

A Q-Study of Game Player Aesthetics

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This article investigates computer-game aesthetics using Q methodology. Four criteria (fantasy, curiosity, challenge, and interactivity) useful in evaluating computer games in past research are isolated. A naturalistic Q-sample of statements based on these criteria are then rank ordered by "frequent" and "accomplished" computer game players. Factor analysis of the Q-sort indicates those aesthetics associated with "all games," "video games," and "home computer games." Further results compare video-game aesthetics with home-computer-game aesthetics. Suggestions for further research discuss the advantages of basing game evaluation and criticism on subjective elements of play.

KEYWORDS: *aesthetics; computer games; game players; games; Q methodology; video games.*

There is little literature on computer-game aesthetics. Yet home computers were first introduced into the home as game-playing machines in the early 1980s,¹ and play behavior remains an important part of creating and adopting new technologies.² Aesthetic analysis of this new medium and its most popular art form has the potential of clarifying how values, preferences, uses, and gratifications established in other media are transformed by the unique characteristics of computer-based media.

Literature Review

In reviewing past literature it is first important to distinguish between those video games that are played—for 25 cents a game—in the presence of other games and other players, and the more sophisticated home computer games played repeatedly in relative silence and isolation on the increasingly ubiquitous personal computer.

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The largest category of research concerns those video games that are played in public. These games have been a topic of both sociological and psychological studies. Probably precipitated by concern over adolescent attendance at video-game arcades in the early 1980s (see Ellis, 1984), sociological studies have investigated the video-game community and the motivations of video-game players. Selnow (1984) applied research on television uses and gratifications to the study of video games and compared video-game play with television viewing behaviors. He suggested that video games differ from television primarily in their ability to provide active participation—or “an electronic friend”—useful in the socialization of certain “heavy” players. Wigand, Borstelmann, and Boster (1986) concentrated on the communication climate in video arcades and correlated “nonmediated communications” with video-game play. These authors concluded that “the video game arcade functions as a place to meet people” and “possesses more positive attributes than has previously been assumed” (pp. 289-290). These and other similar studies (Dominick, 1984; Ellis, 1984) did not investigate individual characteristics of specific video games.

While possibly antisocial effects of video-game play concern most of the sociological studies, a large amount of research assumes prosocial—primarily educational—effects as well (see Condry & Keith, 1983, for an agenda). In several laboratory-based studies representative of the psychological approach, Malone (1981a, 1981b) found three characteristics that make instructional environments (in this case, computer games) interesting and productive: challenge, fantasy, and curiosity. He identified these characteristics in different game types and distinguished the effect of these characteristics on different player types (males and females, for instance).

Both sociological and psychological studies assume a particular set of player uses and gratifications. Sometimes, these uses and gratifications are defined somewhat arbitrarily by the researchers; for instance, Malone and others (Bright, 1985; Dorval & Pepin, 1986) assumed that “learning” is the proper outcome for playing computer games. At other times, computer-game uses and gratifications are assumed to be similar to audience interactions with other noncomputer media. In either instance, game players are typically observed or surveyed in order to isolate and correlate uses-and-gratifications categories in game, game player, and/or game-playing environment.

The few available critical analyses of computer games apply other methodological techniques and make different theoretical assumptions. Here, the emphasis is less on player than on game—perhaps, for this reason, video games serve as objects of interest less often than the more complex home

computer games. A particular genre of home computer games—interactive fiction (also known commercially as “text adventures”)—has received most critical attention.

Niesz and Holland (1984) evaluated the current status of computer game as art by legitimizing interactive fiction as the most “literary” of computer game forms. However, this assumes that interactive fiction is experienced as literature rather as a literary *process* (such as play). Randall (1988) defined “literariness” in a manner which he believed most appropriate for computer game analysis and then used that definition to critique popular, commercial home computer games. He found that interactive fiction was least susceptible to such analysis in the area of plot continuity but concluded that computer games do meet an essential criterion of literariness: making strange that which is linguistically familiar.

Popular commentary has combined sociocultural, psychological, and critical approaches, with emphasis on the latter. The vested interests of most computer magazine reviews of games make their analysis suspect; however, Crawford (1984), a popular game designer, offered a well considered marketer’s version of computer game aesthetics.

Goals

Unsatisfied with past research, I have tried in this study—using Q methodology—to observe more closely (and measure, if possible) the subjective experience of game play. My approach attempts to test the partial and mechanistic theory of computer-game aesthetics that has emerged from sociocultural and psychological studies—without forced reference to more “literary” analysis—and, simultaneously, to shape that theory through the eyes of experienced game players. The goal of the Q-technique, as applied in this study, is to develop a computer-game aesthetic that does not depend on borrowed definitions but springs more naturally from the comments, evaluations, and human subjectivity of those who frequently play computer games.³

Method

In brief, Q methodology requires a list of statements representing a variety of attitudes or beliefs concerning a particular topic—in this case, computer

games. These statements are rank ordered into a forced distribution (for later statistical manipulation) by persons purposively selected to represent established points of view concerning the topic in question. A factor analysis of these Q-sorts indicates those combinations of statements that seem somehow linked together to form a singular point of view, perspective, or *aesthetic*. Construction of factor arrays based on the original factors makes interpretation and description of the subjective perspectives represented by each factor easier to understand.

Procedure

The procedure is statistically similar to more common applications of factor analysis; however, there is both a theory and a methodology connected with the Q-technique and the curious are referred to Stephenson (1953) and McKeown and Thomas (1988) for more detailed explanations.⁴

To develop statements for the Q-sorts, four aesthetic criteria were isolated. These criteria have been discussed and applied to the analysis of computer games in previous research dealing with player uses and gratifications. The first three—challenge, fantasy, and curiosity—are defined in parallel with Malone (1981a) and might apply equally well to computer and noncomputer games, while the fourth—interactivity—was derived from Niesz and Holland (1984) and Crawford (1984) and defines a characteristic assumed more peculiar to computer-game play:

Criterion 1: Challenge

"For an activity to be challenging, it should have a *goal whose outcome is uncertain*" (Malone, 1981a, p. 266).

Criterion 2: Curiosity

"Environments can evoke a learner's curiosity by providing an *optimal level of information complexity*" (Malone 1981a, p. 272).

Criterion 3: Fantasy

"Computer-game fantasies almost certainly derive some of their appeal from the *emotional needs they help satisfy*" (Malone, 1981a, p. 272).

Criterion 4: Interactivity

"Interactive fiction actively tests the reader's *responses*" (Niesz & Holland, 1984, p. 122). "[The computer game] can *react* to the player's moves *with speed and thoroughness*" (Crawford, 1984, p. 10).

These four criteria were used to create 48 Q-statements. Each criterion was expressed positively in three statements and negatively in three statements. Wherever possible, these statements were derived from game player

interviews in order to form a naturalistic Q-sample. Each of the four criteria was also expressed in an "opposite" or "lack of" way. That is, three positive and three negative statements were created to express "ease of play" (the opposite of challenge), "realism" (the opposite of fantasy), "familiarity" (the opposite of curiosity), and "stability/constancy" (the opposite of interactivity). All Q-statements are listed and labeled in Appendix 1.

To gain a baseline comparison for the analysis of computer games, these 48 statements were first Q-sorted by 44 junior and senior college communications students instructed to select those statements that were most and least like their "favorite game." The results of this sort, which described favorite games without regard to the medium in which they are played, served to validate the criteria chosen; in fact, these results are interesting in themselves (see Results section).

Personal data collected concerning type and frequency of computer-game play showed that 11 of the 44 original sorters were self-designated "frequent" (2+ hours per week) and "accomplished" (high scoring) *video-game* players. These 11 students Q-sorted the statements again in order to describe their "favorite video arcade game." Finally, a matched (in age and sex) group of 11 self-designated "frequent" and "accomplished" *home-computer-game* players—chosen from local computer clubs and interest groups—Q-sorted the statements in order to describe their "favorite home computer game."⁵

Results

There are three sets of results from the Q-sorts, each of which indicates one or more preferred types of games, video games, or home computer games. While interesting individually, these results are most significant in comparison—revealing how preferences differ concerning the three types of games. First, were the four criteria chosen adequate to express game preferences? Yes, subjects had no difficulty modeling their favorite games with the statements provided, and the resulting sorts showed a high degree of consistency ($p < 1.0000E-4$)⁶ in all three cases.

Of the four criteria, challenge was most crucial to a preferred game and fantasy the least. Interactivity gained in significance when rating computer-based games. Though other criteria may also be necessary for describing a successful and popular game, the four criteria under investigation allowed sufficient choice and variety to differentiate successfully among several popular game types.

Favorite Games

Orthogonal factor analysis produced 10 minor factors (proportionate variance contributions ranging from .357 to .039) from the first set of Q-sorts ($N = 44$) describing "favorite games." The mean ranking⁷ of each criterion is shown in Appendix 2, along with how five of the more significant factors (selected for detailed description either due to their uniqueness within the sort or due to their similarity to subsequent Q-sorts) differed from that mean.

Each factor represents a different perspective—or aesthetic—applied to game choice and evaluation.⁸ The most common aesthetic (A1) described a favorite game as a new and exciting challenge, offering the opportunity to build and improve skills. A brief label and description of the five most representative factors follows. These descriptions are based on constructing factor arrays—one for each factor. Factor arrays are, in essence, "pure" representations of a particular aesthetic—or at least those representations that would be statistically centered among those individuals loading highly on that factor. Specific games associated with each aesthetic are those that were listed most often by appropriate respondents to the question "What is your favorite game?"⁹ The final interpretation of each array was aided by focus-group interviews with the respondents. The five factors are:

- A1. *The game as a new challenge*—skill-building (proportionate variance = .357). This aesthetic preferred games that were new and somewhat unique, offering the opportunity to learn and improve practical skills through immediate feedback. New and currently popular games were included in this category. Examples: Pictionary and Trivial Pursuit.
- A2. *The game as a pleasant, nonthreatening social diversion* (proportionate variance = .181). This aesthetic preferred games that were familiar and non-complex. Enjoyment of the game experience was a first priority, with "the game experience" defined as social interaction. Examples: Hide-and-Seek, Charades, and drinking games.
- A3. *The game as meditative withdrawal* (proportionate variance = .067). This aesthetic preferred a solitary game that was highly engaging. Improving skills during game play was not so important as maintaining an uninterrupted game experience. These experiences could either be physical or mental. Examples: Klondike and basketball (shooting hoops).
- A4. *The game as enemy* (proportionate variance = .056). This is a sort of "antigame" aesthetic in which "favorite game" was a contradiction. This aesthetic was a broad rejection of the values dominating the previous three aesthetics—challenge, social interaction, and mediation. Games were most disliked when they were too challenging. Example: Chess.

- A5. *The game as new challenge*—skill-proving (proportionate variance = .099). This aesthetic was closely correlated with A1 (correlation with Factor 1/All Games > .8). However, players loading highly on this factor showed much more interest in applying old skills than learning new skills. Examples: Monopoly and Euchre.

The relative low-variance contributions of the factors in this first set of Q-sorts demonstrates the number of aesthetics applied to games in general and the possibility that the criteria developed in this study to evaluate computer games are not really sufficient to represent a wider variety of games. However, many of the perspectives uncovered in this first analysis reappear in stronger form in the subsequent sorts that follow.

Favorite Video Arcade Games

The Q-sort ($n = 11$) describing favorite video arcade games produced three factors, two of which prioritized the challenging aspects of video games and were quite similar to A1 and A5:

- B1. *The game as new challenge*—skill-proving (proportionate variance = .513). This aesthetic preferred a complex and challenging game that had been well mastered. Thus this most dominating aesthetic within the video-game category corresponded most closely to A5 (correlation with Factor 5/All Games > .9). Examples: DEFENDER and CENTIPEDE.
- B2. *The game as a pleasant, nonthreatening social diversion* (proportionate variance = .195). This aesthetic, similar to A2 (correlation with Factor 2/All games > .75), was less concerned with games than with game players. Games were preferred that required minimal concentration and interaction, so that more attention could be given to the social environment surrounding the game. Examples: MARIOS BROS.
- B3. *The game as challenge*—skill-proving and meditative withdrawal (proportionate variance = .292). This aesthetic represented an evolution of B1 (correlation with Factor 1/Arcade Games > .95), wherein video game play was valued as a quickly flowing, yet highly structured and patterned meditative experience. This aesthetic rated highly some of the same games as B1 but also preferred slightly older and more structured games. It combined elements of A3 (correlation with Factor 3/All Games > .55) and A5 (correlation with Factor 5/All Games > .9). Examples: SPACE INVADERS and PACMAN.

Again, challenge and social diversion proved the most desired characteristics of video games. However, the variance explained by these three factors was much greater than before—perhaps representing a convergence of

opinion concerning "favorite video arcade games." This convergence might be expected among the "frequent" and "accomplished" players chosen to do the Q-sort.⁹

Home Computer Games

The final Q-sort ($n = 11$) again produced three factors, described and paralleled with previous factors as follows:

- C1. *The game as new challenge*—skill-defeating (proportionate variance = .460). Somewhat surprisingly, even among practiced and accomplished computer-game players, there were strong negative sentiments toward currently available home computer games. This factor was most highly correlated with A4 (correlation with Factor 4/All Games > .7) and expressed both pleasure with home-computer-game novelties and displeasure with the overall emotional experience provided by the home computer game. This aesthetic preferred long, complex (and occasionally tortuous) games that were only partially mastered through great effort. Examples: DEFENDER and SCEPTRE (a Dungeons & Dragons variant).
- C2. *The game as diversion*—meditative withdrawal (proportionate variance = .171). This aesthetic was similar to A3 (correlation with Factor 3/All Games > .9). Games preferred were relatively simple and well known and usually played outside the computer medium as well. Interactivity was rated very highly. Examples: KLONDIKE and BACKGAMMON.
- C3. *The game as new challenge*—skill-building (proportionate variance = .369). This aesthetic was the home-computer-game version of the most common game aesthetic running through all three game types (correlation with Factor 1/All Games > .9). Players holding this aesthetic found (or imagined) a comfortable and enjoyable level of interactivity in their favorite home computer game. Examples: BOUNCING BABIES and several different types of wargames/simulations.

The results of the home-computer-game Q-sorts are statistically similar to those for video arcade games—a smaller number of factors explaining a larger percentage of the variance. The most revealing difference between the two sets of sorts is the dominance of a somewhat masochistic aesthetic in the latter case. Obviously, video-arcade-game players prefer less difficult games than home-computer-game players. And many things—including costs of game play—might reasonably lead to this preference. Most surprising is the degree to which home-computer-game players enjoy games which begin *and remain* somewhat above their abilities to play them well.

In the player interviews conducted after the Q-sorts, home-computer-game players frequently referred to the "replayability" of a game as an

important component of its success. Replayability may be defined as either (a) a high level of interactivity (as in C3)—in which the home computer game creates an acceptable opponent for its players—or (b) a high level of frustration (as in C1)—in which the home computer game itself becomes the opponent through posing increasingly novel and difficult puzzles for the player to solve.

Comments and Conclusions

The Criteria

Are these criteria valid to determine a "player's aesthetic"? Yes, with limitations and qualifications. The distribution of the criterion statements is far different from what would be expected from chance alone. However, this only indicates the *relative* significance of each criterion. That is, although the results indicate that favorite games can indeed be described using these four criteria (and their opposites), these four criteria may not be the best of all possible criteria available to describe such games.

Furthermore, statistical significance may not indicate construct validity. In many of the factor arrays, curiosity, fantasy, and (at least in the case of noncomputer games) interactivity loaded lower than their opposites, familiarity, realism, and stability/constancy. This contradicts conclusions found in Malone (1981a, 1981b) and deserves further analysis, including a closer look at how these criteria were operationally defined in this study. Obviously, however, psychological analyses of computer games have largely ignored the social context of video-game play, which has proved important here.

Favorite Games

"Challenge" is easily the most preferred characteristic of a favorite game. "Game as challenge" (A1) and "game as social activity" (A2) explained the greatest amount of variance among the Q-sorts. Other factors derived in this set of Q-sorts were not so clearly drawn as these two.

Favorite Video Arcade Games

The increasing importance of "interactivity" in the Q-sorts of computer-based games occurred as expected. However, it appears from the current data

that video-arcade-game players apply a very similar (though not identical) aesthetic to computer and noncomputer games, with both types of games regarded as most successful when they are difficult, but not impossible, to win.

"Curiosity" is one of the least preferred characteristics of a video arcade game (although this may apply only to the "accomplished" players measured). Players preferred familiar games with simple, easy-to-understand rules and play. The degree of fantasy in a game was relatively unimportant in determining the game's popularity.

Favorite Home Computer Games

Since home-computer-game play is not so immediately dependent on social context as video-game play (thus the absence of a "social diversion" aesthetic here), the home-computer-game design must stand more independently—and perhaps be more carefully considered. Nevertheless, there are strong social aspects to home-computer-game play since that play, in many cases, seems to substitute partially for (rather than entirely replace) social contact.

Those players who have had the most success playing computer games and who, as a result, have the most finely developed game aesthetic are members of a relatively rare and unique group. These most successful players (represented best by aesthetic C3) appear to value computer game "interactivity" very highly. And their (pseudo-social) interactions with the computer game are instrumental in determining that game's success or failure. Therefore, it is likely (as was suggested by Myers, 1984) that a computer game "aesthetic" cannot be based solely on game content but must consider player-game *relationships* as well—and further detail the interactive process of play.

Current results show home-computer-game players most often in an intense struggle with their games for mastery and control. And, even in those cases where "ease of play" is valued over "challenge" (in aesthetic C2), successful play is determined by frequent "interaction" between player and game, in which there is escape from struggle only through constant reaffirmation of mastery/control already achieved.

Summary

This study found at least three common aesthetics used by experienced game players to evaluate computer games, based on the subjective criteria of

challenge, fantasy, curiosity, and interactivity. These aesthetics go beyond a mere list of uses and gratifications categories; they demonstrate how players apply these criteria in a linked and structured manner.

Again summarizing the results of the factor arrays in capsule form, three most common aesthetics might be best interpreted as:

1. Game as challenge, subcategorized as (a) game *providing* a challenging opponent (game as referee) and (b) game *being* a challenging opponent (game as enemy).
2. Game as social activity (more common in video than home computer games).
3. Game as meditation.

Q methodologies such as the one presented in this study offer unique opportunities for game designers to explore the subjective experience of game play. And the currently isolated nature of home-computer-game play argues strongly against the use of extensive survey techniques and strongly for more intensive and qualitative analyses of how players interact and relate to their favorite games. The effect of the computer medium on game play and preferences is but one question that can be investigated with techniques of this kind. Future studies might be designed to correlate specific characteristics of individual games with the subjective experience of fantasy, challenge, or other such criteria. Alternatively, the game player's personal or social characteristics might be correlated with preferred aesthetic. This study, for instance, said nothing concerning any possible *reasons* for preferred aesthetic—an important question for further analysis.

Game designers might apply the current data either to create new games or to promote existing ones, since game popularity and success is as likely to depend on subjective audience preference as objective game content. But probably most important, studies of this kind tend to base game design and evaluation in the subjective experience of game players. And this emphasis, regardless of its impact on game design, might serve to collapse computer games, films, novels, and other popular art/recreational forms into a single category for analysis, wherein more critical and interdisciplinary methods of research might be more easily justified and applied.

APPENDIX 1: Q-Statements

Challenge

- This game is an enjoyable challenge. (+)^a
- Winning this game makes me feel like I've accomplished something. (+)
- This game rewards me when I do something well. (+)
- Playing this game requires too much time and effort. (-)^b
- Winning this game is so hard that it's not fun. (-)
- The goals of this game are not made clear enough for me. (-)

Fantasy

- This game arouses my fantasies. (+)
- While I'm playing this game, I can imagine I'm someone else. (+)
- This game lets me enter a world outside my own experiences. (+)
- This game is so far removed from reality that it's absurd. (-)
- Playing this game is like having a nightmare. (-)
- This game leaves me emotionally devastated. (-)

Curiosity

- This game arouses and satisfies my curiosity. (+)
- Playing this game always surprises me—in a good way. (+)
- This game is novel and unique. (+)
- There are some things about this game that I will never understand. (-)
- This game requires that I deal with information overload. (-)
- Playing this game always surprises me—in a bad way. (-)

Interactivity

- This game lets me change it during play. (+)
- I can interact with this game as I play it. (+)
- This game plays differently for different people. (+)
- This game forces me to change it during play. (-)
- This game requires that I interact with it every second. (-)
- This game is fun only when the players who are playing it are fun. (-)

Ease (lack of challenge)

- This game is easy to understand and play. (+)
- Winning this game is simple. (+)
- I find the trick to winning this game very quickly. (+)
- This game doesn't challenge me at all. (-)
- Anybody can win this game—winning requires no skills whatsoever. (-)
- When I play this game, I can't tell whether I'm winning or losing. (-)

Realism (lack of fantasy)

- This game seems very realistic. (+)
 - Playing this game requires down-to-earth, problem-solving skills. (+)
 - I have to be very honest about myself to play this game well. (+)
 - This game is so realistic that it's tedious. (-)
 - Playing this game is like living everyday life—dull and boring. (-)
-

APPENDIX 1 Continued

This game just doesn't excite me. (-)

Familiarity (lack of curiosity)

This game plays just how I expected it would. (+)

This game doesn't need a lot of bells and whistles. (+)

This game is just like a lot of other games—games that I like. (+)

There's nothing interesting or exciting about this game. (-)

I get bored with this game very quickly. (-)

This game is just like a lot of other games—games I dislike. (-)

Stability/constancy (lack of interactivity)

This game has the same rules for everyone. (+)

Everyone who plays this game has the same experience. (+)

This game seems to play itself. (+)

This game forces you to play one way—and one way only. (-)

I like to watch this game more than I do play this game. (-)

No matter how I play this game, the outcome is always the same. (-)

a. A plus sign (+) = positive expression of criterion.

b. A minus sign (-) = negative expression of criterion.

**APPENDIX 2: Factor Analysis of Favorite Game, Favorite
Arcade Game, and Favorite Home Computer Game**

Favorite Game**A1. Factor 1/Array**

<i>Group Mean</i>	<i>Factor Mean</i>
28.8 Interactivity (+)	30.1
26.7 Curiosity (+)	28.4
27.0 Challenge (+)	27.7
21.2 Fantasy (+)	23.2
20.6 Fantasy (-)	21.2
22.5 Curiosity (-)	21.0
22.6 Interactivity (-)	20.5
22.7 Challenge (-)	19.9

Highly ranked statements:

1. This game is an enjoyable challenge. (Challenge)
2. Winning this game makes me feel like I've accomplished something. (Challenge)
3. This game is novel and unique. (Curiosity)

Lowly ranked statements:

48. This game doesn't challenge me at all (Ease)
 47. There's nothing interesting or exciting about this game. (Familiarity)
 46. Playing this game is like living everyday life—dull and boring. (Realism)
-

(continued)

APPENDIX 2 Continued

A2. Factor 2/Array

<i>Group Mean</i>	<i>Factor Mean</i>
28.8 Interactivity (+)	28.2
22.7 Challenge (-)	27.6
27.0 Challenge (+)	26.5
22.6 Interactivity (-)	25.6
26.7 Curiosity (+)	25.4
22.5 Curiosity (-)	24.1
20.6 Fantasy (-)	19.9
21.2 Fantasy (+)	14.7

Highly ranked statements:

1. This game is an enjoyable challenge. (Challenge)
2. This game is easy to understand and play. (Ease)
3. This game has the same rules for everyone. (Stability/constancy)

Lowly ranked statements:

48. Playing this game is like having a nightmare. (Fantasy)
47. This game leaves me emotionally devastated. (Fantasy)
46. This game arouses my fantasies. (Fantasy)

A3. Factor 3/Array

<i>Group Mean</i>	<i>Factor Mean</i>
28.8 Interactivity (+)	66.2
22.7 Challenge (-)	62.3
22.5 Curiosity (-)	36.5
26.7 Curiosity (+)	25.9
22.6 Interactivity (-)	22.7
21.2 Fantasy (+)	16.9
27.0 Challenge (+)	-8.4
20.6 Fantasy (-)	-30

Highly ranked statements:

1. *Anybody* can win this game—winning requires no skills whatsoever. (Ease)
2. This game requires that I interact with it every second. (Interactivity)
3. There's nothing interesting or exciting about this game. (Familiarity)

Lowly ranked statements:

48. This game seems very realistic (Realism)
47. This game is so realistic it's tedious. (Realism)
46. Winning this game makes me feel like I've accomplished something. (Challenge)

A4. Factor 4/Array

<i>Group Mean</i>	<i>Factor Mean</i>
27.0 Challenge (+)	43.4
26.7 Curiosity (+)	32.3
22.5 Curiosity (-)	31.9
28.8 Interactivity (+)	28.8

APPENDIX 2 Continued

21.2 Fantasy (+)	25.3
22.6 Interactivity (-)	24.8
20.6 Fantasy (-)	19.9
22.7 Challenge (-)	-14.0

Highly ranked statements:

1. Winning this game is so hard that it's not fun. (Challenge)
2. Playing this game requires too much time and effort. (Challenge)
3. This game requires that I deal with information overload. (Curiosity)

Lowly ranked statements:

48. Winning this game is simple. (Ease)
47. This game is easy to understand and play. (Ease)
46. This game doesn't challenge me at all. (Ease)

A5. Factor 5/Array

<i>Group Mean</i>	<i>Factor Mean</i>
28.8 Interactivity (+)	31.1
27.0 Challenge (+)	26.3
26.7 Curiosity (+)	25.7
22.7 Challenge (-)	23.3
22.6 Interactivity (-)	22.7
22.5 Curiosity (-)	22.0
21.2 Fantasy (+)	21.8
20.6 Fantasy (-)	19.1

Highly ranked statements:

1. This game is an enjoyable challenge. (Challenge)
2. This game is novel and unique. (Curiosity)
3. This game is fun only when the players who are playing it are fun. (Interactivity)

Lowly ranked statements:

48. There's nothing interesting or exciting about this game. (Familiarity)
47. This game just doesn't excite me. (Realism)
46. Playing this game is like living everyday life—dull and boring. (Realism)

Favorite Arcade Game**B1. Factor 1/Array**

<i>Group Mean</i>	<i>Factor Mean</i>
28.7 Interactivity (+)	31.8
26.7 Challenge (+)	28.3
26.8 Curiosity (+)	28.2
22.4 Fantasy (+)	23.6
24.7 Interactivity (-)	22.9
23.2 Challenge (-)	20.9
21.7 Curiosity (-)	19.9

(continued)

APPENDIX 2 Continued

17.8 Fantasy (-) 16.4

Highly ranked statements:

1. This game is an enjoyable challenge. (Challenge)
2. I can interact with this game as I play it. (Interactivity)
3. This game requires that I interact with it every second. (Interactivity)

Lowly ranked statements:

48. This game doesn't challenge me at all. (Ease)
47. This game just doesn't excite me. (Realism)
46. Playing this game is like living everyday life—dull and boring. (Realism)

B2. Factor 2/Array

<i>Group Mean</i>	<i>Factor Mean</i>
24.7 Interactivity (-)	29.9
26.8 Curiosity (+)	27.6
23.2 Challenge (-)	26.6
26.7 Challenge (+)	25.6
28.7 Interactivity (+)	25.4
21.7 Curiosity (-)	22.4
22.4 Fantasy (+)	18.2
17.8 Fantasy (-)	16.3

Highly ranked statements:

1. Everyone who plays this game has the same experience. (Stability/constancy)
2. This game has the same rules for everyone. (Stability/constancy)
3. This game plays just how I expected it would. (Familiarity)

Lowly ranked statements:

48. This game is just like a lot of other games—games that I dislike. (Familiarity)
47. This game doesn't need a lot of bells and whistles. (Familiarity)
46. This game leaves me emotionally devastated. (Fantasy)

B3. Factor 3/Array

<i>Group Mean</i>	<i>Factor Mean</i>
28.7 Interactivity (+)	34.7
26.8 Curiosity (+)	29.4
26.7 Challenge (+)	29.1
22.4 Fantasy (+)	22.8
21.7 Curiosity (-)	22.3
23.2 Challenge (-)	21.7
24.7 Interactivity (-)	21.7
17.8 Fantasy (-)	10.3

Highly ranked statements:

1. This game has the same rules for everyone. (Stability/constancy)
2. This game doesn't need a lot of bells and whistles. (Familiarity)
3. I can interact with this game as I play it. (Interactivity)

Lowly ranked statements:

48. This game just doesn't excite me. (Realism)
-

APPENDIX 2 Continued

47. The goals of this game are not made clear enough for me. (Challenge)
 46. This game seems to play itself. (Stability/constancy)

Favorite Home Computer Game**C1. Factor 1/Array**

<i>Group Mean</i>	<i>Factor Mean</i>
26.9 Curiosity (+)	30.1
25.8 Challenge (+)	27.7
23.6 Interactivity (-)	26.9
22.4 Curiosity (-)	25.6
27.9 Interactivity (+)	24.8
24.3 Fantasy (+)	19.5
19.7 Fantasy (-)	19.0
21.4 Challenge (-)	18.4

Highly ranked statements:

1. This game is an enjoyable challenge. (Challenge)
2. Winning this game makes me feel like I've accomplished something. (Challenge)
3. This game requires that I deal with information overload. (Curiosity)

Lowly ranked statements:

48. Playing this game is like having a nightmare. (Fantasy)
47. This game is so realistic that it's tedious. (Realism)
46. *Anybody* can win at this game—winning requires no skills whatsoever. (Ease)

C2. Factor 2/Array

<i>Group Mean</i>	<i>Factor Mean</i>
27.9 Interactivity (+)	32.9
21.4 Challenge (-)	30.7
26.9 Curiosity (+)	25.9
23.6 Interactivity (-)	25.3
24.3 Fantasy (+)	23.5
22.4 Curiosity (-)	22.2
25.8 Challenge (+)	19.9
19.7 Fantasy (-)	11.6

Highly ranked statements:

1. I can interact with this game as I play it. (Interactivity)
2. This game requires that I interact with it every second. (Interactivity)
3. This game is easy to understand and play. (Ease)

Lowly ranked statements:

48. This game seems very realistic. (Realism)
 47. I have to be honest about myself to play this game well. (Realism)
 46. Playing this game requires down-to-earth, problem-solving skills. (Realism)
-

(continued)

APPENDIX 2 Continued

C3. Factor 3/Array

<i>Group Mean</i>	<i>Factor Mean</i>
27.9 Interactivity (+)	29.2
26.9 Curiosity (+)	29.0
25.8 Challenge (+)	27.8
24.3 Fantasy (+)	26.2
23.6 Interactivity (-)	21.3
19.7 Fantasy (-)	20.6
22.4 Curiosity (-)	19.1
21.4 Challenge (-)	18.7

Highly ranked statements:

1. This game lets me enter a world outside my own experiences. (Fantasy)
2. This game is novel and unique. (Curiosity)
3. This game is an enjoyable challenge. (Challenge)

Lowly ranked statements:

48. There's nothing interesting or exciting about this game. (Familiarity)
47. This game is just like a lot of other games—games that I dislike. (Familiarity)
48. No matter how I play this game, the outcome is always the same. (Stability/constancy)

Notes

1. For a brief history of video games, see Price (1985).
2. This is most true concerning the play behavior of society's innovators (see "re-invention" in Rogers, 1983, pp. 175-176).

3. Let me use a quote to summarize the benefits of the Q-technique in this respect:

The main strength of Q is its close affinity to theory. Structured Q sorts, by definition, are theoretically oriented. In order to build a structured sort, one has perforce to enunciate some kind of theory. The theoretical emphasis becomes especially prominent in factorial sorts. In order to build two variables into an instrument, one must relate them to each other in some sensible fashion. While often rudimentary, this is the essence of theory: variables related in logical and empirical fashion. . . .

Two related strengths of Q are its heuristic quality and its usefulness in exploratory research. Q seems to be helpful in turning up new ideas, new hypotheses. Stephenson's work perhaps best illustrates this quality. One gets the feeling of a curious mind turning up interesting ideas while working with Q. (Kerlinger, 1973, p. 594)

4. To summarize briefly the Q-technique in this particular case: I develop a series of evaluative statements about games. I then ask a group of game players to use these statements

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to describe their "favorite" games. I expect that these statements will be used in different ways to describe different sorts of games. However, I also expect that there will be recurring patterns of descriptions—patterns indicating that many people choose their "favorite games" (whatever those might be) for similar sorts of reasons. I further expect that the reasons why some players choose (for instance) Monopoly as a favorite board game may be different from the reasons why those same players choose (for instance) Donkey Kong as a favorite video arcade game. Statistics (factor analyses) allow me to test these expectations—that is, to determine to what extent the game players' descriptions of "favorite games," "favorite video arcade games," and "favorite home computer games" (represented by the Q-statement distributions) are alike and/or to what extent they are different.

5. The sample of game players here is small, but purposively chosen. "Q-method is biased toward small person-samples and single case studies. . . . The purpose is to study intensively the self-referent perspectives of particular individuals in order to understand the lawful nature of human behavior [in this case, computer-game play]. . . . Subject selection, therefore, can be governed by *theoretical* (persons are chosen because of their special relevance to the goals of the study) or by *pragmatic* (anyone will suffice) considerations" (McCown & Thomas, 1988, p. 36; emphasis in original).

6. This indicates the level of significance reported by each of three *r* tests ($df = 47$) designed to determine the likelihood that the distributions of the 48 game evaluation statements (within each of the three Q-sorts) were similar to each other. The low *p* level indicates that the distributions were very *dissimilar* to each other and that sorters indeed tended to assign different values to the statements (i.e., distribute the statements differently) when rating a "favorite game" vs. a "favorite video arcade game" vs. a "favorite home computer game." Although the adaptation of the *F* test is useful here, it is also somewhat problematic:

Q has been adversely criticized, mostly on statistical grounds. Remember that most statistical tests assume independence. This means that the response to one item should not be affected by the responses to other items. In Q the placement of one card somewhere on the continuum should not affect the placement of other cards. If Q placements affect each other, then the independence assumption is violated. Q is an ipsative, forced-choice procedure, and it will be recalled that such procedures violate the independence assumption: the placement of one Q card affects the placement of other cards. It is, after all, a rank-order method.

The real question is: How serious is the violation of the assumption? Is it serious enough to invalidate the use of correlations and analysis of variance procedures? There is no doubt that in an 80-item sort, there are not really 79 degrees of freedom. Thus, to some extent, at least, the analysis of variance procedure is vitiated. It is doubtful, however, that too much is risked in Q statistical situations, if there is a fairly large number of items. One can perhaps fall back on Fischer's advice given long ago: raise the requirements for statistical significance. Instead of accepting the .05 level in Q sorts, require the .01 level of significance. In most cases of Q statistical significance encountered by the author, *F* ratios are so high they leave little doubt as to statistical significance (Kerlinger, 1973, p. 595)

7. A brief note on the statistical "meaning" of the means: Mean rankings assume interval-level data, which is not strictly the case in this instance. The subjects *rank ordered* the original

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statements. But the Q-technique *forces* these ranks into a standard-score distribution, which assumes equal intervals between each rank. Therefore, the reader should note that in Appendix 2, the means of each of the criterion *categories* (composed of six statements each) should be expected to lie in the middle of the standard score range which was set (rather arbitrarily) from 0 to 8. Since the center of this range is 4, and since each statement category is composed of 6 statements each, 24 is used as the *expected center* (in a completely random distribution) of each criterion category. Admittedly, the "value" of 24 is meaningless. But the *distribution* of statements about this expected center of 24 is informative—the *distribution* of statements is what is indicated in the comparison of "group means" with "factor means" in Appendix 2. Indeed, the reader will note that each *set* of "group means" and each *set* of "factor means" in Appendix 2 does have a center (mean) of 24, which is indicative of the forced distribution in the original Q-sorts.

8. "In O methodology the presence of several orthogonal (independent) factors is evidence of different points of view in the person-sample. An individual's positive loading on a factor indicates his or her shared subjectivity with others on that factor; negative loadings, on the other hand, are signs of rejection of the factor's perspective" (McKeown & Thomas, 1988, p. 17). A bit more explanation might help. Since these factors are *hypothetical constructs*, some of them indicate very extreme (or "imaginary") versions of the forced distribution curve (such as A3 and A4). This is likely to be the case only when a factor—such as A3 or A4—accounts for a very small amount of the total variance.

9. The 11 subjects who described their favorite video arcade games through Q-sorts were a subset of the 44 subjects who described their favorite non-computer-based games. To what degree did these individual sorts differ in respect to the type of game preferred? These rankings were related (Spearman rank order) as follows:

Subject	Correlation Coefficient	R^2
1	-.902	.813
2	.713	.508
3	.774	.599
4	.140	.020
5	-.563	.317
6	.173	.030
7	.099	.010
8	.331	.110
9	.937	.878
10	.650	.422
11	.665	.443

The correlation coefficient would be 1.00 if the 48 statements were ranked identically (by the same person) for "favorite games" and for "favorite video arcade games" and -1.00 if the rankings were exactly opposite. Although several relatively high degrees of correlation were observed (subjects 1 and 9), there appears no pattern of correlation that would indicate rankings for "favorite games" and "favorite video arcade games" were not independently considered and made. (The predominance of positive correlations is in agreement with the similarity that might

be expected between favorite games of different types—subjects 1 and 5 are exceptions in this regard.) Looking for further relationships between the two sets of criteria revealed several interesting patterns. Variance was greatest in how the 11 respondents ranked “interactivity” in their favorite game versus how they ranked “interactivity” in their favorite video arcade game. “Interactivity” more consistently described a “favorite video arcade game” than a “favorite game” ($p = .0687$). And “challenge” was preferred *less* often in “favorite video arcade games” than “favorite games” ($p = .0945$).

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