



**Impact Planning, Evaluation & Audience Research**

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**Audience Research:  
Whole Garden and West Gallery  
Experiences**

*Prepared for the*  
**United States Botanic Garden  
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# EXECUTIVE SUMMARY

## INTRODUCTION

The United States Botanic Garden (USBG) contracted Randi Korn & Associates, Inc. (RK&A) to study visitors' experiences in the current West Gallery exhibition to inform redesign of the Gallery. However, after an initial meeting, USBG recognized that any changes to the West Gallery should be intentional and done in the context of staff's aspirations for the whole Garden experience; thus, the study evolved into a more holistic endeavor with two main goals: (1) collect data about visitors' experiences in the West Gallery exhibition to inform redesign of the Gallery; and (2) study visitors' experiences in the whole Garden in the context of the newly-articulated visitor impact statement: *Inspired by the welcoming, sensory, and restorative experience, visitors appreciate the diversity of plants, value the essential connection between plants and people, and embrace plant stewardship.*

The impact statement is concretized by outcomes for four primary audiences—children, adults, seniors, and teachers. These outcomes (or intended results) help actualize impact. This summary is organized into three sections based on study goals: (1) study findings in the context of ideas contained in the impact statement; (2) key findings related to the four primary audiences (and their outcomes where relevant); and (3) key findings related to the West Gallery experience. The intent of this organization is to help staff understand audiences' experiences holistically in the context of the impact the Garden hopes to achieve; as well as the West Gallery experience specifically to inform its redesign.

**The findings presented here are among the most salient. Please read the body of the report for a more comprehensive presentation of findings.**

## THE GARDEN'S IMPACT

### INSPIRED BY THE WELCOMING, SENSORY, AND RESTORATIVE EXPERIENCE

- ◆ One-third of questionnaire respondents talked with staff or a volunteer during their visit (33 percent). Staff and volunteers received a very high rating (mean = 6.8).
- ◆ Questionnaire respondents highly rated the accessibility of the plants (mean = 6.6).
- ◆ Questionnaire respondents indicated that their USBG visit surpassed their expectations (mean = 6.0).
- ◆ Of all the characteristics of the USBG experience listed in the questionnaire, respondents highly rated the statement, "Relaxing in a plant-filled space" (mean = 6.3) as important.
- ◆ Many interviewees described the aesthetic qualities of the plants on view and being immersed in nature as the most engaging aspects of their experience.

### APPRECIATE THE DIVERSITY OF PLANTS

- ◆ Among statements related to the impact statement, questionnaire respondents highly rated the statement, "My experience today helped me appreciate how many different kinds of plants there are in the world" (mean = 6.1).

- ◆ Of all the characteristics of the USBG experience listed in the questionnaire, respondents highly rated the statement, “Seeing plants that I have never seen before” (mean = 6.4) as important.

### VALUE THE ESSENTIAL CONNECTION BETWEEN PLANTS AND PEOPLE

- ◆ Among statements related to the impact statement, questionnaire respondents rated the following statement lowest: “My experience today helped me see how plants and people are connected” (mean = 5.5).
- ◆ One of the four visitor clusters, Relevance-seekers (26 percent) align with this idea in the impact statement; Relevance-seekers tend to value experiences that have personal meaning to them, their family, friends, and everyday lives, and what is familiar.
- ◆ About one-third of interviewees described stories of finding plants in the Garden they had seen traveling and/or identified as part of their cultural heritage.
- ◆ Most interviewees came to the Garden with some prior knowledge related to their visiting experience (e.g., one-half recognized ornamental, medicinal, or food-related plants).

### EMBRACE PLANT STEWARDSHIP

- ◆ Among statements related to the impact statement, “My experience today inspired me to support plants and their sustainability” was the middle-rated statement (mean = 5.9).
- ◆ One of the four visitor clusters, Learners (27 percent of respondents) place high value on “Learning about global plant preservation.” Unlike Relevance-seekers, Learners are drawn to experiences that are new or unfamiliar. Learners also have a more global perspective.
- ◆ About one-third of interviewees connected their Garden experience to their role as a plant steward, either caring for a garden and plants at home or through their work in landscaping.

## AUDIENCES

### ADULTS

Adults—defined as 18 to 54 years—comprise three-quarters (74 percent) of the questionnaire sample.

- ◆ Young adults (18 to 34 years) comprise one-third (35 percent) of the sample, and middle-aged adults (35 to 54 years) comprise slightly more than one-third (39 percent) of the sample.
- ◆ Middle-aged adults are more likely to place importance on “Ensuring plants have a place in my life” (than younger adults [18 – 34 years]).

### SENIORS

Older adults—defined as 55 years and older—comprise one-quarter (26 percent) of the questionnaire sample.

- ◆ Older adults are more likely to be visiting for a particular reason.
- ◆ Older adults are more likely to talk with staff or a volunteer.
- ◆ Older adults are more likely to place importance on “Ensuring plants have a place in my life.”

### TEACHERS

Elementary and middle school teachers’ responses are based on the focus groups.

- ◆ Most participating teachers teach in public schools in the D.C. Metro area.

- ◆ About one-third of teachers in each group had visited USBG in the past 12 months (and were motivated to visit by a specific subject or aspect of their curriculum, such as life science).
- ◆ Most participating teachers had not attended a USBG teacher training in the past 12 months.

#### **AWARENESS OF THE GARDEN'S RESOURCES**

- ◆ Two-thirds of teacher participants who had not yet visited with their students were not aware of the Garden's offerings for schools and teachers.
- ◆ Most who had visited with students (about one-third) had worked closely with Garden staff to prepare for their visit and/or used the self-guided field trips.
- ◆ Many middle school teacher participants requested that the USBG send additional information to their schools at the beginning of the school year to inform teachers about resources and field trip opportunities.

#### **RESPONSES TO OPPORTUNITIES FOR HANDS-ON LEARNING**

- ◆ Elementary school teacher participants said they value the hands-on and in-person experiences students can have at the Garden (e.g., seeing the different plant environments and a hands-on activity such as dissecting plants).
- ◆ On the other hand, elementary school teacher participants, especially those who work with younger students, expressed concern about safety and students touching and harming plants.
- ◆ Both sets of teacher participants expressed concern about the logistics of bringing large groups of students to the Garden (and managing the chaperone-to-student ratio).

#### **UNDERSTANDING THAT PLANTS ARE AN IMPORTANT TOPIC TO TEACH**

- ◆ Middle school teacher participants recognized that it is possible to tie a variety of subjects to a Garden visit but said they are most likely to take their students on field trips that can be aligned with Common Core standards.

#### **CHILDREN**

Children—17 years and younger—were not sampled directly. However, one-quarter (24 percent) of the questionnaire sample were visiting with children.

- ◆ Children in all age groups are represented, but the majority are older than eight years of age (65 percent), with a median age of 11 years.
- ◆ Visitors visiting with children are more likely to visit the West Gallery.
- ◆ Visitors with children are more likely to place importance on “Spending time with friends/family.”
- ◆ Visitors with children are more likely to place importance on “Helping others learn about plants.”
- ◆ Teacher participants discussed the importance of tying the USBG experience to students' everyday lives (and this was their favorite child outcome). Suggestions for enhancing this connection include a “make and take” (such as planting a seed from the Garden).
- ◆ Teacher participants also said achieving the outcome that “children have fun and engaging experiences” would be enhanced by creating a more purposeful structure in the Gallery.



## WEST GALLERY

Results about the West Gallery are separated into walk-in visitors' and teachers' responses to the West Gallery (as they are distinct).

### WALK-IN VISITORS

#### MOTIVATION AND USE

- ◆ About one-third of questionnaire respondents visited the West Gallery that day (29 percent).
  - ❖ Most of these respondents did not have a particular reason for visiting the Gallery (84 percent); this finding is supported by the in-depth interviews (two-thirds of interviewees said the same).
  - ❖ The most visited components of the Gallery were: Aroma in Cooking (i.e., smelling the spices) (52 percent), exhibit about rice, corn, and wheat (45 percent) and Aroma in Place (41 percent). Further, the majority of interviewees described these aspects as most engaging.
  - ❖ The least visited components of the Gallery were the videos (18 percent) and Lady Bird Johnson exhibit (17 percent).
  - ❖ Respondents rated the usability of Gallery exhibits very high (mean = 6.4), and the informative nature of the exhibits lower (mean = 5.6).
- ◆ Focused observations revealed some misuse of Gallery exhibits, including haphazard scrolling of the *Public Gardens* postcard tree and removing glass mulch at Aroma in Place and Cooking.

#### MESSAGES

- ◆ Two-thirds of Gallery visitors said the exhibits were trying to show or tell visitors about the use and importance of plants; one-third said the smelling stations and spices reinforced this idea.
- ◆ Gallery visitors highly rated the exhibits' connection to their everyday life (mean = 6.0); one-half referred to the spices and display cases connecting plants and culture as helping them see these connections.
- ◆ Visitors are more likely to place importance on "Learning how different plants from around the world are used" and "Learning how plants I see here connect to my everyday life" (than visitors who did not visit the West Gallery).
- ◆ Interviewees see the West Gallery as a space to learn more about the plants they saw in the rest of the Garden, especially people's use of plants in food, medicine, and culture.
- ◆ Interviewees also discussed their prior knowledge of the use of plants exhibited in the West Gallery (e.g., one-half expressed familiarity with different spices found in the West Gallery).
- ◆ Focused observations reveal a few barriers with visitors' understanding of the Postcard Tree exhibit (e.g., pre-determined responses associated with plants, such as poinsettia = Christmas).

### TEACHERS

- ◆ Teacher participants' top-of-mind responses to the West Gallery were positive; they most liked the connections between plants and culture and plants and students' everyday lives.
- ◆ Teacher participants' top-of-mind responses to the West Gallery also included suggestions for improvement, including: (1) less text (more images and interactives); and (2) a more structured path or experience (e.g., "around the world" plant exploration).

# DISCUSSION

## INTRODUCTION

This discussion closely follows the organization of the Executive Summary. The intent of this discussion is two-fold: (1) to discuss implications of key findings presented in the Executive Summary about the Garden's Impact, Audiences, and the West Gallery specifically; and (2) to report on the reflections, recommendations, and next steps USBG staff generated during two Using Evaluation Results workshops facilitated by RK&A in September 2013.

## THE GARDEN'S IMPACT

USBG's impact statement—*Inspired by the welcoming, sensory, and restorative experience, visitors appreciate the diversity of plants, value the essential connection between plants and people, and embrace plant stewardship*—is staff's vision for the Garden's intended result on the audiences they serve. The impact statement embodies four ideas, easily identified by the commas that separate them. This section highlights the implications of findings associated with the four ideas to provide staff with a baseline understanding of how visitors' experiences do or do not align with the Garden's intended impact.

The first idea in the impact statement describes the Garden's distinct qualities, suggesting that audiences will be “inspired by the welcoming, sensory, and restorative experience.” Findings suggest that visitors' experiences are well aligned with this idea. For instance, questionnaire statements about plant accessibility, staff interaction (helpful/not helpful), and visit expectations all received high ratings, adding up to an overall welcoming experience for visitors. Further, when visitors rated a set of statements about their USBG experiences, they rated the statement, “Relaxing in a plant-filled space” as very important to them, suggesting that visitors' motivations and interests are well aligned with the Garden's vision of providing audiences with a restorative experience. Lastly, the extent to which visitors value the sensory aspects of the Garden was prevalent in the interviews conducted with those who visited the West Gallery exhibition. Visitors described several sensory aspects of their visit as engaging, including seeing the variety and beauty of the orchids, feeling immersed in nature while visiting the *Jungle* exhibition, and smelling cooking spices at the *Aroma in Cooking* exhibition in the West Gallery.

The second idea in the impact statement says that audiences will “appreciate the diversity of plants.” Findings again suggest that visitors' experiences are well aligned with this idea. When rating statements related to the impact statement, visitors rated highest the statement, “My experience today helped me appreciate how many different kinds of plants there are in the world.” Findings also suggest that visitors value seeing the unfamiliar, as they rated “seeing plants that I have never seen before” as very important to them; in fact, it was also the highest-rated statement among those that described specific Garden experiences. Visitor interviews complement these findings; interviewees described the exotic nature of the plants in the *Jungle* and said they felt transported to another place. Interviewees also recognized and liked the diversity of orchids and other plants on display.

The third idea in the impact statement describes another intended result: that audiences will “value the essential connection between plants and people.” Findings suggest that visitors' experiences are moderately aligned with this idea. For instance, among three statements related to the impact statement, the lowest-rated statement is “My experience today helped me see how plants and people are connected.” While the mean rating of 5.5 (on a scale of 1 to 7) seems fairly high, visitors impose a

natural courtesy bias when rating items; thus, it is more helpful to consider evaluative ratings *relative to one another*. What this means is that the plant-people connection is not as top-of-mind for visitors when characterizing the result of their overall experiences at the Garden.

However, there are some interesting findings related to this idea that offer insight into the range of visitor experiences. When analyzing the data to develop visitor types (or clusters), the cluster “Relevance-seeker” emerged. Visitors in this group tend to value experiences that accentuate the familiar and personal, including their family, friends, and everyday life. Thus, while the evaluative statement, “My experience today helped me see how plants and people are connected,” was rated the lowest overall, Relevance-seekers highly rated the idea of connecting plants to people. Survey results also showed that West Gallery visitors more highly rated the statements “learning how different plants from around the world are used” and “learning how plants I see here connect to my everyday life” than those who did not visit the West Gallery. Perhaps those who already value the plant-people connection are more inclined to visit the West Gallery; however, because the majority of those who visited the West Gallery did so for no particular reason (often saying they wandered in), one can conclude that visiting the Gallery may have helped them see the plant-people connection. West Gallery interviews provide insight as well. West Gallery interviewees described ways their experience connected to prior knowledge of plants and/or their everyday lives. For example, one-half of interviewees said they recognized ornamental, medicinal, or food-related plants growing in the Garden, including begonias, Aloe Vera, and pineapple.

The fourth and final idea in the impact statement describes a more aspirational result of Garden experiences—that audiences will “embrace plant stewardship.” While this result is best assessed after some time has passed between the Garden experience and when data are collected, findings give some insight into how visitors think about and value plant stewardship. Of three statements related to the impact statement, “My experience today inspired me to support plants and their sustainability” was the middle-rated statement. Thus, findings suggest visitors felt their Garden experience was moderately aligned with this idea. As with the plant-people connection, analysis revealed a visitor type (or cluster) that highly values “learning about global plant preservation,” the “Learner.” This visitor type is drawn to experiences that are new or unfamiliar and seems to have a more global perspective related to the plant world than other visitor types. Visitor interviews also revealed ways in which some visitors may already embrace plant stewardship. For example, one-third of interviewees discussed caring for a garden at home. Plant stewardship can take many forms; USBG staff have begun to articulate what this might look like (see the Impact Framework in the Appendices). However, more data may be needed to fully assess how visitors think about plant stewardship after visiting the Garden.

## **USBG AUDIENCES**

As part of envisioning impact, USBG staff identified four primary audiences—adults from anywhere, seniors, teachers, and children. Outcomes—intended results on specific audiences and the building blocks towards achieving impact—were articulated for all four audiences. This section provides information about these audiences vis-à-vis the impact statement.

### **ADULTS FROM ANYWHERE**

Findings show that middle-age adults (35 to 54 years) and older adults (55 years and older) are more likely to place importance on “ensuring plants have a place in [their] life” than younger adults (18 to 34 years)—an idea that aligns with the third part of the impact statement, embracing plant stewardship. One can interpret this finding in two ways depending on the point of emphasis for USBG staff. On one hand, staff might decide that because stewardship is the aspirational part of the impact statement, efforts

to engage adults in stewardship should be targeted at middle-age and older adults who already have a natural affinity for it (they represent the low-hanging fruit, if you will). The goal, in this case, might be to deepen their engagement in plant stewardship. On the other hand, staff might decide that it is more important to put resources and efforts towards engaging young adults in plant stewardship. In this case, the goal may be to incite greater interest in stewardship without striving to change behavior in the short term. Staff can review data by age group to inform decision making about resource allocation. Study findings may suggest more than one legitimate path; thus, staff should discuss their priorities to determine the right one for the institution.

## **SENIORS**

Findings also provide concrete information about the older adult audience (i.e., seniors). Older adults are more likely to be visiting the USBG for a particular reason and more likely to talk to staff or a volunteer while there (than visitors in other age groups). Because one of the desired results for this audience is for them to be “engaged at the Garden,” staff may be the best strategy for doing so. The Impact Framework identifies talking with staff about plants and telling them their own stories about plants as an indicator of success. While frontline staff and volunteers may need to be trained to facilitate such conversations with older visitors (if they are not already), they can deepen this outcome with seniors. And, if older adults are more likely to be visiting the Garden for a particular reason, frontline staff and volunteers can be trained to ask non-threatening questions of older adults to learn the purpose of their visit and offer suggestions for an engaging experience at the Garden.

## **CHILDREN**

While children were not directly targeted for this study, adults visiting with children and teachers provide valuable insight about children and those visiting children. The majority of those visiting the Garden with children were doing so with children 8 years and older. Those visiting with children are more likely to place importance on “spending time with friends/family” and “helping others learn about plants.” While not surprising, it is worth noting that adults visiting with children are more likely to value helping others learn about plants, given that this statement was not considered important by the adult audience in general (“helping others learn about plants” ranked last among all the statements that were rated). Since one of the Garden’s desired outcomes for the adult audience is to “become confident in their ability to teach others, including children, about plants,” staff may want to re-consider how they allocate their resources to achieve this outcome. Because adults visiting with children already value helping others learn about plants, perhaps Garden-wide interpretation should support them by providing ways they can respond to children’s common curiosities about plants or engage them with plants on display (e.g., posing a question that invites the adult and child to observe plants together). Focusing efforts in this way often leads to accommodating and engaging other audience groups, too, such as adults who do not place as much importance on “helping others learn about plants.” One reason these individuals may have indicated that “helping others learn about plants” is less important to them is because they do not feel confident enough to do so. Accommodating adults visiting with children through the Garden’s interpretation may have the unintended (and desirable) outcome of bolstering others’ ability to converse about plants.

## **TEACHERS**

Teachers are the fourth audience that staff identified. Focus group findings reveal insight about elementary and middle school teachers in the context of the outcomes articulated by staff. One desired outcome is that teachers are “aware of Garden resources.” Findings show that the majority of teachers who had not visited the Garden with their students were not aware of the Garden’s resources. On the other hand, those who had visited with their students were intimately aware of the Garden’s resources, having worked closely with USBG staff to structure their visit. Clearly staff members are successful at establishing meaningful relationships with teachers who self-select to visit the Garden; however the

Garden’s resources are not known among non-visiting teachers, which in some ways, makes sense. Given the intended outcome that teachers are “aware of Garden resources,” the charge is clear: the Garden will need to expend dollars to broaden awareness of its resources among teachers. Once teachers know about the Garden’s resources and select to visit with their students, then staff will be able to develop sustained relationships.

Another teacher outcome is that they will “embrace opportunities for hands-on learning.” Elementary school teachers valued this idea but expressed concerns about the extent to which students could (and should) engage in *hands-on* learning at the Garden. Since several teachers were not aware of the more tailored program opportunities that the Garden offers, they voiced trepidation about navigating the Garden with a large group of students, expressing concerns that students might disturb other visitors and plants. In the reflection workshops, staff also discussed how the conservatory is not designed for large-group navigation and, therefore, facilitating meaningful hands-on learning for these groups during a walk-in experience may not be realistic. This is not to say that the walk-in experience cannot provide any hands-on experiences; clearly, these kinds of opportunities will be available to all visitors in the West and East Gallery exhibition spaces should they decide to take advantage. Yet, a program may be the best platform for affecting teachers’ *perceptions* of hands-on learning (i.e., the idea of “getting dirty”). To effectively change perceptions, first staff may need to work towards achieving the outcome about awareness of Garden resources, including programs. Further, since large school groups may continue coming to the Garden with little to no knowledge of programmatic offerings, staff may also need to discuss strategies for building teachers’ awareness once they arrive so they have that information for future visits.

The final teacher outcome is that they will “understand plants are an important topic to teach.” One indicator of this outcome is that teachers will prepare for and reflect on their Garden visit with students through pre-/post-lesson materials related to plants. The biggest difference between elementary and middle school teachers is how they prepared for their visit to the Garden: elementary school teachers who had visited the Garden spent time preparing their students for their visit because the visit was connected to a specific part of the curriculum. Middle school teachers who had visited the Garden said reported they generally did not prepare their students for their visit because the Garden was part of a larger field trip that included the U.S. Capitol. Because teachers select which informal education institutions to visit based on whether offerings link to their curriculum, these findings may not be surprising (RK&A, 2013; RK&A, 2010; Guskey, 2002; Fullan & Miles, 1992). Again, staff may want to consider which grade level’s curriculum most aligns with the Garden’s offerings and focus resources on deepening those teachers’ understanding that plants are an important topic to teach.

## WEST GALLERY

Overall, about one-third of respondents visited the West Gallery the day they were surveyed. Findings also suggest that most visitors to the West Gallery wandered in rather than visited for an explicit reason. As mentioned previously, those who visited the West Gallery are more likely to place importance on “learning how different plants from around the world are used” and “learning how plants [they] see [at the Garden] connect to [their] everyday [lives].” In other words, having had no particular reason for visiting the Gallery, we can assume that their West Gallery experience influenced the level of importance they placed on the plant-people connection—a vital part of the impact statement. These findings are encouraging, as they suggest that visiting the West Gallery has the potential to effect visitors’ overall perceptions of plants. Thus, staff’s decision to update the West Gallery with an intentional focus on the plant-people connection is warranted (especially since survey findings reveal that the plant-people connection is not as top-of-mind for visitors when characterizing the effect of their overall Garden

experience). Further, staff may want to consider how to drive more people to the West Gallery to increase this effect.

Findings from in-depth interviews and focused observations in the West Gallery give additional insight into how visitors use and perceive the Gallery exhibits; these findings may provide staff with more specific ideas of how to redesign the space to deepen the plant-people connection. For instance, the West Gallery exhibits received high ratings for usability (i.e., “exhibits were easy to use”), and observations revealed minimal misuse of exhibits (which supports this rating since visitors tend to misuse exhibits more when they do not understand their purpose). On the other hand, visitors rated the informative nature of the exhibits relatively low compared to other aspects of their Gallery experience (i.e., “the information in the exhibits did not tell me what I wanted to know”). This finding is supported by the focused observations and interviews which revealed confusion about the exhibit messages. For example, some visitors who used *Plants and Places* and *Plants and Meaning* (components of the Postcard Tree exhibit) talked about pre-determined associations, such as poinsettias representing Christmas, as not always representative of and/or intuitive for all visitors. This perceived misalignment by some suggests that this exhibit may not feel relevant for all visitors; perhaps, an exhibit that allows for open-ended associations between plants and their meanings or places they grow would increase relevance among visitors. As staff are probably aware, creating points of relevance is an effective strategy for building comfort among visitors (Anderson, 2005; National Research Council, 2000; Mclean, 1993), which can serve as a bridge for helping visitors think about the plant-people connection that is part of the impact statement.

Additionally, as staff surmised, the exhibits that engage visitors’ senses in familiar and unfamiliar ways are among the most popular and engaging exhibits in the West Gallery. Smelling the cooking spices and other aromas were cited as the most engaging aspects of Gallery visitors’ experiences, both because visitors could smell familiar spices, as well as learn about new spices and their uses in cooking. Further, findings suggest that the sensory exhibits helped visitors connect plants to their everyday life, confirming what staff already may suspect (and what research shows): there is a powerful connection between one’s senses and memory (Herz, 2007). Staff’s plan to infuse sensory experiences throughout West Gallery exhibits (as opposed to creating concentrated exhibit areas for these experiences) may help deepen visitors’ overall understanding of the plant-people connections.

Teachers also talked about the potential of the West Gallery to support them and their students’ needs. Teachers’ responses are from a particular point of view (tying the West Gallery experience to their curricular needs), but their feedback may also apply more broadly to walk-in visitors (especially children and their caregivers). Teachers had two primary responses to the West Gallery. First, many appreciated the sensory experiences and connections among plants, culture, and geography that are embedded in the West Gallery, recognizing that these connections are important for making plants relevant to students’ everyday lives (an outcome that staff desire for students, adults, and seniors). Second is that teachers perceived a lack of structure in the West Gallery that might impede students’ level of engagement and recognition of these everyday connections. Staff, too, expressed concern about how disjointed the West Gallery exhibits are, and teachers’ responses echo these feelings. Teachers suggested creating a more defined path in the Gallery (e.g., taking students on an “around-the-world” cultural or geographic journey of plants); while staff may not wish to impose this level of structure in the Gallery, they brainstormed themes in the Using Evaluation Results workshop that they think could unite the exhibits in the West Gallery to create a cohesive experience for all visitors. Staff’s ideas are presented in the next section, “Next Steps and Recommendations.”

## NEXT STEPS AND RECOMMENDATIONS

RK&A facilitated two Using Evaluation Results workshops—one to report study findings and invite staff to ask questions to begin understanding the implications of findings; and one to use findings to brainstorm themes that might unite interpretation in the Garden as a whole, as well as the exhibits in the West Gallery specifically. Many rich ideas were discussed; this section reports the highlights of those discussions.

## QUESTIONS AND INITIAL REFLECTIONS

Throughout the presentation of findings in the first Using Evaluation Results workshop, USBG staff asked many great questions and initial reflections. One key question was how the findings relate to other informal education institutions in terms of audience demographics and visit characteristics. The sample of questionnaire respondents is two-thirds female which is proportionally similar to that of art museums; however, the Garden receives a healthy proportion of young adult visitors (one-third) which is more similar to natural history museums and science centers. Yet, the Garden has fewer families visiting compared to science centers and natural history museums (though the Garden has more families compared to art museums). Keep in mind that USBG females and younger visitors are slightly over-represented in the sample and those visiting with children (i.e., families) are slightly underrepresented in the sample. Observational demographics collected in a 2008 study showed a more even split between females and males (though females still comprised the majority of visitors) and a higher percentage of families (Stein & Storckdiek, 2008). The percentage of young adult visitors in 2008 is similar to this study. The gender and group composition of 2013 visitors in the study may not be truly representative of Garden visitors—a trend we are finding as of late. Women are over represented and families with children tend to opt out of participation. We believe this sampling problem is associated with survey fatigue and the nation-wide trend that women opt in while men opt out of survey participation. While using skilled data collectors, offering incentives to survey respondents, and providing activities to occupy children (all of which were employed in this study) help mitigate sampling issues, it is difficult to eradicate them completely.

Another staff reflection was about the percentages of local versus non-local visitors (which closely mirrors the proportions of repeat and first-time visitors, as repeat visitors tend to be local). The 2008 study showed a smaller percentage of local visitors over the course of four seasons. The 2013 study shows a more even split between local and non-local visitors. During this study, the Titan Arum was blooming, likely drawing more local (and repeat) visitors, suggesting that special events (or exhibitions) tend to draw local and repeat visitors to the Garden, a trend that is typical across informal learning organizations.

Staff also reflected on the visitor types (or clusters) defined by the study. RK&A has found a group of Fans (those enthusiastic about an institution's offerings) and a group of Luke-warms (those who are "tagging along" with someone else and less enthusiastic about an institution's offerings) in most informal learning organizations (RK&A, 2012; RK&A, 2011). Rightly so, staff reflected on the fact that it is not necessary to focus a lot of resources on the experiences of Fans since they tend to love everything the Garden does, regardless. And, staff wondered if the Luke-warms were partly those who are visiting (or "tagging along") with Fans (which is the case in many other institutions). Findings also showed that "Learners" and "Luke-warms" are more likely to have a graduate degree (compared to "Relevance-seekers" and "Fans"). Staff reflected about the importance of remembering the different education levels among the clusters even though the overall education level of Garden visitors is high. Historically, a high education level is a predictor of museum-going, yet institutions sometimes forget that even though many visitors have a college degree or higher, they are not experts in an institution's collections and may require the support of a novice to engage with the content.

Finally, staff reflected on the limitations of the study, discussing the importance of thinking critically about the sample of visitors and what factors may or may not need to be considered when thinking about the findings in the context of decision-making—an important consideration for any study.

## **KEY CHALLENGES**

At the end of the first Using Evaluation Results workshop, RK&A asked staff to reflect on three key challenges for the Garden overall and three key challenges for the West Gallery specifically. These reflections were intentionally drawn from the study findings to encourage staff to make decisions based on evidence. Staff identified the following challenges related to study findings<sup>1</sup>:

### **WHOLE GARDEN**

- ◆ How can the Garden best or better facilitate large group visits?
- ◆ How can the Garden facilitate more staff and volunteer interaction with visitors?
- ◆ How can the Garden build visitors' confidence in learning and teaching others about plants?
- ◆ How can the Garden create a more cohesive interpretive structure from room to room?
- ◆ How can the Garden enhance sensory experiences for visitors?
- ◆ How can the Garden keep information up-to-date and relevant longer?

### **WEST GALLERY**

- ◆ How can the exhibits in the West Gallery be more cohesive?
- ◆ How can the West Gallery orient visitors to its primary purpose (plant-people connection)?
- ◆ How can the West Gallery be connected to the rest of the Garden?
- ◆ How can the West Gallery embrace accessibility?
- ◆ How can the West Gallery remain up-to-date and relevant?

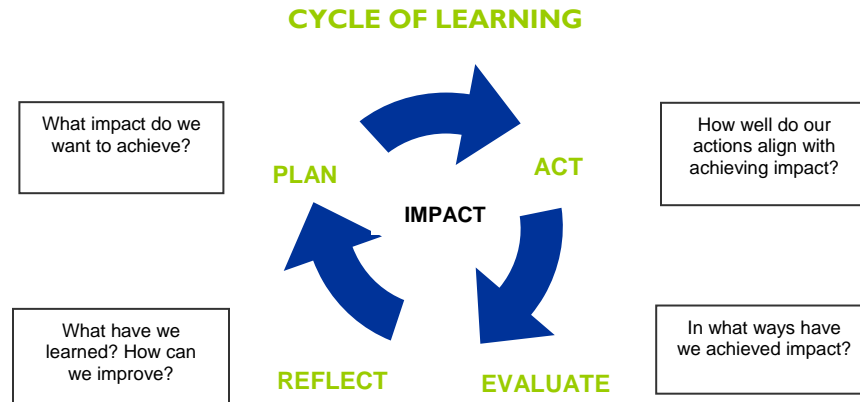
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<sup>1</sup> There are more than three challenges in each case because there were two groups, each of which brainstormed ideas.



## RECOMMENDATIONS

In the second and final Using Evaluation Results workshop, RK&A facilitated staff reflection in two ways to bring the planning and audience research aspects of this project full circle (in the spirit of the Cycle of Learning, pictured below). The ultimate goal of this final workshop was to invite staff to reflect on concrete recommendations and next steps for the Garden and West Gallery that can propel them into the “Act” quadrant of the Cycle moving forward.



### ***ALIGNMENT OF IMPACT WITH GARDEN EXPERIENCES***

RK&A asked staff to reflect on how the Garden experiences align with the impact they want to achieve by asking, “How does the Impact Framework align with the Garden experience?” Using a map of the conservatory, staff considered the different ideas in the impact statement and where in the Garden they might be best achieved. In doing so, staff considered which audience outcomes might be best achieved through a program versus an exhibition experience, and, similarly, which outcomes might need staff facilitation to achieve and which might be realistic to achieve through exposure to the plant environments and written interpretation alone.

### ***FACILITATED VERSUS NON-FACILITATED EXPERIENCES***

While staff’s initial reflections were that potentially all aspects of the impact statement (as well as the outcomes) could be achieved through the walk-in visitor experience, further discussion revealed that certain outcomes are more realistic to achieve through a program or facilitated experience. For instance, some staff thought that achieving, “Teachers are aware of the Garden’s resources,” might not be possible without participation in professional development and/or a facilitated event, similar to Smithsonian Teachers’ Night. Others felt that a visit to the Garden would expose teachers to the resources the Garden has to offer. Some staff also thought that the adult outcomes, “Adults become confident in their ability to teach others, including children, about plants,” and “Adults become better stewards of plants,” as well as the teacher outcome, “Teachers embrace opportunities for hands-on learning,” would best be achieved through a facilitated experience. While some staff thought the exceptional adult or teacher might be able to facilitate experiences for others during a visit, they also thought the majority of adults and teachers would need some kind of support. Inspiring children to learn about plants was another outcome that staff thought might require program participation; though several staff also noted that this outcome might be achieved during a walk-in visitor experience if discovery carts are on the floor.

Some staff also felt that the senior outcomes, “Seniors are engaged at the Garden,” and “Seniors engage in multi-generational activities at the Garden,” both suggest some level of facilitated

interaction where relationships are being forged with senior groups to prompt them to engage at the Garden. Staff may wish to refer back to the indicators developed for each outcome to refresh memories about what “engagement” means. For example, one indicator is that seniors share an experience at the Garden with others including staff (e.g., share their knowledge and/or stories about plants with others). This indicator may require some staff facilitation, but sharing may also be something that takes place naturally within one’s visit group.

### **CONSERVATORY ROOMS**

Staff also reflected on where in the Garden different outcomes might be best achieved. Some staff said that connecting plants to one’s everyday life (a common thread in outcomes articulated for adults, children, and seniors) could happen almost anywhere in the Garden depending on visitors’ prior knowledge and personal experiences. Findings support this claim, as many interviewees articulated connections. Staff also reflected on the *Jungle*, in particular, as a potential primer for the visitor experience because the experience is restorative and visitors expressed feeling immersed in nature, which links to ideas in the impact statement. Yet, when talking about where in the Garden impact might be achieved, staff also recognized that there are no outcomes related to the diversity of plants even though the impact statement explicitly mentions the diversity of plants. This unintentional omission is a perfect example of how the Impact Framework is always a draft that can be changed as staff’s thinking evolves. Because the Garden exhibits a diverse range of plants and appreciation of this diversity is in the impact statement, having an outcome and indicators to reflect this is understandably important. Thus, staff should consider how to alter the Impact Framework to address this gap.

### **A COHESIVE INTERPRETIVE STRUCTURE**

The final reflection exercise asked staff to brainstorm concrete recommendations for one of the key challenges they articulated in the first Using Evaluation Results workshop—a cohesive interpretive structure. RK&A selected this challenge because it focuses on the “what” or the core ideas that visitors will take away. Many of the other challenges staff articulated focus on the “how,” which only can be articulated after reaching consensus about the “what.” In small groups, staff brainstormed responses to the following questions:

- (1) Based on visitor study data, what concept might offer a cohesive interpretive structure for the whole Garden? How will this interpretive structure accommodate all four visitor types (clusters)?
- (2) Based on visitor study data, what interpretive theme would unite the exhibits in the West Gallery? In what ways will it connect to the whole Garden?
- (3) Given this theme, which exhibits would have to change and in what ways? Which exhibits might disappear and why?

In response to these questions, staff then brainstormed a theme for the whole Garden and the West Gallery specifically. Their ideas are reflected below.

### **WHOLE GARDEN**

- ◆ “Plants are not optional:” Regardless of where you are from, who you are, or what you think of plants, they are essential to life. Staff saw this theme accommodating two visitor types in particular—Relevance-seekers and Learners.
- ◆ “Plants are essential to people:” Staff used the language from the impact statement to articulate this idea, similar to the above theme. However, this group argued that people know plants are not optional but the ways in which they are relevant to everyday lives is not always top of mind, and it is important to create those connections.

- ◆ “Taking a journey:” There are many journeys visitors can take related to plants—geographic, cultural, culinary, etc.—and visitors should select a journey that is relevant or meaningful to them.

### WEST GALLERY

- ◆ “Plants and people:” The Gallery’s organization would be around plants needed for essentials (food, medicine) to non-essentials or pleasures (art, perfume) to emphasize the different relationships people have with plants. In considering this theme, staff saw:
  - ❖ Changing the temple exhibit to orient visitors to essential to non-essential uses of plants; and,
  - ❖ Connecting the West Gallery to the conservatory by providing a sensory experience with some of the plants in the conservatory.
- ◆ “Plants and people:” As conceived by another group, the theme of “plants and people” would be limited to *three* topics at any given time that highlight the essential and non-essential connections between plants and people (such as food, medicine, etc.). In considering these topics, staff also saw:
  - ❖ Each exhibit/topic evolving to include sensory components; and,
  - ❖ Creating a flexible space that changed periodically to include three new topics that highlight the essential and non-essential connections between plants and people.

## CONCLUSION

This planning and research collaboration with USBG staff was a rich and rewarding experience for RK&A. We feel it is important to remind staff that the work reflected in this report is a direct result of staff from across the Garden collaborating together to articulate their intentions for the visitor experience, particularly the impact or intended result of Garden experiences on the audiences served. Though this discussion concludes with staff’s initial recommendations and next steps for the Garden and West Gallery, it is encouraging that two initiatives are already in place to maintain the momentum of this project. One is the upcoming interpretive planning project for the Garden, which we hope is guided by the Impact Planning Framework articulated by staff. The other is evaluation of three rooms in the conservatory (*Medicinal Plants*, *Garden Primeval*, and *Plant Adaptations*) which will be conducted by RK&A and informed by the planning work initiated in this project.

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# INTRODUCTION

The United States Botanic Garden (USBG) contracted Randi Korn & Associates, Inc. (RK&A) with the original goal of studying visitors' experiences in the current West Gallery exhibition to inform redesign of the Gallery. However, USBG recognized that any changes to the West Gallery should be intentional and done in the context of staff's aspirations for the whole Garden experience; thus, the study evolved into a more holistic endeavor with two main goals: (1) collect data about visitors' experiences in the West Gallery exhibition to inform redesign of the Gallery; and (2) study visitors' experiences in the whole Garden in the context of the newly-articulated visitor impact statement.

Using the impact statement as the platform, USBG staff and RK&A co-developed an Impact Planning Framework (see Appendix A) that articulates a series of visitor outcomes (intended results) and indicators (evidence of achieving outcomes) among four primary audiences—children, adults, teachers, and seniors. Guided by the Impact Framework, RK&A employed four methods to explore West Gallery experiences and impact among these audiences: (1) a standardized questionnaire (whole Garden and West Gallery); (2) in-depth interviews (whole Garden and West Gallery); (3) focused observations and interviews (West Gallery-specific); and (4) teacher focus groups (West Gallery-specific).

The results of the visitor study are intended to serve as baseline information for the Garden that staff will process and learn from as it continues to pursue and achieve the impact and goals stated in its Impact Framework and Strategic Plan, respectively.

## MISSION AND IMPACT

An institution's mission and impact are two sides of the same coin. *Mission* describes what an institution does (collect, educate, preserve, etc.) and *impact* describes the result of what an institution does—on the audiences it serves. The Garden's strategic plan is designed with mission and vision in mind; the strategic plan outlines what the museum will *do* looking into the future. The Garden's impact framework is a companion piece designed with impact in mind; the Framework outlines the intended *result* of the Garden's work on the audiences—children, adults, teachers, and seniors—it serves.

### USBG MISSION STATEMENT

The U.S. Botanic Garden is an institution dedicated to demonstrating the aesthetic, cultural, economic, therapeutic and ecological importance of plants to the well-being of humans.

### USBG IMPACT STATEMENT

Inspired by the welcoming, sensory, and restorative experience, visitors appreciate the diversity of plants, value the essential connection between plants and people, and embrace plant stewardship.

## STUDY CONTEXT

As stated previously, this study evolved from a specific exploration of the West Gallery experience to a larger visitor study that explores USBG visitors in the context of the Garden's intended impact. The West Gallery experience is one part of the whole Garden experience, which includes several garden environments and exhibits, as well as tours and programs that supplement the Garden experience. As such, staff articulated an impact statement that applies to the whole Garden, including the West Gallery.

The visitor study was conducted as part of the institution’s planning work that also included a series of facilitated workshops. Planning work began with a Clarifying Impact workshop, whereby the end result was the impact statement above. Staff members also participated in an Outcomes and Indicators workshop designed to concretize the impact statement into building blocks (outcomes and indicators) that can be measured. Staff also will participate in two Using Evaluation Results workshops, which are designed to help staff think about the implication and application of the data to their daily work.

## STUDY DESIGN

Four methodologies were employed for the study: (1) standardized questionnaires; (2) in-depth interviews; (3) focused observations and interviews; and (4) focus groups. The target audiences for the study are shown in the table below. All data were collected June to August 2013 by RK&A and/or specially-trained data collectors.

**TABLE A**  
**METHODOLOGY**

METHODOLOGY	AUDIENCE		
	ADULTS <sup>1</sup>	FAMILIES <sup>2</sup>	TEACHERS <sup>3</sup>
Standardized questionnaires	X		
In-depth interviews	X		
Focused observations & interviews	X	X	
Focus groups			X

<sup>1</sup>Adults include individuals 18 years and older visiting alone or in social groups.

<sup>2</sup>Families include adults visiting with children from 5 to 17 years old.

<sup>3</sup>Teachers include elementary and middle school teachers in the D.C. Metro area.

## STANDARDIZED QUESTIONNAIRES

Standardized questionnaires were selected for this study so we could collect in-depth information from a large sample of visitors and use statistical analyses to identify differences among visitors. Additionally, we used the questionnaires as part of an “engagement study” that clarifies differences among visitors to the USBG, which are often determined by visitors’ predispositions and personalities rather than their demographic characteristics.

RK&A designed a four-page standardized questionnaire with a variety of question formats and pre-tested the questionnaire with visitors at the USBG (see Appendix B). Trained data collectors administered all of the questionnaires between July and August 2013. Using a continuous random sampling method, data collectors intercepted adult visitors (18 years or older) near one of two front exit doors of the USBG and invited them to participate in the study. If the visitor declined, the data collector logged the visitor’s gender, estimated age, estimated age of visitors in their group, and reason for declining. If the visitor agreed, the data collector conducted a face-to-face interview using the questionnaire as the interview framework. That is, three pages of the questionnaire were administered using the questionnaire as an interview guide (i.e., data collectors asked each question aloud), and the visitor completed the fourth page on his/her own. Data collectors showed visitors cards for all rating scales so visitors could read them along with the interviewer. As a token of appreciation, the USBG

provided loupes (i.e., small magnifying glasses with the USBG logo) to all visitors who completed a questionnaire.

### **IN-DEPTH INTERVIEWS**

RK&A used in-depth interviews to collect data about visitors' experiences in the West Gallery as well as the Garden as a whole. In-depth interviews encourage and motivate interviewees to share their opinions, understandings, and the meaning they construct using language and words that they naturally use to express themselves (as opposed to the language of the evaluator or researcher). RK&A designed an in-depth interview guide (see Appendix C for the interview guide) that was approved by staff and pre-tested with visitors.

Interviews were conducted in June and July 2013 (before specific components of the West Gallery were removed for a temporary exhibition). Interviews were conducted on four randomly-selected days (two weekdays and two weekend days). A specially trained data collector intercepted visitors as they exited the West Gallery, alternating between the Rare & Endangered and Garden Court exits.

Using a continuous random sampling method, the data collector intercepted adult visitors (18 years or older) at the various exits and asked them to participate in the study. If the visitor declined, the data collector logged the visitor's gender, estimated age, estimated age of visitors in their group, and reason for declining. If the visitor agreed, the data collector conducted the interview, audio-recording the conversation with the visitor's permission to produce verbatim transcripts to facilitate analysis. At the end of each interview, the visitor completed a one-page questionnaire that captured demographic and visit information (see Appendix D).

### **FOCUSED OBSERVATIONS AND INTERVIEWS**

To capture visitors' experiences with four exhibit areas in the West Gallery, RK&A conducted focused observations and short-answer interviews. Each exhibit was observed for four hours. During data collection, the observer watched as visitors used exhibits and took detailed notes guided by evaluation objectives (see Appendix E). For instance, the observer wrote a detailed description of what visitors did, how they interacted with each other, and, when possible, recorded dialogue. During observations, RK&A also randomly selected visitors for short-answer interviews to complement observation data.

For three of four exhibits, the observations and interviews were uncued, meaning RK&A unobtrusively observed visitors as they used exhibits and then randomly selected visitors for interviews. At Aroma in Environment, RK&A conducted cued observations and interviews after an initial observation revealed that few visitors were using the exhibit. Cueing means that RK&A informed visitors that we would observe their experience and conduct an interview about their experience when they were done. Cueing is helpful in that it creates a best-case scenario where visitors are attentive and engaged with the exhibit. Any issues that arise when visitors are "doing their best" are those that require immediate attention.

RK&A conducted interviews to help us understand observed behaviors and interpret visitors' experiences with each exhibit. RK&A conducted interviews using an open-ended interview guide (see Appendix E), and following the interview, RK&A captured demographic and visit information on a one-page questionnaire (see Appendix D).

### **TEACHER FOCUS GROUPS**

Focus groups were selected as the best way to capture teachers' thoughts and opinions. Focus groups are a qualitative research method in which a limited number of participants engage in roundtable discussions about topics that a moderator presents. This study's focus groups were conducted in July with teachers of elementary and middle school students.

A professional focus group facility recruited teachers by using the facility's own lists, and RK&A also e-mailed a flyer to teachers who had visited the Garden previously (see Appendix F). Teachers who contacted the focus group facility were asked screening questions prepared by RK&A (see Appendix G). The facility recruited teachers for two groups, one with elementary school teachers (pre-K to 5<sup>th</sup> grades), and one with middle school teachers (grades 6 to 8). Twelve teachers were recruited for each group.

The focus groups met for 90 minutes each in the West Gallery; before they convened, RK&A asked teachers to tour the West Gallery exhibits for context. RK&A facilitated the conversations using a focus group guide (see Appendix H) and the child outcomes from page 2 of the Impact Framework (see Appendix A). Throughout the conversations, RK&A encouraged teachers to be candid and honest in their responses. Conversations in both groups were audio-recorded with teachers' knowledge and transcribed to facilitate analysis. Teachers also completed a brief questionnaire to report demographic and visit characteristics (see Appendix I).

## DATA ANALYSIS AND REPORTING METHOD

### QUANTITATIVE DATA

Questionnaire data are quantitative and were analyzed using SPSS 12.0 for Windows, a statistical package for personal computers. The objectives of the study as well as our professional experience were used to inform the analyses, which include descriptive and inferential methods. Appendix J contains a list of all statistical analyses run.

#### DESCRIPTIVE

Frequency distributions were calculated for all categorical variables (e.g., gender and first/repeat USBG visit). Summary statistics, including the median (50<sup>th</sup> percentile), mean (average) and standard deviation (spread of scores: "±" in tables), were calculated for variables measured at an interval level or higher (e.g., age and ratings).

#### INFERENCEAL

To examine the relationship between two categorical variables, cross-tabulation tables were computed to show the joint frequency distribution of the variables, and the chi-square statistic ( $X^2$ ) was used to test the significance of the relationship. For example, USBG visitation is compared by gender to determine frequency differences between men and women. To test for differences in the means of two or more groups, an analysis of variance (ANOVA) was performed and the F-statistic was used to test the significance of the difference. For example, mean ratings of USBG experiences are compared by gender to determine differences between men and women. For all inferential tests, a 0.01 level of significance was employed to preclude findings of little practical significance.<sup>2</sup>

#### K-MEANS CLUSTER ANALYSIS

To better understand different types of Garden visitors, a statistical K-Means cluster procedure classified visitors into four cluster groups based on their ratings of 13 statements about USBG experiences. In a K-Means cluster analysis, the statistical program is instructed to divide the cases or respondents into a particular number of clusters based on how respondents rated the 13 statements.

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<sup>2</sup> When the level of significance is set to  $p = 0.01$ , any finding that exists at a probability ( $p$ -value)  $\leq 0.01$  is "significant." When a finding (such as a relationship between two variables) has a  $p$ -value of 0.01, there is a 99 percent probability that the finding exists; that is, in 99 out of 100 cases, the finding is correct. Conversely, there is a 1 percent probability that the finding would not exist; in other words, in 1 out of 100 cases, the finding appears by chance.



For this study, RK&A explored the data with three- and four-group cluster solutions and determined that a four-group cluster solution produced the most distinctive cluster groups.

Data are reported in tables with explanatory text; percentages within tables may not always equal 100 owing to rounding. RK&A ran many inferential statistics to identify external variables. In the body of the report, we have described only those inferential statistics that are statistically significant AND have practical significance for the USBG. However, tables of all statistically significant findings are in Appendices K to U.

## QUALITATIVE DATA

In-depth interviews, focused observations and interviews, and focus groups produce descriptive data that are analyzed qualitatively. This means that the evaluator studies the observation notes and transcriptions for meaningful patterns and, as patterns and trends emerge, organizes similar ideas and responses together. Trends are in thematic sections, and within each section, findings are reported in descending order starting with the most-frequently occurring. Findings are reported in narrative, and verbatim quotations (edited for clarity) are included to illustrate interviewees' and participants' thoughts and ideas as fully as possible. Within the quotations, the interviewer's questions appear in parentheses and an asterisk (\*) signifies the start of a different speaker's comments.

## RELIABILITY AND VALIDITY OF THE STUDY

In designing and implementing the study, RK&A strived for a rigorous study that responded to USBG's needs regarding timing and cost efficiency. Thus, certain methodological decisions were made:

- ◆ The study targets walk-in visitors (with the exception of teachers). While USBG has many program visitors, RK&A and USBG determined that a study of walk-in visitors and teachers was a priority.
- ◆ The study excludes visitors in organized groups (e.g., school groups or tour groups). Visitors in organized groups visit gardens in different ways than walk-in visitors because the agenda of visitors in organized groups is often dictated by a group leader rather than the individuals who comprise the group.
- ◆ The study primarily targets adult visitors. Three of four primary audiences are adults (18 years and older). While some adults' (such as those visiting in family groups and teachers) experiences are highly influenced by visiting with children, the level of depth and reflection required to participate in the study, given the sophistication of the queries, made children illogical study participants. Children occasionally contributed responses during in-depth interviews and focused observations and interviews but they were not targeted.

Further, to ensure the rigor of the study, RK&A took certain actions to bolster the reliability and the validity of the data:

- ◆ RK&A developed all instruments according to stringent construction techniques, assuring appropriate item wording, order, format, and internal consistency. All instruments were tested with visitors prior to being used. The pre-test ensured the readability and coherence of the instruments.
- ◆ RK&A hired experienced data collectors and provided them with thorough training. All four data collectors had prior experience collecting data and/or had collected data for RK&A in the past.

- ◆ RK&A collected minimal data on those visitors who declined to participate in the study. Data collectors reported variables known to affect visitors' likelihood to participate in the study: gender, estimated age, and visiting with children. In this way, RK&A could compare respondents to those who declined to determine if the sample is representative of the Garden population.
- ◆ To combat common sampling challenges, RK&A requested that USBG provide visitors with a token of appreciation for their participation in the study and an age-appropriate craft to occupy children (especially younger children) while their caregivers were participating in the study.

## STUDY LIMITATIONS

Sampling is critical when collecting data to be analyzed statistically because the reliability of the statistical analyses depends on surveying a *representative* sample of USBG's visitors. While the research design makes every effort to ensure a representative sample (see the section above), the validity of the sample is ultimately determined by comparing the demographics and characteristics of visitors who agreed to participate in the study (obtained sample) with visitors who declined to participate in the study (declined sample).

RK&A compared the obtained and declined questionnaire samples by gender, age, and composition of the visit group. There are a few statistically-significant differences between the obtained and declined sample. Compared to the obtained sample, the declined sample has a somewhat higher percentage of men, middle-aged visitors (35 – 54 years), and visitors visiting with children. See Appendix Z for comparisons of the obtained sample and declined sample.

The imbalances in the middle-age group (35 – 54 years) and older-age group (55+ years) might be due to inaccurate age estimates in the declined sample. In previous studies, RK&A has found that data collectors guess visitors' age group incorrectly 10 percent of the time, and most often the data collectors erroneously put visitors in the middle-age group (35 – 54 years) when they should have been put in the older age group (55+ years).

It seems clear, however, that younger visitors (18 – 34 years) were less likely to decline and more willing to participate in the study, so younger visitors are slightly over-represented in the general findings of the visitor study. Based on the total percentages in Table NN in Appendix Z, we would expect 29 percent of the sample to be 18 – 34 years, when in fact 34 percent of the obtained sample was 18 – 34 years.

All items on the questionnaire were tested against gender, age group, and visiting with children; all significant differences are presented in the report. However, because the questionnaire sample is not truly representative regarding gender, age, and group composition, readers should keep these differences in mind when considering the findings presented.

### SECTIONS OF THE REPORT:

1. Standardized Questionnaires
2. In-depth Interviews
3. Focused Observations & Interviews
4. Teacher Focus Groups

# STANDARDIZED QUESTIONNAIRES

## INTRODUCTION

Specially-trained data collectors administered questionnaires to adult walk-in visitors (18 years and older) exiting the USBG in July and August 2013. Using a continuous random sampling method, data collectors intercepted adult visitors and invited them to participate in the study. A total of 408 visitors completed questionnaires; the participation rate was 62 percent.<sup>3</sup>

## DATA COLLECTION CONDITIONS

Over three-quarters of the questionnaires were completed in July (78 percent) and the rest were completed in August (22 percent). About two-thirds of the questionnaires were completed on weekdays (69 percent) and one-third on weekend days (31 percent) (see Table 1).

**TABLE 1**  
**DATA COLLECTION CONDITIONS**

<b>MONTH (<i>n</i> = 408)</b>	<b>%</b>
July	78
August	22
<b>DAY OF THE WEEK (<i>n</i> = 408)</b>	<b>%</b>
Weekdays	69
Weekend days	31

## VISITOR DEMOGRAPHICS AND BACKGROUND INFORMATION

The following section describes respondents' demographic characteristics, such as gender and age, and other background information such as composition of the visiting group and USBG visitation.

### GENERAL DEMOGRAPHICS

Table 2 (next page) presents respondents' general demographic characteristics. Females outnumber males 2:1 (64 percent and 36 percent respectively). Respondents are well distributed across the age categories, with about one-third between 18 and 34 years (35 percent), two-fifths between 35 and 54

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<sup>3</sup> Visitors who declined to participate in the study (the refusal sample) differ from visitors who participated in the study (the obtained sample) in gender, age, and composition of the visit group. Compared to the obtained sample, the refusal sample has a somewhat higher percentage of men, middle-aged visitors (35 – 54 years) and visitors visiting with children. See the report section "Study Limitations" for further discussion and Appendix Z for comparisons of the obtained sample and refusal sample.

years (39 percent), and one-quarter 55 years or older (26 percent); respondents' median age is 45 years. More than three-quarters of respondents identify themselves as Caucasian/white (77 percent).

**TABLE 2**  
**GENERAL DEMOGRAPHIC CHARACTERISTICS**

<b>GENDER (n = 408)</b>	<b>%</b>
Female	64
Male	36
<b>AGE<sup>1</sup> (IN YEARS, n = 393)</b>	<b>%</b>
18 – 24	13
25 – 34	22
35 – 44	14
45 – 54	25
55 – 64	19
65 and older	7
<b>ETHNICITY (n=393)</b>	<b>%<sup>2</sup></b>
Caucasian/white	77
African-American/black	9
Asian/Pacific Islander	8
Hispanic/Latino	7
Other	3
American Indian	2

<sup>1</sup>Age: range = 18 - 81; median age = 45; mean age = 43.2 (± 14.6).

<sup>2</sup>Percentages do not total 100 percent because some respondents selected more than one ethnicity.

## EDUCATION

Most respondents have completed four or more years of college (87 percent) (see Table 3). College graduates are evenly divided between those who only have a Bachelor's degree (43 percent) and those who have an advanced graduate or professional degree (44 percent).

**TABLE 3**  
**EDUCATION**

<b>EDUCATION (n = 403)</b>	<b>%</b>
Some high school	1
High school graduate	10
Technical school	2
College graduate/Bachelor's degree	43
Graduate/professional degree	44

**RESIDENCE**

Most respondents live in the United States (92 percent) and the rest live in a foreign country (8 percent) (see Table 4). Appendix V lists respondents' home states and countries.

U.S. residents were asked to provide their zip code, which was used to identify local and non-local visitors. Local visitors have a zip code from Washington D.C. proper; Montgomery and Prince George's Counties in Maryland; Arlington and Fairfax Counties in Virginia, or the Cities of Alexandria, Fairfax and Falls Church in Virginia. Non-local visitors have a zip code from any other location in the United States or else reside in a foreign country. By this definition, three-fifths of respondents are non-local (58 percent) and two-fifths are local (42 percent) (see Table 4). Appendix V lists respondents' zip codes.

**TABLE 4**  
**RESIDENCE**

<b>RESIDENCE (n = 405)</b>	<b>%</b>
United States <sup>1</sup>	92
Foreign Country <sup>2</sup>	8
<b>LOCAL OR NON-LOCAL RESIDENCE (n = 348)</b>	<b>%</b>
Local	42
Non-local	58

<sup>1</sup>See list of states in Appendix V

<sup>2</sup>See list of countries in Appendix V

**USBG VISITATION HISTORY**

Respondents were asked if they were visiting the Garden for the first time. Slightly more respondents are first-time visitors (55 percent) (see Table 5). Of repeat visitors, more than three-quarters had visited the Garden at least one other time in the past 12 months (81 percent).

**TABLE 5****USBG VISITATION**

<b>FIRST-TIME OR REPEAT VISITORS TO USBG (n = 408)</b>	<b>%</b>
First-time visitor	55
Repeat visitor	45
<b>NUMBER OF USBG VISITS IN PAST 12 MONTHS (NOT INCLUDING CURRENT VISIT) (n = 179)</b>	<b>% OF REPEAT VISITORS</b>
None	19
1 – 2	42
3 – 4	23
5 +	16

**SIGNIFICANT FINDINGS**

- ◆ Local residents are more likely to be repeat visitors (than non-local residents).

**DESCRIPTION OF VISIT GROUP**

One-half of respondents were visiting the Garden with their family (49 percent) (see Table 6). Additionally, almost one-quarter were visiting alone (23 percent), and one-fifth were visiting with friends (21 percent).

**TABLE 6****DESCRIPTION OF VISIT GROUP**

<b>VISIT GROUP (n = 405)</b>	<b>%</b>
My family	49
I am alone	23
My friends	21
Family and friends	4
Other <sup>1</sup>	3

<sup>1</sup>Other visit group: co-workers, n =6; students, n =2; church group, n =1; partner, n=1.

One-quarter of respondents were visiting the Garden with children under 18 years (24 percent) (see Table 7). Children in all age groups are represented, but the majority are older than eight years of age (65 percent). The median age is 11 years.

**TABLE 7****VISITING WITH CHILDREN**

<b>VISITING WITH CHILDREN (n = 407)</b>	<b>%</b>
No	76
Yes	24
<b>AGE OF CHILDREN IN YEARS (n = 144)</b>	<b>%</b>
0 – 2	5
3 – 5	11
6 – 8	19
9 – 11	20
12 – 14	29
15 – 17	16

<sup>1</sup>Age: range = 0 – 17; median age = 11; mean age = 10.2 (± 4.2).

**SIGNIFICANT FINDINGS**

- ◆ Repeat visitors are more likely to be visiting alone (than first-time visitors).
- ◆ Visitors with children are more likely to be middle-aged adults [35 – 54 years] (than younger adults [18 – 34 years] or older adults [55+ years]).

**EXPERIENCES AT THE USBG**

This section presents information about respondents' experiences at the Garden, including their reason for visiting that day, participation in tours and activities, visitation to the West Gallery, and ratings of their experiences on the day of their visit.

**VISIT REASON**

Less than one-half of respondents were visiting the Garden that day for a specific reason (44 percent) (see Table 8). Of those respondents who had a specific purpose for their visit, most were visiting to see the titan arum/corpse plant (85 percent).

**TABLE 8****PARTICULAR REASON FOR VISITING THE USBG THAT DAY**

<b>VISITING THE USBG THAT DAY FOR A PARTICULAR REASON (n = 408)</b>		<b>%</b>
Yes		44
No		56
<b>PARTICULAR REASON</b>	<b>% OF THOSE VISITING FOR A PARTICULAR REASON (n = 178)</b>	<b>% OF ALL RESPONDENTS (n = 408)</b>
No particular reason	--	56
See titan arum/corpse flower	85	37
Other reason <sup>1</sup>	9	4
See other particular type of plant <sup>2</sup>	6	3
See a particular exhibition or garden <sup>3</sup>	1	<1
Attend a program or event	0	0

<sup>1</sup>Other reasons: photograph plants/take pictures, *n* = 4; restroom, *n* = 4; see blooming plants/live plants, *n* = 2; see what's new/renovations, *n* = 2; attend Harvard Club talk, *n* = 1; escape office, *n* = 1; family reunion, *n* = 1; girl scout project, *n* = 1.

<sup>2</sup>Other type of plant: orchids, *n* = 7; begonias, *n* = 1; Joshua Tree, *n* = 1; mushrooms, *n* = 1; outdoor plants, *n* = 1; Venus fly trap, *n* = 1.

<sup>3</sup>Garden or exhibit: Jungle, *n* = 1; not reported, *n* = 1.

**SIGNIFICANT FINDINGS**

Visitors who are visiting for a particular reason are more likely to be:

- ◆ Older adults (55 + years) (versus younger adults [18 – 34 years] and middle-aged adults [35 – 54 years]).
- ◆ Local residents (versus non-local residents).
- ◆ Repeat visitors (versus first-time visitors).

**PARTICIPATION IN USBG ACTIVITIES****TOURS AND DEMONSTRATIONS**

Less than one-tenth of respondents attended a tour and/or a demonstration (8 percent), with 8 percent attending a demonstration and 1 percent attending a tour (see table 9).

**TABLE 9****PARTICIPATION IN USBG ACTIVITIES**

<b>ATTENDED A TOUR OR DEMONSTRATION (n = 408)</b>		<b>%</b>
No tour or demonstration		92
Attended a demonstration <sup>1</sup>		8
Attended a tour <sup>2</sup>		1

<sup>1</sup>Demonstrations: Food – Late Summer Bounty, *n* = 8; Carnivorous Plants, *n* = 7; Titan Arum/Corpse Flower, *n* = 6; Cooking – Summer Stones, *n* = 4; Coffee Beans *n* = 3, do not remember, *n* = 1.

<sup>2</sup>Tour: Lunchtime tour, *n* = 2; 10:30 AM tour, *n* = 1; Dr. Ross, *n* = 1.



There are no significant findings associated with participating in a tour or demonstration.

**INTERACTION WITH STAFF OR VOLUNTEERS**

One-third of respondents talked with staff or a volunteer during their visit (33 percent) (see Table 10). Those who interacted with staff or a volunteer rated the quality of the interaction on the scale from 1, “Staff or the volunteer was not at all helpful,” to 7, “Staff or the volunteer was very helpful.” Staff and volunteers received a very high rating (mean = 6.8).

**TABLE 10**  
**INTERACTION WITH STAFF OR VOLUNTEERS**

<b>INTERACTION WITH STAFF OR VOLUNTEER (n = 407)</b>	<b>%</b>
No	67
Yes	33
<b>RATING OF QUALITY OF INTERACTION (n = 95)</b>	<b>MEAN</b>
Staff or the volunteer was not at all helpful (1) / Staff or the volunteer was very helpful (7)	6.8

**SIGNIFICANT FINDINGS**

Visitors who talk with staff or a volunteer are more likely to be:

- ◆ Older adults (55 + years) (versus younger adults [18 – 34 years] and middle-aged adults [35 – 54 years]).
- ◆ Visiting for a particular reason (versus visiting for no particular reason).

**WEST GALLERY**

Less than one-third of respondents visited the West Gallery that day (29 percent) (see Table 11). Most of these respondents did not have particular reason for visiting the West Gallery (84 percent) (see Table 12).

**TABLE 11**  
**VISITED THE WEST GALLERY**

<b>VISITED THE WEST GALLERY (n = 406)</b>	<b>%</b>
No	71
Yes	29

**TABLE 12****PARTICULAR REASON FOR VISITING THE WEST GALLERY THAT DAY**

<b>VISITING THE WEST GALLERY FOR A PARTICULAR REASON</b>	<b>% OF WEST GALLERY VISITORS (n = 117)</b>
No	84
Yes	16
<b>PARTICULAR REASON</b>	<b>% OF WEST GALLERY VISITORS (n = 117)</b>
No particular reason	84
See a particular exhibit <sup>1</sup>	5
Other <sup>2</sup>	5
Escape the heat	4
Sit down and relax	2

<sup>1</sup>Exhibits: smelling stations, *n* = 6; metal sculpture, *n* = 1.

<sup>2</sup>Other reasons: wanted to see it/enjoy it, *n* = 3; looking for restroom/exit, *n* = 2; entered at West gallery, *n* = 1.

**SIGNIFICANT FINDINGS**

- ◆ Visitors visiting with children are more likely to visit the West Gallery (than visitors without children).

**WEST GALLERY EXPERIENCES**

Experiences with the highest participation are Aroma in Cooking (i.e., smelling the spices) (52 percent), looking at the exhibit about rice, corn, and wheat (45 percent) and Aroma in Place (41 percent) (see Table 13). Experiences with the lowest participation are the Lady Bird Johnson exhibit (17 percent) and watching a video (18 percent).

**TABLE 13****WEST GALLERY EXPERIENCES**

<b>EXPERIENCES (n = 113)</b>	<b>%<sup>1</sup></b>
Aroma in Cooking (i.e., smelling the spices) <sup>2</sup>	52
Looked at the exhibit about rice, corn, and wheat	45
Aroma in Place <sup>2</sup>	41
Looked at the quotations in the temple	33
Looked at the objects in the glass cases	30
Sat on stone platform in the temple	27
Looked at flip/scroll postcard related to words <sup>3</sup>	27
Looked at flip/scroll postcard related to public gardens <sup>3</sup>	24
Looked at flip/scroll postcard related to places <sup>3</sup>	21
Took a photograph	20
Watched a video	18
Looked at the Lady Bird Johnson exhibit	17

<sup>1</sup>Total percentage exceeds 100 because respondents reported all of their experiences in the West Gallery.

<sup>2</sup>Overall, 56 percent of West Gallery visitors smelled the spices (Aroma in Cooking) and/or places (Aroma in Place).

<sup>3</sup>Overall, 42 percent of West Gallery visitors looked at one or more of the flip/scroll postcards.

There are no significant findings associated with any of the West Gallery activities.

**WEST GALLERY MESSAGES**

Respondents were asked what the West Gallery exhibits were trying to show or tell visitors. Almost two-thirds of respondents said the exhibits were trying to show or tell visitors about the use and importance of plants (e.g., “The uses of plants and spices, and uses for other things, like clothes;” “The importance of different kinds of plants and what to do with them.”) (61 percent) (see Table 14).

**TABLE 14****WHAT THE WEST GALLERY WAS TRYING TO SHOW OR TELL VISITORS**

<b>TRYING TO SHOW OR TELL (n = 110)</b>	<b>%<sup>1</sup></b>
Use and importance of plants	61
Plants are more than visual (“There’s a lot more to plants than meets the eye; they engage the senses.”)	11
Unsure of message	11
Diversity of plants (“The diverse range of plants and spices from around [the world].”)	7
Other response <sup>2</sup>	7
Importance of plant conservation (“Conservation of plants is very important.”)	6

<sup>1</sup>Total percentage exceeds 100 because respondents reported multiple messages.

<sup>2</sup>See list of other responses in Appendix W.

Respondents also were asked what in the West Gallery helped them understand what the space was trying to show or tell visitors. More than one-third of respondents said that the smelling stations and spices helped reinforce the message (39 percent) (see Table 15). Almost one-fifth spoke about the signage and the exhibits in a general way (e.g., “Read a sign;” “Interactives!”) (18 percent).

**TABLE 15****WEST GALLERY ELEMENTS THAT HELPED VISITORS UNDERSTAND THE MESSAGE**

<b>ELEMENTS (n = 104)</b>	<b>%<sup>1</sup></b>
Smelling stations, spices (“Spices and smelling; how we cook.”)	39
Generic signage or exhibits (“Boards and info.”)	18
Rice, corn, and wheat panels (“Corn, wheat [and] rice display – edible plants that people use.”)	14
Temple area (“The statements [and] poems in the Temple.”)	9
Plants & Culture display cases (“Boxes with plants used as ornaments and tools.”)	8
Lady Bird Johnson exhibit (“Lady Bird Johnson [was] important for the environment.”)	8
Postcard Trees (“The postcard tree about public gardens.”)	7
Other response <sup>2</sup>	7
Nothing	5

<sup>1</sup>Total percentage exceeds 100 because respondents reported multiple elements that helped them understand the message.

<sup>2</sup>See list of other responses in Appendix X.

### **RATINGS OF WEST GALLERY EXPERIENCES**

Respondents rated the West Gallery on three scales. In looking at the rating scales, note that it is best to interpret mean ratings relative to each other, versus individually. That is, respondents' ratings are naturally affected by courtesy bias (i.e., the tendency for visitors to provide responses that they think the Garden wants). However, we can assume that all ratings are affected by the same bias, and thus, the most authentic interpretation is to look at ratings that rise to the top or fall to the bottom.

Respondents rated all three scales favorably, and two of the three very highly (see Table 16). The highest rating was given to the scale from 1, "The exhibits were difficult to use," to 7, "The exhibits were easy to use" (mean = 6.4), followed by the rating of the scale from 1, "The exhibits did not help me see the connections between plants and my everyday life," and 7, "The exhibits helped me see the connections between plants and my everyday life" (mean = 6.0). The lowest rating was given to the scale from 1, "The information in the exhibits did not tell me what I wanted to know," to 7, "The information in the exhibits told me what I wanted to know" (mean = 5.6).

**TABLE 16**  
**RATINGS OF WEST GALLERY**

<b>SCALES FOR WEST GALLERY RATINGS</b>	<b><i>n</i></b>	<b>MEAN</b>	<b>±</b>
The exhibits were difficult to use (1) / The exhibits were easy to use (7)	107	<b>6.4</b>	1.09
The exhibits did not help me see the connections between plants and my everyday life (1) / The exhibits helped me see the connections between plants and my everyday life (7)	107	<b>6.0</b>	1.29
The information in the exhibits did not tell me what I wanted to know (1) / The information in the exhibits told me what I wanted to know (7)	107	<b>5.6</b>	1.33

Regarding the scale from 1, "My visit today did not help me see connections between plants and my everyday life," to 7, "My visit today helped me see connections between plants and my everyday life," respondents who gave a rating of 5, 6, or 7 were asked what in the West Gallery helped them see connections between plants and their everyday life (see Table 17).

More than one-half of respondents referred to the smelling stations, the use of spices in food, and the display cases connecting plants and culture (e.g., "The spices; we use them every day;" "The display cases with the connections between plants and different aspects of life. She plays the violin, so they were reminders that [plants] are all around us.") (57 percent). All other areas were noted by a much smaller percentage of respondents; however, each interpretation area in the West Gallery was mentioned at least a few times.

**TABLE 17****CONNECTIONS BETWEEN PLANTS AND EVERYDAY LIFE**

<b>WHAT IN THE WEST GALLERY HELPED YOU SEE CONNECTIONS BETWEEN PLANTS AND EVERYDAY LIFE (n = 91)</b>	<b>%<sup>1</sup></b>
Smelling stations and plants & culture display cases (“All the spices you see and smell; how we use them in our everyday lives.”)	57
Rice, corn and wheat panels (“I use a lot of corn products in my job, so the info about corn mostly.”)	15
Other response <sup>2</sup>	14
Postcard Trees and Temple area (“The association with plants emotionally, like Christmas trees.”)	10
Medicine, ceremony and therapy tables (“How [plants are] used in regional ceremonies.”)	9
Nothing	7
Lady Bird Johnson exhibit	3

<sup>1</sup>Total percentage exceeds 100 because respondents reported multiple elements of the West Gallery.

<sup>2</sup>See list of other responses in Appendix Y.

**RATINGS OF OVERALL USBG EXPERIENCE**

Respondents rated three outcomes of their overall experience at the Garden that day on the scale from 1, “Strongly disagree,” to 7, “Strongly agree.” All three received favorable ratings (see Table 18). The highest ratings were given to the statements “My experience today helped me appreciate how many different kinds of plants there are in the world” (mean = 6.1), and “My experience today inspired me to support plants and their sustainability” (mean = 5.9). A somewhat lower rating was given to the statement “My experience today helped me see how plants and people are connected” (mean = 5.5).

**TABLE 18****RATINGS OF USBG VISIT OUTCOMES**

<b>SCALE: STRONGLY DISAGREE (1) / STRONGLY AGREE (7)</b>			
<b>USBG VISIT OUTCOMES</b>	<b>n</b>	<b>MEAN</b>	<b>±</b>
My experience today helped me appreciate how many different kinds of plants there are in the world.	408	6.1	0.98
My experience today inspired me to support plants and their sustainability.	408	5.9	1.14
My experience today helped me see how plants and people are connected.	408	5.5	1.20

**SIGNIFICANT FINDINGS**

- ◆ Visitors who visiting USBG for no particular reason are more likely to say that their experience helped them appreciate how many different kinds of plants there are in the world (than visitors who were visiting USBG for a particular reason).

- ♦ Visitors of non-Caucasian ethnicity<sup>4</sup> are more likely to say that their experience helped them appreciate how many different kinds of plants there are in the world; that their experience inspired them to support plants and their sustainability; and that their experience helped them see how plants and people are connected (than visitors of Caucasian ethnicity).

Respondents rated two additional aspects of their overall experience that day. Both received high ratings (see Table 19). On the scale from 1, “I was not able to get close enough to the plants to experience them the way I wanted,” to 7, “I was able to get close enough to the plants to experience them the way I wanted,” respondents gave a mean rating of 6.6. On the scale 1, “Did not meet my expectations” to 7 “Surpassed my expectations,” respondents gave a mean rating of 6.0.

**TABLE 19**  
**RATINGS OF OVERALL USBG EXPERIENCE THAT DAY**

SCALES FOR OVERALL USBG EXPERIENCE THAT DAY	<i>n</i>	MEAN	±
I was not able to get close enough to the plants to experience them the way I wanted (1) / I was able to get close enough to the plants to experience them the way I wanted (7)	408	6.6	0.77
Did not meet my expectations (1) / Surpassed my expectations (7)	407	6.0	0.92

There are no significant findings associated with these two scales (except for cluster differences, which are reported in the cluster section of the report).

## IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES

Respondents rated 13 statements describing characteristics of USBG experiences on a scale from 1, “Less important to me,” to 7, “More important to me,” to determine what visitors value about their experiences at the Garden (see Table 20). Experiences of highest importance—those statements that respondents rated highest on the scale from 1 to 7—are “Seeing plants that I have never seen before” and “Relaxing in a plant-filled space” (means = 6.4 and 6.3, respectively). The experience of least importance—the statement that visitors rated lowest on the scale from 1 to 7—is “Helping others learn about plants” (mean = 4.5).

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<sup>4</sup> Respondents who identified themselves as African American/Black, American Indian, Asian/Pacific Islander, Hispanic/Latino, or Other ethnicity.

**TABLE 20**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES**

<b>SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME (7)</b>			
<b>USBG EXPERIENCES</b>	<b>n</b>	<b>MEAN</b>	<b>±</b>
Seeing plants that I have never seen before	401	6.4	0.86
Relaxing in a plant-filled space	401	6.3	1.10
Ensuring that plants have a place in my life	401	5.9	1.34
Learning how different plants from around the world are used	401	5.7	1.23
Smelling plants	401	5.7	1.44
Spending time with friends/family	401	5.6	1.67
Learning how plants I see here connect to my everyday life	401	5.4	1.42
Learning details about plants that I might not otherwise know	401	5.3	1.36
Learning about global plant preservation	401	5.1	1.55
Feeling the textures of plants	401	5.0	1.74
Sharing knowledge and stories about plants with others	401	4.7	1.60
Seeing plants that are familiar to me	401	4.6	1.69
Helping others learn about plants	401	4.5	1.66

**SIGNIFICANT FINDINGS**

- ◆ Females are more likely to place importance on “Ensuring that plants have a place in my life,” “Smelling plants,” and “Seeing plants that are familiar to me” (than males).
- ◆ Middle-aged adults (35 – 54 years) and older adults (55+ years) are more likely to place importance on “Ensuring plants have a place in my life” (than younger adults [18 – 34 years]).
- ◆ Non-college graduates are more likely to place importance on “Learning how plants I see here connect to my everyday life,” “Seeing plants that are familiar to me,” “Sharing knowledge and stories about plants with others,” and “Helping others learn about plants” (than college graduates).
- ◆ Visitors of non-Caucasian ethnicity<sup>5</sup> are more likely to place importance on “Relaxing in a plant-filled space” (than visitors of Caucasian ethnicity).
- ◆ Visitors with children are more likely to place importance on “Spending time with friends/family” (than those without children).
- ◆ Visitors with children are more likely to place importance on “Helping others learn about plants” (than visitors without children).
- ◆ Visitors in a group are more likely to place importance on “Spending time with friends/family” (than those visiting alone).

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<sup>5</sup> Visitors identifying themselves as African American/Black, American Indian, Asian/Pacific Islander, Hispanic/Latino, or Other ethnicity.



- ◆ Non-locals are more likely to place importance on “Seeing plants I have never seen before” (than locals).
- ◆ Visitors who are visiting for a particular reason are more likely to place importance on “Learning details about plants that I might not otherwise know” (than those not visiting for a particular reason).
- ◆ Visitors who visited the West Gallery are more likely to place importance on “Learning how different plants from around the world are used” and “Learning how plants I see here connect to my everyday life” (than visitors who did not visit the West Gallery).

## ENGAGEMENT WITH EXPERIENCES AT THE USBG

The previous section describes respondents’ ratings of 13 statements of meaningful USBG experiences on a scale from 1, “Not important to me,” to 7, “Very important to me,” to determine what visitors value about their experiences at the Garden. This section identifies four distinct types of visitors, or clusters, derived from a statistical procedure called a cluster analysis that, in this case, identified distinct clusters of visitors based on their ratings of the 13 statements.<sup>6</sup> We have named the four clusters based on their unique qualities: “Fans” (33 percent), “Learners” (27 percent), “Relevance-seekers” (26 percent), and “Luke-warms” (14 percent) (see Table 21).

**TABLE 21**  
**VISITOR CLUSTERS**

<b>VISITOR CLUSTERS (n = 401)</b>	<b>%</b>
Fans	33
Learners	27
Relevance-seekers	26
Luke-warms	14

Table 22 presents ratings of the 13 statements about USBG experiences according to cluster group. Overall, Fans give the highest ratings to USBG experiences, Luke-warms the lowest, while Relevance-seekers and Learners fall in the middle. In addition to looking at the numeric ratings of the experiences, it is useful to compare how the experiences rank within each cluster. For example, it is notable that two experiences were given top billing by all four clusters, despite having different numeric ratings. The two experiences most valued by all four clusters are “Seeing plants that I have never seen before” and “Relaxing in a plant-filled space.”

### FANS

This cluster, comprising 33 percent of the total sample, is named “Fans” because respondents in this cluster rated all 13 statements the highest among the four clusters. In fact, they rated the experiences so highly that only two of the 13 statements have a rating below 6.0 (on a 7-point scale). As with the other clusters, Fans place the most importance on “Seeing plants that I have never seen before” and “Relaxing

<sup>6</sup> The cluster analysis procedure is described in the Study Design section of this report.

in a plant-filled space.” Next in importance is “Ensuring that plants have a place in my life.” The least important experience is “Seeing plants that are familiar to me.” RK&A has found a group of Fans present in all its engagement studies. Invariably, Fans are loyal to the institution and enthusiastic about all it offers.

### **RELEVANCE-SEEKERS**

Relevance-seekers comprise 26 percent of the sample. As with the other clusters, Relevance-seekers place the most importance on “Seeing plants that I have never seen before” and “Relaxing in a plant-filled space.” Third in importance is “Ensuring that plants have a place in my life.” The least important experience is “Helping others learn about plants.” Since Relevance-seekers and Learners occupy the middle ground together, it is interesting to note how they differ. Compared to Learners, Relevance-seekers place higher value on “Spending time with friends/family,” “Learning how plants I see here connect to my everyday life,” and “Seeing plants that are familiar to me.” Although not wholly consistent, Relevance-seekers value experiences that have personal meaning to them: family, friends, their everyday life, and what is familiar.

### **LEARNERS**

Learners comprise 27 percent of the sample. As with the other clusters, Learners are most interested in “Seeing plants that I have never seen before” and “Relaxing in a plant-filled space.” Next in importance is “Learning how different plants from around the world are used.” Learners are least interested in “Seeing plants that are familiar to me.” Of the four clusters, Learners give the lowest rating to “Spending time with friends/family.” Compared to Relevance-seekers, Learners place higher value on “Learning details about plants that I might not otherwise know” and “Learning about global plant preservation.” Unlike Relevance-seekers, Learners are drawn to experiences that are new or unfamiliar. Learners also have a more global perspective.

### **LUKE-WARMS**

Luke-warms are the smallest cluster, comprising just 14 percent of the sample. Luke-warms are so named because respondents in this cluster gave the lowest ratings to all but one of the 13 statements. Of potential USBG experiences, Luke-warms are most interested in “Seeing plants that I have never seen before,” and “Relaxing in a plant-filled space.” Third in importance is “Spending time with friends/family.” Least important to Luke-warms is “Helping others learn about plants” and “Feeling the textures of plants.” RK&A has also found a group of Luke-warms present in all its engagement studies.

**TABLE 22**

**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY CLUSTERS**

SCALE: LESS IMPORTANT TO ME (1) /MORE IMPORTANT TO ME (7)  USBG EXPERIENCES (n = 401)	CLUSTERS				
	FANS 33%	RELEVANCE- SEEKERS 26%	LEARNERS 27%	LUKE- WARMS 14%	TOTAL 100%
	MEAN	MEAN	MEAN	MEAN	MEAN
Seeing plants that I have never seen before <sup>1</sup>	6.8	6.4	6.4	5.6	6.4
Relaxing in a plant-filled space <sup>2</sup>	6.8	6.4	5.9	5.5	6.3
Ensuring that plants have a place in my life <sup>3</sup>	6.7	6.1	5.4	4.2	5.9
Learning how different plants from around the world are used <sup>4</sup>	6.5	5.5	5.6	4.2	5.7
Smelling plants <sup>5</sup>	6.5	5.8	5.5	3.6	5.7
Spending time with friends/family <sup>6</sup>	6.2	6.0	4.7	5.4	5.6
Learning how plants I see here connect to my everyday life <sup>7</sup>	6.4	5.6	5.0	3.6	5.4
Learning details about plants that I might not otherwise know <sup>8</sup>	6.3	4.9	5.2	4.0	5.3
Learning about global plant preservation <sup>9</sup>	6.4	4.1	5.1	3.5	5.1
Feeling the textures of plants <sup>10</sup>	6.0	4.8	5.0	2.8	5.0
Sharing knowledge and stories about plants with others <sup>11</sup>	6.0	4.2	4.2	3.2	4.7
Seeing plants that are familiar to me <sup>12</sup>	5.6	5.6	3.2	3.2	4.6
Helping others learn about plants <sup>13</sup>	5.9	3.8	4.1	3.0	4.5

<sup>1</sup>F = 29.228; *p* = .000

<sup>5</sup>F = 92.493; *p* = .000

<sup>9</sup>F = 127.462; *p* = .000

<sup>13</sup>F = 89.390; *p* = .000

<sup>2</sup>F = 28.298; *p* = .000

<sup>6</sup>F = 19.407; *p* = .000

<sup>10</sup>F = 69.370; *p* = .000

<sup>3</sup>F = 79.176; *p* = .000

<sup>7</sup>F = 98.993; *p* = .000

<sup>11</sup>F = 84.910; *p* = .000

<sup>4</sup>F = 65.001; *p* = .000

<sup>8</sup>F = 65.029; *p* = .000

<sup>12</sup>F = 118.969; *p* = .000

### **SIGNIFICANT FINDINGS**

Background information (note that age, ethnicity, residence, visiting with children, visiting alone, USBG visitation, visiting for a particular reason, and visiting West Gallery are not among the significant differences):

- ◆ Fans and Relevance-seekers are more likely to be female. Learners and Luke-warms are less likely to be female.
- ◆ Learners and Luke-warms are more likely to have a graduate-professional degree. Fans and Relevance-seekers are less likely to have a graduate-professional degree.
- ◆ Males and females are equally likely to have a graduate-professional degree, so the gender and education variables are unrelated and do not confound the findings.

Ratings of overall USBG experiences that day (note that ratings of West Gallery experiences are not among the significant differences):

On the scale from 1, “I was not able to get close enough to the plants to experience them the way I wanted,” to 7, “I was able to get close enough to the plants to experience them the way I wanted”:

- ◆ Fans give higher ratings than Learners, Relevance-seekers and Luke-warms.

On the scale from 1, “Did not meet my expectations,” to 7, “Surpassed my expectations”:

- ◆ Fans give the highest ratings; Luke-warms give the lowest ratings; Learners and Relevance-seekers fall in the middle.

On the scale from 1, “Strongly disagree,” to 7, “Strongly agree”:

- ◆ Fans agree most strongly with the statement “My experience today helped me appreciate how many different kinds of plants there are in the world.” Luke-warms agree least strongly with the statement. Learners and Relevance-seekers fall in the middle.
- ◆ Fans agree most strongly with the statement “My experience today inspired me to support plants and their sustainability.” Luke-warms agree least strongly with the statement. Learners and Relevance-seekers fall in the middle.
- ◆ Fans agree most strongly with the statement “My experience today helped me see how plants and people are connected.” Luke-warms agree least strongly with the statement. Learners and Relevance-seekers fall in the middle.

# IN-DEPTH INTERVIEWS

## INTRODUCTION

This section of the report presents findings from interviews conducted with eligible adult visitors<sup>7</sup> exiting the West Gallery during two randomly selected weekdays and weekend days in July 2013. The interviewer intercepted 66 visitor groups, and a total of 50 visitors agreed to participate for a participation rate of 76 percent.<sup>8</sup>

## DEMOGRAPHIC CHARACTERISTICS AND BACKGROUND INFORMATION

- ◆ Two-thirds of interviewees are female;
- ◆ Three-quarters of interviewees identified as Caucasian;
- ◆ 49 percent are middle-age adults (35 to 54 years), 42 percent are young adults (18 to 34 years), and 10 percent are older adults (55 years or older); the median age is 38;
- ◆ One-third of interviewees were visiting with children; the median age of children is 9;
- ◆ Three-quarters of interviewees were first-time visitors, and nearly all were first-time visitors to the West Gallery; and
- ◆ Over three-quarters of interviewees are United States residents and nearly one-fifth live locally.

## VISIT MOTIVATION

### THE GARDEN

When asked what motivated them to visit the Garden, interviewees often named several reasons. Some said they visited to learn more about plants (e.g., orchids or regional plants) or because they liked plants in general (see the first quotation below). About one-quarter, including locals and tourists, were curious to visit the Garden as they had never been before, while another one-quarter decided to visit spontaneously since they were passing by or in the area. Several interviewees said the Garden was recommended to them, either by word of mouth, a guidebook, or a website (see the second quotation). Several others were bringing friends or escaping the weather.

(So why did you choose to visit the United States Botanic Garden today?) \*I think every place, every town we visit, we always visit the botanic gardens. \*\*They're interested in plants. \*And I have a garden. But it's just [that] I love to see different presentations [of plants].

(Why did you choose to visit the United States Botanic Garden today?) We are in the area; we wanted to do something indoors, and my sister recommended it. My sister is local; she's in Maryland. She's been here and she recommended [it to] us.

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<sup>7</sup> Interviews were conducted with visitors who: (1) were 18 years or older; (2) spoke English; and, (3) were selected using a continuous random sampling method.

<sup>8</sup> RK&A compared the gender and age of the interview and declined sample; there are no differences.

## THE WEST GALLERY

When asked what brought them to the West Gallery, nearly two-thirds of interviewees said the West Gallery happened to be along the path they were taking through the Garden (see the first quotation below). The remaining one-third of interviewees were more deliberate in their choice to visit the West Gallery. Several visited the area specifically for the multisensory exhibits, having known about them from prior visits or having seen the exhibits through the glass doors (see the second quotation). A few others visited because of the air conditioning, and two said they were attracted to the colorful displays.

(Why did you choose to enter the West Gallery specifically?) That kind of happened organically. We came in [to the Garden] and we started making the rounds through the court and it terminates here.

(Why did you choose to enter this area [the West Gallery] specifically?) Because we're visiting with our granddaughter, and we're fascinated by the exhibit here with senses, visuals, smells, so it just looks like a very attractive place to bring a young child.

## MOST ENGAGING ASPECTS

### THE GARDEN

When asked to talk about the most engaging aspect of their whole Garden experience, about one-quarter mentioned seeing the orchids, commenting on their overall beauty and the variety of species on view. Several liked the *Jungle* exhibit because they saw unfamiliar plants and felt immersed in nature (see the first quotation below). Several others named the *Aroma* exhibits in the West Gallery, enjoying the sensory and educational nature of the exhibits. Several interviewees said they generally enjoyed seeing new plants and being immersed in nature (see the second quotation). A few liked seeing familiar plants highlighted for their therapeutic purposes in the *Medicinal Plants* exhibit; and a few found the ability to switch between many natural environments in the Garden to be engaging (see the third quotation).

We like going up in the canopy. That is probably, by far, one of my favorites here because it has the kind of plant life that I really enjoy that you can't see [normally]. I'm from Minnesota, so to be allowed up into [the canopy] with all of those tropical plants is quite lovely.

(What has been the most engaging aspect of your whole Garden visit so far?) I'm fairly knowledgeable with my plants and flowers, but there's always room for growth. So I actually go to see some new species and things I had not seen before.

(What has been the most engaging aspect of your whole Garden visit so far?) The different environments as you go from one to the other. I like how that is set up. You go from Hawaii and then you go to the desert, and then you go into the jungle, and it's just cool to go from one environment to the next.

### THE WEST GALLERY

When probed further about the most engaging aspects of the West Gallery in particular, about one-half of interviewees mentioned smelling the spices in the metal flowers. Interviewees enjoyed smelling familiar and unfamiliar scents, guessing the names of different scents, and seeing how plants were used in cooking (see the first quotation below). Nearly one-quarter named the therapy table as most engaging because it showed how plants were used in familiar medicines and provided information about where the plants originated (see the second quotation). Several said the fragrance table was most engaging because of its sensory and educational nature (see the third quotation), and a few liked that they could

smell scents at exhibit areas throughout the West Gallery. A few others each liked the postcard trees or the cultural study videos as they were educational and featured familiar plants, foods, and flowers.

(What was the most engaging aspect of the West Gallery?) These things [the metal flowers with spices] that give the smell. (What was engaging about that?) Just actually seeing and being able to smell the ingredients that are usually in a lot of foods and to get to smell separate ones.

(What is the most engaging aspect of the West Gallery?) \*The connection between everyday products and the plants they come from. That was the most interesting thing to me because you don't always think about that. (Was there something that jumped out at you?) \*Yes, the charcoal pills. She uses those overnight. \*\* Yes, I have some stomach issues and the charcoal pills are awesome. They stop your cramps in ten minutes.

(What is the most engaging aspect of the West Gallery?) Going to the fragrance [table] and testing my sense of smell. I was seeing if I actually knew what things smell like and that was very interesting to me.

## LEAST ENGAGING ASPECTS

### THE GARDEN

When asked to talk about the least engaging aspects of their experience at the Garden, nearly two-thirds said they enjoyed the Garden and found nothing as least engaging. Among the remaining interviewees, several mentioned areas of the Garden that had fewer plants (e.g., the East and West Galleries) or plants with which they were less familiar (see the first and second quotations below). Several others described aspects that lay outside of the Garden's logistical control such as the weather outdoors or the indoor humidity. A few described the Garden's signage as the least engaging aspect, with interviewees interested in more information on plant identification signs and better wayfinding information for locating the restrooms.

(What was the least engaging aspect of your whole Garden visit so far?) I would say this is [the West Gallery]. I was a little confused by this room initially because there are [fewer] plants. I wouldn't stay in this particular room for very long. . . . It seems nice if you have some smelly things, but . . . if there were more plants it would make more sense to me. It seems like it's trying to be overly educational somehow.

(What about least engaging?) I think the Southern [Exposure area]. I'm from Atlanta; I thought I would see more southern [plants]—I think Atlanta, Texas—and I didn't see anything [from there]. (You didn't see things native to Atlanta?) No.

### THE WEST GALLERY

When probed further to find out what interviewees found least engaging about the West Gallery, nearly one-half said there was nothing they found least engaging. Conversely, several described exhibit areas to be least engaging because they did not understand the area's purpose, including two interviewees who thought the metal scent flowers were solely decorative sculptures (see the first quotation below). A few found an area to be least engaging because surrounding exhibits were more interesting (see the second quotation). A few others described exhibits that were old or broken, with one each mentioning that the scents smell stale or that a broken cork could not be removed from a café table vial. The several remaining interviewees made idiosyncratic comments about what would make the West Gallery more engaging, including more interpretive materials, interactive elements, and plants.

(What has been the least engaging aspect of your whole Garden visit so far?) We were just saying that that one exhibit over there [postcard trees] was confusing to us because we didn't understand if it was focused on the U.S. or if it was global.

(How about the section that we're standing in [West Gallery], anything that was least engaging?) Therapy and the fragrance [café tables], but only because I got distracted by the pillars, the trunks and the spices side. I think that [area] just looks more colorful. I'm quite a visual person so I always go by what I like [to see].

## CONNECTIONS BETWEEN THE GARDEN AND WEST GALLERY

When asked to make connections between the West Gallery and the rest of the Garden, slightly more than one-third said the West Gallery showed people's use of plants elsewhere in the Garden, such as using plants for food, making products from violins to medicine, and/or interacting with plants in daily life (see the first quotation below). About one-quarter perceived the West Gallery as a place where visitors could learn more about the plants, as the rest of the Garden contained limited interpretation (see the second quotation). Several others connected the two spaces more generally, suggesting that both spaces focus on plants or contain the same plants. A few others viewed the two spaces as complementary, suggesting that visitors see plants in the Garden and can explore them more in depth through interactive and sensory experiences in the West Gallery (see the third quotation). Among the remaining interviewees, about one-quarter said the West Gallery and the Garden are disconnected, explaining that the West Gallery did not have real plants, was a more educational setting, and showed plants in a processed form. Several other interviewees said they didn't know or could not articulate how the two areas are connected.

(What, if any, connections do you see between the West Gallery and the rest of the Garden?) This is showing you how the things [plants] are used across the country, across the world for medicinal purposes, for fragrance and spices across the world that we might know of. (How do you see that connected to the rest of the garden?) You've got the plants growing out there, some of them, some of the fruit plants, some of the spice plants, and so you can see how the plants that are grown out there are actually used in here.

(What, if any, connections do you see between this section, the West Gallery, and the rest of the Garden?) Maybe because [the West Gallery] tells us about flowers more specifically whereas in the rest of Garden, you just see them but you didn't really know; you don't know anything about them, whereas, here you learn stuff.

(What, if any, connections do you see between this section, the West Gallery, and the rest of the Garden?) [The West Gallery] gives you a different way to interact with the plants, which I think is good. . . . You get to touch things and when I'm walking through there [the rest of the Garden], I feel like I shouldn't be touching anything.

## PERSONAL CONNECTIONS

Interviewees were asked if their visit to the Garden and West Gallery brought to mind any personal interests or stories or connected to their everyday life, and nearly all said it did.



## THE GARDEN

When talking about the Garden overall, about one-third of interviewees connected their experience to their personal role as a plant steward, either caring for a garden and plants at home or through their work in landscaping. Nearly one-quarter described stories of finding plants in the Garden that they had seen before on their travels abroad, and several interviewees found plants in the Garden they identified as part of their cultural heritage (see the quotation below).

(Did your experience in the whole Garden today bring to mind any personal interests or stories?)  
Yes this one in the medicinal section called 'Tulsi. I'm from in India, and in India, in traditional houses, all the houses, every house has a Tulsi plant in the courtyard. It's something you grow up knowing, and I've never seen it anywhere else in the world other than in India so for me that was kind of cool.

## THE WEST GALLERY

When talking about the West Gallery, about one-half said they smelled familiar spices or those they use in their own cooking, such as vanilla, cardamom, curry, and lemon grass (see the quotation below). Several others each connected with plants familiar to them through use in medicine, fragrances (e.g., lotions), or food; a few others noted plants and spices that related to their cultural heritage (e.g., cumin used in Indian cuisine).

(Did your whole experience in the garden today bring to mind any personal interests or stories?)  
\*I'm a cook, so a lot of the spices and things like that, I'm familiar with them. . . . I've never really worked with lemon grass or stuff like that. But most of the other spices, I'm kind of familiar with. But it's still interesting to see it put out like that in a place like this. . . . [They have] all the ingredients [that] go into curry, so you can smell each different ingredient. I find that interesting and I think others who may not be as familiar with it would probably find that interesting. \*\*He also pointed out that there was a certain ingredient that I never knew of, [and] he was like, 'oh, it's obviously for a dish that's sweet.' And I would not have known that because I didn't know [about] Cardamom.

## PRIOR KNOWLEDGE

### THE GARDEN

Most interviewees came to the Garden with some prior knowledge related to their visiting experience. For example, nearly one-half said they recognized either ornamental, medicinal, or food-related plants that were growing in the Garden, pointing out plants such as begonias, Aloe Vera, and pineapple (see the first quotation below). Nearly one-quarter said they were generally knowledgeable about plants from owning a garden, visiting other botanic gardens, or from doing landscape work (see the second quotation). Several others described more in-depth their knowledge of plants, often recounting the different properties of a plant, ways in which a plant can be used, or methods of caretaking (see the second quotation).

(Did you have any prior knowledge of anything you saw or experienced today in the whole Garden?) [There were] a couple of things that I pointed out to my friend here, a couple of varieties of the lilies and the hydrangeas. . . . I was pointing out a couple of things to her before I saw the sign and I said, 'Oh, I think it's Saint John's Wart.' And then I saw the sign; I like to challenge myself as well.

(What, if anything, did you see in the whole garden that connects to your everyday life?) I have flowers and every day I have to water them and take care of my garden and so that's everyday life. I have all kinds of vegetables, flowers, and grass, which I have to cut every week, all those kind of things.

(Did you have any prior knowledge of anything you saw or experienced today in the whole Garden, something that you saw that you already knew something about?) In Africa, we do [have a garden]. You have a Palm Tree and the stuff that comes [from the Palm Tree], we boiled it and then blend it and take the seed out and then we can make that [into] oil. So you boil it over and over and over, then the palm oil comes [out] just like olive oil. And then the inside of it too, you can take it out, crush it, and it looks like coconut oil, and that coconut cream you can use to make coconut cake.

## THE WEST GALLERY

Interviewees also discussed their prior knowledge of exhibit themes in the West Gallery, including plants used for cooking, medical therapy, fragrance, etc. Nearly one-half of interviewees commented on their familiarity with different spices found in the West Gallery, such as cinnamon, cardamom, and curry from their own cooking or culinary experiences. About one-third described prior knowledge of medicinal plants, of which many described in-depth the plant's healing properties or its use in different medicines (see the quotation below). A few interviewees said they were familiar with how food-related plants, such as the wheat and rice featured in the cultural study videos, were grown or made into food products. Two other interviewees said they were familiar with some of the plants featured as fragrances. The remaining few interviewees said they had no prior knowledge related to their experience in the West Gallery.

(Did you have any prior knowledge about anything you saw in here [West Gallery]?) Yes. My Mom uses Aloe Vera. In fact she has an Aloe Vera plant right in front of her condominium and she used to put that on our scrapes and whatever. [She would say,] 'Here's Aloe Vera.' Aloe Vera was used for sunburn, [for] everything.

## INTEREST IN FURTHER EXPLORATION

When asked if there was anything in the Garden they wanted to explore further, about one-half of interviewees named a specific aspect of the Garden. Several wanted to learn more about plants they had seen in the Garden, which they were interested in growing at home (see the first quotation below). Several others were curious about the properties of medicinal plants, the chemicals they contain, and how they are used. Two interviewees each were interested in learning more about one of the following topics: rare/endangered plants, plant environments (e.g., the jungle or cold climates), the names of plants, or food-related plants. The remaining one-quarter of interviewees said there was nothing they were interested in further exploring.

(Did you see or experience anything in the Garden that you would want to explore further?) [There are] a lot of herbs and stuff like that; we've been thinking about starting an herb garden. . . That's what I've really gotten out of [visiting]. [I think] 'Oh, maybe I'll use these spices whenever I'm cooking Chinese, like these spices only.' (How might you go about learning more about building up your herb garden?) There is a garden place near where we live, and I'm pretty sure that they have herbs and stuff like that. So I think we would probably go and [ask] the people who work there [about] the best way to cultivate everything.

# FOCUSED OBSERVATIONS AND INTERVIEWS

## INTRODUCTION

This section of the report presents findings from observations and short-answer interviews that RK&A conducted to gather detailed information about visitors' experiences at select exhibit components in the West Gallery. Findings for each individual exhibit are presented below.

## AROMA AND ENVIRONMENT

### IMAGE A. EXHIBIT



### BACKGROUND INFORMATION

Aroma and Environment, one-half of the garden area in the West Gallery, features metal flower sculptures. This exhibit contains three display cases of objects relating plants to the arts and different cultures, as well as illustrating how plants are used as symbols and ornamentation. Objects featured in the display cases include a boater hat constructed from straw, a violin made of wood, and a teapot with floral designs, among other items. This exhibit also connects plants to places and features three smelling stations with scents (i.e., cedar, balsam fir, and creosote) of different environments. Aroma and Environment also contains two videos displayed in the center of the larger metal flowers.

### VISITOR DEMOGRAPHICS

At the Aroma and Environment exhibit, RK&A observed and interviewed 10 visitor groups comprised of 20 adults and three children. About three-quarters of interviewees were first-time visitors to the Garden, and nearly three-quarters were female. Nearly all groups were composed of two or more adults, and about one-third of groups were visiting with a child. The children were ages 1, 6, and 12.

### OVERALL RESPONSE

#### OBSERVATIONS

When walking around the Aroma and Environment exhibit, visitor groups paid the most attention to the contents of the glass display cases, with a few visitor groups visibly reading the associated text. Nearly all viewed the *Plants as Ornamentation* display, and many viewed the *Plants in Art* and *Plants as Symbol* displays. Nearly all visitor groups were observed reading the quotations and proverbs found on the metal flowers, such as “art imitates life” and “he who plants trees cares for others.” Many visitor groups also stopped at the smelling stations, often smelling all three of the available scents. Fewer

visitor groups noticed and watched the videos in the large, blue and yellow flowers. No visitor groups were observed misusing the exhibit (e.g., picking up the glass mulch).

### **MOST ENGAGING ASPECTS**

Many visitor groups said they liked the aesthetic design of the Aroma and Environment exhibit. About one-half liked the artistic design of the metal flowers, with a few describing that the larger-than-life size of the flowers created a magical environment akin to being in *Alice in Wonderland*, *The Wizard of Oz*, or *A Bug's Life*. Nearly one-half also liked the quotations found on the leaves, with one interviewee noting, "I like the messages on the flowers. [They're] short, easy to read, [and] inspirational." A few visitor groups said they liked the smelling stations because the extrasensory activity made the metal plants seem more real. A few other visitor groups liked how the exhibit provided a visual representation of how plants are incorporated into and have influenced art, design, and culture.

### **LEAST ENGAGING ASPECTS**

Visitor groups varied in their opinions of what was least engaging about the Aroma and Environment exhibit. Two visitor groups were confused and distracted by the display cases; one interviewee commented that the displays did not seem to be about plants, and another interviewee suggested that viewing the displays created a museum-like setting instead of a botanic garden environment. Another two visitor groups commented on the metal flowers, with interviewees saying they wanted more natural representations of plants or live plants to be incorporated. The remaining visitor groups made idiosyncratic comments. Members in one visitor group disliked the smelling stations because the members were interested in more visual experiences. In contrast, another visitor group wanted additional sensory aspects to be incorporated such as music and objects to touch. One other visitor group found the objects in the display cases least engaging, and another visitor group said nothing was least engaging.

### **WHAT THE EXHIBIT PROMPTED VISITORS TO THINK ABOUT**

One-third of visitor groups said that the Aroma and Environment exhibit prompted them to think about how plants inspire and are incorporated into art and design, with one interviewee giving an example of how the beauty of nature was captured in the design of the metal flowers and the inspiration behind the quotations. Another one-third of visitor groups said the exhibit made them think about how plants are used as a material to make objects such as violins or fragrances. The remaining visitor groups made idiosyncratic comments, with one group each saying they were prompted to think about: the importance of plants in daily life, how different cultures use plants, and how plants are used for health. Members in one visitor group did not know what the exhibit prompted them to think about.

### **ROLE OF PLANTS**

When asked what the Aroma and Environment exhibit was trying to tell visitors about the role of plants, many visitor groups talked about the different uses of plants and how people do not often realize how many everyday objects come from plants. A few visitor groups commented on the role of plants in the arts, with one interviewee saying, "[the exhibit was] designed to show how plants are reflected in man-made objects that are artistic." One other interviewee said, generally, that the exhibit shows "how plants are important and how they influence our life."

### **CONNECTION TO EVERYDAY LIFE**

Nearly all visitor groups made various connections between the Aroma and Environment exhibit and their everyday lives. About one-quarter connected the exhibit's depiction of the arts (in the display cases and through the metal flowers) and their own interest in art and literature. For example, one interviewee said, "I was into music. I played the violin. [It] represents my life." Two visitor groups related to the henna on view in the display case, as it represented their cultural heritage or tattoos. Two other visitor

groups described smelling familiar scents such as creosote and fir tree at the smelling stations. Another two visitor groups found relevance in the depiction of plants, saying they had the same plants at home.

### CONNECTION TO THE REST OF THE GARDEN

When asked if there was any connection between what visitors saw in the Aroma and Environment exhibit and what they saw in the rest of the Garden, about one-half of visitor groups said the exhibit showed how plants in the Garden are used in everyday life and incorporated into common products. For example, one interviewee said, “the Garden shows us raw materials and this exhibit shows what people do with those materials.” About one-quarter of visitor groups described how the Garden and plants in general act as an artistic inspiration for the objects on view in the Aroma and Environment exhibit. Two other visitor groups described the exhibit as an educational center for the Garden, where visitors can learn more about plants.

## POSTCARD TREE

### IMAGE B. EXHIBIT



### BACKGROUND INFORMATION

The Postcard Tree exhibit is comprised of three four-sided pillars with images of postcards displayed; each postcard tree is interactive and relates to a different topic: *Plants and Places*, *Public Gardens*, and *Plants and Meaning*. *Plants and Places* and *Plants and Meaning* display a series of flip panels where postcard images are shown and can be lifted up to view related information. At *Plants and Places*, visitors lift the flip panels to view the names of the landscapes and locations depicted on the postcards (e.g., tulips, which bring to mind Holland and originate in Turkey), and at *Plants and Meaning*, visitors view text associated with the plant image on the postcard (e.g., plant’s name, related season, and related symbolism, such as poinsettia brings Christmas to mind). At the *Public Gardens* postcard tree, visitors use a hand crank to scroll through postcards of public gardens from around the world.

### VISITOR DEMOGRAPHICS

At the Postcard Tree and Temple exhibit, RK&A observed and interviewed 10 visitor groups comprised of 22 adults and six children. Most interviewees were first-time visitors to the Garden, and two-thirds are female. Many groups were composed of two or more adults, and about one-third of groups were visiting with a child. Adult visitors range from 42 years to 74 years, with a median age of 58 years and children range in age from 4 to 15 years, with a median age of 11 years.

## OVERALL RESPONSE

### OBSERVATIONS

When visiting the Postcard Tree exhibit, visitor groups used one to three of the three postcard trees, with nearly one-half using two. When using the exhibit, about two-thirds of visitor groups were observed reading text aloud from the postcard trees. About two-thirds of visitor groups also were observed using the flip panels, with some guessing or discussing the answers. One visitor group was observed misusing the flip panels, smacking the panels against the postcard tree. Nearly one-half of visitor groups used the hand crank to scroll through the postcards at *Public Gardens*, with some visitor groups using the hand crank slowly and some visitor groups, many of which contained children, spinning the hand crank quickly (and often without purpose).

### MOST ENGAGING ASPECTS

When visitor groups were asked what they found most engaging about the exhibit, about one-half named specific postcard trees that sparked their interest and prompted them to learn something new, with a few naming *Plants and Meaning* and/or *Public Gardens*. A few visitor groups liked the opportunity to test how much they already knew by guessing the information under the flip panels. Two other visitor groups said they liked how the Postcard Tree exhibit provided a quick and child-friendly educational activity. Members in one visitor group said they did not know what aspects they found to be most engaging.

### LEAST ENGAGING ASPECTS

About one-third of visitor groups described *Public Gardens* as the least engaging aspect of the exhibit, often because the crank-based activity was perceived to be less interactive than the flip panel postcard trees. Another one-third of visitor groups named *Plants and Places* as least engaging, with two visitor groups noting that the descriptions of place were more general than they had expected, and one visitor group wondering why certain places were listed while others were not. Nearly one-third of other visitor groups said nothing was least engaging about their experience. One visitor group was concerned about potential crowding, and another visitor group was concerned about accessibility for older individuals who may have difficulty reaching the flip panels or hand crank of the postcard trees.

### WHAT THE EXHIBIT PROMPTED VISITORS TO THINK ABOUT

When asked what the exhibit prompted them to think about, visitor groups made a variety of associations. Two visitor groups suggested the exhibit prompted them to think about the importance of plants to the environment and human life, with one interviewee describing plants as “fundamental to our living.” Two visitor groups wondered about the symbolic associations of different plants featured at *Plants and Meaning*, and two other visitor groups said that postcards made them think about places they had visited or would want to visit in the future. Two visitor groups commented upon the creative design of the Postcard Tree exhibit, with one interviewee saying, “Because I’m a teacher, it gave me an idea of how to do bulletin boards with this idea of answer on outside [and] question on inside.” Members in one visitor group said the exhibit made them think about nature and gardens in general, and members in another group said they did not know what the exhibit made them think about.

### ROLE OF PLANTS

Visitor groups took away different ideas about the roles of plants based on their experiences at the Postcard Tree exhibit. About one-half of visitor groups described the relationship between plants and the environment, noting that different plants are indigenous to different areas and the overall diversity of plant life. Nearly one-half of visitor groups described how plants permeate and are integrated into human life, with references to the social and cultural meanings of plants (e.g., roses symbolize love, an olive branch symbolizes peace, etc.). Members in one visitor group said they moved through the exhibit quickly and did not take away messages about the roles of plants.

### CONNECTION TO EVERYDAY LIFE

When asked if they saw anything in the exhibit that connected to their everyday lives, all visitor groups said that they did. About one-half connected plants featured in the Postcard Tree exhibit with places they have lived, visited, or wanted to visit in the future. For example, one interviewee commented upon being familiar with poison ivy and kudzu because he lives in Virginia. The other one-half of visitor groups connected with the symbolic meanings of plants described in the exhibit, with two visitor groups connecting to the relationship between plants and people's names in particular. As one interviewee said, "I was going to be [named] Heather if I wasn't a boy."

### CONNECTION TO THE REST OF THE GARDEN

Some visitor groups did not make connections between the West Gallery and the rest of the Garden, while other groups did. About one-half of visitor groups said that they could not make connections between the two spaces because the West Gallery was the first place they had visited that day. Two visitor groups viewed the spaces as connected because the Postcard Tree activity in the West Gallery encouraged them to think about plant symbolism elsewhere in the Garden when looking at roses and wildflowers or pondering the symbolic meaning of orchids. One visitor group described the West Gallery as different from the rest of the Garden, saying the West Gallery is "more interactive" and "more of an artificial garden" because the area did not feature living plants. One visitor group was unable to describe how the two areas connected.

## CAFÉ TABLES

### IMAGE C. EXHIBIT



### BACKGROUND INFORMATION

The *Café Tables* exhibit in the West Gallery consists of three round tables dedicated to the use of plants in ceremony, fragrance and therapy (e.g., medicine). The *Ceremony* table presents examples such as the use of incense and henna. Each example features an object illustrating or representing the use of the plant in a particular ceremony, accompanied by a text label, as well as a table-based spinner that provides information about the ceremony and the plant. The *Fragrance* table features eight bottles with scent beads; visitors can remove the cork stoppers from the bottles to smell the fragrances. Each fragrance station also features a cylindrical spinner with information about the highlighted plant, including where the plant grows and what part of the plant is used to create the fragrance. The *Therapy* table features eight examples of plants used in medicine (such as aspirin) or other therapies (such as the use of lavender in lotions). Each station also features a flip label that provides information about the plant and its therapeutic uses.

## VISITOR DEMOGRAPHICS

At the *Café Tables* exhibit, RK&A observed and interviewed 10 visitor groups comprised of 18 adults and six children. Almost two-thirds are female, and about one-third are male. More than one-half of visitor groups had at least two adults, and more than one-half of groups were visiting without children. Children in groups range in age from 8 to 17 years.

## OVERALL RESPONSE

### DWELL TIME

The *Café Tables* exhibit had a dwell time of three to five minutes. Many visitor groups interacted with more than one table, with several visiting all three tables and looking at the majority of the stations at each table.

### OBSERVATIONS

The majority of visitor groups stopped at more than one table. In several cases, visitors were observed returning to previously visited tables, either to talk with another member of their visit group, or to look at information with which they did not originally engage. In addition to looking at and interacting with the objects, the majority of visitors also looked at some of the information provided on the flip labels and spinners.

A few visitors were observed sitting at the tables while engaging with the text information, and some visitors, who were not interviewed, were observed sitting at the tables and resting; in many cases, these visitors were not actively engaging with the text information at the tables. At the *Fragrance* table, several visitors were observed having difficulty opening the bottles.

### MOST ENGAGING ASPECTS

Most visitor groups talked about the interactivity of the *Café Tables* exhibit when asked about the most engaging aspects. For example, one interviewee said, “They were interactive; [you] can move things.” A few visitor groups talked about the variety of senses that were engaged at the *Café Tables*, often talking about the different things visitors could do while they explored the area. One interviewee said, “[I liked] that there was text [and] visuals, [and you] could smell things.” One interviewee specifically mentioned the text, saying, “[I] like the anecdotes and vignettes; [they were] not just factual. [They] tell stories.”

### LEAST ENGAGING ASPECTS

The majority of visitor groups said that everything about the *Café Tables* exhibit was engaging, with a few reiterating the fact that they found the information provided to be educational and engaging, even for adults. Least engaging aspects cited by other visitor groups were idiosyncratic: one visitor group wanted there to be real examples of plants in the space. Another visitor group mentioned that the fragrance jars were difficult to open.

### WHAT THE TABLES PROMPTED VISITORS TO THINK ABOUT

Almost three-quarters of visitor groups said the *Café Tables* exhibit made them think about the different uses of plants. A few of these visitor groups talked specifically about the medicinal uses of plants. For example, one interviewee said, “[It made me think about] uses of different plants for healing naturally. [I got to] see what you can use instead of commercial products.” The remaining visitor groups mentioned idiosyncratic ideas. For example, one interviewee said, “[The tables made me think about] the tobacco controversy. Some [plants] might be illicit in the United States but acceptable elsewhere.” One interviewee, talking specifically about the *Ceremony* table, said, “[The tables made me think about] different cultures and especially the mass producers. Is it still accurate? [It gave] an international perspective on different companies and different things.”



### CONNECTION TO EVERYDAY LIFE

When asked if they saw or experienced anything at the *Café Tables* exhibit that connected to their everyday life, more than one-third of visitor groups talked about spices or herbs that they use. Many of these visitor groups specifically mentioned chocolate. Almost one-third talked about the role of medicine in everyday life, and a few talked about specific scents that had a connection to their everyday life. For example, one interviewee said, “I love lavender. [It is] one of my favorite scents. [It was] nice to see it in the natural form.”

### CONNECTION TO THE REST OF THE GARDEN

When asked if there was any connection between what they saw at the *Café Tables* exhibit and what they saw in the rest of the Garden, almost three-quarters of visitor groups talked about plants, specifically that the *Café Tables* presented the uses of and stories of plants seen elsewhere in the Garden. For example, one interviewee said, “You see [products] in plant form and then how [the plant] carries over to [be used in] the products.” A few visitor groups did not see a connection between the *Café Tables* and the rest of the Garden.

### MOST ENGAGING TABLE

Visitor groups that looked at more than one table were asked which table they felt was most engaging. Many visitor groups said that the *Therapy* table was most engaging, often citing personal reasons. For example, one interviewee noted that she had “informally studied the medicinal traits of plants.” Many also mentioned the *Fragrance* table. One interviewee said that the *Fragrance* table was most engaging because the table was more interactive than the other tables.

## AROMA OF COOKING

### IMAGE D. EXHIBIT



### BACKGROUND INFORMATION

The *Aroma of Cooking* exhibit, one-half of the garden area in the West Gallery, features metal flower sculptures. This area has an assortment of smelling stations inside the metal flowers. There are three groups of spices that offer visitors the smells of certain types of food (e.g., curry, gumbo); these smelling stations are made up of six to eight different spices. The remaining smelling stations are individual and inside the large metal flowers. These spices are French vanilla, cinnamon, and wasabi, among others. Each smelling station has labels with the name of the spice and an example of how the spice might be used. The *Aroma of Cooking* exhibit also includes two videos and one object display case.

## VISITOR DEMOGRAPHICS

At *Aroma of Cooking*, RK&A observed and interviewed 10 visitor groups comprised of 27 adults and 18 children. More than three-quarters are female. All groups had at least two adults, and almost three-quarters of groups were visiting with two or more children. Children range in age from 3 to 13, with most between 6 and 9 years. The median age was 7 years.

## OVERALL RESPONSE

### DWELL TIME

Time spent at the *Aroma of Cooking* exhibit ranged from less than one minute to as much as three minutes. All visitors interacted with at least two of the smelling stations, with the majority stopping to smell most of the spices.

### OBSERVATIONS

All visitor groups stopped at more than one smelling station, with most visitor groups stopping at five or more stations<sup>9</sup>. In several cases, visitors were observed calling to other members of their group to smell specific scents. For example, one visitor called to another saying, “Come smell vanilla. Vanilla smells so good!” Visitors also were observed talking to others in their visit group about the different spices, where they are used, and where the visit group may have encountered them. For example, one adult said to the children in his/her group, “Lemongrass; that was in our curry last night.” Visitors were observed interacting with the smelling stations in a variety of ways. At least one visitor group turned smelling the spices into a game, with the child covering up the label and having the adult guess the spice.

A few visitor groups watched at least part of one or both videos. A few visitor groups stopped at the object display case; however, most visitor groups’ main focus was on smelling the spices. A few children were observed picking up the glass mulch.

### MOST ENGAGING ASPECTS

More than three-quarters of visitor groups said the most engaging aspect of the *Aroma in Cooking* exhibit was that they could smell the spices. Often times these visitor groups talked about smelling generally (e.g., “You could smell the different things”); however, a few visitor groups talked more specifically about the experience. For example, one interviewee said, “[You could] experiment with the smells. [You] see certain spices, and you don’t always know what they smell like.” A few group visitors said the most engaging part of the area was that the spices reminded them of different things. For example, one interviewee said, “[The most engaging part was] the fact that it made us think about other food and [the] times we had them. [They] took us places.” A few groups said they liked the appearance of the exhibit. For example, one interviewee said, “I liked the way it was displayed, the presentation.” Another interviewee in the same group said, “I like the accessibility, you can get down [and smell things]. And it is pretty.”

### LEAST ENGAGING ASPECTS

A few visitor groups said that everything about the *Aroma of Cooking* exhibit was engaging. A few said the least engaging part was that the smell of some of the spices was not that strong. A few also named specific spices that they smelled and did not enjoy. One interviewee talked about access to the flowers, saying, “Some of [the flowers] were hard for kids to get to. [I] hate it when kids feel [they] can’t get to things or they have to climb.”

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<sup>9</sup> Smelling stations are defined as the individual flowers and the grouped spices. Visitors who stopped at the grouped spices (e.g., curry) were counted as stopping at one smelling station.

### **WHAT THE AREA PROMPTED VISITORS TO THINK ABOUT**

One-half of visitor groups said that the *Aroma of Cooking* exhibit prompted them to think about food, cooking, or eating. For example, one interviewee said, “[It made me think] about how this is all used in our food and how different places use different spices.” Two visitor groups said the area made them think about the everyday use of plants. For example, one interviewee said the objects in the display case were interesting because they were all derived from plants. Two visitor groups talked about the beauty of the display; for example, “We just came to visit. I didn’t expect things [that are] this beautiful, and to be able to smell [the spices].”

### **ROLE OF PLANTS**

When asked what the *Aroma in Cooking* exhibit was trying to tell visitors about the role of plants, all visitor groups talked about the many uses of plants and how often times people aren’t aware of the origin of spices or scents. Several also talked about the fact that people use plants for many different things. For example, one interviewee said, “[Plants are] very essential to our lives. Everyday products that you smell, some you don’t really know where they come from.”

### **CONNECTION TO EVERYDAY LIFE**

When asked what connection, if any, the information in the *Aroma in Cooking* exhibit had to their everyday lives, more than three-quarters of visitor groups talked about the use of spices in cooking and food. For example, one interviewee said, “Some [of the] spices we use in tea [and] cooking. We do use a lot of them in cooking.” One interviewee said that the area gave him/her an opportunity to “relate the smells to the products that I use.”

### **CONNECTION TO THE REST OF THE GARDEN**

When asked if there was any connection between what visitor groups saw in the *Aroma in Cooking* exhibit and what they saw in the rest of the Garden, almost two-thirds of visitor groups talked about the fact that they could see and smell plants in the Garden as well. Several of these visitor groups specified that it was easier to smell plants in the West Gallery than in the rest of the Garden. Two visitor groups talked about the design of the *Aroma of Cooking* exhibit, with one interviewee saying, “The imagination, how it is designed; how beautifully displayed things are here.” One visitor group had not visited the rest of the Garden and therefore was unable to make any connections.

# TEACHER FOCUS GROUPS

## INTRODUCTION

RK&A facilitated two focus groups with teachers, one each with elementary school teachers (pre-k through 5<sup>th</sup> grade) and middle school teachers (6<sup>th</sup> through 8<sup>th</sup> grades) local to the District of Columbia and surrounding suburbs. Focus groups were conducted in July 2013 before components of the West Gallery were removed for a temporary exhibition.

## SAMPLE DESCRIPTION

### ELEMENTARY SCHOOL TEACHERS

Almost all participants are employed in public schools; one participant teaches in a private school. Almost one-half teach in schools in the District of Columbia, and a few each teach in schools in Montgomery County and Fairfax County. One each teaches in Calvert County (MD), Prince George's County and Anne Arundel County. Participants' teaching experience ranges from 1 to 33 years, with a median of 7 years. All participants teach at least 2 subjects, with more than one-half of participants teaching all subjects. A few participants teach a more narrow focus of subjects, including science, history, social studies, art and math.

Participants were asked several questions about their museum visiting habits with their students. More than one-half of participants had visited a museum on the National Mall with their students at least once in the last 12 months. Almost two-thirds had visited a botanic garden or nature center/park with their students in the last 12 months. More than one-third had visited the United States Botanic Garden at least once with their students in the last 12 months. Most participants had not attended teacher training at the USBG in the last 12 months.

Participants also were asked to list the last two museums or botanic gardens they had visited with their students. Participants offered a range of institutions including those focused on science, art, and history, as well as zoos and parks. One-quarter of participants had visited the National Air & Space Museum and the United States Botanic Garden. Please see Appendix AA for tables representing all the data presented in this section.

### MIDDLE SCHOOL TEACHERS

Almost three-quarters of participants are employed in public schools, and a few teach in public charter schools and private schools. More than one-third teach in schools in the District of Columbia, and more than one-quarter teach in Montgomery County. A few each teach in schools in Fairfax County and Loudon County. Participants' teaching experience ranges from 2 to 41 years, with a median of 11 years. More than one-half of participants teach a single subject such as social studies, history, science, English, math and geography.

More than three-quarters of participants had visited a museum on the National Mall with their students at least once in the last 12 months. Almost one-half had visited a botanic garden or nature center/park with their students in the last 12 months. Almost one-third had visited the United States Botanic Garden at least once with their students in the last 12 months. Most participants had not attended teacher training at the USBG in the last 12 months.

Again, when asked about the last two museums or botanic gardens participants had visited with their students, participants offered a range of institutions including those focused on science, art, and history, as well as zoos and parks. More than one-quarter of participants had visited the National Air & Space Museum and the National Museum of Natural History. Please see Appendix BB for tables representing all the data presented in this section.

## PAST MOTIVATION FOR VISITING WITH STUDENTS

### ELEMENTARY SCHOOL TEACHERS

Most elementary school teacher participants who had visited the Garden with students (about one-third overall) were motivated by specific aspects of their curriculum, such as botany, including the parts of plants and the study of photosynthesis (see the quotation below). A few also said they wanted to take their students to a museum that was new and different to the students. One teacher brought his/her students to see the Christmas train display, which led to a closer relationship with Garden staff.

I ran a STEM summer camp, and I work at a Title I school, so I'm always looking for those experiences. Everybody's been to the zoo; everybody's been to Air & Space. I'm looking for the other museums that they haven't been to. And then, also, plant adaptations and ecosystems run throughout the science curriculum pretty strongly. So this met all those things that I was looking for. And it is an amazing place.

### MIDDLE SCHOOL TEACHERS

Middle school teacher participants who had visited the Garden with students (about one-third overall) were motivated by specific subject matter, particularly life science studies (see the quotation below). Many of these participants spoke about working with education staff to develop the materials for their visit.

The curriculum that we tied to [a Botanic Garden visit] is the life of a plant, so, we use pretty much all of the galleries. Not the East Gallery so much anymore, but we use the Jungle, [and] we use the Garden Court to do a scavenger hunt with the students; [an] Education specialist does a special flower dissection thing that we do with our students.

## AWARENESS AND PAST USE OF GARDEN RESOURCES

### ELEMENTARY SCHOOL TEACHERS

Elementary school teacher participants who had not visited the Garden with their students (about two-thirds overall) were not aware of the resources available for teachers.

All elementary school teacher participants who had visited the Garden with their students (about one-third overall) completed a pre-visit lesson or activity of some kind; many participants said they talked about plants before they came to the Garden (see the first quotation below). Several participants used educator resources from the Garden to augment their lessons, either using parts of the self-guided field trips or creating more specialized resources with the help of Garden education staff (see the second and third quotations).

I did a pre-lesson on adaptations and the plants in our schoolyard. Then we came here to compare [the plants at the Garden] to what we were seeing around our school.

I did use the educator resources. There was a packet, like a student journal. I used bits and pieces of it, but not the whole packet. (Any particular piece that was useful to you?) It's lengthy. . . . It was maybe eight pages or something like that. It was a little too much and parts of it were too text heavy for some of my kids. . . . There's a drawing piece to it. There's a lot where they are looking for overarching ideas in the Jungle, that sort of thing.

We partner with Lee to create the curriculum. Because of the kind of work we do, we make sure it is skill-based and standards-based and rigorous, but Lee provides a lot of the content, the types of things that will really be engaging because of what [plants] they have [at the Garden].

## MIDDLE SCHOOL TEACHERS

Middle school teacher participants who had not visited the Garden with their students (about two-thirds overall) were not aware of the resources available for teachers.

Many middle school teacher participants who had visited the Garden with their students (about one-third overall) did not complete a pre-visit activity before arriving. In a few cases, participants indicated that their visit to the Garden was one stop on a larger visit that included another institution such as the Capitol. A few participants said they have used teacher resources on the USBG web site to augment their teaching (see the quotation below).

We do some of the activities that [USBG] has. I usually make my own stuff just so I can adapt everything to what I need, but I use their ideas. We did the parts of a plant and all that. And we even planted our own stuff, so they have stuff on [the web site] for that.

Many middle school teacher participants, regardless of whether they have visited the Garden with students, requested that additional information be sent to the schools at the beginning of the school year, informing teachers about resources and field trip opportunities. According to participants, this is something other institutions in the area do to keep the organizations top-of-mind with teachers (see the quotation below).

I know, as a DCPS teacher, I get tons of things from [the National Air & Space Museum] and tons of things from [the National Museum of] Natural History, and the Archives. They send out different things. But I don't think I've ever received anything from the Botanic Garden. It's not their obligation to contact me. If we wanted to come, the visit would be more for me."

## PERCEIVED VALUE OF VISITING THE GARDEN WITH STUDENTS

### ELEMENTARY SCHOOL TEACHERS

Elementary school teacher participants said they value the hands-on and in-person experiences students can have at the Garden. Several participants said the value of a USBG visit is in combining the Garden experience (e.g., seeing the different plant environments) with a hands-on activity such as dissecting plants (see the first quotation below). Many participants also said that students in urban school districts do not always have access to garden spaces and may have limited experience with plants (see the second quotation).

When [other focus group participants] were saying [their students] dissected the flowers, we do talk about the complete flower and [parts of the flower], all those things. For my fifth graders, that would be perfect, something [that is] hands-on.

Coming from a Title I school where the kids all live in apartment complexes, [many] don't even know what a plant looks like until they get to school. And they're also coming from other countries where they don't know what these things [plants] are. Seeing them in person rather than in a picture [is valuable]. . . . This place seems like it would be good at giving them exposure to things they don't see because they are so low income.

### MIDDLE SCHOOL TEACHERS

Middle school teacher participants did not talk as extensively about the value of visiting the Garden with students, however, several participants said they valued that there were always new things to experience at the Garden, although this sentiment was not limited to the participants' visits with their students (see the quotation below).

Every time I come, there's always somebody at some little station. They have the cocoa beans and they show the different parts when you break [a flower] down. It is always a fantastic kind of thing.

### PERCEIVED BARRIERS TO VISITING THE GARDEN WITH STUDENTS

#### ELEMENTARY SCHOOL TEACHERS

Elementary school teacher participants, especially participants that work with younger students (pre-kindergarten and kindergarten) said they have many concerns about bringing students to the Garden. Overall, participants said they are worried about the safety of their students, given the narrow and sometimes damp walk-ways around the Garden. Additionally, participants are concerned about students touching and harming plants in the Garden spaces and disrupting other visitors. Many participants talked about the importance of balancing traditionally large class sizes with enough adult supervision to ensure students are controlled in the space (see the first and second quotations below). However, participants that work with older students (specifically fourth and fifth graders) had fewer of these concerns. A few participants also talked about the amount of text, specifically in the West Gallery, which was a concern when bringing younger students (see the third quotation).

I just don't feel safe with my little kids with the wet floors and [getting enough] chaperones is always an issue. I could probably bring my children because I can control them. . . . But when we are talking about over 15 kids, and wet floors, and a lot of 'Do not touch this, do not touch that,' I just feel like that is why I [haven't] used [the Garden].

I felt very, 'Oh my gosh! They're going to ruin things and we'll disrupt people.' Adults were painting and [the students] wanted to see the paintings. They weren't being rude, but they were interrupting people.

My only issue with [the West Gallery] is, with our kindergarteners, a lot of them aren't reading yet, so I feel like there is a lot to look at, but I feel like there's also a lot to read, and so they'd need someone here to [answer] 'what does this say? What does this say?'

Elementary school teachers talked about the need for pre- and post-visit materials to be used in conjunction with Garden visits<sup>10</sup>. Participants wanted a mixture of activities and more general preparation materials, such as rules of the Garden that teachers could use to prepare students for a visit to the Garden.

## MIDDLE SCHOOL TEACHERS

Middle school teacher participants said they are likely to take their students on field trips that can be tied to the Common Core standards now being used in the District of Columbia, Maryland, and Virginia (see the first quotation below). They said it is becoming increasingly important for teachers to prove the educational value of field trips, so while participants recognize that it is possible to tie in a variety of subjects to a Garden visit, follow-up resources available on the USBG web site would be valuable to participants (see the second quotation).

[A field trip] has to be approved, especially in a school that is not functioning on a particular level. What would be helpful for me is to tie it into the Common Core, especially in reading. . . . I'm a social studies teacher, so I primarily teach history. This would not be on the top of my list to [visit], even though it's very beautiful. I love plants and flowers, but it's a hard sell.

Something else that would be nice to provide is additional follow-up information online. The plants and flowers, where they come from, ways to find out more about the climate, the history of those regions. What other products can be found there, what kind of people are there; how do they use the wheat?

Several middle school teacher participants talked about bringing small groups, such as one class at a time, explaining that visiting the Garden with a large group of students can be difficult (see the quotation below). Participants talked about the possibility of staggering the times at which they bring student groups as a possible solution to this problem. Middle school teacher participants also talked about the declining funds for field trips as a barrier to visiting the Garden. A few participants suggested more tangible resources from the Garden, such as providing transportation for students.

We only bring one class at a time, and even then, I split the kids up into smaller groups and let them sort of navigate on their own. It is difficult to navigate with a whole group of students all at once. But it is perfect to break them up.

## TOP-OF-MIND RESPONSES TO THE WEST GALLERY

### ELEMENTARY SCHOOL TEACHERS

Overall, elementary school teacher participants had positive reactions to the West Gallery exhibition, specifically that the area was hands-on. For example, when asked about their initial reaction to the space, one focus group participant's reaction was, "Oh! Good; stuff [students] can touch!"

Specifically, participants liked the fact that the West Gallery exhibition focused on plants in culture, with many participants talking about the variety of countries represented in the Gallery (see the first quotation below). A few participants also liked the focus on plant use in different products, talking

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<sup>10</sup> The Garden currently offers pre- and post-visit materials online. A few teachers had previously used these materials; however, many teachers spoke generally about the need for pre- and post-visit materials regardless of their familiarity with the Garden's current offerings.



about how the connection to everyday life reinforced the importance of plants (see the second quotation).

What I am seeing in education is a lot of geography content being lost. It seems like [this is] an awesome place to do some geography work, because it [has] plants from around the world. I am thinking we could have a map and, as [the students] are going around searching for things, there are different types of things you can put on the map and notice how plants around the world provide so many resources for us.

I like the one with the scents [the *Fragrance* table], and this one right here, [the *Therapy* table]. [It shows] what different products you can get from plants. I talk about that all the time: How we can't let one plant disappear because it may be the source of [something], especially medicine. I think those two tables, especially, would intrigue the fourth and fifth grade[rs].

Participants did have some concerns and suggestions about improving the Gallery. Many participants talked about wanting additional information or differing ways of presenting information in the space. For example, participants of younger students talked about the need for pictures to convey information instead of just text (see the first quotation below). Also, participants talked about the need for music or sound to enrich the experience (see the second quotation). Although participants appreciated all of the information provided in the space, they also said they wanted labels for the West Gallery exhibition (see the third quotation). A few participants talked about what they felt was a non-cohesive presentation of information in the West Gallery, with one teacher calling the space “choppy” (see the fourth quotation).

Even at the zoo, something they have [is] a flip chart next to an exhibit. It'll say, 'How tall is the average giraffe's neck?', and you try to guess, and then you flip it up and it'll show you [an answer]. . . . I think if they had something like that, which was visually stimulating and hands-on at the same time, [and] if [students] can't read a postcard with a paragraph of text then there [are] large, high-frequency words that they're more familiar with. . . . Even though these [*Postcard Trees*] have answers, [they are] a little more challenging.

It would be good if there were some listening stations or something, you could press and hear how you pronounce the spice. Some of these things are pronounced funny, so something like listening or teaching them how to say the words I think would be really nice.

Maybe if [things] were labeled. We would know what tree this wood comes from [in the Temple], and we could note that this [pillar] came from the Capitol.

There are plants from every continent in here. If it was set up in a [more cohesive] way where kids were going on a path, but they were going from North America to South America to Asia, and then, they are learning about the scents and plants. . . . There [are] totally enough resources in here to be able to do that.

A few participants talked about the *Public Gardens* postcard tree. These participants said that the action of turning the crank was not connected to the content in a meaningful way and instead, encouraged students to turn the crank without looking at the information provided (see the quotation below).

Because the hand crank is on the side, [the students do not] have the coordination to [turn the] hand crank on the side and watch the pictures go by, so [they] are standing on the side cranking it, sort of looking around. . . . There is no connection there.

## MIDDLE SCHOOL TEACHERS

Middle school teacher participants had mixed reactions to the West Gallery exhibition. Several participants liked the fact that the area was hands-on, but a few participants thought the area was not hands-on enough. The latter group of participants said the area relied too heavily on text and needed additional interactive elements such as audio features and touch stations to more actively engage students (see the first quotation below). In response to this, a few participants talked about the need to balance written elements and interactive elements. These participants argued that, although students react positively to technology and interactive elements, reading is still important in the classroom and central to what students are doing in school (see the second quotation).

We come here and only do the smelling thing because I've got to do what I can engage them. I always wish there was less text and more hands-on stuff.

I get the point of the videos and being able to touch and smell things, but if you can't read, it doesn't mean anything, so there needs to be a balance where you have stuff you can touch and also read [on] the screen. You can read about the things you have touched [as] you're feeling or smelling it, because I think today, reading is what gets you by, not you being able to sniff to see what it smells like.

Participants also expressed some concern about the culture bias in the West Gallery exhibition and the fact that the materials were not easily kept up-to-date and accurate (see the quotation below).

There are a few things in here that are actually culturally biased. Particularly these flip-up things [*Postcard Trees*]. There are certain things where it says, 'What does this make you think of? Christmas?' What if you aren't Christian? . . . . The exhibit is designed based on the idea that whoever lifts it up will be thinking of Christmas when they see a picture of a [poinsettia].

## PERCEIVED COMMUNICATION GOALS OF THE WEST GALLERY

### ELEMENTARY SCHOOL TEACHERS

Many elementary school teacher participants talked about the cultural aspect of the West Gallery exhibitions. For example, one teacher said, "[The West Gallery is] showing something in another culture where they use plants in some way." Several participants said the connection between people and plants can be seen throughout the Gallery (see the quotation below). Several participants noted that although the exhibition engages the senses and presents the idea of human plant use, how plants are used to build shelters is missing from the exhibition.

Humans, throughout time and place, all have certain needs. Whether it's shelter [or] clothing, plants are part of that. And [the West Gallery] [shows] what it looks like in different forms. Plants are used for therapy. Plants are used for fragrance. Plants are used for cooking. These are things that all humans need, and this is what it looks like around the globe.

### MIDDLE SCHOOL TEACHERS

Most middle school teacher participants said the West Gallery exhibition is about plants in culture (see the first quotation below). A few participants also talked specifically about the focus on food in the exhibition. These participants liked that the information is tied to something familiar (see the second quotation). Participants also talked about the connection between the West Gallery exhibition and what is presented in the rest of the Garden (see the third quotation).

[The exhibition presents] something about plants on a greater level. Not just [the] parts of the plants, leaves and things like that. But plants in culture, plants in art, plants in the different materials that they can make from plants. Medicines and things like that.

[You see] the various plants from the different parts of the world, and how we get those herbs and how that ties into everyday living on the supermarket shelf. I think that's a great lesson there, too, for children.

You have [plant use examples] in writing. You have it in video. . . . Then the idea is, 'Okay, now you've seen the products that can be made from this. . . . Now let's go find it [in the Garden]'.

## **PERCEIVED ALIGNMENT OF THE WEST GALLERY WITH THEIR TEACHING**

### **ELEMENTARY SCHOOL TEACHERS**

#### ***CURRENT USE OF THE WEST GALLERY IN TEACHING***

When asked how they could envision using the West Gallery exhibition in their teaching, participants talked about tying the ideas to lessons ranging from history to writing to math. Participants also mentioned art and geography. Overall, participants focused on the cultural aspects of the space as a way to tie the exhibition content to their lesson plans (see the quotation below).

I work with fourth and fifth graders and we're into a lot of drawing inferences. How can we look at this, or what does this symbolize? Where have you seen an apple before? A lot of them could connect to the story from Adam and Eve, or they could connect it to a story about Snow White. . . . This idea of, 'This has a meaning to it,' too. The way to tell a story around using parts of the plant, it has tons of ELA [English/Language Arts] stuff you can do.

#### ***SUGGESTIONS FOR IMPROVING THE WEST GALLERY TO SUPPORT TEACHERS***

Participants had many suggestions about how the West Gallery experience could better support their needs, although most of these suggestions focused on improving what students took away from the space. Many participants talked about the importance of a "make and take" that would allow students to plant a seed they could take home with them. The participants had a variety of ideas about how this could work, but all agreed that such an activity would enhance the connection students felt to plants in general and the Garden specifically (see the first quotation below). A few participants talked about the need for more purposeful structure in the West Gallery, which would allow teachers to facilitate a more meaningful experience for their students and ensure they did more than "just kind of [walk] around looking at things" (see the second quotation). A few participants also talked about the importance of engaging the sense of taste in some way, suggesting that this type of experience would stand out in students' memories of their Garden experience (see the third quotation).

I think we should end the tour with [the students] planting their own seeds and taking [them] home. . . . It could be a recycling thing. . . . They can take part and feel a connection with the Botanical Garden. Because, they can plant a seed in the classroom and they're not going to feel the connection. But, if they [planted] it while they were here, then not only is this a building that they went to, but the tree that's growing in the backyard came from a seed that I got from the Botanical Garden.

I hesitate [to say] this because I love lots of open spaces, but maybe some walls. Something to guide us to a place. . . . There's just an open space where I can just go look at one area, like I can go to everything. But if there was a story to tell, I'll be more forced to look at things.

I think, catering to a younger audience, something visually stimulating, or using all five senses. Anytime kids can put something in their mouth, they're going to remember it. . . . Just something that they know came from a plant, [something] that they can actually see, from a plant that they can digest.

Several participants also had more concrete ideas about content that could further support their teaching. Math was talked about in a more general way (e.g., average number of leaves on a plant, average rain fall), but participants spoke about a few specific science topics including cross-pollination and more detailed information about how plants grow (see the quotations below). Participants specifically mentioned the life-span of seeds as an area of interest.

I think [cross-pollination] would be cool because kids don't know that you can do that [mix plants]. They know if you mix colors you're going to get another color, but they don't know you can mix plants to get something else.

[I think it would be interesting to learn about] the life span of a seed. People think that if you have a pack of seeds, 'It's been in my garage for ten years, I just haven't gotten a chance to do that. I think I'm going to plant those seeds.' People don't understand it's not that you don't have a green thumb, but you're trying to plant dead seeds. \*And to know that plants don't just come from seeds. There are other ways of [growing plants]. And I do that in my classroom. We put potatoes in water and [the students] watch it grow.

## MIDDLE SCHOOL TEACHERS

### *SUGGESTIONS FOR IMPROVING THE WEST GALLERY TO SUPPORT TEACHERS*

Middle school teacher participants did not talk extensively about how the West Gallery currently aligned with their teaching. When asked about how the West Gallery could better support their needs as a teacher, participants said that it would be easier to tie the materials in the West Gallery to a larger Garden visit if the connection between the West Gallery and the rest of the Garden was more explicit (see the first quotation below). A few participants said it would be beneficial if the Garden provided resources that addressed a variety of subjects. This would allow teachers to connect the plants and materials in the West Gallery to more topics (see the second quotation). Also, participants said they would like to have some pre-planning done by the Garden, so they can more easily integrate a USBG visit into their classroom and teaching plan (see the third quotation). A few participants suggested that this integration could be achieved by forming a teacher advisory group and tasking them with writing lesson plans or ideas that could be posted on the USBG web site.

I just saw there was a medicinal display, so you could tie [West Gallery content] to where you could find [the plants] in the Garden. So, rather than there being fragrance, just say, 'Yeah, this is from the Jungle.' This [content] is [from] the Jungle exhibit, or this [content] is [from] the medicinal exhibit, or this [content] is [from] the desert exhibit. Keep [the West Gallery content] still categorized, because [the Gallery] is kind of confusing. . . . Make it more focused on whatever that area is and tie [the West Gallery content] in more [directly to the rest of the Garden].

[There are] historical applications you can make out of some of the different medicines or the regions where they come from. Or, why are these people tied to this sort of plant? There's a lot of really good information [in the West Gallery].

What I'm realizing is that a lot of the pre-planning is where teachers don't have time or where we fall short. 'What could [the] Botanic Garden do to alleviate that problem?' Maybe it's something like themed field trips. And you have Common Core standards and you have other interdisciplinary connections that you can make, but just a general skeleton to at least give a teacher somewhere to start. Maybe it's culture and regions. Or maybe it's math and geography. Whatever it is, teachers can go on the web site and at least get an idea.

Several middle school teacher participants also talked about how important it is for students to make a personal connection between what they see at the Garden and in the West Gallery and their own lives. For example, a few participants talked about giving students opportunities to plant their own plants, ideally something they can take home with them at the end of their Garden visit (see the first quotation below). A few other participants talked about making a stronger connection between the use of plants and students' lives (see the second quotation).

That could be very make and take, just a seed and a cup of dirt. [Maybe] you have three choices of which [seed you plant] and as it grows, you have to figure out what it is.

I think I get what they're trying to do. Everything else [in the Garden] is very specific about the plants, about regions. You've got the primeval garden and it goes into the desert and it goes into medicinal and you've got the orchids. 'Alright, I'm learning a little bit [about] all of these plants.' And then, big picture, 'Why do I care about plants? Why are they important?'. . . . [The West Gallery is about] the greater applications of plants, and just how much they are a part of our lives.

## FEEDBACK ON STUDENT OUTCOMES

Some of the middle school teachers spoke generally about what would be engaging to students in the West Gallery. For instance, participants spoke extensively about the use of technology in the West Gallery space. Several participants felt strongly that the Garden in general and the West Gallery in particular should use technology as a way to engage students (see the first quotation below); however, several other participants expressed concern about encouraging the use of cell phones or iPads, or they said cell phones were not allowed in their school districts. Regardless of their feelings about the use of technology, many participants agreed that a detailed hand-out or scavenger hunt could be used in the space to encourage a deeper connection with the information presented (see the second quotation).

Allowing them to use those devices [cell phones, iPads, etc.], you're accepting their generation, because that is where they are. You're accepting them. You're saying, 'Let's use your technology that you have,' because they are the next generation of people that'll be using the technology. So, don't take it away.

I thought, if my kids come in here, there would be a handout at the door. It would almost be like a scavenger hunt. And [the students] would look and go experiment at the different exhibits that [are] in here. . . . They could walk around, interact, and do whatever, but they would be answering questions on the handout I give them. . . . At a specific time, when they are finished,

I would go into the middle [of the Temple], we would all sit around and talk about what we've seen.

All teachers reflected on the Children outcomes developed by USBG. Their reactions are below.

### ELEMENTARY SCHOOL TEACHERS

Overall, elementary school teacher participants thought that the outcomes USBG staff articulated for children were well aligned with how participants think children will interact with the Garden. Participants said the second outcome, "Children connect plants with their everyday life," was most compelling (see the quotation below).

I like the second [outcome]. Just so [the students] can see the connection. Not just that there are plants in the yard or plants at school, but we get food, we get clothing, we get medicine. There are fragrances. That plants are a part of our everyday lives. You get the multi-cultural things in there, too. Plants from around the world and how people around the world use plants in their everyday life. I really like the second one.

Participants also spoke about the first outcome, "Children have fun and engaging experiences," with several participants talking about how students calling others over to share in the experience might not lead to the ideal experience (see the first quotation below). Again, participants said that having a more intentional structure in the West Gallery could help students have fun and engaging experiences (see the second quotation).

The children say 'Come and look at this.' I actually found that was an issue when I brought my students into this room because somebody might have been smelling the fragrance jars across the room . . . and they're just smelling things, but it was too distracting, actually. Because there were so many things they wanted to see, they weren't actually taking the time to learn what they were smelling.

I like the idea of having the footprints or something to direct students to different stations. Making it centered. . . . I do think there should be centers. We should go here first, go there second, so kids aren't saying, 'Come see what I'm doing,' and nobody's really getting anything [out of it].

Participants also discussed the third outcome, "Children are inspired to learn about plants," but expressed concern about the use of QR codes as evidence of this outcome. The use of cell phones is generally prohibited during school hours, so if technology was to be built into the experience, participants said the Garden would need to provide interactive technology or alternative hands-on activities for the students or encourage them to learn more at home (see the quotations below).

You talked about putting something in this room, like maybe technology, or, like, where they've got those touch screen exhibits at the other museums, or even having a little bookshelf in one corner for kids that finish early. . . . They could sit down and look at the books about plants or something.

If we can somehow teach [the students] how they can go home and find more information, that's what's really important. Then it sticks with them. Because, you had an activity, then you've done a follow up, [and] on your own, you've done research.

## MIDDLE SCHOOL TEACHERS

Overall, middle school teacher participants felt that each of the outcomes could be achieved during a single visit. Like elementary participants, most middle school teacher participants found the second outcome, “Children connect plants to their everyday lives” most compelling. Participants said the alignment between the West Gallery and the second outcome was particularly strong since the West Gallery talks about plants in medicine, food, and culture.

Middle school teacher participants said that achieving the first outcome, “Children have fun and engaging experiences,” was more dependent on the teacher than on the Garden. To allow a fun and engaging experience, participants said West Gallery and Garden visits would have to be more guided or structured. However, participants did not indicate that all of the guidance would have to come from Garden staff. A few participants said a teacher pre-visit or teacher workshop would allow educators to better prepare students for a visit to USBG (see the quotation below).

If [USBG] offered hours, recertification hours for a six-hour workshop at the Botanic Garden and [staff] did everything to [the teachers] that we would do with our children, so therefore, when we walked in the door, there would be a small bit of education, but teachers for the most part like to do what the kids are going to do. We want to go out and do the scavenger hunt. We want to do this. We want to do that. We can also talk to [Garden staff] afterward [and say], ‘you [could] tweak this or tweak that.’

Most middle school teacher participants said the third outcome, “Children are inspired to learn about plants,” is more aligned with the rest of the Garden. These participants said that the whole Garden offers many opportunities for students to see familiar plants or draw comparisons between familiar and more exotic plants (see the quotations below).

(What about the rest of the Garden? Do you think [that] could help you accomplish [the third outcome]?) The plants that are in their backyards or gardens, even in a house, you might have cactuses growing. . . . They might see a plant and say, ‘Hey, we have one of those in our backyard.’ Orchids, or something.

I don’t care what grade you are in, you’re still doing compare and contrast. That could be something down here in ‘are inspired to learn about plants.’ They compare plants that they saw with plants they know. Or plants that they learned about with plants that they know and can describe differences and similarities.

# APPENDICES

## APPENDIX A: IMPACT PLANNING FRAMEWORK

<b>MISSION</b> What <i>USBG</i> does	The U.S. Botanic Garden is an institution dedicated to demonstrating the aesthetic, cultural, economic, therapeutic and ecological importance of plants to the well-being of humans.
<b>IMPACT</b> Ultimate effect of <i>USBG</i> on audiences	Inspired by the welcoming, sensory, and restorative experience, visitors appreciate the diversity of plants, value the essential connection between plants and people, and embrace plant stewardship.
<b>OUTCOMES</b> Intended results among specific audiences	Children
	<ol style="list-style-type: none"> <li>1. Children have fun and engaging experiences.</li> <li>2. Children connect plants with their everyday lives.</li> <li>3. Children are inspired to learn about plants.</li> </ol>
	Adults from anywhere
	<ol style="list-style-type: none"> <li>1. Adults connect plants with their everyday lives.</li> <li>2. Adults become confident in their ability to teach others, including children, about plants.</li> <li>3. Adults become better stewards of plants.</li> </ol>
	Teachers
	<ol style="list-style-type: none"> <li>1. Teachers are aware of the Garden’s resources.</li> <li>2. Teachers embrace opportunities for hands-on learning (“getting dirty”).</li> <li>3. Teachers understand that plants are an important topic to teach.</li> </ol>
	Seniors
<ol style="list-style-type: none"> <li>1. Seniors engage in multi-generational activities at the Garden.</li> <li>2. Seniors are engaged at the Garden.</li> <li>3. Seniors connect plants with their everyday lives.</li> </ol>	



<b>INDICATORS</b>	Children
Evidence of achieving outcomes	1. Children have fun and engaging experiences.
	<ul style="list-style-type: none"> <li>• Children share an experience at the Garden with others (e.g., bring others over to see something, “Come look at this!”; share their knowledge and/or thoughts about plants with others, “Did you know ...?”; take photographs)</li> <li>• Children verbalize a positive experience at the Garden (e.g., “Wow!”; “This is fun!”; describe something that engaged them)</li> <li>• Children purposefully engage with the West Gallery exhibits (i.e., do not misuse exhibits, engage with multi-sensory exhibit)</li> <li>• Children keep something they created at the Garden (e.g., craft from an activity/program)</li> </ul>
	2. Children connect plants with their everyday lives.
	<ul style="list-style-type: none"> <li>• Children connect a typical activity they do with something they experience at the Garden (e.g., growing plants/gardening, exploring plants in nature/their backyard)</li> <li>• Children connect something they use/consume every day with plant(s) they see at the Garden (e.g., “That’s in the medicine I use,” “That’s in the food I eat!”)</li> <li>• Children connect prior knowledge with a Garden experience (e.g., “We learned about that plant in school”; “I knew that chocolate came from a tree!”)</li> </ul>
	3. Children are inspired to learn about plants.
	<ul style="list-style-type: none"> <li>• Children seek to discover more about plants at the Garden (e.g., use phone to access information from QR codes, ask questions or for additional resources; seek out another sensory experience)</li> <li>• Children state they will seek to discover more about plants after their Garden visit (e.g., looking up something on the Garden’s web site or other web resources, return to the Garden to participate in programs like Junior Botanist, Sprouts; create a garden at home )</li> </ul>

<b>INDICATORS</b> Evidence of achieving outcomes	Adults from anywhere
	1. Adults connect plants with their everyday lives.
	<ul style="list-style-type: none"> <li>• Adults share personal stories about and/or prior knowledge of plants with others at the Garden (“I saw/read something about X on The Discovery Channel/in a book”; share knowledge or experiences about plants)</li> <li>• Adults connect an activity they do with something they see or experience at the Garden (e.g., gardening, hiking, traveling)</li> <li>• Adults connect something they use/consume every day with plant(s) they see at the Garden (e.g., medicine, clothes, food)</li> </ul>
	2. Adults become confident in their ability to teach others, including children, about plants.
	<ul style="list-style-type: none"> <li>• Adults facilitate a Garden experience for others (e.g., read and interpret text for others; use knowledge/skill to help others, “Did you know ...?,” “Try using it like this ...”; call others over to see/experience something)</li> <li>• Adults share knowledge of plants with others at the Garden (“Did you know some of your clothes come from a plant?”)</li> </ul>
3. Adults become better stewards of plants.	
<ul style="list-style-type: none"> <li>• Adults request additional information or resources for taking care of plants (e.g., gardening classes; how to care for a specific type of plant)</li> <li>• Adults give an example of way(s) they will value plants in their decision making (e.g., state an intent to: plant a garden/more sustainable garden, participate in a community garden, donate to the Garden or other related organization, tell others to visit the Garden, make smarter consumer choices)</li> <li>• Adults engage in stewardship of plants (<i>aspirational</i>)</li> </ul>	

<b>INDICATORS</b>	<b>Teachers</b>
Evidence of achieving outcomes	1. Teachers are aware of the Garden’s resources.
	<ul style="list-style-type: none"> <li>• Teachers use the Garden’s pre- and post-visit materials and/or web site</li> <li>• Teachers attend teacher trainings</li> <li>• Teachers are empowered to bring their students to the Garden (e.g., schedule tours)</li> <li>• Teachers request information/materials about plants from the Garden</li> </ul>
	2. Teachers embrace opportunities for hands-on learning (“getting dirty”).
	<ul style="list-style-type: none"> <li>• Teachers engage in hands-on activities with students at the Garden</li> <li>• Teachers verbally encourage students to participate in hands-on exhibits or activities at the Garden (“It’s okay to get dirty!”)</li> <li>• Teachers schedule and/or bring their students to the Garden’s hands-on programming</li> <li>• Teachers request information about additional hands-on activities for the classroom</li> </ul>
	3. Teachers understand that plants are an important topic to teach.
	<ul style="list-style-type: none"> <li>• Teachers prepare their students for their Garden visit (e.g., use Garden’s pre-visit materials, prepare/use their own worksheets and/or materials)</li> <li>• Teachers bring their students to the Garden (and return multiple times)</li> <li>• Teachers make connections between plants and their students’ everyday lives</li> <li>• Teachers request additional information/materials about plants after their visit</li> <li>• Teachers integrate plants into their curriculum (and/or make connections between plants and their SOLs)</li> <li>• Teachers remember something they learned about plants during their Garden visit (e.g., new knowledge, personal connection)</li> </ul>

INDICATORS	Seniors
Evidence of achieving outcomes	1. Seniors engage in multi-generational activities at the Garden.
	<ul style="list-style-type: none"> <li>• Seniors use or participate in exhibits/programs with others (either in or outside their group) at the Garden</li> <li>• Seniors engage in social interaction in the West Gallery (e.g., taking group photos, sitting on benches with family, back-and-forth conversation with others)</li> <li>• Seniors facilitate the experience for others (e.g., read and interpret text for others; use knowledge/skill to help others, “Did you know ...?”, “When I was young, I used to ...”; call others over to see/experience something)</li> </ul>
	2. Seniors are engaged at the Garden.
	<ul style="list-style-type: none"> <li>• Seniors express a desire to return to the Garden for another experience (e.g., “I want to come back to ...”)</li> <li>• Seniors share an experience at the Garden with others including staff (e.g., share their knowledge and/or stories about plants with others, “Did you know ...?”)</li> <li>• Companions report that seniors were engaged (e.g., telling stories, “come alive”)</li> </ul>
	3. Seniors see connections between plants and their everyday lives.
	<ul style="list-style-type: none"> <li>• Seniors share personal stories about and/or prior knowledge of plants at the Garden with others (“My mom used to grow ...”; “In my country, we have ...”)</li> <li>• Seniors connect an activity they do with something they see or experience at the Garden (e.g., gardening, hiking, traveling)</li> <li>• Seniors connect something they use/consume every day with plant(s) they see at the Garden (e.g., medicine, clothes, food)</li> </ul>

## **APPENDIX B: QUESTIONNAIRE**

Removed for proprietary purposes

## APPENDIX C: IN-DEPTH INTERVIEW GUIDE

Removed for proprietary purposes

## APPENDIX D: DEMOGRAPHIC/VISIT QUESTIONNAIRE

Removed for proprietary purposes

## APPENDIX E: FOCUSED OBSERVATION AND INTERVIEW GUIDES

Removed for proprietary purposes



## APPENDIX F: FOCUS GROUP FLYER

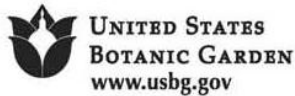
### Participants Needed for Teacher Focus Groups!

The United States Botanic Garden would like teachers' input about its West Gallery exhibition.

- ❖ Focus groups will be on **Wednesday, July 10<sup>th</sup> at 9:30 am and 11:30 am** at the Garden
- ❖ Teachers will receive **\$100.00** for their participation and refreshments will be provided
- ❖ We need **elementary** and **middle school** teachers who teach a variety of subjects, including science and/or social studies

If interested in participating, please contact Tonya at 301-215-7248 x358 Monday to Friday from 10am-9pm or Sunday 6-9 pm.

**Space is limited so please contact us ASAP!**



## APPENDIX G: FOCUS GROUP SCREENER

Removed for proprietary purposes

## **APPENDIX H: FOCUS GROUP SCRIPT**

Removed for proprietary purposes

## APPENDIX I: FOCUS GROUP QUESTIONNAIRE

Removed for proprietary purposes

## APPENDIX J: QUESTIONNAIRE STATISTICS

### DESCRIPTIVE STATISTICS

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#### FREQUENCY DISTRIBUTION

Gender  
Age  
Ethnicity  
Education  
Residence  
Visit group  
Visit with children  
Children's ages  
First time or repeat visitor to the USBG  
USBG visitation in the past 12 months  
USBG visit reason  
Attend tour/demonstration  
Talk to staff or a volunteer  
West Gallery visit  
West Gallery visit reason  
West Gallery activities

### SUMMARY STATISTICS

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#### RANGE, MEDIAN, MEAN, AND STANDARD DEVIATION

Age  
Ratings of overall USBG experiences  
Rating of USBG staff or volunteer  
Ratings of characteristics of USBG experiences  
Ratings of West Gallery experiences

## INFERENCEAL STATISTICS

### CROSSTABS

Education (college graduate: yes, no)		Gender (male, female)
Residence (local, non-local)		Age (18-34, 35-54, 55+)
USBG visitation (first or repeat)		Ethnicity (each ethnicity: yes, no)
Visit group (alone, in group)		Education (college graduate: yes, no)
Visit with children (yes, no)		Education (not college graduate, bachelor's degree, advanced or professional degree)
Visit USBG for a particular reason (yes, no)	by	Residence (local, non-local)
Attend tour or demonstration (yes, no)		USBG visitation (first or repeat)
Visit West Gallery (yes, no)		Visit group (alone, in group)
West Gallery Activities (each activity: yes, no)		Visit with children (yes, no)
4 Clusters (derived from k-means cluster procedure)		Visit USBG for a particular reason
		Visit West Gallery

## INFERENCEAL STATISTICS

### ANOVAS

		Gender (male, female)
		Age (18-34, 35-54, 55+)
		Ethnicity (each ethnicity: yes, no)
		Education (college graduate: yes, no)
		Residence (local, non-local)
Ratings of overall USBG experiences		USBG visitation (first or repeat)
Rating of USBG staff or volunteer	by	Visit group (alone, in group)
Ratings of characteristics of USBG experiences		Visit with children (yes, no)
Ratings of West Gallery experiences		Visit USBG for a particular reason (yes, no)
		Attend tour or demonstration (yes, no)
		Talk with staff or a volunteer (yes, no)
		Visit West Gallery (yes, no)
		4 Clusters (derived from k-means cluster procedure)

## APPENDIX K: STATISTICALLY SIGNIFICANT DIFFERENCES BY GENDER

This appendix presents all statistically significant differences that emerged by gender and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table A:

- ◆ \*Females place more importance on “Ensuring that plants have a place in my life” (than males).
- ◆ \*Females place more importance on “Smelling plants” (than males).
- ◆ \*Females place more importance on “Seeing plants that are familiar to me” (than males).

**TABLE A**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY GENDER**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME (7)		GENDER		
		MALE	FEMALE	TOTAL
USBG EXPERIENCES	<i>n</i>	MEAN	MEAN	MEAN
Ensuring that plants have a place in my life <sup>1</sup>	401	5.6	6.0	5.9
Smelling plants <sup>2</sup>	401	5.3	5.9	5.7
Seeing plants that are familiar to me <sup>3</sup>	401	4.3	4.8	4.6

<sup>1</sup>F = 9.068; *p* = .003

<sup>2</sup>F = 14.129; *p* = .000

<sup>3</sup>F = 8.367; *p* = .004

## APPENDIX L: STATISTICALLY SIGNIFICANT DIFFERENCES BY AGE

This appendix presents all statistically significant differences that emerged by age and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table B:

- ♦ \*Middle-aged adults (35 – 54 years) are more likely to be visiting with children (than younger visitors [18 – 34 years] and older visitors [55+ years]).

**TABLE B**  
**VISITING WITH CHILDREN BY AGE**

	AGE			TOTAL
	18 – 34	35 - 54	55+	
<b>VISITING WITH CHILDREN<sup>1</sup> (n = 392)</b>	%	%	%	%
No	84	58	91	76
Yes	16	42	9	24

<sup>1</sup> $\chi^2 = 45.272; p = .000$

As shown in Table C:

- ♦ \*Older adults (55 + years) are more likely to be visiting for a particular reason (than younger adults [18 – 34 years] and middle-aged adults [35 – 54 years]).

**TABLE C**  
**VISITING FOR A PARTICULAR REASON BY AGE**

	AGE			TOTAL
	18 - 34	35 – 54	55+	
<b>VISITING FOR A PARTICULAR REASON<sup>1</sup> (n = 393)</b>	%	%	%	%
No	66	60	42	57
Yes	34	40	58	43

<sup>1</sup> $\chi^2 = 15.073; p = .001$

As shown in Table D (next page):

- ♦ \*Older adults (55 + years) are more likely to talk with staff or a volunteer (than younger adults [18 – 34 years] and middle-aged adults [35 – 54 years]).



**TABLE D****TALK WITH STAFF OR A VOLUNTEER BY AGE**

	AGE			TOTAL
	18 - 34	35 - 54	55+	
<b>TALK WITH STAFF OR A VOLUNTEER<sup>1</sup> (n = 392)</b>	%	%	%	%
No	87	74	68	77
Yes	13	26	32	23

<sup>1</sup> $\chi^2 = 12.487; p = .002$

As shown in Table E:

- ◆ \*Older adults (55 + years) and middle-aged adults (35 – 54 years) are more likely to place importance on “Ensuring that plants have a place in my life” (than younger adults [18 – 34 years]).

**TABLE E****IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY AGE**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	n	AGE			TOTAL
		18 - 34	35 - 54	55+	
USBG EXPERIENCES		MEAN	MEAN	MEAN	MEAN
Ensuring that plants have a place in my life <sup>1</sup>	386	5.5	6.0	6.0	5.8

<sup>1</sup>F = 5.657; p = .004

## APPENDIX M: STATISTICALLY SIGNIFICANT DIFFERENCES BY ETHNICITY

This appendix presents all statistically significant differences that emerged by ethnicity and includes tables presenting the data.<sup>11</sup> Findings that are also reported in the body of the report are marked with an asterisk (\*).

### AFRICAN-AMERICAN

As shown in Table F:

- ◆ African-American visitors are more likely to be local residents (than non-African-American visitors).

**TABLE F**  
**RESIDENCE BY AFRICAN-AMERICAN ETHNICITY**

RESIDENCE <sup>1</sup> (n = 334)	ETHNICITY		
	AFRICAN-AMERICAN	NON-AMERICAN-AMERICAN	TOTAL
	%	%	%
Local	68	42	44
Non-local	32	58	56

<sup>1</sup> $\chi^2 = 7.241; p = .009$

### ASIAN

As shown in Table G:

- ◆ Asian visitors are more likely to be young adults (18 – 34 years) (than non-Asian visitors).

**TABLE G**  
**AGE GROUP BY ASIAN ETHNICITY**

AGE GROUP <sup>1</sup> (n = 379)	ETHNICITY		
	ASIAN	NON-ASIAN	TOTAL
	%	%	%
18 – 34	64	31	34
35 – 54	23	41	40
55+	13	28	26

<sup>1</sup> $\chi^2 = 14.005; p = .001$

### CAUCASIAN

As shown in Table H:

<sup>11</sup> RK&A only tested those ethnicities identified by at least 20 respondents, which are African-American, Asian, and Caucasian.

- ◆ Non-Caucasian visitors are more likely to be local residents (than Caucasian visitors).

**TABLE H**  
**RESIDENCE BY CAUCASIAN ETHNICITY**

RESIDENCE <sup>1</sup> (n = 334)	ETHNICITY		
	CAUCASIAN	NON-CAUCASIAN	TOTAL
	%	%	%
Local	40	58	44
Non-local	60	42	56

<sup>1</sup> $\chi^2 = 8.006; p = .005$

As shown in Table I:

- ◆ \*Non-Caucasian visitors place more importance on “Relaxing in a plant-filled space” (than Caucasian visitors).

**TABLE I**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY CAUCASIAN ETHNICITY**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME (7)	ETHNICITY			
		CAUCASIAN	NON-CAUCASIAN	TOTAL
	USBG EXPERIENCES	n	MEAN	MEAN
Relaxing in a plant-filled space <sup>1</sup>	386	6.2	6.6	6.3

<sup>1</sup>F = 7.017; p = .008

As shown in Table J (next page):

- ◆ \*Non-Caucasian visitors are more likely to say that their experience helped them appreciate how many different plants there are in the world (than Caucasian visitors).
- ◆ \*Non-Caucasian visitors are more likely to say that their experience inspired them to support plants and their sustainability (than Caucasian visitors).
- ◆ \*Non-Caucasian visitors are more likely to say that their experience helped them see how plants and people are connected (than Caucasian visitors).

**TABLE J****RATINGS OF USBG VISIT OUTCOMES BY CAUCASIAN ETHNICITY**

SCALE: STRONGLY DISAGREE (1) / STRONGLY AGREE (7)	ETHNICITY			
		CAUCASIAN	NON- CAUCASIAN	TOTAL
	USBG VISIT OUTCOMES	<i>n</i>	MEAN	MEAN
My experience today helped me appreciate how many different kinds of plants there are in the world <sup>1</sup>	393	6.0	6.3	6.1
My experience today inspired me to support plants and their sustainability <sup>2</sup>	393	5.8	6.2	5.9
My experience today helped me see how plants and people are connected <sup>3</sup>	393	5.4	5.8	5.5

<sup>1</sup>F = 7.548; *p* = .006

<sup>2</sup>F = 9.938; *p* = .002

<sup>3</sup>F = 11.869; *p* = .001

## APPENDIX N: STATISTICALLY SIGNIFICANT DIFFERENCES BY EDUCATION

This appendix presents all statistically significant differences that emerged by education and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table K:

- ◆ Non-college graduates are more likely to say that the information in the West Gallery exhibits told them what they wanted to know (than college graduates).

**TABLE K**  
**RATINGS OF WEST GALLERY BY EDUCATION**

SCALE:	COLLEGE GRADUATE			TOTAL MEAN
	n	YES	NO	
		MEAN	MEAN	
The information in the exhibits did not tell me what I wanted to know (1) / The information in the exhibits told me what I wanted to know (7) <sup>1</sup>	103	5.6	6.4	5.7

<sup>1</sup>F = 4.561; *p* = .021 (reported as significant due to small sample size)

As shown in Table L (next page):

- ◆ \*Non-college graduates place more importance on “Learning how plants I see here connect to my everyday life” (than college graduates).
- ◆ \*Non-college graduates place more importance on “Seeing plants that are familiar to me” (than college graduates).
- ◆ \*Non-college graduates place more importance on “Sharing knowledge and stories about plants with others” (than college graduates).
- ◆ \*Non-college graduates place more importance on “Helping others learn about plants” (than college graduates).

**TABLE L****IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY EDUCATION**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	COLLEGE GRADUATE	TOTAL		
		YES	NO	TOTAL
USBG EXPERIENCES	<i>n</i>	MEAN	MEAN	MEAN
Learning how plants I see here connect to my everyday life <sup>1</sup>	396	5.4	6.0	5.4
Seeing plants that are familiar to me <sup>2</sup>	396	4.6	5.5	4.7
Sharing knowledge and stories about plants with others <sup>3</sup>	396	4.6	5.3	4.7
Helping others learn about plants <sup>4</sup>	396	4.4	5.1	4.5

<sup>1</sup>F = 7.660; *p* = .006<sup>2</sup>F = 14.562; *p* = .000<sup>3</sup>F = 8.870; *p* = .003<sup>4</sup>F = 8.367; *p* = .004

## APPENDIX O: STATISTICALLY SIGNIFICANT DIFFERENCES BY RESIDENCE

This appendix presents all statistically significant differences that emerged by residence and includes tables presenting the data. For these analyses, local residence is defined as a zip code from Washington D.C. proper, Montgomery and Prince George’s Counties in Maryland, Arlington and Fairfax Counties in Virginia, or the Cities of Alexandria, Fairfax and Falls Church in Virginia. Non-local residence is defined as a zip code from any other location in the United States or a foreign country. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table M:

- ◆ \*Local residents are more likely to be repeat visitors (than non-local residents).

**TABLE M**  
**USBG VISITATION BY RESIDENCE**

	RESIDENCE		
	LOCAL	NON-LOCAL	TOTAL
<b>USBG VISITATION<sup>1</sup> (n = 348)</b>	%	%	%
First-time visitor	33	73	56
Repeat visitor	67	27	44

<sup>1</sup> $\chi^2 = 54.674; p = .000$

As shown in Table N:

- ◆ \*Local residents are more likely to have visited USBG that day for a particular reason (than non-local residents).

**TABLE N**  
**PARTICULAR REASON FOR VISITING USBG THAT DAY BY RESIDENCE**

	RESIDENCE		
	LOCAL	NON-LOCAL	TOTAL
<b>VISITING FOR A PARTICULAR REASON<sup>1</sup> (n = 348)</b>	%	%	%
No	47	66	58
Yes	53	34	42

<sup>1</sup> $\chi^2 = 12.893; p = .000$

As shown in Table O:

- ◆ \*Non-local visitors place more importance on “Seeing plants I have never seen before” (than local visitors).

**TABLE O**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY RESIDENCE**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	RESIDENCE			
		LOCAL	NON-LOCAL	TOTAL
USBG EXPERIENCES	<i>n</i>	MEAN	MEAN	MEAN
Seeing plants I have never seen before <sup>1</sup>	341	6.2	6.6	6.4

<sup>1</sup>F = 11.399; *p* = .001



## APPENDIX P: STATISTICALLY SIGNIFICANT DIFFERENCES BY USBG VISITATION

This appendix presents all statistically significant differences that emerged by USBG visitation and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table P:

- ◆ \*Repeat visitors are more likely to have visited USBG that day for a particular reason (than first-time visitors).

**TABLE P**  
**PARTICULAR REASON FOR VISITING USBG THAT DAY BY USBG VISITATION**

VISITING USBG THAT DAY FOR A PARTICULAR REASON <sup>1</sup> (n = 408)	USBG VISITATION		
	FIRST-TIME VISITORS	REPEAT VISITORS	TOTAL
	%	%	%
No	71	38	56
Yes	29	62	44

<sup>1</sup> $\chi^2 = 44.307; p = .000$

As shown in Table Q:

- ◆ \*Repeat visitors are more likely to visit USBG alone (than first-time visitors).

**TABLE Q**  
**VISITING IN A GROUP BY USBG VISITATION**

VISITING IN A GROUP (n = 405)	USBG VISITATION		
	FIRST-TIME VISITORS	REPEAT VISITORS	TOTAL
	%	%	%
Visiting alone	17	31	23
Visiting in a group	83	69	77

<sup>1</sup> $\chi^2 = 11.802; p = .001$

As shown in Table R (next page):

- ◆ \*Repeat visitors are more likely to be local residents (than first-time visitors).

**TABLE R****RESIDENCE BY USBG VISITATION**

<b>RESIDENCE (n = 358)</b>	<b>USBG VISITATION</b>		
	<b>FIRST-TIME VISITORS</b>	<b>REPEAT VISITORS</b>	<b>TOTAL</b>
	<b>%</b>	<b>%</b>	<b>%</b>
Local	25	65	42
Non-local	75	35	58

<sup>1</sup> $\chi^2 = 54.674; p = .000$

## APPENDIX Q: STATISTICALLY SIGNIFICANT DIFFERENCES BY VISITING USBG THAT DAY FOR A PARTICULAR REASON

This appendix presents all statistically significant differences that emerged by visiting USBG that day for a particular reason and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table S:

- ◆ Visitors visiting USBG that day for a particular reason are more likely to talk to staff or a volunteer (than visitors USBG that day for no particular reason).

**TABLE S**  
**TALKED TO STAFF OR A VOLUNTEER BY VISITING USBG THAT DAY FOR A PARTICULAR REASON**

TALKED TO STAFF OR A VOLUNTEER (n= 407)	VISITING USBG THAT DAY FOR A PARTICULAR REASON		
	NO	YES	TOTAL
	%	%	%
No	82	70	77
Yes	18	30	23

<sup>1</sup> $\chi^2 = 7.630; p = .007$

As shown in Table T:

- ◆ \*Visitors visiting USBG that day for a particular reason are more likely to place importance on “Learning details about plants that I otherwise might not know” (than visitors visiting USBG that day for no particular reason).

**TABLE T**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY VISITING USBG THAT DAY FOR A PARTICULAR REASON**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	USBG EXPERIENCES	n	VISITING USBG THAT DAY FOR A PARTICULAR REASON		
			NO	YES	TOTAL
			MEAN	MEAN	MEAN
	Learning details about plants that I otherwise might not know <sup>1</sup>	401	5.2	5.5	5.3

<sup>1</sup>F = 7.574; p = .006

As shown in Table U:

- ◆ \*Visitors visiting USBG that day for no particular reason are more likely to say that their experience helped them appreciate how many different plants there are in the world (than visitors visiting USBG that day for a reason).

**TABLE U**

**RATINGS OF USBG VISIT OUTCOMES BY VISITING USBG THAT DAY FOR A PARTICULAR REASON**

SCALE: STRONGLY DISAGREE (1) / STRONGLY AGREE (7)	VISITING USBG THAT DAY FOR A PARTICULAR REASON			TOTAL MEAN
	<i>n</i>	NO MEAN	YES MEAN	
USBG VISIT OUTCOMES				
My experience today helped me appreciate how many different kinds of plants there are in the world <sup>1</sup>	408	6.2	5.9	6.1

<sup>1</sup>F = 7.124; *p* = .008

## APPENDIX R: STATISTICALLY SIGNIFICANT DIFFERENCES BY VISITING WITH CHILDREN

This appendix presents all statistically significant differences that emerged by whether visitors are with children younger than 18 years of age and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table V:

- ◆ \*Visitors with children are more likely to be middle-aged visitors (35 – 54 years) (than visitors without children).

**TABLE V**  
**AGE BY VISITING WITH CHILDREN**

	VISITING WITH CHILDREN		
	YES	NO	TOTAL
<b>AGE (n = 392)</b>	%	%	%
18 – 34	22	38	34
35 – 54	68	30	40
55+	10	32	26

<sup>1</sup> $\chi^2 = 45.272; p = .000$

As shown in Table W:

- ◆ \*Visitors with children are more likely to have visited the West Gallery (than visitors without children).

**TABLE W**  
**VISITED THE WEST GALLERY BY VISITING WITH CHILDREN**

	VISITING WITH CHILDREN		
	YES	NO	TOTAL
<b>VISITED THE WEST GALLERY (n = 322)</b>	%	%	%
No	60	75	71
Yes	40	25	29

<sup>1</sup> $\chi^2 = 7.952; p = .007$

As shown in Table X:

- ◆ Visitors with children are more likely to say that the exhibits helped them see the connections between plants and their everyday life (than visitors without children).

**TABLE X**  
**RATINGS OF WEST GALLERY BY VISITING WITH CHILDREN**

SCALE:	VISITING WITH CHILDREN			TOTAL MEAN
	<i>n</i>	YES MEAN	NO MEAN	
The exhibits did not help me see the connections between plants and my everyday life (1) / The exhibits helped me see the connections between plants and my everyday life (7) <sup>1</sup>	107	6.4	5.8	6.0

<sup>1</sup>F = 5.462; *p* = .021 (reported due to the small sample size)

As shown in Table Y:

- ◆ \*Visitors with children are more likely to place importance on “Spending time with friends/family” (than visitors without children).
- ◆ \*Visitors with children are more likely to place importance on “Helping others learn about plants” (than visitors without children).

**TABLE Y**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY VISITING WITH CHILDREN**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	VISITING WITH CHILDREN			TOTAL MEAN
	<i>n</i>	YES MEAN	NO MEAN	
USBG EXPERIENCES				
Spending time with friends/family <sup>1</sup>	400	6.2	5.5	5.7
Helping others learn about plants <sup>2</sup>	400	4.8	4.3	4.5

<sup>1</sup>F = 16.153; *p* = .000

<sup>2</sup>F = 6.863; *p* = .009

## APPENDIX S: STATISTICALLY SIGNIFICANT DIFFERENCES BY VISITING IN A GROUP

This appendix presents all statistically significant differences that emerged by whether visitors are visiting alone or in a group and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table Z:

- ◆ \*Visitors visiting alone are more likely to be repeat visitors (than visitors in a group).

**TABLE Z**  
**USBG VISITATION BY VISIT GROUP**

	VISIT GROUP		
	ALONE	GROUP	TOTAL
<b>USBG VISITATION (n = 322)</b>	%	%	%
First visit	39	60	55
Repeat visit	61	40	45

<sup>1</sup> $\chi^2 = 7.952; p = .007$

As shown in Table AA:

- ◆ \*Visitors in a group are more likely to place importance on “Spending time with friends/family” (than visitors who are visiting alone).

**TABLE AA**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY VISIT GROUP**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	USBG EXPERIENCES	n	VISIT GROUP		
			ALONE MEAN	GROUP MEAN	TOTAL MEAN
	Spending time with friends/family <sup>1</sup>	400	4.8	5.9	5.7

<sup>1</sup>F = 131.315; p = .000

## APPENDIX T: STATISTICALLY SIGNIFICANT DIFFERENCES BY VISITED WEST GALLERY

This appendix presents all statistically significant differences that emerged by whether visitors visited the West Gallery and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table BB:

- ◆ \*Visitors to the West Gallery are more likely to place importance on “Learning how different plants from around the world are used” (than visitors who did not visit the West Gallery).
- ◆ \*Visitors to the West Gallery are more likely to place importance on “Learning how plants I see here connect to my everyday life” (than visitors who did not visit the West Gallery).

**TABLE BB**  
**IMPORTANT CHARACTERISTICS OF USBG EXPERIENCES BY VISITED WEST GALLERY**

SCALE: LESS IMPORTANT TO ME (1) / MORE IMPORTANT TO ME(7)	VISITED WEST GALLERY			
		YES	NO	TOTAL
	USBG EXPERIENCES	MEAN	MEAN	MEAN
Learning how different plants from around the world are used <sup>1</sup>	<i>n</i> 399	5.9	5.6	5.7
Learning how plants I see here connect to my everyday life <sup>2</sup>	<i>n</i> 399	5.8	5.3	5.4

<sup>1</sup>F = 7.000; *p* = .008

<sup>2</sup>F = 10.539; *p* = .001



## APPENDIX U: STATISTICALLY SIGNIFICANT DIFFERENCES BY CLUSTERS

This appendix presents statistically significant differences that emerged by the clusters and includes tables presenting the data. **Findings that are also reported in the body of the report are marked with an asterisk (\*).**

As shown in Table CC:

- ◆ \*Fans and Relevance-seekers are more likely to be female (than Learners and Luke-warms).

**TABLE CC**  
**GENDER BY CLUSTERS**

	CLUSTER				
	FANS 33%	RELEVANCE- SEEKERS 26%	LEARNERS 27%	LUKE- WARMS 14%	TOTAL 100%
<b>GENDER<sup>1</sup> (n = 401)</b>	%	%	%	%	%
Male	30	26	46	52	36
Female	70	74	54	48	64

<sup>1</sup> $\chi = 17.383; p = .001$

As shown in Table DD:

- ◆ \*Learners and Luke-warms are more likely to have a graduate or professional degree (than Fans or Relevance-seekers).

**TABLE DD**  
**EDUCATION BY CLUSTERS**

	CLUSTER				
	FANS 33%	RELEVANCE- SEEKERS 26%	LEARNERS 27%	LUKE- WARMS 14%	TOTAL 100%
<b>EDUCATION<sup>1</sup> (n = 337)</b>	%	%	%	%	%
Not a college graduate	19	12	5	7	12
Bachelor's Degree	41	51	43	39	44
Graduate or Professional Degree	40	36	53	54	44

<sup>1</sup> $\chi = 18.828; p = .004$

As shown in Table EE:

- ◆ \*Fans are most likely to say that their experience “helped them appreciate how many different plants there are in the world,” and Luke-warms are least likely to say that their experience “helped them appreciate how many different plants there are in the world.”
- ◆ \*Fans are most likely to say that their experience “inspired them to support plants and their sustainability,” and Luke-warms are least likely to say that their experience “inspired them to support plants and their sustainability.”
- ◆ \*Fans are most likely to say that their experience “helped them see how plants and people are connected,” and Luke-warms are least likely to say that their experience “helped them see how plants and people are connected.”

**TABLE EE**  
**RATINGS OF USBG VISIT OUTCOMES BY CLUSTERS**

SCALE: STRONGLY DISAGREE (1) / STRONGLY AGREE (7)	CLUSTER				
	FANS 33%	RELEVANCE- SEEKERS 26%	LEARNERS 27%	LUKE- WARMES 14%	TOTAL 100%
USBG VISIT OUTCOMES (n = 401)	MEAN	MEAN	MEAN	MEAN	MEAN
My experience today helped me appreciate how many different kinds of plants there are in the world <sup>1</sup>	6.5	6.0	5.9	5.3	6.1
My experience today inspired me to support plants and their sustainability <sup>2</sup>	6.5	5.7	5.8	4.8	5.9
My experience today helped me see how plants and people are connected <sup>3</sup>	6.2	5.4	5.3	4.3	5.5

<sup>1</sup>F = 26.508; *p* = .000

<sup>2</sup>F = 35.000; *p* = .000

<sup>3</sup>F = 45.139; *p* = .000

As shown in Table FF:

- ◆ \*Fans are more likely to say they were able to get close enough to the plants to experience them the way they wanted (than Relevance-seekers, Learners, and Luke-warms).
- ◆ \*Fans are most likely to say the overall experience at USBG that day surpassed their expectations, and Luke-warms are least likely to say the overall experience at USBG that day surpassed their expectations

**TABLE FF**

**RATINGS OF OVERALL USBG EXPERIENCE THAT DAY BY CLUSTERS**

SCALES FOR OVERALL USBG EXPERIENCE THAT DAY	CLUSTER					TOTAL 100%
		FANS 33%	RELEVANCE- SEEKERS 26%	LEARNERS 27%	LUKE- WARMS 14%	
	<i>n</i>	MEAN	MEAN	MEAN	MEAN	
I was not able to get close enough to the plants to experience them the way I wanted (1) / I was able to get close enough to the plants to experience them the way I wanted (7) <sup>1</sup>	401	6.8	6.5	6.5	6.4	6.6
Did not meet my expectations (1) / Surpassed my expectations (7) <sup>2</sup>	400	6.4	6.0	5.8	5.5	6.0

<sup>1</sup>F = 17.295; *p* = .000

<sup>2</sup>F = 4.277; *p* = .005

## APPENDIX V: RESIDENCE DETAILS

**TABLE GG**

**ZIP CODES FOR US RESIDENTS**

ZIP CODES	n	ZIP CODES	n	ZIP CODES	n	ZIP CODES	n	ZIP CODES	n
20002	9	06512	1	20772	1	23230	1	70806	1
20001	8	07039	1	20774	1	23669	1	73801	1
20003	7	07712	1	20783	1	24502	1	74037	1
20010	4	07866	1	20812	1	24701	1	75077	1
20011	4	08610	1	20832	1	27407	1	75240	1
20036	4	08822	1	20850	1	27513	1	76028	1
22207	4	10021	1	20852	1	27539	1	77025	1
20007	3	10025	1	20854	1	27707	1	77385	1
20009	3	10075	1	20859	1	28054	1	77503	1
20175	3	10930	1	20871	1	28461	1	77619	1
20814	3	11422	1	20877	1	28803	1	77845	1
20815	3	14543	1	20879	1	30144	1	78109	1
20901	3	15101	1	20905	1	30180	1	78119	1
20910	3	15116	1	20912	1	31602	1	78382	1
21401	3	15219	1	21031	1	32780	1	78735	1
22003	3	16509	1	21032	1	33021	1	78751	1
20012	2	17837	1	21075	1	33025	1	80503	1
20019	2	18302	1	21108	1	33542	1	80631	1
20020	2	18403	1	21114	1	33765	1	81435	1
20037	2	19081	1	21201	1	35801	1	82082	1
20191	2	20004	1	21212	1	35803	1	83832	1
20723	2	20008	1	21215	1	37917	1	84629	1
20740	2	20015	1	21524	1	37918	1	85024	1
20770	2	20016	1	21557	1	43055	1	85308	1
20855	2	20024	1	21601	1	43230	1	87114	1
20878	2	20031	1	21703	1	43560	1	87544	1
20902	2	20052	1	21710	1	44240	1	92107	1
20906	2	20057	1	21740	1	45044	1	92253	1
21208	2	20059	1	22015	1	45243	1	93307	1
21210	2	20098	1	22030	1	45459	1	94588	1
21403	2	20110	1	22031	1	46033	1	94952	1
22042	2	20121	1	22032	1	46037	1	95128	1
22180	2	20147	1	22033	1	46375	1	95404	1
22201	2	20148	1	22043	1	47401	1	95816	1
22202	2	20164	1	22153	1	47532	1	95959	1
22205	2	20187	1	22181	1	47905	1	96161	1
22306	2	20265	1	22192	1	48307	1	96816	1
01002	1	20337	1	22193	1	50158	1	97213	1
01826	1	20415	1	22203	1	50613	1	97404	1
02130	1	20460	1	22209	1	54701	1	98022	1
02563	1	20505	1	22303	1	57035	1	98038	1
02780	1	20599	1	22310	1	60048	1	98226	1
02842	1	20601	1	22314	1	60060	1	98229	1
03103	1	20613	1	23103	1	60073	1		
03276	1	20657	1	23221	1	60201	1		
03840	1	20706	1	22209	1	60457	1		
04496	1	20716	1	22303	1	60612	1		
05737	1	20732	1	22310	1	60618	1		
06033	1	20736	1	22314	1	65559	1		
06410	1	20737	1	23103	1	67101	1		
06489	1	20762	1	23221	1	68046	1		

**TABLE HH****STATE OF RESIDENCE**

<b>STATE</b>	<b><i>n</i></b>	<b>STATE</b>	<b><i>n</i></b>
Maryland	72	New Mexico	2
District of Columbia	69	Oklahoma	2
Virginia	50	Oregon	2
Texas	13	Tennessee	2
California	10	Hawai'i	1
Pennsylvania	8	Idaho	1
Illinois	7	Kansas	1
North Carolina	7	Louisiana	1
Ohio	7	Maine	1
Indiana	6	Michigan	1
New York	6	Missouri	1
Florida	5	Nebraska	1
Massachusetts	5	Rhode Island	1
New Jersey	5	South Dakota	1
Connecticut	4	Utah	1
Washington	4	Vermont	1
Colorado	3	West Virginia	1
Georgia	3	Wisconsin	1
New Hampshire	3	Wyoming	1
Alabama	2		
Arizona	2		
Iowa	2		

**TABLE II****OTHER COUNTRY OF RESIDENCE**

<b>COUNTRY (<i>n</i> = 31)</b>	<b><i>n</i></b>
Canada	5
United Kingdom	5
France	4
Germany	3
Mexico	3
Australia	2
Netherlands	2
Argentina	1
Belgium	1
Columbia	1
India	1
Kenya	1
New Zealand	1
United Arab Emirates	1

## APPENDIX W: LIST OF OTHER WEST GALLERY MESSAGES

**TABLE JJ**

**OTHER MESSAGES THE WEST GALLERY WAS TRYING TO CONVEY**

<b>OTHER MESSAGES (n = 8)</b>
The importance of greens, children's education
Very educational
There are different ways to display flowers
Seeds are importance aspects
Teach them, show them where it began as far as Lady Bird Johnson
Nice place to chill out
Plants are interesting
Thought it was geared to children

## APPENDIX X: LIST OF OTHER ELEMENTS THAT HELPED VISITORS UNDERSTAND WEST GALLERY MESSAGES

**TABLE KK**  
**OTHER RESPONSES ELEMENTS THAT HELPED VISITORS UNDERSTAND WEST GALLERY MESSAGE**

<b>OTHER RESPONSES (n = 7)</b>
Plants from all over the world, connecting to my home, natural beauty
Different ways to arrange plants, make plant arrangements
Observing the children
Required me to use different senses to connect to plants
Tactile – use senses to learn
Shows how people rely on plants not vice versa
Different, unexpected, not too many live plants



## APPENDIX Y: LIST OF OTHER WEST GALLERY ELEMENTS THAT HELPED VISITORS SEE THE CONNECTION BETWEEN PLANTS AND EVERYDAY LIFE

**TABLE LL**  
**OTHER RESPONSES FOR WHAT IN THE WEST GALLERY HELPED SHOW CONNECTION BETWEEN PLANTS AND EVERYDAY LIFE**

<b>OTHER RESPONSES (n = 13)</b>
Open the specific things
Physical objects are more realistic than pictures
The greens exhibit
Interactivity of exhibit
The plants I'm familiar with
The manufacturer
I felt a real connection to the plants as I relaxed there and felt comforted
The explanations of the exhibits
Interaction with exhibits, calming effect of the plants
Just so it is filtered
Saves our planet
The people in the exhibit – how other people are interested in plants, too
Hard to believe people wouldn't think of connection – we need plants to clean our air to breathe!

## APPENDIX Z: OBTAINED AND REFUSAL SAMPLES

Of 653 adult visitors who were intercepted and invited to participate in the study, 408 visitors agreed (obtained sample) and 245 visitors declined (refusal sample), for a participation rate of 62 percent. The principal reasons given by visitors for declining were “no time/in a hurry” (52 percent), “not interested/not today,” (30 percent) and other miscellaneous reasons (18 percent).

Females were more likely to participate in the study than males. The obtained sample is somewhat under-represented by males and over-represented by females.

All items on the questionnaire were compared by gender, so all statistically significant gender differences in demographic characteristics, background characteristics, and visit experiences have been identified and are presented in the body of the report.

**TABLE MM**  
**GENDER BY OBTAINED AND REFUSAL SAMPLE**

GENDER	SAMPLE		
	OBTAINED (n = 408)	REFUSAL (n = 245)	TOTAL (n = 653)
	%	%	%
Male	36	49	41
Female	64	51	59

<sup>1</sup> $\chi^2 = 10.866; p = .000$

Younger visitors (18 – 34 years) and older visitors (55+ years) were more likely to participate than middle-aged visitors (34 – 55 years). The obtained sample is somewhat under-represented by middle-aged visitors (34 – 55 years) and over-represented by younger (18 – 34 years) and older visitors (55 percent).

All items on the questionnaire were compared by age group, so all statistically significant age differences in demographic characteristics, background characteristics, and visit experiences have been identified and are presented in the body of the report.

**TABLE NN**  
**AGE BY OBTAINED AND REFUSAL SAMPLE**

AGE GROUP	SAMPLE		
	OBTAINED (n = 393)	REFUSAL (n = 245)	TOTAL (n = 638)
	%	%	%
18 – 34	34	22	29
35 – 54	40	60	48
55+	26	18	23

<sup>1</sup> $\chi^2 = 26.046; p = .000$

Visitors without children were more likely to participate in the study than visitors with children. The obtained sample is somewhat under-represented by visitors with children and over-represented by visitors without children.

All items on the questionnaire were compared according to the visiting-with-children variable, so all statistically significant differences in visitor characteristics, background characteristics, and visit experiences that are related to visiting with children have been identified and are presented in the body of the report.

**TABLE III**  
**VISITING WITH CHILDREN BY OBTAINED AND REFUSAL SAMPLE**

	SAMPLE		
	OBTAINED ( <i>n</i> = 407)	REFUSAL ( <i>n</i> = 245)	TOTAL ( <i>n</i> = 652)
VISITING WITH CHILDREN	%	%	%
No	76	50	66
Yes	24	50	34

<sup>1</sup> $\chi^2 = 48.587; p = .000$

## APPENDIX AA: ELEMENTARY SCHOOL TEACHERS FOCUS GROUP DATA

**TABLE OO**  
**ELEMENTARY SCHOOL TEACHERS' MUSEUM AND GARDEN VISIT HISTORY**

<b>MUSEUM ON THE NATIONAL MALL (<i>n</i> = 12)</b>	<b>%</b>
None	42
1-2 times	25
3-4 times	25
5+ times	8
<b>BOTANIC GARDEN OR NATURE CENTER/PARK (<i>n</i> = 12)</b>	<b>%</b>
None	33
1-2 times	58
3-4 times	0
5+ times	8
<b>UNITED STATES BOTANIC GARDEN (<i>n</i> = 12)</b>	<b>%</b>
None	58
1-2 times	33
3-4 times	0
5+ times	8

**TABLE PP**  
**ELEMENTARY SCHOOL TEACHERS' MUSEUMS, PARKS AND GARDENS VISITED MOST RECENTLY WITH STUDENTS**

<b>INSTITUTION (<i>n</i> = 12)</b>	<b><i>n</i></b>
National Air & Space Museum	3
United States Botanic Garden	3
National Museum of Natural History	2
National Zoological Park	2
Green Springs Gardens Park (Fairfax Co., VA)	1
Jefferson Patterson Park and Museum (Calvert Co., MD)	1
National Building Museum	1
National Children's Museum	1
National Gallery of Art	1
National Museum of American History	1
National Museum of the American Indian	1
Port Discovery Museum Children's Museum	1
Reston Petting Zoo	1

## APPENDIX BB: MIDDLE SCHOOL TEACHERS FOCUS GROUP DATA

**TABLE QQ**  
**MIDDLE SCHOOL TEACHERS' MUSEUM AND GARDEN VISIT HISTORY**

<b>MUSEUM ON THE NATIONAL MALL (<i>n</i> = 10)</b>	<b>%</b>
None	20
1-2 times	20
3-4 times	20
5+ times	40
<b>BOTANIC GARDEN OR NATURE CENTER/PARK (<i>n</i> = 10)</b>	<b>%</b>
None	60
1-2 times	20
3-4 times	10
5+ times	10
<b>UNITED STATES BOTANIC GARDEN (<i>n</i> = 10)</b>	<b>%</b>
None	70
1-2 times	20
3-4 times	0
5+ times	10

**TABLE RR**  
**MIDDLE SCHOOL TEACHERS' MUSEUMS, PARKS AND GARDENS VISITED MOST RECENTLY WITH STUDENTS**

<b>INSTITUTION (<i>n</i> = 10)</b>	<b><i>n</i></b>
National Air & Space Museum	3
National Museum of Natural History	3
National Museum of the American Indian	2
None	2
Metropolitan Museum of Art (New York, NY)	1
Museum of History (Quebec, Canada)	1
National Building Museum	1
National Museum of American History	1
National Portrait Gallery	1
Newseum	1
Phillips Collection	1
United States Botanic Garden	1