twentieth century. Research aimed at 80
associationist principles involved the investigation of 81

82 memory and the effect of practice on behavior, the
83 measure of reaction times in the production of verbal
84 associates, and the use of verbal association in the study
85 of individual differences, development, intelligence, and
86 psychopathology. Warren (1921) also mentions the “con-
87 ditioned reflex” as a case of “motor association” and
88 suggests that “the conditioned reflex belongs to the pre-
89 sent and future of association psychology” (p. 257).

90 Applying the label of “associationism” to any theory
91 formulated after the early twentieth century, however,
92 faces a serious conceptual problem. In the twentieth
93 century, the emergence of behaviorism shifted the meth-
94 odological ground of psychology from introspection to
95 behavioral evidence (Brunswik 1952), and the informa-
96 tion-processing theories formulated after the establish-
97 ment of behaviorism often appealed to representational
98 constructs that may not be accessible to consciousness.
99 Thus, contemporary psychological theories typically do
100 not involve the association of conscious contents with
101 one another. The associationist label can retain its useful-
102 ness only if a definition of “associationism” can be pro-
103 vided that is broad enough to cover widely different
104 perspectives but not so broad as to exclude nothing.

105 Anderson and Bower (1973) have risen to the chal-
106 lenge and proposed a definition of “associationism” in
107 terms of four basic assumptions (p. 10):

- 108 • Psychological units are connected by experience.
- 109 • Complex units can be reduced to a limited stock of
110 primitive units.
- 111 • These primitive units consist of sensations.
- 112 • Units combine through simple additive rules.

113 Although this characterization of associationism as rely-
114 ing on elementary sensations may be adequate to mentalis-
115 tic psychology, it fails to capture the associationism (if any)
116 of behavioral psychology, the basic units of which are cer-
117 tainly not sensory experiences. Following on Anderson and
118 Bower’s proposal, therefore, Fodor (1983) has defended
119 a broad definition of “associationism” that is better
120 designed to cover “the classical mentalist or the more recent
121 learning-theoretic variety” (p. 27) of associationist psychol-
122 ogy. According to Fodor, associationism entails:

- 123 • A set of basic elements out of which more complex
124 structures are built
- 125 • A relation of association defined over these elements
126 and structures
- 127 • Principles of association whereby experience deter-
128 mines which structures are built
- 129 • Theoretical parameters of the associative relation and
130 its terms

Fodor explicitly admits behavioral as well as mental 131
elements in his definition of “associationism,” so the latter 132
does cover the full range of approaches that may be rea- 133
sonably called associationist. His definition accommo- 134
dates the philosophical tradition of associationism (in 135
which mental contents are associated with one another) 136
as well as current connectionist models of cognition (in 137
which the links between nodes are strengthened on the 138
basis of experience) and behavioral forms of association- 139
ism in which the conditional probabilities between stimuli 140
and operant actions change through reinforcement. 141

142 At the same time, Fodor’s (1983) definition is not so 142
general as to be vacuous. An important point, left implicit 143
in the 1983 definition but later emphasized by Fodor and 144
Pylyshyn (1988), is that not any relation or structure- 145
building process among psychological components qual- 146
ifies as association. To qualify as the latter, the process that 147
builds more complex units out of simpler ones must 148
proceed on the basis of experience (expressed as contigu- 149
ity, correlation, or statistical dependency) and *regardless of* 150
the structure of the components being related. The issue with 151
associationism, therefore, is not whether psychological 152
states are structured. All parties in the debate agree on 153
this score. The issue is rather whether the processes that 154
build complex psychological states are structure-sensitive 155
or not. The claim that they are not is characteristic of 156
associationism. 157

158 In current behavioral theories, for example, reinforce- 158
ment depends on the temporal correlation between 159
responding and its consequences and operates regardless 160
of the organization of the action being reinforced. 161
Whether the latter consists of a simple response or 162
a complex hierarchy of interlocked actions is irrelevant 163
to the reinforcement process (although the speed with 164
which conditioning takes place may depend on the dura- 165
tion of the reinforced unit and other temporal paramet- 166
ers). Similarly, the strength of the links in a connectionist 167
network is modified by statistical and temporal relations 168
among activation values regardless of the internal struc- 169
ture (if any) of the connected nodes and of what they are 170
supposed to represent. And in the philosophical tradition 171
of associationism, mental contents are associated by expe- 172
rience regardless of their intrinsic organization. 173

174 By contrast, in the theory of mind as a physical symbol 174
system, the *computational* (not associative) operations 175
that produce new states out of previous ones are sensitive 176
to the structure of these states (Fodor and Pylyshyn 1988). 177
Thus, when a desktop computer prints “17” in response to 178
“13 + 4” and “35” in response to “31 + 4,” what is printed 179
does not depend on a history of association between 180
inputs and output – a history which, under different 181

182 circumstances, might just as well have linked “31 + 4” to
183 “17” and “13 + 4” to “35.” Rather, the printed output
184 depends on a sequence of built-in operations such that
185 structural differences in the input (“13 + 4” versus
186 “31 + 4”) lead to structural differences in the output
187 (“17” versus “35”) through different intermediate steps.
188 Such structure-dependent operations are characteristic of
189 the computational theory of mind and other approaches
190 to cognition that oppose associationism (Fodor 1983).

191 Associationism and the computational theory of
192 mind, however, do not exhaust all theoretical possibilities.
193 The analysis of development in ecological psychology, for
194 example, qualifies neither as computational nor as associ-
195 ationist, since the principles it proposes operate neither
196 according to associative principles nor on the basis of
197 internal representations. Neither are associationism and
198 representational systems mutually exclusive, since repre-
199 sentational models may combine aspects that are
200 structure-independent (as when objects are linked to
201 a cognitive map regardless of their composition) with
202 others that are structure-sensitive (as when combining
203 two paths into a novel one). Furthermore, authors may
204 disagree on whether a model is or is not strictly associative,
205 depending on what they stipulate to be the defining fea-
206 tures of “associationism” (besides the broad notion of
207 a building process indifferent to the structures that it
208 relates). The label of “associationism,” although useful in
209 pinpointing shared issues, should not obscure the variety
210 and richness of the theoretical views to which it has been
211 applied.

212 **Important Scientific Research and Open** 213 **Questions**

214 Associationism in a broad sense assumes principles of
215 development or psychological change that are structure-
216 independent. A set of associative relations defined over
217 a collection of components, however, is itself a form of
218 organization. According to associationism, the latter orga-
219 nization has been derived from experience. The main
220 question with respect to associationism, therefore, is the
221 question of the origins of psychological structure; in par-
222 ticular, the extent to which psychological structure can be
223 attributed to regularities in experience, and the extent to
224 which other sources of organization must be postulated.
225 In the case of syntax acquisition, for example, the issue

may concern how much of a child’s linguistic organization 226
derives from statistical regularities in the child’s input. 227

228 There is no guarantee that this sort of question has
229 a unified answer across domains or even phenomena
230 within the same psychological domain. Associationism
231 may well fail in some cases while applying to others. The
232 basic phenomena of Pavlovian conditioning, for instance,
233 seem to call for explanations with associationist aspects.
234 (The researchers who attribute conditional responding to
235 the formation of cognitive maps may want to deny this,
236 but their denial would simply reflect a narrower definition
237 of “associationism” than the one adopted here.) As formal
238 models developed in the field of conditioning are extended
239 to cover features of human perception, memory, and
240 language, the limits of associationist explanations in psy-
241 chology should become clearer.

242 In many cases, a successful associationist account of
243 the data may require relations among elements, as well as
244 the elements themselves, to be subject to association. If the
245 structure-building operation proceeds regardless of the
246 nature of the relations involved, then the resulting models
247 will remain within the province of associationism as we
248 defined it (although they may fail to qualify on a narrower
249 definition). The most difficult cases for any associationist
250 account involve cognitive phenomena in which structure
251 is paramount: in particular, inference and reasoning
252 through language-like processes. Whether such phenom-
253 ena can be accommodated within a broadly associationist
254 framework may depend on the development of more
255 powerful theoretical formalisms.

256 **Cross-References**

- ▶ Associative Learning 257
- ▶ Connectionism 258
- ▶ Statistical Learning 259

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