Journal of Experimental Psychology: General
1988, Vol. 117, No. 4, 390-394

0096-3445/88/$00.75

Reality Monitoring: An Experimental Phenomenological Approach

Marcia K. Johnson
Princeton University

This article briefly reviews three empirical articles (Johnson, Foley, Suengas, & Raye, 1988; Johnson & Suengas, in press; Suengas & Johnson, 1988) investigating differences in qualitative characteristics of memories for perceived and imagined events. Major results from these three articles are highlighted and related issues are suggested.

In collaboration with students and colleagues, I have been studying *reality monitoring*, that is, the processes involved in discriminating between memories of real and imagined events. In this work we assume that confusions between memories for imagined events and memories for perceived events arise from the same processes as do accurate classifications of memories: from processes of attribution or judgment based on subjective (phenomenal) qualities of experience (Johnson, 1985, 1988a; Johnson & Raye, 1981).

In this issue of JEP: General, we present two articles (Johnson, Foley, Suengas, & Raye, 1988; Suengas & Johnson, 1988) that illustrate research based on an approach that might be called *experimental phenomenology* (also see Johnson & Suengas, in press). I am not using the term *phenomenology* in the technical way philosophers do (e.g., Casey, 1987; Ihde, 1977; Jennings, 1986), but the word captures a similar intention to systematically examine qualitative characteristics of mental experience. The experimental phenomenology illustrated by our articles involves studying the impact of variables on subjective reports. It usually requires collecting reports from several subjects (e.g., Brown, Shevell, & Rips, 1986; Johnson, Kahan, & Raye, 1984; Nigro & Neisser, 1983; Reiser, Black, & Kalamarides, 1986), but experimental controls also can be introduced with a single-subject design (Linton, 1986). Our immediate goal in these articles was to investigate differences in the representation in memory of perceived and imagined events. Our long-term goal is to develop ways of determining which aspects of mental experience create one's sense of a personal past and one's conviction (accurate or not) that memories, knowledge, beliefs, attitudes, and feelings are tied to reality in a veridical fashion.

In these studies either we asked people to remember an autobiographical event (e.g., a trip to the library, a dream) or we supplied them with simulated autobiographical events. We call these simulated experiences "minievents"; they are such things as wrapping a package, meeting someone, or having coffee and cookies. Our minievents are very likely not as extended in time nor so emotionally engaging as similar naturally occurring events, and they are not embedded in other personality relevant events, but they are considerably more complex than the types of events usually studied in the laboratory.

For both naturally occurring and simulated autobiographical events, we asked subjects to fill out the Memory Characteristics Questionnaire (MCQ; Johnson et al., 1988), which assesses a wide range of qualitative characteristics of the experience of remembering an event (e.g., amount of perceptual and contextual detail, thoughts and feelings). In these experiments, we manipulated the origin of the event, retention interval, and number and type of rehearsals, and we observed the impact of these variables on subjects' responses on various scales on the MCQ. In addition, we analyzed responses to questions asking subjects to explain how they knew a remembered event happened or how they knew it was only imagined. We also tried to determine what features of someone else's description of events subjects used in deciding whether the "witness" had described a perceived or an imagined event. The findings we report, and issues they suggest, are indicated in the first section. The second section briefly mentions two additional areas in which a systematic consideration of phenomenal qualities of memories might be useful: the analysis of amnesia and the study of beliefs and knowledge.

Evidence and Issues from Studies of Complex Event Memories

Differences in Qualitative Characteristics of Perceived and Imagined Events

Compared with memories for imagined events, memories for perceived events have more sensory and contextual information, and they are more likely to give rise to supporting memories (Johnson et al., 1988, Study 1; Suengas & Johnson, 1988). Furthermore, these differences between memories for perceived and imagined events are used in reality monitoring of naturally occurring autobiographical events (Johnson et al., 1988, Study 2).

Over time, various characteristics of memories become unavailable at different rates. Especially important is that

Preparation of this article was supported by National Science Foundation Grant BNS-8510633. This article, and the other two appearing in this issue (Johnson, Foley, Suengas, & Raye and Suengas & Johnson) were completed when I was a Fellow at the Center for Advanced Study in the Behavioral Sciences (CASBS).

I am grateful for financial support provided by the John D. and Catherine T. MacArthur Foundation and Princeton University. I would also like to express my appreciation to Carol Baxter, Lynn Gayle, Deanna Knickerbocker, and Kathleen Much (members of the CASBS staff), who provided excellent technical assistance, and to Lincoln Moses for suggestions regarding statistical analyses.

Correspondence concerning this article should be addressed to Marcia K. Johnson, Department of Psychology, Princeton University, Princeton, New Jersey 08544.

some qualitative characteristics are forgotten more quickly for imagined than for perceived events (Suengas & Johnson, 1988, Experiment 3). The increasing difference between perceived and imagined events as time passes provides some protection against confusion between perceptions and fabrications.

The Impact of Rehearsal

When people think about events, they do not completely activate all potentially available aspects of the event. Rather, our results show that thinking about events is a selective process that typically involves activation of perceptual (especially visual) qualities (Suengas & Johnson, 1988, Experiment 2). Selectivity in the way characteristics are forgotten, and selectivity in the aspects rehearsed, argue for viewing complex memories as composed of different characteristics that can be activated somewhat independently. Studying which characteristics are truly independent in thought and which tend to bundle together is an interesting direction for future research, as are the appropriate types of cues for each.

We found similar effects on remembering when people talked about events and when they just thought about them (Suengas & Johnson, 1988, Experiment 1). Depending on the specific nature of what people think or talk about—perceptual aspects versus thoughts and feelings—there are somewhat different effects on the rated qualitative characteristics of the memory (Suengas & Johnson, 1988, Experiment 1). When subjects rehearsed perceptual aspects of events, memories for imagined events remained phenomenally less perceptual than memories for perceived events. Thinking about thoughts and feelings appears to reduce later access to perceptual information. In addition, it also tends to make imagined and perceived events more alike in the amount of thoughts and feelings the memories include. Perhaps people can represent thoughts and feelings to themselves better than they can represent perceptual information. Perhaps they can more easily fabricate thoughts and feelings. Or perhaps because thoughts and feelings are difficult to remember (Suengas & Johnson, 1988, Experiment 3), people can easily convince themselves that the thoughts and feelings they rehearsed are the ones that they likely had initially. In any event, this finding suggests the interesting possibility that reality monitoring is more likely to suffer if, earlier, people focused on thoughts and feelings as they remembered events than if they focused on perceptual characteristics.

An important and interesting question is whether rehearsal reinstates information that was initially present in memory or causes new information to be fabricated. Our best guess is that both effects commonly occur. A related question is whether rehearsal acts on the original memory, perhaps changing it (e.g., Loftus, 1979), or establishes new memories, which then become part of the basis of remembering (e.g., Johnson & Raye, 1981). Eventually, we would like to be able to answer such questions. The important points for the present argument are that, whatever the mechanism, rehearsal will have qualitative effects on remembering, and these qualitative phenomenal characteristics play a central role in one's autobiographical experience.

Social Aspects of Reality Monitoring

The same kind of information that people use to evaluate the reality of their own memories is also used when they evaluate the veridicality of other people's memories (Johnson & Suengas, in press; also see Schooler, Gerhard, & Loftus, 1986; Undeutsch, 1982). Furthermore, people's overt descriptions of events are affected by the aspects of memories they have rehearsed (Johnson & Suengas, in press). Compared with thinking about thoughts and feelings, thinking about perceptual aspects leads to descriptions of both real and imagined events that judges are likely to assume came from perceived events. This result implies that well-rehearsed testimony may be specific and confident, but not an accurate picture of the original event as remembered initially. (Of course, rehearsal does not necessarily make remembering less accurate.)

There are many interesting social aspects of remembering that deserve investigation (e.g., Hirst & Levine, 1985). One of these is that people's attributions about the source of someone else's memories and beliefs determine how they will respond to them. If you say you made up an example that nicely illustrates a point, your argument is not as persuasive as if you say that it is a real example. Even if you do not acknowledge that your example is made up, if I suspect it is, I will probably give less weight to your argument. As I forget my initial misgivings, however, your argument may take on more force, producing a kind of "sleeper effect" (e.g., Greenwald, Pratkanis, Leippe, & Baumgardner, 1986; Hovland & Weiss, 1951). Of course, the speaker as well as the listener might forget that the example was invented to make a point. Thus both speaker and listener may make errors in monitoring the source of information. Furthermore, for both speaker and listener, the characteristics on which source monitoring is based may change over time and as a consequence of the type of rehearsal engaged in.

Descriptions Versus Rating Phenomenal Characteristics

Descriptions of events (i.e., recall protocols) may at first appear to be more objective memory data than ratings of the phenomenal qualities of memories for events, but descriptions do not necessarily provide a truer picture of the nature of what is represented in memory. For example, requiring subjects to put memories into words may make memories, particularly memories of imagined events, seem more concrete than they really are. If so, one consequence might be to decrease differences between memories for real and imagined events that have been described compared with differences between memories for real and imagined events that have not been described. (This may be one reason to keep fantasies to oneself.)

We have only begun to explore the relation between asking people to describe an event and asking them to rate their subjective experience while remembering. Whereas we consistently find some differences between perceived and imagined events with rating measures, in one study (Johnson & Suengas, in press) oral descriptions of real and imagined events did not differ significantly. A subsequent study (Hash-

troudi, Johnson, & Chrosniak, in press), however, produced significant differences between perceived and imagined events with written descriptions. One possibility is that people might use more stringent criteria for editing memories (e.g., Hasher & Griffin, 1978; Johnson, 1988a; Lindsay & Johnson, in press; Raye et al., 1980) when writing than when talking. We also speculated that, compared with written descriptions, oral descriptions might be more subject to social considerations such as the speaker wanting to produce an interesting or cohesive narrative. Such effects might influence descriptions of imagined more than descriptions of perceived events, reducing differences between them. A more general question is, given constant acquisition conditions, what are the test conditions that affect the magnitude of differences between perceived and imagined events and are the effects similar across memory measures? For instance, do payoffs, time restrictions, or social factors (e.g., compliancy pressures, self-presentational concerns, demand characteristics) affect differences observed between memories for perceived and imagined events and, if so, in the same way for various measures?

Other Potential Applications of an Experimental Phenomenological Approach

Amnesia

Our primary interest was in investigating the nature of the representation in memory of perceived and imagined events in order to understand normal reality monitoring processes. Nevertheless, focusing on the qualitative characteristics of mental experience may also help us in our analysis of cognitive dysfunctions such as amnesia (Johnson, 1987, 1988b) or delusions (Johnson, 1988a). For example, the Johnson et al. (1988) and Suengas and Johnson (1988) articles suggest that thinking and talking about events may play a critical role in maintaining the clarity of memories and, thus, their autobiographical quality. Patients with anterograde amnesia may produce less integrated or embellished encodings of events initially (e.g., see chapters in Cermak, 1982; Johnson, 1988b), and they certainly will engage in less subsequent thinking and talking about the events. Thus they suffer from deficits operating both when the event occurred and later when the event might have been thought about but was not (Johnson, 1987). Their problem is not just that they cannot recall events but also that they cannot "compound the interest" from recalling events. If people without amnesia never subsequently thought or talked about autobiographical events, their memory for these events would also have a nonspecific or vague, "free-floating" (Schacter & Tulving, 1982) quality.

Baddeley and Wilson (1986) reported some interesting observations about qualitative aspects of amnesics' recall of autobiographical events. They described an amnesic patient with frontal lobe damage who has trouble separating experiences he actually had from those he imagines. Interestingly, his fabricated reports include a great deal of detail. A second amnesic (also with frontal lobe damage) also has trouble in evaluating the origin—real or imagined—of apparent memories. Thus, although many amnesics may have trouble specifying the particular external source of information in memory (e.g., Schacter, Harbluk, & McLachlan, 1984), some may have severe reality monitoring problems in addition to their other memory deficits. (As illustrated in a study by Hashtroudi, Johnson, & Chrosniak, in press, of normal aging effects, a deficit in external source monitoring is not necessarily accompanied by a deficit in reality monitoring.)

The Origin of Beliefs and Knowledge

Much research in the last 20 years has been based on the idea that remembering and knowing reflect separate systems (e.g., as represented by Tulving's, 1983, episodic–semantic distinction). The problems with this approach are increasingly apparent (see Johnson & Hasher, 1987, for recent references). Although the distinction between remembering and knowing captures a clear phenomenal difference between mental experiences, evidence for a meaningful theoretical difference has been harder to come by. But this clear phenomenal difference is perhaps itself the heart of the matter. The distinction between remembering and knowing (like that between reality and fantasy) reflects attributions made on the basis of subjective qualities of mental experiences. In fact, some of the same qualities that make a memory seem real (i.e., perceptually derived) also give it the specificity of a memory for an autobiographical event (also see Johnson, 1987, 1988b; Klatsky, 1984; Reiser, 1987). If it is phenomenal characteristics that discriminate between real and imagined events and that discriminate between autobiographical memory and other types of memory (e.g., knowledge and beliefs), then the systematic study of subjective or phenomenal qualities of memories is essential (also see Brewer & Pani, 1983).

Most of out work has been concerned with reality monitoring of events. Nevertheless, the mechanisms and issues of source monitoring (Hashtroudi et al., in press; Johnson, 1988a; Lindsay, 1987; Lindsay & Johnson, 1987) in general, and reality monitoring (Johnson & Foley, 1984; Johnson & Raye, 1981) in particular, apply equally to discriminating the origin of event memories and to discriminating the origin of beliefs and knowledge (Johnson, 1988a; Johnson & Lindsay, 1986). Take, for example, the event memory "John said he would help me but he didn't." This could be an accurate representation of an actual prior experience, or it could be a memory for an imagined or anticipated event that never happened. From events one also acquires knowledge, attitudes, and beliefs, such as "John is unreliable" or (if John happens to be a lawyer) "lawyers are unreliable." If no corresponding event actually happened, the memory that "John said he would help but didn't" is a failure of reality monitoring at the event level; the belief that "John is unreliable" would be a failure of reality monitoring at the level of beliefs and knowledge. That is, knowledge and beliefs, like event memories, may or may not accurately reflect actual events. Thus understanding reality monitoring requires not only an analysis of the nature of memories of complex events (e.g., Johnson et al., 1988; Johnson et al., 1984; Johnson & Suengas, in press; Suengas & Johnson, 1988) but also an analysis of the development and maintenance of knowledge and beliefs (Johnson, 1988a; Slusher & Anderson, 1987).

Some of the same factors that are important in making event memories seem real are important in making a belief or knowledge seem compelling. These include embeddedness in supporting knowledge and beliefs and even perceptual detail, embeddedness in spatial and temporal context, and embeddedness in supporting event memories. Such specificity may at first seem contrary to what one usually means by knowledge and beliefs. However, the conviction in the abstractions one is willing to assert is very likely increased by the availability of specific cases that "fit" (e.g., an example of a lawyer behaving unreliably). "Normal" misconceptions and clinical delusions often involve failures of reality monitoring at the level of knowledge and beliefs, as well as at the level of events (Johnson, 1988a). In addition, just as for event memories, the nature of knowledge representations, and hence the potential for reality monitoring failure, will be affected by rehearsal. Thus the similarity in processes operating in remembering and knowing should be as interesting as potential differences.

Taken together, our studies suggest that similar relationships are found with autobiographical events and simulated autobiographical events and that simulation techniques can help clarify results found for natural memories. Laboratory experiments and autobiographical studies, as well as observations of how memory operates in natural contexts (e.g., Bruce, 1985; Neisser, 1978; and other chapters in Gruneberg, Morris, & Sykes, 1978), should converge on an understanding of the mechanisms of memory and their functional importance. For both natural remembering and laboratory remembering, reports of the phenomenal qualities of mental experience provide a potentially rich source of data. Such data can help clarify the role of qualitative characteristics of memories in identifying their origin and the selective impact of time and rehearsal on event memories,. Studying the phenomenal qualities of mental experience associated with amnesia, or with knowing, or with believing might augment our analyses of these mental experiences as well.

References

Baddeley, A., & Wilson, B. (1986). Amnesia, autobiographical memory, and confabulation. In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 225–252). Cambridge, England: Cambridge University Press.

Brewer, W. F., & Pani, J. R. (1983). The structure of human memory. In G. H. Bower (Ed.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 17, pp. 1–38). New York: Academic Press.

Brown, N. R., Shevell, S. K., & Rips, L. J. (1986). Public memories and their personal context. In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 137–148). Cambridge, England: Cambridge University Press.

Bruce, D. (1985). The how and why of ecological memory. *Journal of Experimental Psychology: General, 114*, 78–90.

Casey, E. S. (1987). *Remembering: A phenomenological study.* Bloomington: Indiana University Press.

Cermak, L. S. (1982). *Human memory and amnesia.* Hillsdale, NJ: Erlbaum.

Greenwald, A. G., Pratkanis, A. R., Leippe, M. R., & Baumgardner, M. H. (1986). Under what conditions does theory obstruct research progress? *Psychological Review, 93*, 216–229.

Gruneberg, M. M., Morris, P., & Sykes, R. H. (Eds.). (1978). *Practical aspects of memory.* New York: Academic Press

Hasher, L., & Griffin, M. (1978). Reconstructive and reproductive processes in memory. *Journal of Experimental Psychology: Human Learning and Memory, 4*, 318–330.

Hashtroudi, S., Johnson, M. K., & Chrosniak, L. D. (in press). Aging and source monitoring. *Psychology and Aging.*

Hashtroudi, S., Johnson, M. K., & Chrosniak, L. D. (1988). *Aging and qualitative characteristics of memories for complex events.* Manuscript submitted for publication.

Hirst, W., & Levine, E. (1985). Ecological memory reconsidered: A comment on Bruce's "The how and why of ecological memory." *Journal of Experimental Psychology: General, 114*, 269–271.

Hovland, C. I., & Weiss, W. (1951). The influences of source credibility on communication effectiveness. *Public Opinion Quarterly, 15*, 635–650.

Ihde, D. (1977). *Experimental phenomenology.* New York: Putnam.

Jennings, J. L. (1986). Husserl revisited: The forgotten distinction between psychology and phenomenology. *American Psychologists, 41*, 1231–1240.

Johnson, M. K. (1985). The origin of memories. In P. C. Kendall (Ed.), *Advances in cognitive–behavioral research and therapy* (Vol. 4, pp. 1–27). New York: Academic Press.

Johnson, M. K. (1987, February). *Origin of memories.* Paper presented at annual Lake Ontario Visionary Establishment conference, Niagara Falls, Ontario, Canada.

Johnson, M. K. (1988a). Discriminating the origin of information. In T. F. Oltmanns & B. A. Maher (Eds.), *Delusional beliefs: Interdisciplinary perspectives* (pp. 34–65). New York: Wiley.

Johnson, M. K. (1988b). Functional forms of human memory. In J. L. McGaugh, N. M. Weinberger, & G. Lynch (Eds.), *Brain organization and memory: Cells, systems and circuits.* New York: Oxford University Press.

Johnson, M. K., & Foley, M. A. (1984). Differentiating fact from fantasy: The reliability of children's memory. *Journal of Social Issues, 40*, 33–50.

Johnson, M. K., Foley, M. A., Suengas, A. G., & Raye, C. L. (1988). Phenomenal characteristics of memories for perceived and imagined autobiographical events. *Journal of Experimental Psychology: General, 117*, 371–376.

Johnson, M. K., & Hasher, L. (1987). Human learning and memory. *Annual Review of Psychology, 38*, 631–668.

Johnson, M. K., Kahan, T. L., & Raye, C. L. (1984). Dreams and reality monitoring. *Journal of Experimental Psychology: General, 113*, 329–344.

Johnson, M. K., & Lindsay, D. S. (1986, August). *Reality monitoring.* Paper presented at the 94th annual convention of the American Psychological Association, Washington, DC.

Johnson, M. K., & Raye, C. L. (1981). Reality monitoring. *Psychological Review, 88*, 67–85.

Johnson, M. K., & Suengas, A. G. (in press). Reality monitoring judgments of other people's memories. *Bulletin of the Psychonomic Society.*

Klatsky, R. L. (1984). Armchair theorists have more fun. *The Behavioral and Brain Sciences, 7*, 223–268.

Lindsay, D. S. (1987). *Whence comes this memory?* Unpublished doctoral dissertation, Princeton University, Princeton, NJ.

Lindsay, D. S., & Johnson, M. K. (1987). Reality monitoring and suggestibility: Children's ability to discriminate among memories from different sources. In S. J. Ceci, M. P. Toglia, & D. F. Ross (Eds.), *Children's eyewitness memory* (pp. 92–121). New York: Springer-Verlag.

Lindsay, D. S., & Johnson, M. K. (in press). The eyewitness suggestibility effect and memory for source. *Memory & Cognition.*

Linton, M. (1986). Ways of searching and the contents of memory.

In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 50–70). Cambridge, England: Cambridge University Press.

Loftus, E. F. (1979). *Eyewitness testimony.* Cambridge, MA: Harvard University Press.

Neisser, U. (1978). Memory: What are the important questions? In M. M. Gruneberg, P. Morris, & R. H. Sykes (Eds.), *Practical aspects of memory* (pp. 3–24). New York: Academic Press.

Nigro, G., & Neisser, U. (1983). Point of view in personal memories. *Cognitive Psychology, 15,* 467–482.

Raye, C. L., Johnson, M. K., & Taylor, T. H. (1980). Is there something special about memory for internally-generated information? *Memory & Cognition, 8,* 141–148.

Reiser, B. J. (1987). *The content of event knowledge structures.* Paper presented at the 94th Annual Conference of the Cognitive Science Society, Seattle, WA.

Reiser, B. J., Black, J. B., & Kalamarides, P. (1986). Strategic memory search processes. In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 100–121). Cambridge, England: Cambridge University Press.

Schacter, D. L., Harbluk, J. L., & McLachlan, D. R. (1984). Retrieval without recollection: An experimental analysis of source amnesia. *Journal of Verbal Learning and Verbal Behavior, 23,* 593–611.

Schacter, D. L., & Tulving, E. (1982). Memory, amnesia, and the episodic/semantic distinction. In R. L. Isaacson & N. E. Spear (Eds.), *The expression of knowledge.* New York: Plenum Press.

Schooler, J. W., Gerhard, D., & Loftus, E. F. (1986). Qualities of the unreal. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 12,* 171–181.

Slusher, M. P., & Anderson, C. A. (1987). When reality monitoring fails: The role of imagination in stereotype maintenance. *Journal of Personality and Social Psychology, 52,* 653–662.

Suengas, A. G., & Johnson, M. K. (1988). Qualitative effects of rehearsal on memories for perceived and imagined complex events. *Journal of Experimental Psychology: General, 117,* 377–389.

Tulving, E. (1983). *Elements of episodic memory.* New York: Oxford University Press.

Undeutsch, U. (1982). Statement reality analysis. In A. Trankell (Ed.), *Reconstructing the past: The role of psychologists in criminal trials.* Deventer, The Netherlands: Kluwer.

Received July 22, 1987
Revision received February 17, 1988
Accepted April 11, 1988 ■

Correction to Ceci and Liker

In the commentary "Stalking the IQ–Expertise Relation: When the Critics Go Fishing" by Stephen J. Ceci and Jeffrey K. Liker (*JEP: General,* 1988, Vol. 117, No. 1, pp. 96–100), subjects #24 and #25 were incorrectly listed as failing race 5 (0s). There ought to have been 1s next to them for this race, making the marginal totals add up to 90% for each.

In addition, in Footnote 2 of their article, a line was inadvertently deleted during production. The line should have read: "b) D & S contend that a restricted scale range compromises the trustworthiness of a reliability estimate. Scale restrictions may . . . " (p. 99).