

# THE WIZ QUIZ<sup>®</sup>

An Evaluation of

The Wiz Quiz

at

Five Star Premier Residences and Springvale Terrace

by

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## Introduction

This is a report of a study conducted to examine Classic Vi residents' perceptions of The Wiz Quiz, a game-show like activity conducted on a bi-weekly basis at the residence for slightly more than 16 years with the goal of providing intellectual and social stimulation to foster cognitive maintenance and emotional well-being. The purpose of the study was threefold: to determine resident perceptions of any benefits derived from participation in the activity; to collect their sentiments toward the modifiable features of the activity, such as the complexity of the questions, the humor of the activity host, and the friendliness of the atmosphere; and to examine whether the modifiable features were contributing to (or detracting from) the perceived benefits of the activity.

In brief, the findings indicate very favorable perceptions of the benefits of the activity, as well as the features designed to maximize those benefits. One hundred percent of the respondents indicated (i) that the atmosphere of The Wiz Quiz sessions is friendly, (ii) that they learn new information in the activity, (iii) that The Wiz Quiz host manages the activity effectively, and (iv) that they look forward to sessions of The Wiz Quiz. Statistical analysis of the influence of the modifiable features of the activity on participant perceptions of benefits revealed that the friendly atmosphere of the activity session, the humor of the host, and several rules/procedures of the activity are all instrumental to the achievement of perceived benefits. The analysis also did not identify any feature of The Wiz Quiz as detrimental to participant perceptions of benefits. In addition, participant reactions to the questions used in The Wiz Quiz sessions underscored the need to always invest great care in crafting questions of appropriate difficulty.

It is acknowledged that this study focused on the respondents' *perceptions* of benefits (e.g., memory and learning), rather than on objective measures of those constructs. That noted, there is abundant research on self-efficacy—a belief in one's ability to achieve a goal—indicating that if older adults believe they are benefitting from an activity, they will invest greater effort in order to maximize the good that they derive from it. This belief leads in turn to actual benefits as measured by valid and reliable instruments. Thus, the favorable perceptions expressed by participants in The Wiz Quiz are likely reflections of actual intellectual and emotional benefits.

The purpose and results of this evaluation will be best understood in the context of the intended benefits to participants that are the target outcomes of the WQ activity, as well as the features that were incorporated in the original design to foster those benefits.

### Target Outcomes and Design Features of The Wiz Quiz

WQ is a group activity that lasts about an hour, and engages multiple teams, each composed of from four to eight participants, in responding to questions within a set time limit about carefully selected information in a friendly competition resembling a television quiz show. The activity is aimed at fostering five specific benefits: memory, comprehension/learning, attention, reasoning, and well-being.

## Memory

A central goal of The Wiz Quiz is to maintain the memory performance of older adults, who constitute the primary audience of the activity, and this group was chosen largely because age may be the single largest risk factor for the onset of dementia. According to statistics cited by Jacoby (2011)\*, for every five-year period above the age of sixty-five, the prevalence of dementia doubles, starting at 10% of the population between the ages of 65 and 70. Consistent with this progression, according to The National Institute of Mental Health's report, *The Numbers Count: Mental Disorders in America 2010*, approximately 50% of Americans over the age of 85 suffer from Alzheimer's disease. While clearly sobering, these statistics do not condemn older adults to a preordained fate of memory disorders. Rather, a growing corpus of research evidence and theory indicates that active steps can be taken to forestall the onset of the clinical symptoms of memory loss.

In Total Memory Workout, Green (1999), an authority on ways to maintain memory performance, refers to research findings that older adults who engage in mentally stimulating activities are less likely to develop memory disorders, and she recommends further in her Facilitator Training Manual (2011) that particularly beneficial are those activities in which participants are required to perform with a time limit, or as Green says, "beat the clock" (p.13). A study by Verghese et al. (2003) is illustrative of the line of research concluding that activities requiring mental effort engender effects that are protective against the symptoms of dementia. Referring to this study, Coyle (2003, New England Journal of Medicine) explained "... persistent engagement by [older adults] in effortful mental activities may promote plastic changes in the brain that circumvent the pathology underlying the symptoms of dementia" (p. 2490).

This does not mean, as Restak (2009) points out, that effortful mental activities will prevent the formation of the neurofibrillary tangles and amyloid beta plaques found at autopsy in the brains of those who had suffered from Alzheimer's Disease. Rather, Restak continues, by engaging in some sort of cognitive training we can increase our "cognitive reserve" (p.221) and postpone the onset of the symptoms of dementia. Very recently, Stine-Morrow and Basak (2011) conclude their excellent review of the research on the efficacy of cognitive activity interventions with older adults by observing, "Our literature review suggests that a high level of mental fitness is possible longer into the life span than is often believed, but that it may depend on the coordinated enhancement of physical fitness, *intellectual stimulation* (emphasis added), and strong social networks" (p. 165).

The Wiz Quiz questions are designed to require *effortful mental activity*. Moreover, the procedures of the group activity require participants to play against the clock (a 30-second time limit for each question), which, again, Green (2011) suggests is particularly conducive to beneficial effects for cognition. Thus, The Wiz Quiz, according to key aspects of its design has the potential to help maintain cognitive reserve and stave off the symptoms of dementia.

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\*References provided upon request.

## Comprehension and Learning

Hirsch (1988) points out in the introduction to his *Dictionary of Cultural Literacy: Everything an American Needs to Know*, “People who already know a lot, tend to learn new things faster and more easily than people who do not know very much” (p. xii). This virtually self-evident maxim is at the heart of The Wiz Quiz goal to maintain and perhaps improve reading and listening comprehension by focusing participants’ attention on information designed to serve as effective anchorage for incoming spoken and written ideas. Moreover, the activity increases the likelihood that this information is effectively refreshed/learned through a mode of presentation that requires active responding by participants, as well as in an environment that is emotionally conducive to learning.

There is abundant research indicating that people have a stronger memory for the ideas and facts that they practice remembering, that is, intentionally retrieve from memory. (see Pavlik and Anderson, 2008) In addition, there is related research (see, Christopher and DeLosh, 2005.) indicating that engagement of learners in a pattern of active questioning and responding, as opposed to passively listening, results in superior learning. The recurring quizzing format of The Wiz Quiz was thus chosen because it provides practice in the form that has the greatest likelihood of generating effective learning. In addition, as Goleman (1995) points out, learning is facilitated when the learner is relaxed and in a good mood, and The Wiz Quiz is conducted in an atmosphere of sociability in an effort to better stimulate the favorable emotions that are the allies of learning. As an aside, the friendly atmosphere is designed to contribute to achievement of another outcome, as well, which will be discussed in a later section on well-being.

While engaging participants in effortful attempts to retrieve information from their long term memories may maintain their general memory faculty, another objective of the WQ activity is to improve storage and retrieval of the specific information contained in the questions read by the host. The selection of these topics was guided by the finding, which is well established by empirical research (see Bransford, Barclay, and Franks, 1972), that understanding of new information is heavily influenced by what we already know. One reason for this phenomenon is the principle of learning that the easiest way to learn something new is to associate it with something we already know.

In a study by Hirsch and Harrington (1978) that tested this theory, experimental volunteers read passages that were written either skillfully or poorly on topics that were either familiar or unfamiliar. The findings underscored the importance of prior background knowledge, in that the readers did not comprehend the expertly written passages any better than those that were poorly written, *unless* the topics were familiar to them. The importance of prior knowledge was also concluded from a study by Recht and Leslie (1988) that compared the comprehension of average readers who were baseball enthusiasts to the comprehension of expert readers with limited knowledge of baseball. The expert readers out-performed those with average skills on most passages, *unless* the topic was baseball. Under those conditions, the aficionados of America’s Pastime were able to yoke newly encountered information to knowledge that was

already secure in memory, and this resulted in performance that was superior both to that of the better readers, as well as to themselves when reading about non-baseball topics.

A goal of The Wiz Quiz is to refresh the information that promises to make participants a bit like baseball fans when they are reading about baseball. Most Wiz Quiz questions intentionally focus on the exact information that has a high likelihood of functioning as prior knowledge that is useful for comprehension in American society, that is, the broadly shared background knowledge that is often assumed by speakers and writers. A methodical sifting process by Hirsch, Kett, and Trefil (2002) has identified those topics that are most usefully deployed by readers and listeners as anchors for newly presented information from either writers or speakers. By improving the accessibility of these anchor topics in long term memory, participation in The Wiz Quiz has the potential to facilitate learning of newly encountered, incoming information, because the new ideas can more readily be linked to ideas that are known already. In addition, because information is stored in memory in networks of related facts, referred to as schemas, the process of refreshing access to a single item of information in a schema tends to improve accessibility to the other pieces of information comprised by that network. (see McVee, Dunsmore, and Gavelek 2005)

### Sharpened Attention

Research shows that people may wrongly blame a mental lapse on forgetfulness, when the actual culprit is inattention. An example is when we can't find our car in a large parking lot, because we failed to take note of its location when we parked it. Another is the bag of groceries "forgotten" on the roof of the car, because of the cell phone call that was incoming just as we were unlocking the door of our vehicle.

Information cannot be effectively stored in long term memory for later retrieval unless it is attended to in the first place. Increased distractibility is a known consequence of natural aging, and, when our minds wander, critical information will be processed superficially, and its later retrieval will be compromised. If, however, we counter this tendency by intentionally mustering our attention at the time of initial processing, it can lead to more successful accessing of information when we need it later.

The Wiz Quiz provides participants with repeated practice paying close attention to what they hear, and that exercise is designed to be even more challenging—and beneficial—by the need to attend to the multiple clues contained in most questions. The length and complexity of Wiz Quiz questions are specifically designed to build the attention muscle, and bring about an increased effort to focus attention more vigilantly while processing information during the routine encounters of daily living.

Aside from the complexity of the questions, the procedures of The Wiz Quiz include two additional mechanisms that magnify the opportunity to practice attending. One of these is the 30-second time limit for answering questions. Unlike solving crossword puzzles, which do not have

a time limit and permit shifting of attention elsewhere, The Wiz Quiz requires participants to stay continuously focused on answering the question at hand.

A second mechanism subtly encourages participants to focus closely on every single question that is read, rather than only when it is their team's turn to answer. According to this procedure, each team is issued a tablet of paper and a pencil, and they are encouraged to write down the answers to all questions when it is not their turn. If the turn team fails to answer their question within the time limit (30 seconds), the host checks the tablets of the other teams, and if they have recorded the correct answer, a bonus of five points is added to their score. Perhaps more critical to the competition among teams, if not a single person on any team records the correct answer when the turn-team is stuck, then the question is judged to be too difficult, and a new question is read to the turn team, thus affording them the chance to score more points for that round. As an aside, the Tablet system also tends to limit instances of participants answering out of turn by giving non-turn team participants a vehicle (written rather than verbal) for expressing their answers.

### Reasoning Practice

Research by Salthouse (2009) indicates that the reasoning ability of adults with normal health may begin to decline as early as 20 years of age. There are different kinds of reasoning ability, but in general they all require combining multiple pieces of information—"connecting the dots" or "putting two and two together"—in order to arrive at correct conclusions, solutions, or answers. Without effortful attempts to maintain this faculty, it tends to decline with age.

Many of The Wiz Quiz questions call for participants to reason or problem-solve by combining multiple clues in order to figure out correct answers. This is illustrated by the following item about idioms:

*What is the Spanish word that expresses a sentiment or action akin to "kicking the can down the road", as in "That's not solving the budget crisis; it's just kicking the can down the road."*

An accurate response to this question requires, first, identifying postponement or procrastination as the essence of the "kicking the can" idiom, which can be inferred from the "budget crisis" clause, and then using that partial result as a bridge to the correct answer "manana", which is also an idiom associated with procrastination.

Another example of how many of The Wiz Quiz questions provide an opportunity to practice the skill of reasoning is the following one from the category of Life Sciences.

*What is the fossilized resin whose name in patriotic song describes America's grain?*

While it is entirely possible to answer correctly based on the paired associate (declarative) knowledge that amber is the name for fossilized resin, a team's chances of answering correctly are increased if they add the "amber waves of grain" clue from the well-known song, *America*. As with the opportunity to practice paying attention described previously, the beneficial effect of systematic practice on many varieties of skill is well documented (see Pavlik and Anderson, 2008), and, thus, the opportunity for Wiz Quiz participants to repeatedly use their reasoning operations may contribute to maintenance of this faculty for deployment outside of the activity session.

## Well-Being

According to research in the field of aging, older adults do better cognitively and, not surprisingly, physically, if they are able to maintain a reasonably strong sense of well-being, the term professionals in the positive psychology field use for the notion of happiness. There are two specific features of The Wiz Quiz that are designed to contribute to a sense of well-being. The first of these is socializing. Studies as distant as China (Xiao, 2003) and as proximate as the United States (Weismann, 2008) found that engagement in regular social activities is conducive to the well-being of older adults. Rossen (2007) found that the well-being of older adults in congregate living is inversely proportional to feelings of isolation. Krueger et al. (2009) used linear regression to isolate a relationship between social support/social activity and cognitive functioning.

The Wiz Quiz promotes socializing in multiple ways. As a group activity, it can draw a sizeable number of people to the activity venue for chatting before and following the session. Second, during the activity, participants confer with, congratulate and encourage one another, sometimes linking arms for a heightened sense of kinship at critical moments in the competition. There also is frequent banter among teams, and there is an abundance of give and take between participants and the host, who strives to maintain a consistent atmosphere of good cheer.

Beyond the contributions of social contact to well-being, there is also evidence from Dahua (2004), Guedea (2007), and Seipke (2008) that the well-being of older adults is increased if their lives include a number of reasonable challenges. The notion of *reasonable challenge*, that is, challenge that is approximately equal to the ability of the individual, and thus neither overwhelming nor boredom-inducing, is one of the hallmarks of the types of activities identified by Csikszentmihalyi's (1990) research as those generating the greatest enjoyment or *Flow* for the individual.

Multiple features of The Wiz Quiz are designed to pose appropriate challenge. There is the challenge of teams at approximately equal knowledge levels competing against one another. In a sense, even within teams there is a form of competition as each member strives to be the first to answer. There is also the challenge of the questions, which are intentionally crafted to be rather difficult. An additional challenge comes in the form of the 30-second time limit for answering, one point deducted from the team's score for every second that ticks off the host's

stop watch.

The Wiz Quiz also includes mechanisms for lessening challenge when the need is apparent, so that it is at a level that does not overwhelm. Although working against the clock does constitute a challenge, the generous time limit is much more suited to the processing speed of older adults than the instantaneous response time of contestants on, say, television's Jeopardy. Challenge is also adjusted by the mode of questioning. In the initial phase of question presentation, items are presented in a recall mode, requiring that participants generate a response without any prompts beyond the stem of the item, like the questions about manana and amber, seen previously. If, however, a team is unable to answer correctly after 30 seconds, phase two of questioning takes place, and in addition to repetition of the original question, it includes the presentation of four choices for the correct answer, converting the task from recall to one of recognition, which is less difficult. One final method of calibrating the challenge of the activity so that it is at an appropriate level is the use of the tablet system that was described previously. Again, if none of the teams records the correct answer for an item, it is discarded because it is too difficult, and the turn team receives a fresh question, assumed to pose a more appropriate level of challenge.

Again, these five benefits are the target outcomes of the activity, and the design features are those that were chosen because of their theoretical potential to foster achievement of those outcomes. The principal purpose of this evaluation was to determine participants' perceptions of whether these outcomes were achieved and, if they were, whether their perceptions of the features of the activity were consistent with conditions conducive to outcome achievement.

### Data Collection

Data were collected via a questionnaire administered at the conclusion of a session of The Wiz Quiz conducted in the spring of 2011. The questionnaire, which appears as Appendix A of this report, began with several items pertaining to gender, education level, and frequency of participation, and it concluded with four fill-in items eliciting resident perceptions of any unique benefits to them personally, as well as their suggestions of ways to improve the activity. The bulk of the instrument comprised 30 statements about the features of the activity and its perceived benefits.

Residents indicated their agreement or disagreement with each statement by selecting one of the options from a six-point Likert scale that included the choices Strongly Agree, Agree, Mildly Agree, Mildly Disagree, Disagree, and Strongly Disagree. In order to minimize a phenomenon known as *response set*, ten of the items were negatively worded (e.g. *I wish the questions had different topics. The host is disrespectful toward participants.*) In order to quantify responses for statistical analysis, the response choices were assigned the values one to six, six corresponding to Strongly Agree and one corresponding to a response of Strongly Disagree.

The items focusing on the modifiable features of The Wiz Quiz were in four categories. A



Question category included seven items about the questions read by the host (e.g. *The questions are sometimes too easy.* and *The questions are sometimes challenging.*). A Social Atmosphere category comprised three items (e.g. *The atmosphere is friendly.* and *Participants are sometimes discourteous.*) A third category focused on the Host, and it included five items (e.g. *The host has a sense of humor.* and *The host speaks clearly.*). A fourth category of “feature” item included five items pertaining to the Rules and Procedures of the activity (e.g. *The tablet system helps me pay attention to every question.* and *Visitors should be allowed to participate.*) Again, if responses to any of these items reflected unfavorable sentiments and/or if the analyses indicated that they were adversely related to the perceived benefits of the activity, then one or more of the modifiable features would be subject to change.

In contrast to the foregoing items focused on the design features of The Wiz Quiz, the questionnaire included seven outcome items devoted to the Perceived Benefits of The Wiz Quiz. Examples were *The Wiz Quiz helps my memory. I learn new things at The Wiz Quiz sessions. I look forward to sessions of The Wiz Quiz.* and *The Wiz Quiz is a plus for Classic Vi.* In order to generate a reliable measure of the Perceived Benefits of the activity, each respondent’s expressed sentiments for these items were averaged to form a single value to be used in statistical analysis. The calculated reliability of this seven-item sub-scale (Chronbach’s Alpha) was an excellent .92, indicating that if these seven items were administered at some future time, respondents could be expected to obtain a very similar score. Two additional items elicited opinions regarding whether Classic Vi is a good place to live and whether the respondents would recommend the residence to others. These were included in an attempt to determine whether sentiments about the Perceived Benefits of The Wiz Quiz were linked to feelings about the residence.

### Respondents

Sixteen participants completed the questionnaire. Eleven of the respondents classified their attendance at Wiz Quiz sessions as “Rarely Miss”, three selected “often” and two indicated “Occasionally”. Respondents reported the following as highest educational level: three with less than a bachelor’s degree, five with bachelor’s degrees, six with master’s degrees, and two with law degrees. Ten of the respondents were female and six were male.

This evaluation was one of three undertaken at residences where The Wiz Quiz is conducted on a regular basis. The other two are Maplewood, where a different host conducts the activity and where a modified version of the survey instrument was used, and Springvale Terrace, which has the same host and where the same instrument was used. In order to achieve greater statistical power in one of the analyses reported below, namely, the regression analysis, the data from the two locations (Classic Vi and Springvale) using the same form of the survey were merged, more than doubling the sample size. In another type of analysis, which examined the possible effects of gender and educational level on Perceived Benefits, it was possible to merge the data of all three residences, resulting in a sample size of 60.

## Analysis

### Descriptive Statistics

One type of analysis simply calculated the average response for each questionnaire item across all Classic Vi respondents, as well as the percentages of respondents who agreed or disagreed with each statement. Inspection of these statistics identified game features that either should be maintained in their present form or modified in some manner in order to enhance the quality of the game, and it revealed the strength of sentiments related to the various benefit items, as well as the Perceived Benefits summary measure.

### Inferential Statistics

An inferential statistic known as a t-test was used to examine any relationship between the demographic variables, gender and educational levels of the participants and their responses to the items summarized as the Perceived Benefits variable. As stated, in order to improve the statistical power for this analyses, the data collected from all three Wiz Quiz sites were merged into a single file. This resulted in a sample size of 60: ten participants with educational levels below a bachelor's degree, 24 with bachelors degree, and 26 with post graduate education. Nineteen men and 41 women are included in the analysis of the demographic variables.

Multiple regression analysis was used to determine the strength of the relationships between the Perceived Benefits variable and every modifiable feature variable, namely, the multiple features comprised by the categories, Host, Atmosphere, Questions, and Rules/Procedures. In contrast to simple correlation, regression has the advantage of examining more than one feature variable at the same time. For example, the relationships of participant perceptions related to the characteristics of questions (e.g., their challenge and their complexity) to Perceived Benefits could be considered simultaneously. This avoids making duplicate—and sometimes misleading—use of the variation in the Perceived Benefits outcome variable. Multiple regression isolates the importance of the various features—and the various categories of features (Host, Questions, Social Atmosphere, and Rules/Procedures)—suggesting the emphasis they should receive during future sessions of The Wiz Quiz.

The regression procedure reveals whether the modifiable features and Perceived Benefits variables share a relationship that is either strong and positive, strong and negative, or weak. A relationship that is strong and positive suggests that a feature is contributing to the respondents' perception of the benefits derived from participating in The Wiz Quiz, and this argues in favor of maintaining a feature in its current form. A strong and negative relationship indicates that a feature may be detracting from perceptions that the activity is beneficial, and it means that consideration should be given to abandoning the feature or modifying it.

A weak relationship between a design feature and Perceived Benefits indicates that it apparently is not influencing sentiments related to the target outcomes of the activity. In instances

of findings such as this, it is necessary to base modification decisions on (1) the theoretical rationale for initially including the feature in the original design of the activity, and (2) respondent sentiments—either positive or negative—toward the feature as reflected by the descriptive statistics. For example, a regression result might indicate a weak relationship between Perceived Benefits and respondent enjoyment of the complexity of the questions. There is a strong theoretical rationale for including questions that are relatively complex, because that feature gives practice in paying attention and in reasoning, two of the five target benefits of the activity. If, however, the descriptive statistics indicated a preponderant respondent sentiment that they were *not* enjoying the complexity of the questions, that would be a basis for considering the use of questions with a simpler structure.

## Results

A table displaying descriptive statistics for all questionnaire items appears as Appendix B. of this report. In the narrative that follows, numerical values are presented in some cases, and recall those are based on assignment of the value six to a survey response of Strongly Agree descending to the value one assigned to a response of Strongly Disagree. Along with the average values for each item, this table presents the percentages of respondents expressing either agreement or disagreement.

### Perceived Benefits

The Classic Vi respondents as a group expressed a number of very strong favorable sentiments about the Perceived Benefits derived from participation in The Wiz Quiz, and the aggregated responses indicated no negative sentiments related to outcomes. Examination of the descriptive statistics in section E of the table reveals that the respondents felt that The Wiz Quiz is directly responsible for a number of desirable outcomes. There was 100% agreement (all 16 respondents indicating at least mild agreement) that they benefit from The Wiz Quiz; the average response was 5.6 out of a possible 6.0. Strong favorable sentiments were also expressed related to respondent perceptions that The Wiz Quiz helps memory (100% agreement and an average response of 5.4), that they learn new things in the WQ sessions (also 100% agreement with an average response of 5.3), and that they have accomplished something when they answer a WQ question (100% and 5.4). There was also convergent agreement that respondents are satisfied at the end of a WQ session (5.4), that they look forward to sessions of WQ (5.7), and that WQ is a plus for Classic Vi (5.7). Again, there were no negative sentiments expressed related to the outcomes of WQ.

Table 1 displays the responses of different participants to the fill-in survey item, “If you do feel that you benefit, describe how you benefit.” To the left of each comment is the respondent’s anonymous identification number.

Table 1 Classic Vi responses to survey item, "... describe how you benefit?"

1. Trying to access questions (good for brain)
2. .... leads me to seek info on subjects I found myself weak in.
3. Revives my memory.
7. Makes me think
8. I enjoy the mental challenge.
9. I often hear answers I didn't know.
10. Challenges my knowledge, memory, and reasoning.
11. It stimulates the mind.
12. It encourages me to think and encourages my memory.
13. I learn a lot.
14. I like the challenge—it's stimulating.
15. I learn something new each session.
16. Stimulates my mind and encourages me to think.

The survey included two outcome items related to participant satisfaction with their living arrangements, *Classic Vi is a good place to live* and *I would recommend Classic Vi to others*. Both of these items elicited an average response that was in the neighborhood of Agree, and some level of agreement was expressed by 86% of the respondents to both items. The relationship between these items and Perceived Benefits was not statistically significant, and this suggests that there are many factors other than a bi-weekly, one-hour activity that may affect satisfaction with one's living circumstances.

To reiterate, it needs to be acknowledged that these data reflect the respondents' *subjective perceptions* of benefits, rather than benefits more objectively measured by instruments with proven validity and reliability. That noted, there is evidence from the research literature (see Stine-Morrow and Basak, 2011, for a review) indicating that older adult attitudes can play a crucial role in physical, emotional, and cognitive health. More specifically, research on the self-efficacy of older adults indicates that if older adults feel they have a reasonable likelihood of succeeding at an undertaking, or, as in this case, if they sense they are benefitting from an activity, they will put forth greater effort in order to maximize their success and benefit. Thus, if nothing else, the favorable findings related to Perceived Benefits portend participants' sustained and effortful engagement with The Wiz Quiz and other potentially beneficial activities.

### Demographic Factors

The larger data base, which merged the responses of all three residences, was used to examine possible differences in Perceived Benefits due to the demographic factors, gender and attained educational level, and the statistical significance of differences were evaluated with a procedure called a t-test. The statistical significance of a difference between groups can be conveniently summarized as the p-value of a statistic, which is the probability of obtaining the results found in the data. Results that are commonplace, and therefore not significant, have a high

probability of occurring and thus generate a relatively high p-value. Those that are relatively rare, and therefore remarkable, generate a low p-value, and the usual standard for deciding statistical significance is a p-value of .05 or lower.

Turning to the examination of the gender factor, the average Perceived Benefits value for the 19 men in the sample was 5.23, and for the 41 women the value was 5.28, a difference that was far from statistically significant ( $p = .73$ ). Men and women appear to perceive getting equal benefit from participation in The Wiz Quiz.

Examination of participant educational level as a possible determinant of Perceived Benefits presents a more nuanced picture. Among the 60 respondents in the three-site data set, ten had attained less than a bachelor's degree, and their average value on the Perceived Benefits variable was 5.62; 24 had earned a bachelor's degree and they obtained the value 5.25 on the Perceived Benefits variable. The remaining 26 respondents had received at least some post graduate education including medical, law, and PhD degrees, and the average Perceived Benefits value for this group was 5.14. The t-test examining the difference between the Perceived Benefits of the those with bachelor's degrees and those with graduate education was not statistically significant ( $p=.48$ ). The difference between the average Perceived Benefits values of those with less than a bachelor's degree and those with either a bachelor's or higher, an average of 5.19, was statistically significant with a p-value for the t-test statistic of .016. The difference between the average Perceived Benefits values of those with less than a bachelor's degree and those with graduate education was even more statistically remarkable, a p-value of .013. The specific survey items that contributed most to the differences on the overall Perceived Values variable were *I think the WQ helps my memory*, and *I feel satisfied at the end of a WQ session*.

The implications of this are that, although respondents at all three levels of educational attainment expressed strong agreement that they benefit from participating in The Wiz Quiz, those who are in theory the least prepared to answer questions are the very group who feel that they benefit the most. This means that when the activity is conducted with groups of participants whose educations are limited to high school degrees, hosts should feel no reticence about administering an assortment of questions that pose the usual varied level of challenge: some hard, some easier, but certainly not withheld for fear of overwhelming those with "only" a high school education.

The sections that follow report respondent sentiments toward the modifiable features of the activity, as well as examine their possible roles in fostering Perceived Benefits.

### The Host of The Wiz Quiz

Section A of Appendix B. contains the descriptive statistics for the survey items that focused on the performance of The Wiz Quiz host. These data reflect a strong consensus of approval among Classic Vi respondents. There was virtual unanimity that the host has a sense of humor (5.8 out of 6.0, 100% agreement), and that he is not disrespectful to participants (average

response: 1.6, indicating between Disagree and Strongly Disagree). Respondents agreed on average (5.2) that the host speaks clearly, and yet 36% expressed some level of agreement with another survey item that they have a hard time hearing. This underscores the need to strive for ever clearer enunciation and intonation when communicating orally with older adults. It may also be useful to explore ways to improve audibility, perhaps through use of a room with better acoustics, through better articulation by the host, or through better positioning of the host and participants in relation to each other. The overall perceptions of the host are summarized in the survey item, *The WQ host manages the activity effectively*, and the average value for a response to this item was 5.8.

The regression analysis examined the aspects of the Host's profile that seem to contribute most to participant Perceived Benefits, and the combined Springvale and Classic Vi data set was the focus of this analysis. The regression revealed a significant relationship between participant perceptions of the host and Perceived Benefits, summarized by a p-value of less than .001. Among the variables constituting the host profile, the most important were *host manages effectively*, a p-value less than .008 and *host has a sense of humor*, with a p-value of .011. Variables that were not influential according to this analysis were *host speaks clearly* and *host is disrespectful*. This does not recommend a disregard for clear speech or a respectful manner of engagement, which are certainly essential ingredients for conducting the game from an intuitive perspective. Rather it underscores the importance of conducting the activity with a certain light-hearted approach when the participants are engaged in the sometimes stressful task of scouring long term memory for answers while faced with the pressure of a ticking clock. In support of this, based on the Classic Vi data, the correlation between the *host manages effectively* item and the *host has a sense of humor* item was a strong .67 with a p-value of .005, indicating statistical significance.

### The Social Atmosphere.

Section B of Appendix B. displays the descriptive statistics for the three survey items related to Social Atmosphere, and respondents expressed a number of very favorable perceptions in this realm. To the item, *I enjoy the social interaction*, the average response was 5.2 with 88% expressing some level of agreement. The average response to *The atmosphere is friendly* item was also very positive, 5.4 (100% agreement.) The average response to the *Participants are sometimes discourteous* item was 2.0, which corresponds to Disagree. The fill-in items of the survey also generated responses that reflect a favorable social atmosphere. One said "I like joining a group activity and find it somewhat stimulating." These combined results indicate that The Wiz Quiz host, the audience, and the participants, themselves, orchestrated a favorable Social Atmosphere, one that, according to an important theoretical design feature of the activity, is conducive to effective learning, leading to better Memory and Comprehension, as well as to an elevated feeling of well-being.

The regression analysis based on the two-site data revealed a statistically significant relationship between the Social Atmosphere of the Wiz Quiz sessions and their Perceived

Benefits; the overall p-value was .034. The variable that most strongly predicted participant perceptions that they attain favorable outcomes from the activity was the item, “The atmosphere is friendly”, and this relationship was statistically significant with a p-value of .025. These results are a reminder that one of the host’s primary responsibilities is to set a tone of friendliness, and to take diplomatic action if ever that atmosphere is jeopardized.

### The Questions

Section C of Appendix B. displays the descriptive statistics related to the survey items that focused on the questions read by the host. There were seven such items, making Questions the most scrutinized aspect of the activity. It should be stated at the outset of the discussion of the Question results that, according to the regression analysis, none of the Question items on the survey evinced a statistically significant relationship with Perceived Benefits of The Wiz Quiz. The only item that came close to significance was *The questions are sometimes too easy*, which generated a p-value of .075. While one interpretation of the overall weak statistical relationships is that the nature of the questions does not make a difference in how the participants feel about the activity, a brief visit to any session of The Wiz Quiz would quickly reveal that the participants feel quite strongly about the questions they are fielding. It just may be that these survey items tapped what was important to the survey designer, rather than question characteristics that the participants consider salient.

Another interpretation of the weak statistical relationships between the question items and Perceived Benefits is that the characteristics of the questions are not detracting from participants’ feelings that they are deriving benefit from the activity. If survey items relate to question characteristics that have a sound theoretical basis, *and* are not generating adverse sentiments among the participants, this argues for retaining those aspects of questions, regardless of the weakness of their statistical relationships to Perceived Benefits. A key evaluation question is whether the participant responses reflect conditions in the activity that are theoretically conducive to achievement of the five core objectives of The Wiz Quiz.

One item that reflects conditions that are conducive to achievement of WQ goals is *I like the complexity of the questions*. Recall that many of the questions are written with a complex structure in order to stimulate effortful mental activity to promote memory, reasoning, and attention. The average response to this item was Agree, a value of 4.8, and 87% of the respondents expressed some level of agreement. This is consistent with conditions likely to lead to better memory, attention, and reasoning. These conditions are similarly reflected by the responses to the item, *The questions are sometimes challenging*, and the average response was Agree (5.2), with 94% of the respondents expressing some level of agreement. Recall also that appropriate challenge leads to a sense of well-being, so these results suggests that the challenge of the questions also may be contributing to achievement of the well-being goal.

The perceived challenge of the questions, as reflected in the responses described above, notwithstanding, 57% of the respondents expressed some degree of agreement that the questions

are sometimes too easy. This is a two-fold reminder: one, that participants do not want to be coddled with constant softball questions, and, two, it is imperative that questions be written so that they pose a reasonable level of challenge. These points aside, it should be recalled that the survey item related to questions that showed the strongest relationship to Perceived Benefits was this very one, which just missed a p-value that was significant. Apparently at some level, participants are not averse to encountering an occasional easy question. Given the findings from this item and the one related to questions being sometimes challenging, it is not surprising that the average response was agreement with the survey statement, *The difficulty of the questions is not uniform*. The average response to this item was a value of 4.9, Agree; 87% of the respondents indicated at least mild agreement that the difficulty of the questions is not uniform. This is a desirable result, because, just as band leaders and DJ's avoid monotony by striving for variety in their music by varying the tempo, it is a goal in each Wiz Quiz session to use a set of questions written at different levels of difficulty.

Other results were that the respondents seem satisfied with the accuracy of the information in the questions; 86% disagreed with the statement that the information in the questions/answers is inaccurate. The majority are satisfied with the topics of the questions: 73% disagreed with *I wish the questions had different topics*. This argues in favor of continuing to follow the theoretically sound practice of basing questions on the broadly shared knowledge that writers and speakers in American society assume is known by their audiences. Finally, useful feedback was provided by the item, *The language of the questions is not complicated*. The average response to this item was Mildly Agree, and 40% expressed some level of disagreement with the statement, meaning they felt that the language *is* indeed complicated. This result, too, is not altogether surprising, because of the Wiz Quiz goal of writing questions that pose challenge through a certain amount of complexity. At times, that goal may lead to complicated language, and this result constitutes encouragement to strive for complexity, while also working toward linguistic economy. The combined results related to the features of Wiz Quiz questions are a reminder that, because of the variety of interests and knowledge levels among participants, we can never be sanguine that the questions will always be satisfactory to everyone.

### Procedures and Rules

Section D of Appendix B. reports descriptive statistics related to participant sentiments toward important rules and procedures of The Wiz Quiz activity. Regression analysis found a significant relationship ( $p = .002$ ) between sentiments toward these procedures/rules and Perceived Benefits. Specific findings were the following:

- 67% of the respondents agreed with the statement that a small number of people seem to answer questions. On the surface, this might suggest a need to create more teams with fewer people on each in order to give more people an opportunity to answer questions. However, in the regression analysis, this item was not an important contributor to the relationship of Rules/Procedures to Perceived Benefits. Moreover, at a different facility, Maplewood, where a modified version of the survey instrument was used, 96% indicated



that they enjoy being on a team even if they don't answer a question, and the regression analysis there revealed that in this category of survey item, enjoyment of team membership was the strongest predictor of Perceived Benefits. Thus no adjustment of team size seems to be indicated by this finding.

- 100% expressed agreement, an average response of 5.1, that the tablet system helps them pay attention to every question. In addition, this item was one of the two strongest contributors ( $p = .014$ ) to the relationship between this category of item and the Perceived Benefits variable. This finding indicates that the procedure should be maintained in its present form. Recall that one purpose of distributing tablets among teams is to increase the opportunity to practice paying attention.
- 80% of the respondents agreed, an average response of 4.9, that they would like to see the activity happen more often. This can be taken as an expression of dissatisfaction with the frequency of the program. Another way to interpret this result is that participant sentiments are really another expression of a favorable outcome, akin to *I look forward to sessions of The Wiz Quiz*. Supporting this view, this variable contributed most (a p-value of .002) to the relationship between this category of survey item and Perceived Benefits. The *wish-more-often* item is strongly related to the outcome variables, because this item may, itself, be best considered an outcome variable.

Other results from the Rules/Procedures category of item were that visitors should be allowed to participate; 67% agreed (4.1). While this is not a resounding invitation to include family members, neither is it a mandate to separate participants from loved ones who have come to visit on the day of a session of The Wiz Quiz. Finally, a majority, 86%, seem to think that the prizes are worthwhile.

### Analysis Across Categories of Features

While the regression analyses reported above examined how features within categories stacked up against one another in their relative contributions to Perceived Benefits, one final analysis was conducted to determine the effect of combining features from different categories and calculating their relationship to the Perceived Benefits variable. To that end, features that performed most strongly in the within-feature category analysis were included in an among-feature category analysis. Included as candidates in this final regression were the items

- I would like The Wiz Quiz to happen more often.
- The atmosphere during The Wiz Quiz is friendly.
- The host has a sense of humor.
- The host manages the activity effectively.
- The questions are sometimes too easy.
- The tablet system helps me pay attention to every question.

This analysis revealed a significant relationship between the features and Perceived Benefits, one that was stronger than any of the earlier within-feature category analyses. The multiple correlation resulting from the regression was .812, and this means that the percentage of variance in the Perceived Benefits variable explained by the select features variables was 66%; the associated p-value was less than .001. The feature variables that emerged as the largest contributors to the relationship were *wish more frequently*, *host manages effectively*, *friendly atmosphere*, and *tablet system helps attention*. These results indicated that multiple aspects of the Wiz Quiz are essential to its success. In combination, these data suggest that The Wiz Quiz is contributing to achievement of the outcomes that are its target goals.

### Concluding Remarks

The results reported herein indicate that older adults who participate in The Wiz Quiz regard it as a beneficial activity. There also are robust indications that the features of the activity are contributing to those favorable perceptions. The regression analyses showed strong positive relationships between Perceived Benefits and many of the modifiable features, and revealed not one single indication that a feature was detracting from Perceived Benefits. Moreover, the descriptive statistics isolated several opportunities to alter the features of the activity in order to improve it. This is completely in keeping with the philosophy of evaluation expressed by Stufflebeam (2003), namely, that the purpose of evaluation is not to prove but to *improve*.

## A Penny for your thoughts on The Wiz Quiz

The Classic Vi staff and I are interested in getting your perceptions of the Wiz Quiz so that we can continue features that are working well and, where possible, make improvements. Please take a few moments to answer this anonymous survey candidly and completely.

**Part I. About you.** Circle one answer for each question.

1. About how often do you attend? a. Rarely miss b. Often c. Occasionally d. First Time
2. Which best describes your participation? a. participate as team member b. audience observer
3. What best describes your highest level of education?  
a. High School b. Bachelor's c. Master's d. PhD e. MD f. Other (specify) \_\_\_\_\_
4. What is your gender? Female \_\_\_\_\_ Male \_\_\_\_\_

**Part II. Your perceptions of The Wiz Quiz.** Please indicate your agreement or disagreement with each of the following statements about The Wiz Quiz by circling one of the answer choices.

SA=Strongly Agree      SD=Strongly Disagree  
A=Agree                      D= Disagree  
MA=Mildly Agree      MD=Mildly Disagree

***Note: some statements are positive and some are negative.***

1. I have a hard time hearing the questions.      SA A MA MD D SD
  2. The host speaks clearly.      SA A MA MD D SD
  3. A small number of people seem to answer questions.      SA A MA MD D SD
  4. I enjoy the social interaction.      SA A MA MD D SD
  5. The prizes awarded are worthwhile.      SA A MA MD D SD
  6. I would like The Wiz Quiz to happen more often.      SA A MA MD D SD
  7. Participants are sometimes discourteous.      SA A MA MD D SD
  8. The difficulty of the questions is not uniform.      SA A MA MD D SD
- (Continue on the reverse side)

## The Wiz Quiz Survey (continued)

- |  |    |   |    |    |   |    |
|--|----|---|----|----|---|----|
| 9. I wish the questions had different topics.                    | SA | A | MA | MD | D | SD |
| 10. The questions are sometimes too easy.                        | SA | A | MA | MD | D | SD |
| 11. The language of the questions is usually not complicated.    | SA | A | MA | MD | D | SD |
| 12. The tablet system helps me pay attention to every question.  | SA | A | MA | MD | D | SD |
| 13. The questions are sometimes challenging.                     | SA | A | MA | MD | D | SD |
| 14. The host has a sense of humor.                               | SA | A | MA | MD | D | SD |
| 15. The host is sometimes disrespectful toward participants.     | SA | A | MA | MD | D | SD |
| 16. The info in questions and answers is sometimes inaccurate.   | SA | A | MA | MD | D | SD |
| 17. I like the complexity of the questions.                      | SA | A | MA | MD | D | SD |
| 18. I think The Wiz Quiz helps my memory.                        | SA | A | MA | MD | D | SD |
| 19. The atmosphere during the Wiz Quiz is friendly.              | SA | A | MA | MD | D | SD |
| 20. I learn new things at The Wiz Quiz sessions.                 | SA | A | MA | MD | D | SD |
| 21. Visitors should be allowed to participate.                   | SA | A | MA | MD | D | SD |
| 22. I feel I've accomplished something when I answer a question. | SA | A | MA | MD | D | SD |
| 23. I feel satisfied at the end of a session of The Wiz Quiz.    | SA | A | MA | MD | D | SD |
| 24. I look forward to sessions of The Wiz Quiz.                  | SA | A | MA | MD | D | SD |
| 25. Classic Vi is a good place to live.                          | SA | A | MA | MD | D | SD |
| 26. I would recommend Classic Vi to others.                      | SA | A | MA | MD | D | SD |
| 27. The Wiz Quiz host manages the activity effectively.          | SA | A | MA | MD | D | SD |

(Continue on the next page)

**The Wiz Quiz Survey (continued)**

28. The Wiz Quiz is a plus for Classic Vi. SA A MA MD D SD

29. a. I benefit from The Wiz Quiz program. SA A MA MD D SD

b. If you do feel you benefit, describe how you benefit. \_\_\_\_\_

\_\_\_\_\_

c. What changes would allow you to benefit even more from The Wiz Quiz? \_\_\_\_\_

\_\_\_\_\_

30. Describe anything about The Wiz Quiz that you specifically *dislike*? \_\_\_\_\_

\_\_\_\_\_

31. If you know any resident who attended sessions of The Wiz Quiz one or more times and then stopped, please describe the reason if you know it or write "Do not know"? \_\_\_\_\_

\_\_\_\_\_

Thank you for your help improving

**The Wiz Quiz**

Appendix B.

Average Classic Vi participant responses to The Wiz Quiz survey. (N=16)

Response Choices: Strongly Agree (6) Agree (5) Mildly Agree (4)			Mildly Disagree (3) Disagree (2) Strongly Disagree (1)		
Item	Average Response	% Trends			
<b>A. Pertaining to the Host of The Wiz Quiz</b>					
I have a hard time hearing.	Mildly Disagree (2.6)	*36% Agree			
The host speaks clearly.	Agree (5.2)	93% Agree			
The host has a sense of humor.	Strongly Agree (5.8)	100% Agree			
The host is disrespectful toward participants.	Disagree (1.6)	94% Disagree			
The Wiz Quiz host manages effectively.	Strongly Agree (5.8)	100% Agree			
<b>B. Pertaining to the Social Atmosphere during The Wiz Quiz</b>					
I enjoy the social interaction.	Agree (5.2)	88% Agree			
Participants are sometimes discourteous.	Disagree (2.0)	80% Disagree			
The atmosphere is friendly.	Agree (5.4)	100% Agree			
<b>C. Pertaining to the Questions of The Wiz Quiz</b>					
The difficulty of the questions in not uniform.	Agree (4.9)	*87% Agree			
I wish the questions had different topics.	Mildly Disagree (2.7)	73% Disagree			
The questions are sometimes too easy.	Mildly Agree (3.8)	*57% Agree			
The language of the questions is not complicated.	Mildly Agree (4.1)	40% Disagree			
The questions are sometimes challenging.	Agree (5.2)	94% Agree			
The question/answer is sometimes inaccurate.	Disagree (2.3)	86% Disagree			
I like the complexity of the questions.	Agree (4.8)	87% Agree			
<b>D. Pertaining to the Procedures and Rules of The Wiz Quiz</b>					
A small number of people seem to answer ques.	Mildly Agree (4.3)	*67% Agree			
I would like The Wiz Quiz to happen more often.	Agree (4.9)	80% Agree			
Visitors should be allowed to participate.	Mildly Agree (4.3)	*67% Agree			
The tablet system helps me pay attention to every question.	Agree (5.1)	100% Agree			
The prizes are worthwhile.	Agree (4.7)	86% Agree			

E. Pertaining to the Outcomes of The Wiz Quiz		
I wish more of my friends would attend The WQ.	Agree (4.9)	80% Agree
I think The Wiz Quiz helps my memory.	Agree (5.4)	100% Agree
I learn new things at The Wiz Quiz sessions.	Agree (5.3)	100% Agree
I feel I've accomplished something when I answer a question.	Agree (5.4)	100% Agree
I feel satisfied at the end of a session of The Wiz Quiz.	Agree (5.4)	100% Agree
I look forward to sessions of The Wiz Quiz.	Strongly Agree (5.7)	100% Agree
The Wiz Quiz is a plus for Classic Vi	Strongly Agree (5.7)	100% Agree
I benefit from The Wiz Quiz program.	Strongly Agree (5.6)	100% Agree
F. Pertaining to Sentiments Toward the Residential Facility		
Classic Vi is a good place to live.	Agree (4.6)	86% Agree
I would recommend Classic Vi to others.	Agree (4.6)	85% Agree