GOODMAN RESEARCH GROUP, INC.
Program Evaluation • Consultation • Market Research

NOVA scienceNOW
Season 4
Summative Evaluation

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

WGBH has produced NOVA scienceNOW since 2005, with major funding from the National Science Foundation, the Howard Hughes Medical Institute, and the Alfred. P. Sloan Foundation. NOVA scienceNOW (NsN) is comprised of a science news and magazine television series, a companion website, and a science café outreach initiative. All NsN offerings share common goals: (a) increase public awareness and understanding of cutting edge science content, and (b) increase public engagement in science-related activities. Beginning in Season 4 of NOVA scienceNOW (NsN), WGBH increased its efforts to promote the entire NsN program – the series, website, and outreach – as a whole, and to promote it to younger audiences.

Goodman Research Group. Inc. (GRG), a research firm specializing in the evaluation of educational programs, materials, and services, has served as the summative evaluator of NOVA scienceNOW since its first season. The current process and summative evaluation took a more integrative approach than in prior years' evaluations; we examined users' engagement with all NsN resources (series, website, and outreach). The main research questions addressed in the Season Four evaluation were:

- To what extent did the NsN resources, as a whole, reach a broad audience and increase public awareness, understanding, and engagement with science content and related activities? and
- What were the implementation and effectiveness of NsN's new promotional efforts?

METHODS

Through the use of a post-only viewing and engagement study design, the evaluation examined how NsN users, with varied levels of prior experience with the program, make use of all of the resources available and how their use of the different elements influences their overall experience.

A total of 206 people participated in this research study. Based on information they provided before the study began, participants were considered either **NsN Enthusiasts** (had a great deal of previous experience with NsN) or **NsN Novices** (had little, if any, previous experience with NsN). For the purpose of the study, NsN Novices were asked to begin their NsN use by one of the following: joining an NsN fanpage (e.g., on Facebook, Twitter), viewing NsN video clips online, or visiting and exploring the NsN website. Regardless of the first experience with NsN, all participants were asked to keep track of all experiences they had with NsN resources over a period of four weeks.

The sample was approximately two thirds female, predominately white, and ranged in age from 15 to 78 years. The median age was 34 years; with more than half between the ages of 18-34.

KEY FINDINGS

NsN continues to engage most users through its longstanding established resources; participants expressed a preference for watching episodes of NsN on TV over watching online.

All participants used, learned from, and were most engaged by watching NsN on TV and online and, next, by visiting the NsN website to browse.

The NsN website was considered a valuable resource.

The site is visited repeatedly once NsN users discover it themselves (i.e., via web search) or are made aware of it by friends or family. Most visited the site to watch video clips and nearly three quarters of participants read Science News on the site

NsN-related activities often lead to more of the same or similar activities.

Participation in an online activity most often led to another online activity, while social networking activities led to other social networking activity.

Season Four episodes were on par with the previous season in terms of viewing frequency and behavior and response to the episodes.

Participants viewed more Season Four segments on TV than online, and most viewed multiple episodes. After viewing, they indicated increases in the extent to which they seek out science-related experiences, their interest in science, and their motivation to learn more about current events in science.

Social networking media were used more as a way to connect with others than to seek out information.

While approximately half of participants used NsN-related social networking, far fewer rated such activities as either the most engaging or the aspect from which they learned the most.

The newer TV-related promotional strategies used by NsN have effectively reached potential users. Primetime and late night promotions are particularly effective.

Placement of NsN directly after NOVA on television effectively brings viewers to NsN on television. Promotional spots during primetime programming were seen by more participants than were those seen during daytime or children's programming. Neil Degrasse Tyson's appearances on late night TV were seen by more participants than his appearances on morning talk shows. Beyond the direct promotional strategies, many are still learning about NsN through word of mouth.

KEY RECOMMENDATIONS

GRG recommends that NsN increase efforts to highlight the presence of NOVA scienceNOW video clips on the website, the availability of science cafés, and the presence on social networking sites. Together, these efforts may increase use among those who are newer to NsN (i.e., NsN Novices, in the current study). Lower prior familiarity with NsN episodes on TV may be seen as an opportunity for the newer emerging technologies and related NsN components.

GRG recommends future research that examines ways in which one activity can be used to promote a different type of activity. If participants learn the most from viewing NsN episodes (whether it be on television or online), future research should examine how all of the other portals could lead to this ultimate end, and determine the barriers to such connections.

GRG recommends that NsN consider the topics that have been of most interest to viewers throughout prior seasons and use those as a guide for Season 5 and 6 production. Beginning with Season 5, NsN will produce episodes comprised of 4-5 segments all in the same general content area. Participants may be drawn to topics with some familiarity to them, as they are interested in learning more about areas that are already meaningful to them.

We learned in the current study that once viewers are watching, they will stay engaged. ***NsN can capitalize on this by introducing new and innovative content in an episode that viewers will already be watching due to the topic or title that has hooked them in enough to view.***

GRG recommends promoting or including on the TV episodes some of the scientists profiled in the Secret Lives of Scientists online feature. This piece may be a key factor in drawing TV viewers to the website (if their interest in a given scientist's profile can extend to seeking out more information on the website).

GRG recommends that NsN continue to have a presence on social networking sites because this phenomenon is still growing rapidly. The use of such applications may draw viewers to other NsN-related products that they find educational or engaging.

GRG recommends NsN further enhance new promotional strategies by using and highlighting specific terminology consistently across media. Knowing that many potential NsN users are reached during primetime or evening hours, promotion should continue to target those areas and introduce terminology that prospective users will recognize, remember, and act on.

In conclusion, GRG's evaluation findings from Season 4 indicate the continued success of the NsN series and website at providing an appealing and meaningful science-related experience to a wide range of the public audience.

INTRODUCTION

WGBH has produced NOVA scienceNOW since 2005, with major funding from the National Science Foundation, the Howard Hughes Medical Institute, and the Alfred. P. Sloan Foundation. NOVA scienceNOW is comprised of a science news and magazine television series, a companion website, and a science café outreach initiative. All NOVA scienceNOW offerings share the common goals of (a) increasing public awareness and understanding of cutting edge science content, and (b) increasing public engagement in science-related activities.

Beginning this season (Season 4) of NOVA scienceNOW (NsN), and slated to continue in seasons to follow, WGBH increased its efforts to promote the entire NsN program, including the series, website, and outreach, to younger audiences. For example, full episodes were downloadable free of cost, scientist profiles appeared on the website only and were posted on YouTube and social networking sites, scientists profiled were encouraged to participate in science cafés, and promotional spots for the series aired throughout the day including during children's programming blocks.

Goodman Research Group. Inc. (GRG), a research firm specializing in the evaluation of educational programs, materials, and services, has served as the summative evaluator of NOVA scienceNOW since its first season. During that time, GRG has completed an evaluation for each season's initiatives.

Based on prior year's evaluations which revealed similar findings across the various resources and NsN components, and in consideration of NsN's increased focus on how users interact with all program components such that the program as a whole can reach a wider audience, our process and summative evaluation took a more integrative approach. Rather than evaluate each NsN component separately, the evaluation examined users' engagement with all NsN resources, including the series, website, and outreach.

Research questions addressed through GRG's summative evaluation of NOVA scienceNOW Season Four included the extent to which NsN resources, as a whole, reached a broad audience and increased public awareness, understanding, and engagement with science content and related activities, and the implementation and effectiveness of NsN's new promotional efforts.

METHODS

RESEARCH DESIGN

GRG's summative evaluation in Season 4 focused on examining NsN's success to date with their increased efforts to reach a broader audience, including younger viewers, web visitors, and science café attendees. Through the use of a post-only viewing and engagement study design, the evaluation examined how NsN users, with varied levels of prior experience with the program, make use of all of the resources available and how their use of the different elements influences their overall experience.

RECRUITMENT AND SAMPLE SELECTION

Information about potential participants was obtained from a screener survey that was designed to assess interest in and level of familiarity with NsN resources. Based on demographic information and previous experience with internet in general and NsN in particular, GRG assigned eligible and interested participants to one of four groups to ensure feedback on all elements of NsN.

Participants were considered either **NsN Enthusiasts** (had a great deal of previous experience with NsN) or **NsN Novices** (had little, if any, previous experience with NsN). NsN Novices were assigned to one of three "prescription groups" described below. All NsN Enthusiasts were assigned to a fourth, "no-prescription" category. Regardless of group assignment, all participants were asked to keep track of all experiences they had with NsN resources over the course of four weeks.

1. **NOVICE Prescription One (NsN Fan Pages)***:* Comprised of participants who indicated they were already social network users (e.g. Facebook, Twitter), but had never visited the NsN fan page on any of those sites. Members of this group were asked to join an NsN fan page, and record all experiences with NsN.

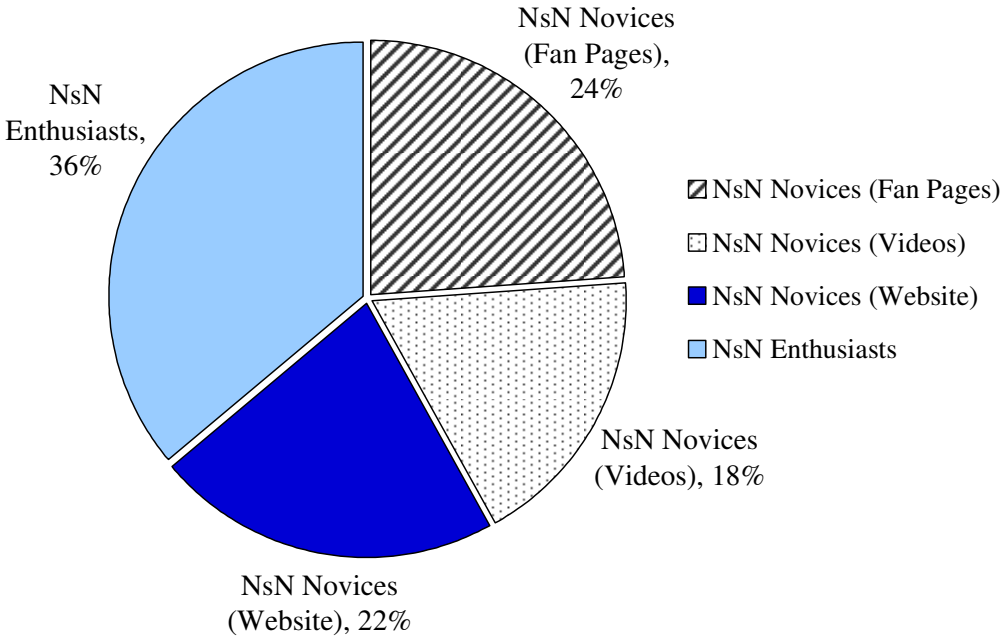
2. **NOVICE Prescription Two (NsN Online Video)***:* Comprised of participants with experience watching online videos, but who had not specifically watched any NsN video online. Members of this group were asked to view NsN videos online (e.g., NsN website, YouTube), and record all experiences with NsN.

3. **NOVICE Prescription Three (NsN Website)***:* Comprised of participants with experience using the internet, but had never previously visited the NsN website. Members of this group were asked to spend time exploring the NsN website, and record all experiences with NsN.

4. **NsN ENTHUSIASTS (no prescription):** All NSN enthusiasts were instructed to track and record their experiences with NsN during the four-week period so that we could obtain feedback about their typical means of accessing NSN resources.

Among a total of 768 respondents to the screening survey, we were able to contact 510 (i.e., some did not provide their contact information), and 236 (46%) were eligible for and interested in study participation. GRG sent instructions, via email, based on the prescription group to which they were assigned, weekly reminders to continue keeping track of their NsN experiences, and the final survey after four weeks of NsN use. A total of 206 completed the final survey, for a response rate of 87%. They were split among the four different groups, as shown in Figure 1.

Figure 1
Breakdown of Participants by Prescription



There was a significant age difference between the Enthusiast group and the Novice group, with Enthusiasts being older than Novices. Two-thirds of Enthusiasts were older than age 35, compared to one-third of Novices. This difference has been accounted for in the data analysis. It is also important to note that Enthusiasts tended to watch more NsN video segments, and that the number of segments watched also drives the difference between Enthusiasts and Novices. When reading this report it is important to take note that differences due to previous experience with NsN may also reflect the number of NsN segments participants have viewed.

DATA COLLECTION

The web-based survey was designed to learn about the ways in which participants used NsN resources, which resources led them to explore other NsN resources, and their opinions of all of the available resources. Additional questions addressed participants' familiarity with and perceptions of Season Four episodes, their general internet habits, informal science experiences, and demographic information. The full survey is in Appendix A.

Approximately three months after the study concluded, GRG sent participants a brief follow up survey with questions about participants' NsN resource use since their participation in the study. After one reminder, 170 people filled out the survey for a response rate of 83%. The majority of respondents (62%) indicated that they have used a NOVA scienceNOW resource since completing GRG's study.

RESULTS

The Results section begins with a profile of the study participants. We were particularly interested in how participants progressed through the various NsN experiences, so there is an emphasis on that and on participants' use of various NsN resources, their learning from the resources, and their engagement. Next, feedback specifically about NsN Season 4 is presented, as are results on the effectiveness of the NsN promotional strategies. The Results section concludes with data about participants' informal science activities in general and their general media uses and preferences.

PROFILE OF PARTICIPANTS

The sample was approximately two thirds female, predominately white, and ranged in age from 15 to 78 years. The median age was 34 years; with more than half between the ages of 18-34, most likely due to our heavy recruitment on Social Networking sites such as Facebook, which is commonly used by individuals in this age bracket. Table 1 displays demographic information about the participants. (Appendix B contains a full breakdown of demographic information by prescription group).

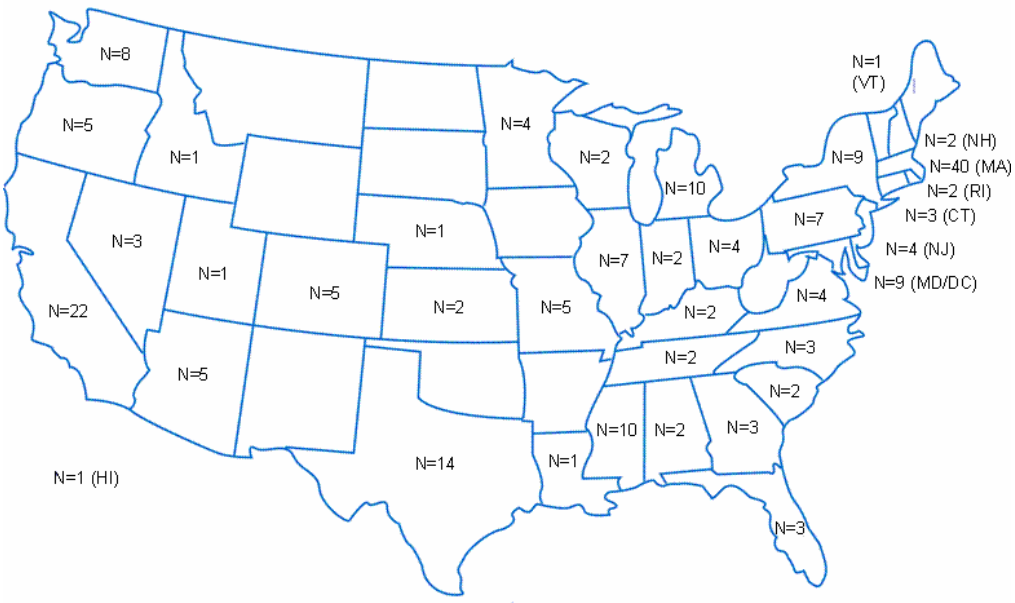
Table 1
Profile of Respondents

		% of Respondents
Gender	Male	32%
	Female	68%
Race/ Ethnicity	African American or Black	3%
	Asian	7%
	Native Hawaiian/Other Pacific Islander	1%
	Caucasian or White	85%
	Latino or Hispanic	3%
	American Indian/Alaska Native	<1%
	Other	1%
	Choose not to response	3%
Age Group	17 years or younger	<1%
	18-34 years	52%
	35-49 years	31%
	50-64 years	13%
	65 years or older	4%

N=206

Study participants were from around the country. The U.S. map (Figure 2) shows that all but eight states had at least one participant.

Figure 2
Distribution of Study Participants



PROGRESSION OF NSN EXPERIENCES

Once a person engaged with a particular NsN resource, he or she was likely to go to another similar activity after that.

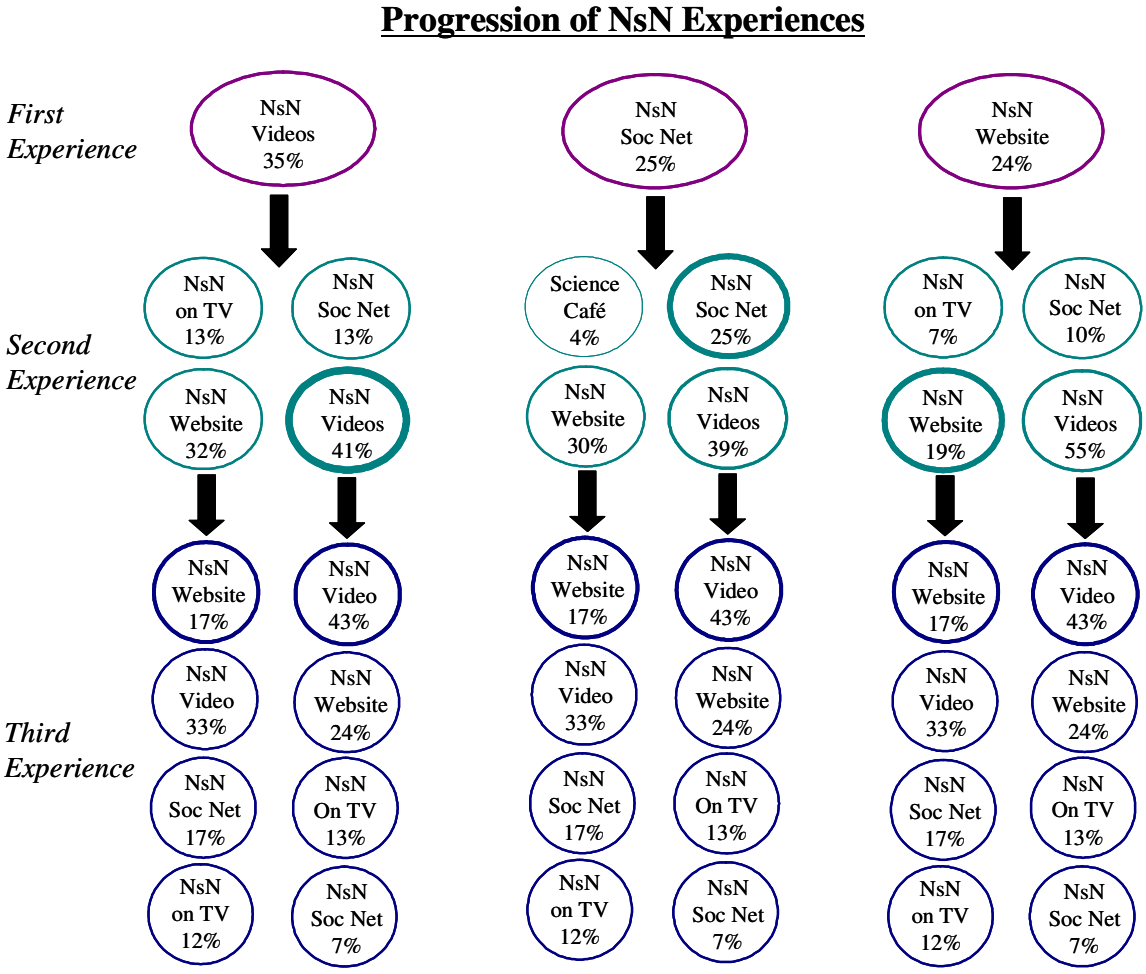
Use of NsN resources more often led to more use of the same or similar resources, rather than to a different NsN activity.

Over the four weeks of the study, the majority of participants watched video segments regardless of their first NsN activity. An interesting pattern of results was revealed for the progression of participation in NsN activities, as we attempted to determine whether certain types of activities were more or less likely to lead to other NsN-related activities. While no one particular activity clearly and consistently predicted another, overall it appeared that certain *types* of activities most often predicted more of that same type of activity in the future. This was true for both Novices and Enthusiasts.

For example, participating in an online NsN activity (e.g., watching an NsN video clip online, visiting the NsN website) led to another online NsN activity. Similarly, participation in a social networking activity (e.g., joining a NsN-related Facebook group, following NOVAonline on Twitter), more than any other NsN activity, led to another social networking activity.

Figure 3 is a pictorial representation of the most common progression of NsN-related experiences. Each bold circle represents the NsN-related experience that most commonly followed a previous NsN-related activity. For example, the figure highlights the finding that watching NsN videos first (carried out by 35% of respondents) most often led to watching NsN videos as the second experience (41%) and the third experience (43%). In addition, social networking activities were more likely to lead to other social networking activities than were any other type of NsN-related activities.

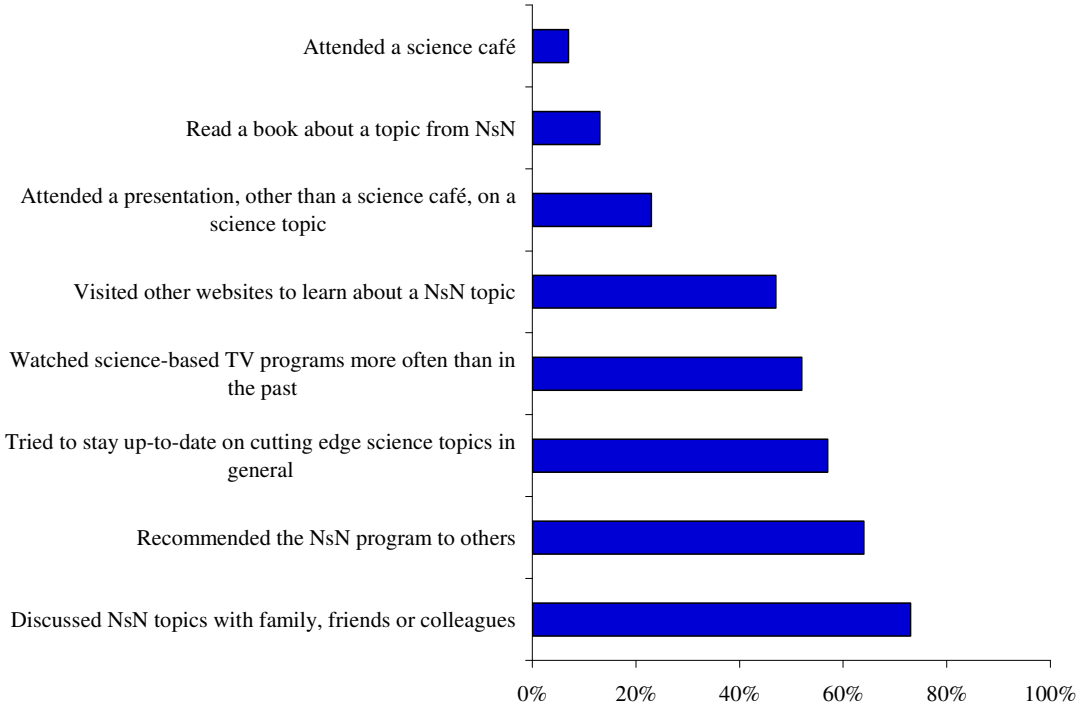
Figure 3
Progression of NsN Experiences



Since they entered the study, participants engaged in a wide variety of NsN-related activities; discussing the show with others was most popular.

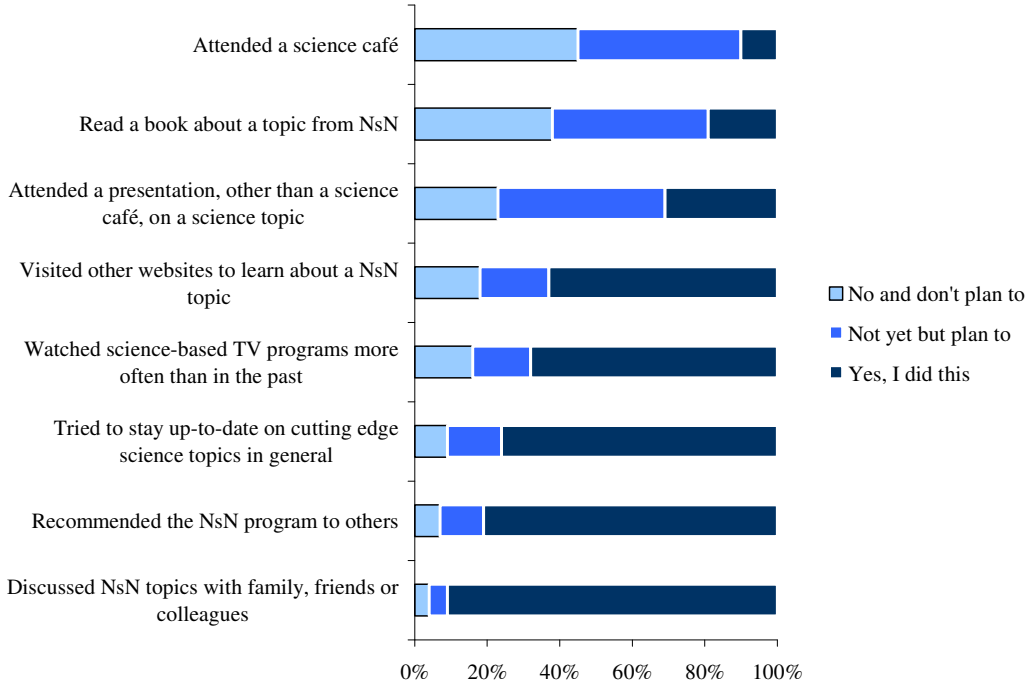
Participants were asked about their involvement in a number of science-related activities since entering the study. As shown in Figure 4, the majority had discussed NSN-related topics with family, friends, or colleagues (73%) and had recommended the NsN program to others (65%). In contrast, few respondents had read a book about a topic from NSN (13%) or attended a science café (7%).

Figure 4
Proportion of participants who participated in various NsN-related activities



Participants also indicted whether they *planned* to participate in these activites in the future. Figure 5 illustrates participants' self-reported plans. As is evident from the graph, a large percentage had already participated in most of these activities. In addition, a sizable percentage planned either to attend a presentation (other than a science café) on a science topic, read a book about a topic from NSN, or attend a science café. An equal percentage, though, had no plans to attend a science café.

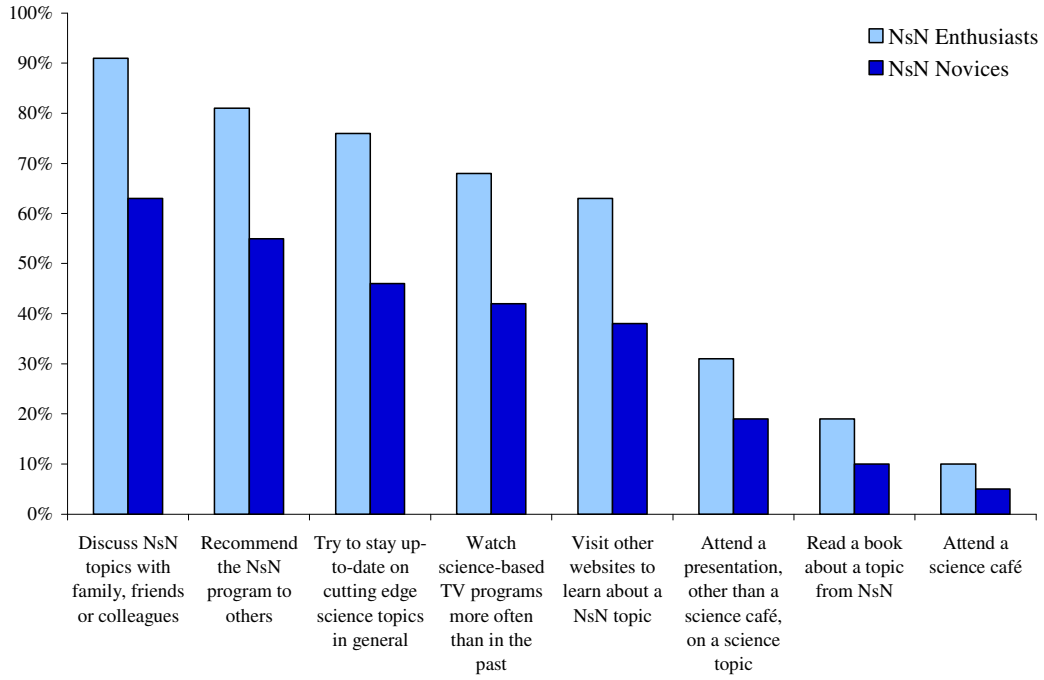
Figure 5
Actions versus intentions to participate in NsN-related activities



A statistically higher proportion of NsN Enthusiasts (and those who viewed more NsN segments), relative to NsN Novices, had participated in this set of science-related activities during the study, as illustrated in Figure 6. In particular, 90% of Enthusiasts, compared to 60% of Novices, discussed NsN topics with family, friends, or colleagues. In addition, a high percentage of Enthusiasts recommended the NsN program to others, and they attempted to stay up-to-date on science topics by watching science-based TV programs and visiting science-based websites.

These findings were true for younger (younger than 35 years old) and older (35 and older) respondents alike, with the exception of recommending the NsN program to others. In this regard, the Enthusiast-Novice difference was observed only among respondents younger than age 35.

Figure 6
Most commonly experienced science-activities by NsN background



USE OF VARIOUS NSN RESOURCES

Use of NsN resources parallels participants' general internet habits.

All participants used a wide variety of NsN resources over the course of the study, as shown in Figure 7. Most respondents visited the NsN website just to browse (76%) and to watch NsN video clips on the website (78%), while almost two-thirds viewed NsN episodes on TV (62%). In contrast, only 6% watched NsN video clips on iTunes. All of these findings parallel respondents' patterns and frequency of *overall* internet use, as shown in Figure 8.

Figure 7
Percent participation in NsN-related activities

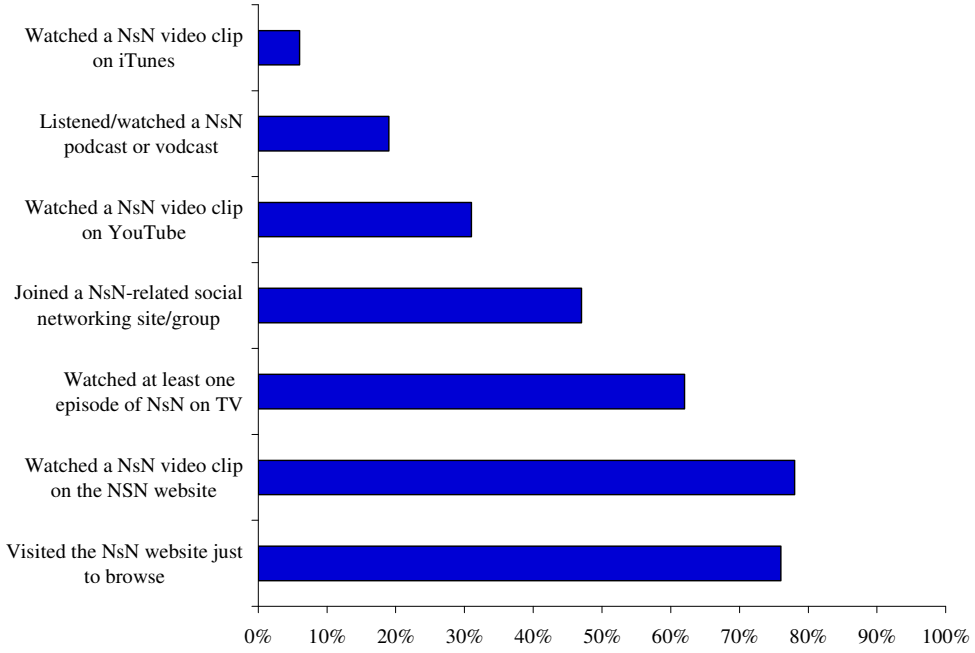
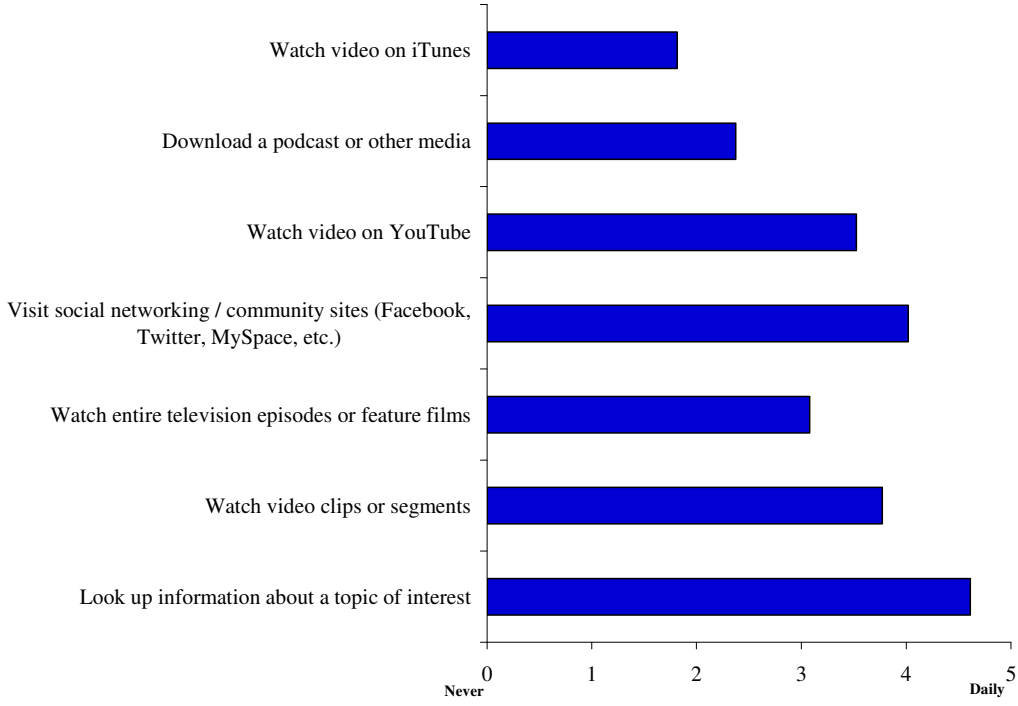


Figure 8
Frequency of participation in *general* online activities



Regular use of general online resources differs among younger and older participants and this is paralleled in our NsN study.

Similar to other research that suggests that older audiences participate in online

activities with less frequency than do younger audiences, in this study we documented statistically significant differences between age groups in their online activity. Table 2 displays differences between younger participants (under 35 years old) and older participants (35 years old and older).

Table 2
Activities in which more than one-quarter of participants indicated *Daily* participation, by age group

Younger Participants	Older Participants
Visit social networking sites (Facebook, Twitter, MySpace, etc.)	Visit social networking sites (Facebook, Twitter, MySpace, etc.)
Share/Send email, bookmarks, or recommendations to friends	Share/Send email, bookmarks, or recommendations to friends
Look up information about a topic of interest	Look up information about a topic of interest
Get News	
Watch video clips or segments	
Seek information related to a hobby	
Read blogs	
Look up information about a topic of interest	
Get News	

The large majority of participants visited and browsed the NsN website and viewed NsN episodes on TV and/or online.

The top four NsN resources used by the most people were:

- 78% watched a NsN video clip on the NsN website;
- 76% visited the NsN website just to browse
- 61% watched at least one episode of NsN on TV; and
- 43% joined a NsN group on Facebook.

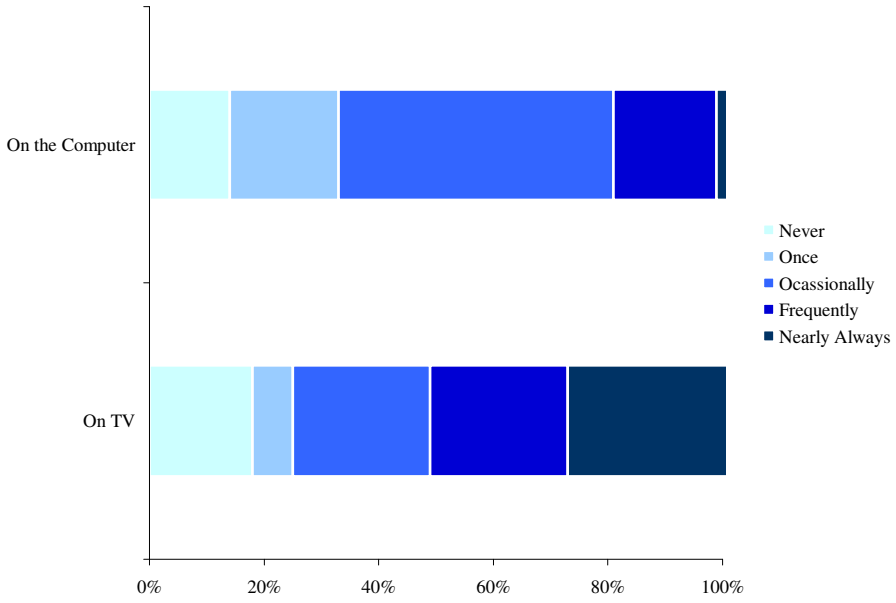
The only resource of the four for which there was a difference between the NsN Enthusiasts and the NsN Novices was NsN on TV: 81% of Enthusiasts versus 52% of Novices had watched it on TV. A complete breakdown of the NsN resources used is in Appendix C (annotated survey instrument).

Watching NsN on TV is more popular than watching it online.

Among those who watched NsN during the study, more than half (53%) preferred to watch NsN episodes on the television; prior season's shows were on the air during the study period. One in five (21%) reported they preferred watching NsN episodes online, and more than a quarter (26%) of respondents had no viewing format preference.

After participation in the study, respondents viewed NsN episodes *on television* more frequently than they viewed of NsN episodes *online*. Compared to the nearly 30% of respondents who watched nearly every episode of NsN on television, only 2% of respondents indicated that they watched nearly every NsN segment on the computer (See Figure 9). The largest percentage of respondents (48%) reported they watch NsN via the computer/download *occasionally* and 14% indicated that they *never* watch NsN via the computer/download.

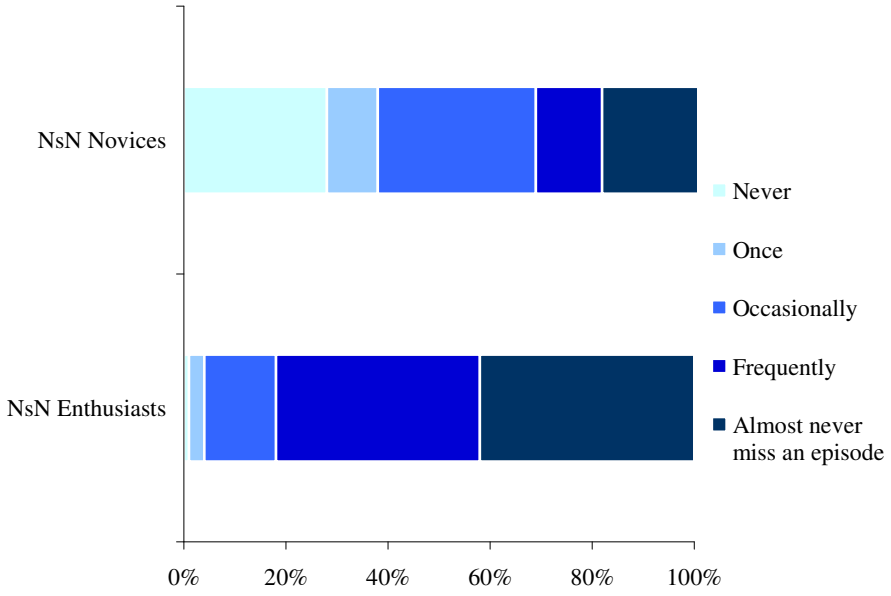
Figure 9
Frequency of NsN4 Season 4 Episode Viewing by Media Type



NsN Enthusiasts (who were already familiar with NsN before the study) reported viewing the episodes on TV, throughout the course of the study, more than did the Novices.

Before the study began, 65% of participants had watched at least one episode of NsN in any format (e.g., on TV, online, etc). At the end of the study, 89% of participants (n=183 of 206) had done so. As shown in Figure 10, not surprisingly, a much larger percentage of NsN Enthusiasts (82%) than NsN Novices (32%) watched NsN *almost always* or *frequently* ($p<.001$). (A separate statistical test confirmed that this difference held up when controlling for age difference between the two groups.)

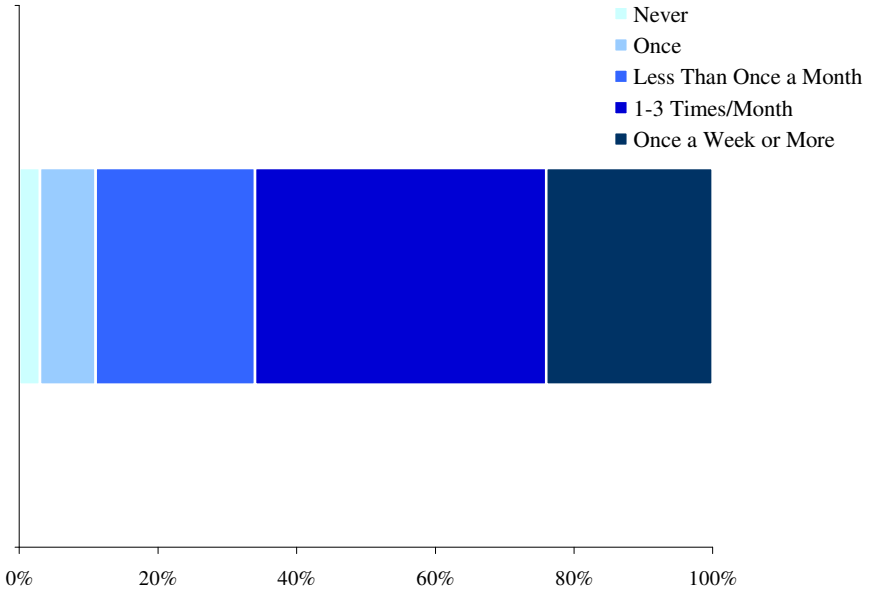
Figure 10
Frequency of NsN episode viewing on television by prescription group



Those who were already using the website before the study began continued using it frequently throughout the study period, and more than half of those who were told to use the website at least once *continued* to do so multiple times.

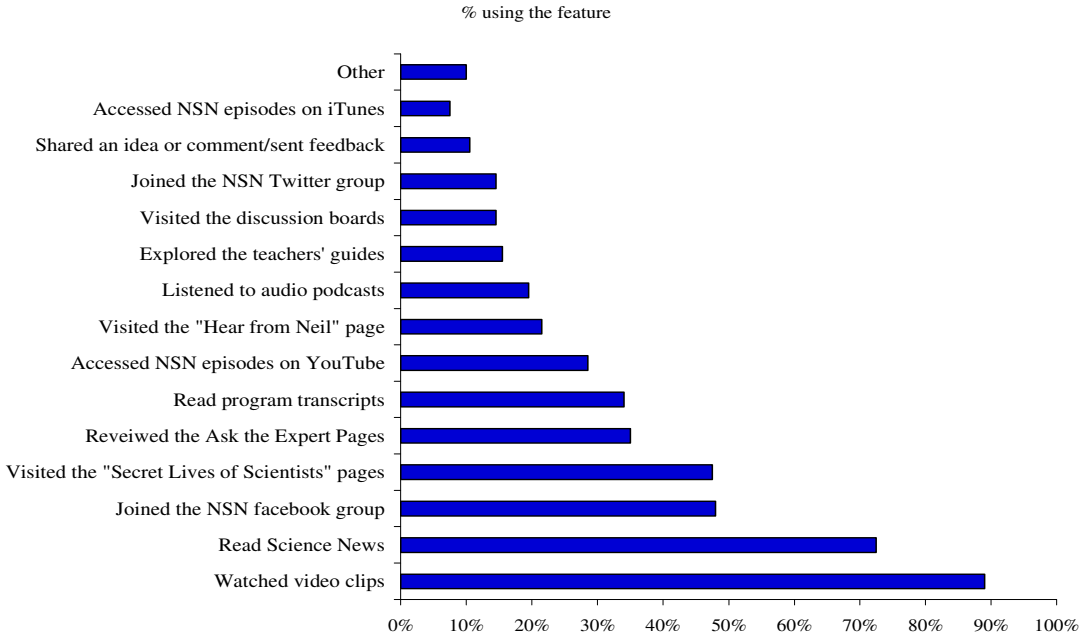
Prior to the study, only half of participants had visited the NsN website. After the four-week study, all but six participants (97% of the sample) had visited the website and nearly one in four reported visiting *once a week or more* during the study period. (See Figure 11.) No significant differences existed in frequency of website visitation among older and younger participants.

Figure 11
Frequency of NsN-website Visits



Participants accessed a variety of the NsN website features, as shown in Figure 12. A large majority watched video clips (89%) and read Science News (73%) on the site. Far fewer interacted on the site by sharing an idea or comment (10%) or accessing NSN episodes on another site (e.g., 8% accessed video via iTunes.).

Figure 12
Proportion of Participants Using each of the Various NsN Website Features



Secret Lives of Scientists has yet to find a sizeable audience.

Overall, viewership of the *Secret Lives of Scientists* web pages on the NsN site, a new feature that was launched just two months before the study began, was not very high. Joe DeGeorge's and Mark Disall's pages were viewed by the most participants; approximately one quarter of participants reviewed their pages (see Table 3).

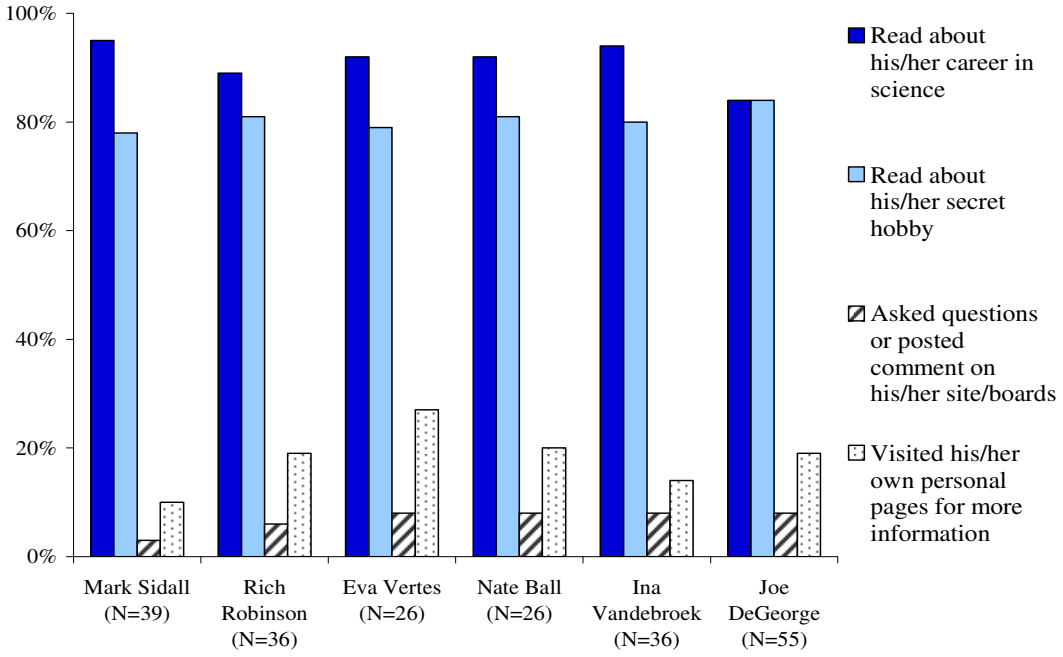
Table 3
Viewership of Each Scientist's *Secret Lives of Scientists* Page

Scientist	% Who Viewed Page
Joe DeGeorge	27%
Mark Disall	20%
Rick Robinson	18%
Ina Vandebroek	18%
Eva Vertes	13%
Nate Ball	13%

Participants are reading what is shown on the SLoS pages, but are not clicking or interacting further with the featured scientists.

The majority of those who visited the *Secret Lives of Scientists* pages read about the scientists' careers and about their secret hobbies. Fewer went beyond reading the information presented on the page to read more on the scientists' personal web pages or to pose questions or comments on the site. While only 13% of participants viewed Eva Vertes' pages, hers was the profile that participants engaged with most thoroughly. (See Figure 13.) (Percentages are reported with respect to only those participants who reported reading about that scientist.)

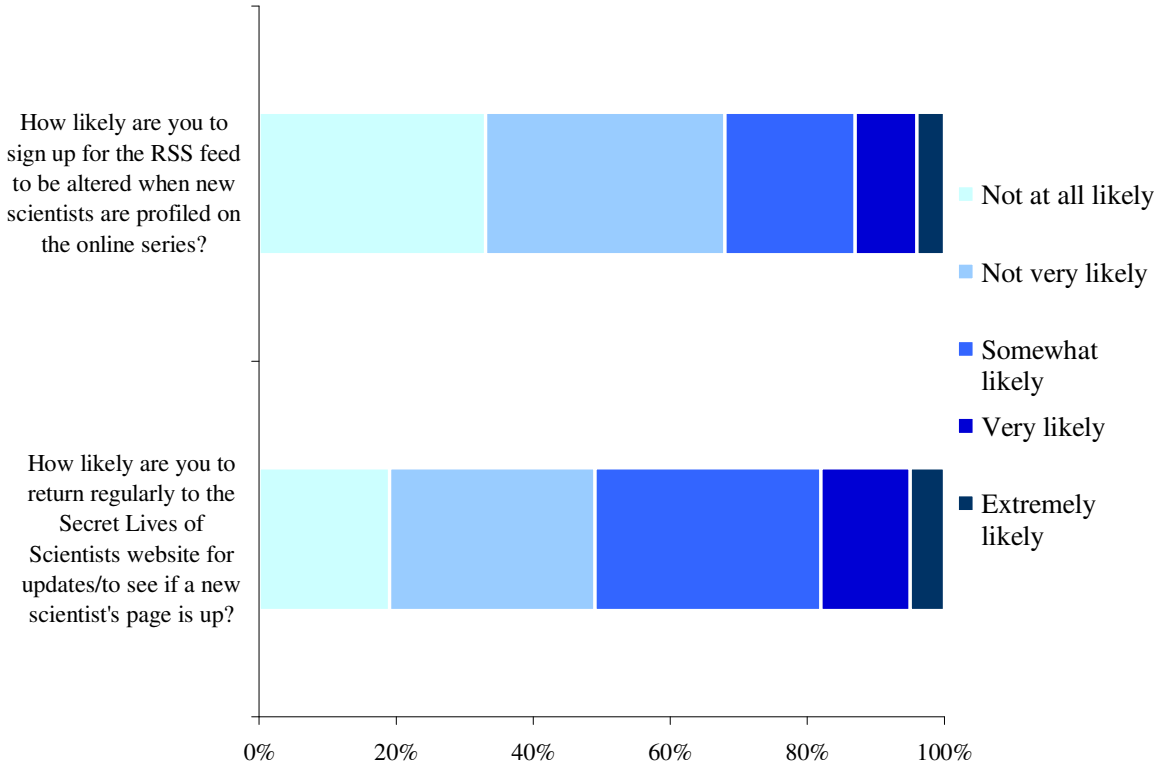
Figure 13
Participation in SLoS Page Activities, by Scientist



The relatively low use of the *Secret Lives of Scientists* pages may be due, in part, to how new the feature was, both in content and format (i.e., web-only series). All participants, whether or not they reviewed the *Secret Lives of Scientists* pages, had mixed opinions regarding the online-only format. Half (52%) liked this format (58% of younger adults and 46% of older adults liked this format). Thirty-nine percent of all respondents said they would prefer it to be available as both a web *and* a TV series, and 9% would prefer it be on TV only.

Following the above findings, just over half of the participants (51%) reported they were *somewhat* to *extremely likely* to return regularly to the *Secret Lives of Scientists* website for updates or to see if a new scientist's page was posted or to sign up for an RSS feed that would alert them when a new scientist was profiled; the other half were *not very likely* to return to the page. On a scale from 1 (*Not at all likely*) to 5 (*Extremely likely*), the average responses were 2.56 (likely to return regularly) and 2.19 (likely to sign up for an RSS Feed) out of 5. (See Figure 14.) Younger and older participants had similar opinions.
return

Figure 14
Likelihood of Participation in Future *Secret Lives of Scientists* Activities



A large percentage of participants have heard about science cafés (typically from the NsN website), yet only a small percentage have actually participated in them.

While knowledge of science cafés was high among participants, actual participation remained low. Most (79%) had at least *heard of* science cafés, even if they did not know what they were, yet only 10% (n=20) had participated in one as either an attendee or an organizer. Note: A few more participants indicated having participated in a Science Café after participation in the study.

Those who were familiar with science cafés learned about them primarily through the NsN website; nearly three quarters listed the website as their source of information about the concept. A smaller proportion (26%) learned about science cafés from a friend or colleague or from direct communication with WGBH or NOVA scienceNOW staff.

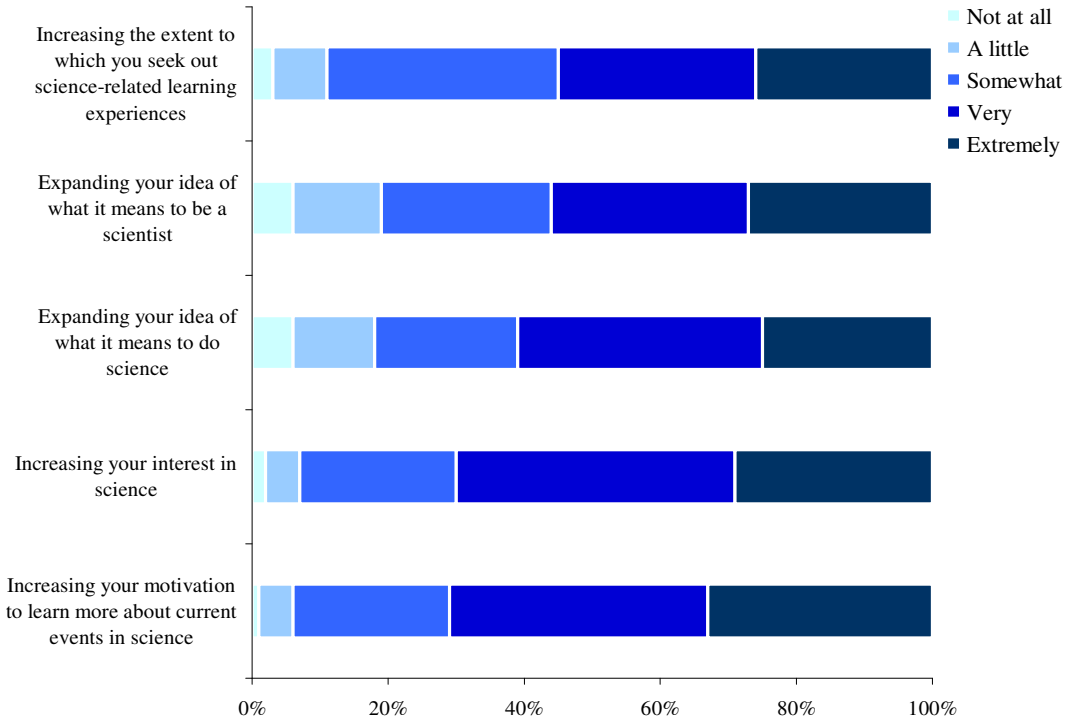
Visitation to the science cafés website (www.sciencecafes.org) was also low. Most participants did not visit very frequently (i.e., less than once a month), and their main purpose for visiting was to find a science café near them (61%; n=35) or to learn more about the concept (32%; n=18).

LEARNING FROM AND ENGAGEMENT WITH NSN

NsN4 has had a positive influence on participants' science-related interests.

The fourth season of NsN was successful at enhancing participants' science-related attitudes and interests. Ratings, on a scale from 1 (*Not at all effective*) to 5 (*Extremely effective*), suggested positive changes after viewing NsN4 segments in viewers' interest in science, their motivation to learn more about current events in science, the extent to which they seek out science-related learning experiences, and their ideas of what it means to be a scientist and do science. All of these items were rated higher than the midpoint of the 5-point scale, as shown in Figure 15.

Figure 15
Extent to Which NsN was Successful at Accomplishing its Goals



Older participants rated the extent to which watching NsN season 4 expanded their ideas of what it means to be a scientist and what it means to do science higher than did younger participants. Also, participants who watched more of NsN (17-32 segments) rated the extent to which watching expanded their ideas of what it means to be a scientist and what it means to do science significantly higher than did the participants who watched fewer segments (1-16 segments).

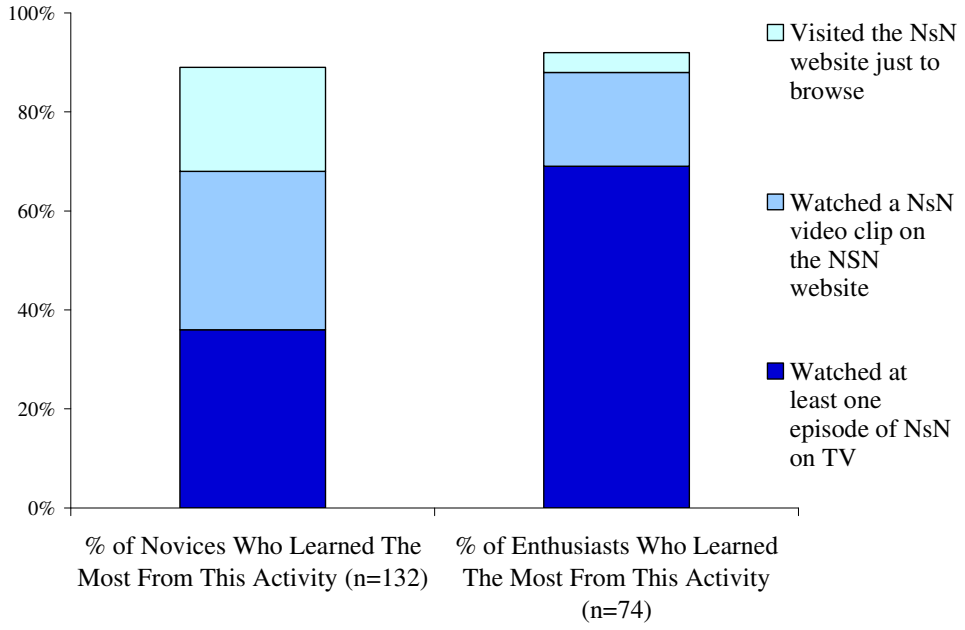
Use of NsN resources was similar among NsN Novices and Enthusiasts, but opinions of what they *learned the most from* was different for the two groups.

Almost half of participants joined a NsN group on Facebook, yet very few indicated this was the experience they learned the most from or found the most engaging.

More than three-quarters of all respondents listed viewing NsN – either episodes on TV (48%) or video clips on the NsN website (28%) – as the experience from which they learned the most. However, while the majority of NsN Enthusiasts (69%) indicated learning the most from watching an episode of NsN on TV, NsN Novices were much more varied in their responses. As shown in Figure 16, the three activities were each selected by a comparable proportion of Novice respondents.

Not shown here is that there was a difference between younger and older Novices in terms of identifying NsN website browsing as the experience from which they learned the most. Novices younger than age 35 were more likely to identify this experience than were Novices older than age 35 (30% compared to 14%). (The Appendix contains a list of all the NsN resources from which they learned.)

Figure 16
Proportion of NsN Novices and Enthusiasts Rating Each NsN Resource as the One They Learned the Most From



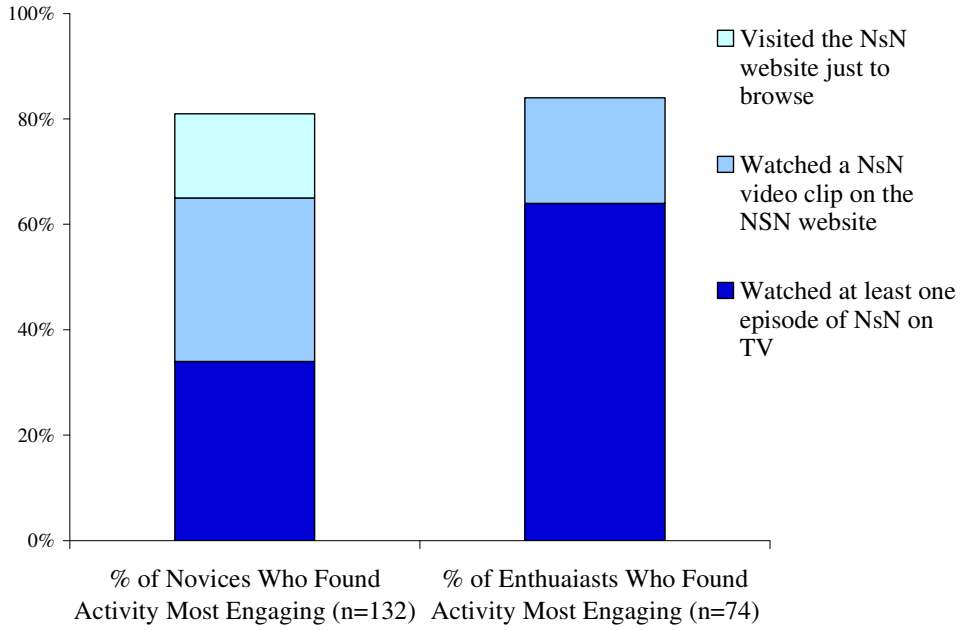
Viewing NsN episodes on TV was rated as the *most engaging activity* by the largest proportion of participants overall; however, there was a difference between NsN Enthusiasts and Novices in what they found to be most engaging.

Nearly two-thirds of NsN Enthusiasts were most engaged by episodes of NsN on TV, and video clips on the website were rated second most engaging. NsN Novices, on the other hand, were more split in their opinions: 35% rated episodes on TV as most engaging, 31% chose video clips on the website, and 16% chose

visiting the website just to browse. In contrast, no Enthusiasts mentioned browsing as most engaging. (See Figure 17.)

Similar to what was reported above, Novices younger than age 35 were more likely to identify website browsing as an engaging experience than were Novices older than age 35 (25% compared to 11%). The Appendix contains a list of which resources were rated as most engaging.

Figure 17
Proportion of NsN Novices and Enthusiasts rating each NsN resource as most engaging



FEEDBACK SPECIFICALLY ON NSN SEASON 4

Season 4 episodes specifically were viewed on TV with regularity.

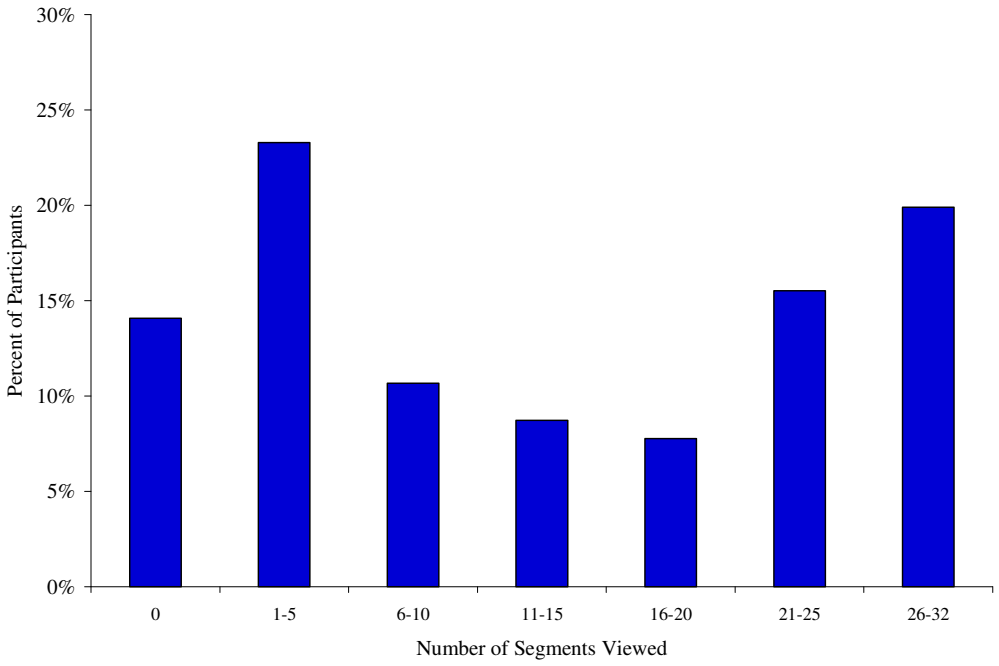
The fourth season of NOVA scienceNOW (NsN4) aired this past summer (June-September, 2009). On the final survey, participants reported that during the summer season of NsN:

- More than a third (36%) had watched NsN4 episodes on television *almost every week*
- 19% of respondents watched approximately *every other week*.
- 17% watched *at least one time*.
- 28% of respondents *did not watch any* NsN4 episodes on television.

Regardless of whether they watched on TV or online, the majority of participants viewed multiple segments of NsN4. The segment on Sleep was viewed by the highest percentage of viewers.

The degree of NsN4 viewing varied widely across participants, as shown in Figure 18. More than a third of respondents (36%) had viewed 20 or more of the segments, 23% viewed one to five segments, while only 14% of respondents had not viewed *any* of the NsN Season 4 segments either on TV or online.

Figure 18
Number of NsN Season 4 Segments Viewed



Either online or on television, before and during the study, more than 60% of respondents reported they watched the following segments:

- Sleep (71%)
- How Memory Works (66%)
- The Science of Picky Eaters (65%)
- Autism Genes (63%)

One third or fewer of respondents indicated they had watched:

- Smart Sea Lions and Talking Walruses (33%)
- Profile: Franklin Chang-Diaz - First (29%)
- Mystery of the Gakkel Ridge (28%).

On average, participants watched more than half (57%) of the Season 4 segments on TV and 35% of them online. They watched the remainder (12%) both on TV and online.

Viewers enjoyed the NsN Season 4 segments and found them interesting.

On average, participants assigned a rating of 4.27 out on a scale from 1 (*Poor*) to 5 (*Excellent*). Nearly half (43%) rated the season overall as "*Excellent.*" Individual segments were differentially received across participants. No one segment stood out as being the clear favorite of the season. In fact, all segments except one (Profile: Lonnie Thompson) received at least one vote for being the NsN4 segment that *most* stood out.

Segments that stood out as favorites were those in which viewers had either a general interest in the topic or either a personal or professional connection to the topic.

Five segments stood out most for 11 or more participants:

- *How Memory Works* (n=20 participants)
- *Sleep* (n=18)
- *Autism Genes* and *The Science of Picky Eaters* (n=16 for each one)
- *Saving Hubble Update* (n=11).

Four common themes emerged when participants described why a segment was their favorite of the season. These included:

- General interest in the segment topic (56% of responses)
- The topic had personal meaning for the viewer (22%)
- The topic was related to their job/field of study (7%)
- Enjoyed the way the topic was presented (7%)

Appendix D shows a representative sample of responses within each theme for the most popular five segments.

Increased exposure to NsN Season 4 segments was associated with more positive attitudes about science.

Generally, those who viewed more of the Season 4 segments rated the influence on their overall science attitudes as significantly stronger than did those who viewed fewer segments.

Table 4
Effectiveness of NsN Season 4 Episodes by Number of Segments Viewed

	Mean (1-5)	
	Participants who viewed fewer (1-16) segments	**Participants who viewed more (17-32) segments**
Increasing their interest in science*	3.71	4.15
Increasing their motivation to learn more about current events in science*	3.67	4.32
Increasing the extent to which they seek out science-related experiences*	3.32	4.07
Expanding their idea of what it means to do science*	3.19	4.12
Expanding their idea of what it means to be a scientist*	3.14	4.04

Scale: 1 (not at all) to 5 (extremely)
*p<0.05

Similarly, those who viewed more segments rated the season overall higher than those who viewed fewer segments.

Table 5
Overall Rating of NsN Season 4 by Number of Segments Viewed

	Mean (1-5)	
	Participants who viewed fewer (1-16) segments	**Participants who viewed more (17-32) segments**
Their overall rating of NsN season 4*	3.92	4.66

Scale: 1 (poor) to 5 (excellent)
*p<0.05

EFFECTIVENESS OF NSN PROMOTIONAL STRATEGIES

To date, traditional promotional efforts are working better than newer forms of promotion.

The NsN resources were discovered by participants in a variety of ways. Most effective were the more traditional forms of promotion, including: visiting the NsN website, NsN airing immediately following NOVA, and primetime promotional spots. These were the promotional efforts most often encountered, regardless of age group, as shown in Table 6.

Table 6
Promotional efforts encountered by greater than one-third of participants, by age group

Younger Participants	Older Participants
NOVA Website (67%)	NsN Commercial (64%)
NsN Commercial (45%)	NOVA Website (60%)
NOVA leading to NsN (39%)	NOVA leading to NsN (59%)
Hearing of NsN via word of mouth (36%)	Watching NsN with someone (39%)
	Neil DeGrasse Tyson-Related Experience (36%)

Exposure to NsN most often resulted in individuals having conversations with others about either NsN itself or a science-related topic, highlighting the success of NsN at sparking science-related dialogue.

While nearly half (45%) of all respondents were aware of "Super Science Tuesdays," a higher percentage of those who watched more NsN segments (69%) than those who watched fewer segments (28%), younger and older alike, were aware of this term. This suggests that enhanced and continued promotion of the term is likely to reach more viewers, over time.

NsN promotional strategies led most often to conversations with others about either a science topic or about NsN specifically.

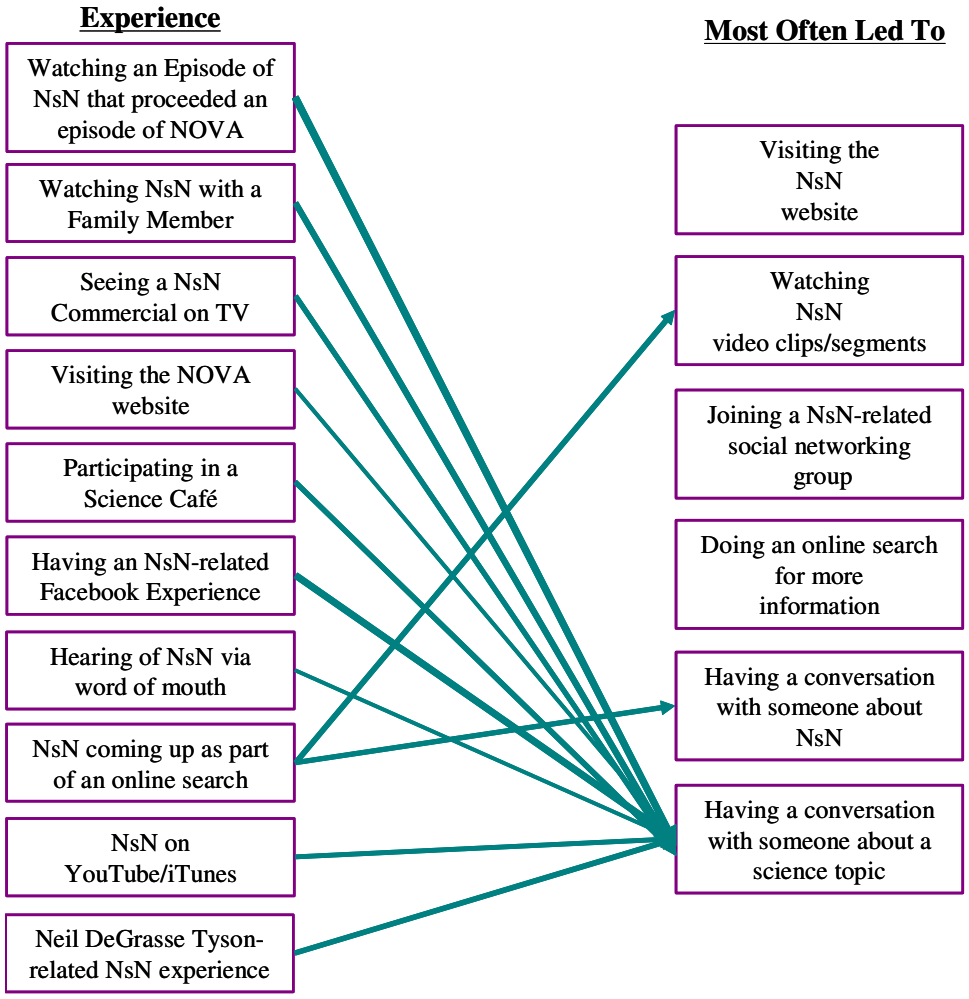
More in-depth analysis of participants' progression and movement among the various NsN resources, including the various ways the program was promoted, highlighted which experiences were more or less likely to result in future NsN-related experiences. Figure 19 presents participants' behaviors after experiencing various NsN-related resources or promotional strategies. The green arrows represent the activity that each type of exposure led to in the highest proportion of respondents.

- Watching an episode of NOVA and then NsN led to the highest percentage of any other NsN-related activities. More than three quarters of those who watched an NsN episode went on to have a conversation with someone about a science topic (86%) or have a conversation with someone about NsN (76%).
- Watching NsN with a family member was the experience that led most often to having a conversation with someone about a science topic.
- Visiting the NsN website was the experience that most often led to individuals further exploring the NsN website. Nearly three quarters

(71%) of those who visited the NsN website wound up subsequently watching a NsN video segment.

- Coming across NsN as part of an online search led 86% of respondents to visit the NsN website and sparked conversation with others about NsN related topics in 48% of the participants.
- Seeing a commercial or promotional spot for NsN or having an NsN-related social networking experience was less likely to lead to further NsN- or science-related experiences.

Figure 19
Patterns of NsN-related Experiences Following Promotions



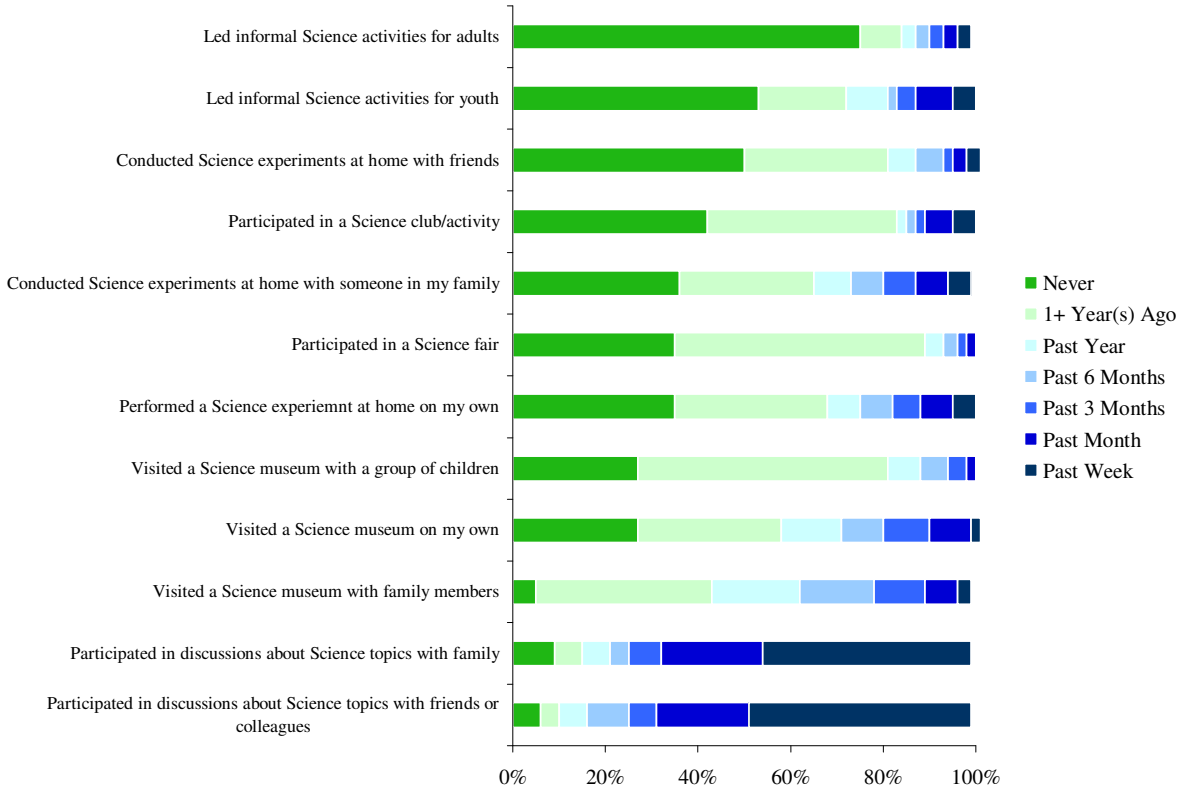
PARTICIPANTS' GENERAL INFORMAL SCIENCE ACTIVITIES

Participants frequently engage in discussions about science topics with family, friends, and colleagues.

Before this study began, many of the participants had engaged in science-related activities. For instance, 31% of the sample reported that they were either currently studying or working in a science related field. While we did not recruit specifically for individuals interested in science, the screener link was posted on the NOVA scienceNOW website. We can assume that people already interested in science would be more likely to participate in a study about NOVA scienceNOW than people who have little previous science experience. Below are examples of the ways in which participants engaged in science discussions and activities:

- As shown in Figure 20, almost half of all participants engaged in discussions about science topics with friends/colleagues (48%) or with family (45%) in the past weeks (i.e., just prior to completing the survey) and more than two-thirds had done so in the past month.
- More than one third of participants (37%) visited a science museum with a family member within the past 6 months. More than two out of every five of participants (43%) visited a science museum on their own in the past year.
- One quarter of participants had led informal science activities for adults at some point in time while half of participants had conducted science experiments at home with friends (although only 20% had done so in the past year).

Figure 20
Most Recent Participation in Science-related Social Activities



Study participants also reported they typically turn to a variety of media to seek out science-related content.

- Two thirds of participants indicated having read a magazine article and/or newspaper article about current science research in the past month, and over 40% had done so in the past week.
- More than half of participants indicated having listened to a story about current science research on the radio (58%) and having watched a non-PBS TV show related to science topics (52%) in the past month. More than one quarter had done so in the past week.
- Very few participants had signed up for an RSS feed about current science research in the recent past; 56% indicated having never done this.

PARTICIPANTS' GENERAL MEDIA USES AND PREFERENCES

Social networking is being used quite often, but is not necessarily considered educational.

While social networking activity has been more common among younger individuals, the number of adults with profiles on social networking sites has increased more than fourfold since 2005 (Pew Internet & American Life Project, Dec 2008). Three quarters of Americans ages 18-24 use these types of sites, and almost 60% of individuals ages 25-34 use them. A recent New York Times article reported that more than half of all Facebook members in the U.S. are 35 or older (http://www.nytimes.com/2010/03/07/business/07digi.html).

A high percentage of our sample participated in social networking, most likely due to our recruitment methods (i.e., recruitment via the NsN website and NsN's social networking sites).

- In our study, 90% of the younger respondents were members of Facebook, compared to 71% of the older participants.
- After participation in the study, more than half (56%) of those who had indicated being social network users before participating in the study were members of a Facebook group related to NsN (compared to 33% before participation in the study).
- More than one third (36%) of social networkers were also members of Facebook groups, other than NsN, with science content (a list of the NSN and non-NSN science-related Facebook groups participants belonged to can be found in the Appendix).

These findings are comparable to those we have seen for other multimedia resources with a presence on Facebook. Many of those already on Facebook report becoming a "Fan" of the project under evaluation before or during the course of the study. Although Facebook users do not necessarily see the organization's Facebook page as educational, they would be interested and

willing to see more advanced or academic information or resources posted on the social networking site (GRG, 2010).

Paralleling the general popularity of social networking sites such as Twitter and MySpace relative to Facebook among the general public, far fewer participants indicated they are active on other social networking sites.

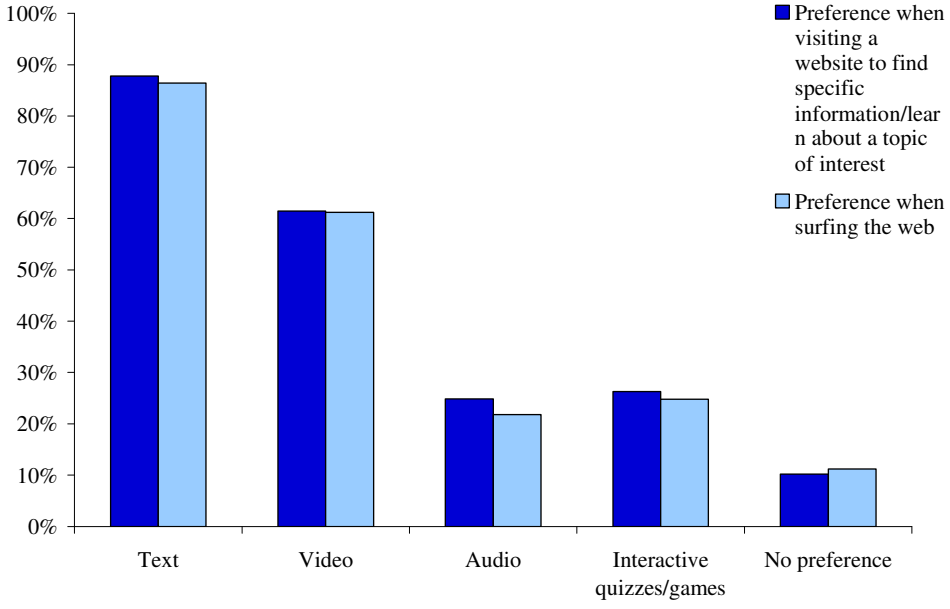
Whether looking for specific information or just surfing the web, participants were most interested in reading text and watching video.

- Before the study began, 32% of respondents (N=67) were members of Twitter; and at the end of the study, 35% of respondents (N=71) were Twitter members.
- Approximately half (51%) of these 71 participants were followers of NOVAonline on Twitter after the study (compared to 10% of Twitter users who indicated receiving NOVA or NsN related Twitter messages before participation in the study).
- After participation in the study, half of these 71 Twitter users also indicated following other science related content on Twitter (a list of the science-related Twitter groups participants followed to can be found in the Appendix).

Most participants like to read text and watch videos on websites.

When visiting a website for the purpose of finding specific information or to learn about a topic of interest, the large majority (88%) like text. Almost two-thirds (62%) also like video. Approximately one quarter of respondents indicated liking audio components (25%) or interactive quizzes/games (26%) and one in ten respondents had no preference. When they are surfing the web without a specific purpose, preferences are nearly identical. No age differences were revealed. (See Figure 21.)

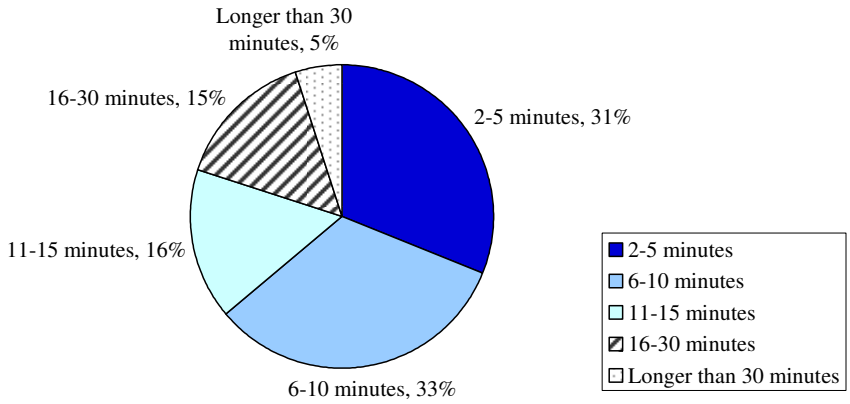
Figure 21
Preference for Website Formats



Most participants prefer podcasts 2-10 minutes in length.

It does not appear that one specific length of podcast is uniformly more desirable than another. While the option of 6-10 minutes was most favored by our sample, receiving 36% of the votes, responses ranged from 2-5 minutes to over 30 minutes, as shown in Figure 22.

Figure 22
Preferences for Length of Podcasts



At the time they completed the survey, about one quarter of the sample reported they followed blogs related to science.

More than half of participants in the current study (58%, n=119) followed blogs on the internet. Almost half of them (n=54) followed blogs related to general science topics and 11 of them followed blogs specifically related to NsN content.

Fewer than one in five (19%) respondents currently has a blog of his or her own that they update regularly. Topics respondents blogged about varied from science to food to family to politics (The Appendix contains a complete list of the topics about which participants blog.)

CONCLUSIONS AND RECOMMENDATIONS

GRG's summative evaluation of NOVA scienceNOW Season Four addressed the broad questions of most interest to WGBH, with a focus on the following:

- To what extent have the NsN resources, as a whole and individually, reached a broad audience?
- To what extent has NsN increased public awareness, understanding, and engagement with science content and related activities?
- How effective are NsN's new promotional efforts?

The evaluation's findings demonstrate the continued success of the NsN series and website at providing an appealing and meaningful science-related experience to a wide-ranging public audience.

NsN continues to engage most through its longstanding established resources.

Participants express a preference for watching episodes of NsN on TV over watching online; this is particularly true of NsN Enthusiasts, and specifically those participants who had watched a greater number of NsN segments. All participants used, learned from, and were most engaged by watching NsN on TV and online, and by visiting the NsN website to browse. NsN Novices, in particular, gave extremely high ratings.

Among the fairly small number of study participants who attended a science café, the experience was considered educational and engaging. Moreover, after participation, attendees tended to continue to discuss science topics with others. Science cafés were rated higher by NsN Novices than by Enthusiasts. Within this evaluation sample, science cafés were definitely underused; more participants had heard of them than had attended one as either an organizer or participant.

Similarly, use of NsN via social networking sites is not common among the majority of NsN users. Nonetheless, those who did visit NsN on Facebook or Twitter find it very engaging and continue to follow the program in this way.

> ***GRG recommends that NsN increase efforts to highlight the presence of NOVA scienceNOW video clips on the website, the availability of science cafés, and the presence on social networking sites.*** Together, these efforts may increase use among those who are newer to NsN (i.e., NsN Novices, in the current study). Lower prior familiarity with NsN episodes on TV may be seen as an opportunity for the newer emerging technologies and related NsN components.
>
> ***GRG recommends further research to examine the promotion of science cafés.*** These outreach events may be another opportunity to reach those with less NsN experience and increase their interest in additional NsN and/or general science-related activities.

The NsN website is seen as a valuable resource that is visited repeatedly once NsN users discover it themselves (i.e., via web search) or are made aware of it (i.e., by friends or family).

Following participation in the study, almost all participants had visited the NsN website, regardless of the NsN resource they were asked to use first when the study began. Most visited the site to watch video clips and nearly three quarters of participants read Science News on the site. The use of sharing features on the site and downloading were less popular, as was the downloading of audio podcasts.

> ***GRG recommends NsN investigate further the low use of the NsN podcast features on the site and elsewhere (e.g., iTunes).*** Despite low use of such NsN resources, 42% of the sample indicated they download podcasts in other domains 1 to 3 times a month or more. During the study 19% of participants listened to or watched a NsN podcast or vodcast, raising a question about why more people are not downloading NsN podcasts or vodcasts. The low percentage may reflect the content of the podcasts or their visibility on the NsN website. NsN may want to consider increasing its presence in the world of mobile devices.

In general, when seeking specific information and when generally surfing the web, text and video are more useful than audio or interactive games.

Participation in online activities is more frequent among younger audiences (while older adults were more likely to use the Web for sending email, sharing bookmarks or recommendations to friends, and looking for TV schedule information). Participants' preferences for length of podcasts varied, and participants appear to enjoy science-related blogs.

> ***GRG recommends NsN consider tailoring certain aspects of its media presence towards the demographic most likely to use that resource.*** Future research can probe whether preferred podcasts length varies as a function of podcast topic/type. NsN may consider increasing the visibility of NsN-related blogs across a variety of domains (social networking, NsN website, etc).

NsN-related activities often lead to more of the same or similar activities.

In general, activity types appear to cluster together such that participation in an online activity often leads to another online activity, while social networking activities lead to other social networking activity.

> ***GRG recommends future research that examines ways in which one activity can be used to promote a different type of activity.*** If participants learn the most from viewing NsN episodes (whether it be on television or online), future research should examine how all of the other

portals could lead to this ultimate end as well as the barriers to such connections.

NsN episodes motivate viewers to think more about the science content and often to seek out more information.

After viewing NsN 4 episodes, participants indicated increases in the extent to which they seek out science-related experiences, their interest in science, and their motivation to learn more about current events in science. Similarly, their ideas about science grew, with participants, particularly those over 35 years and those who watched a greater number of NsN segments, noting an expansion in their idea of what it means to be a scientist and what it means to do science.

Season Four episodes were on par with the previous season in terms of viewing frequency and behavior and response to the episodes.

Participants viewed more Season Four segments on TV than online, and most viewed multiple episodes; one third of the sample had seen more than 20 NsN segments. Most popular segments included *Sleep*, *How Memory Works*, *The Science of Picky Eaters*, and *Autism Genes*. These stood out for viewers for the following reasons: viewer had a general interest in the topic, had personal or professional connections to the topic, and/or liked the way the topic was presented.

Segments viewed by fewer participants (less than one third of respondents viewed these) included: *Smart Sea Lions and Talking Walruses*, *Franklin Chang-Diaz*, and *The Mystery of the Gakkel Ridge*.

> ***GRG recommends that NsN consider the topics that have been of most interest to viewers throughout prior seasons and use those as a guide for Season 5 and 6 production.*** Beginning with Season 5, NsN will produce episodes comprised of 4-5 segments all in the same general content area. Participants may be drawn to topics with some familiarity to them, as they are interested in learning more about areas that are already meaningful to them.
>
> We learned in the current study that once viewers are watching, they will stay engaged. ***NsN can capitalize on this by introducing new and innovative content in an episode that viewers will already be watching due to the topic or title that has hooked them in enough to view.***

The new *Secret Lives of Scientists* web pages provide an opportunity to engage and educate a large group of users.

This new feature has not received as much attention from study participants as it might have. A couple possible reasons are that the feature is not particularly obvious on the website and that participants may not have recognized the name (just thinking they were reading about a scientist). Novices may be more likely to attend to this feature, given that they often prefer online content. A challenge will

be to engage those who prefer television viewing.

> ***GRG recommends promoting or including some of the scientists profiled in this online feature on the TV episodes.*** This piece may be a key factor in drawing TV viewers to the website (if their interest in a given scientist's profile can extend to seeking out more information on the website).
>
> ***GRG also recommends NsN examine the specific content or information that led some profiled scientists to be more popular among website visitors than others.*** Determining the characteristics with the most appeal would help with future decisions about who to profile and how to present their stories.

Use of Fan Pages and social networking as a way to learn about a program and to learn about science content is still emerging.

The current sample's use of social networking was similar to the average US population. Use of NsN-related Facebook options was higher than Twitter, which, in turn, was higher than MySpace. While approximately half of participants used NsN-related social networking, far fewer rated such activities as either the most engaging or the aspect they learned the most from. These media are used more as a way to connect with others than to seek out information.

> ***GRG recommends that NsN continue to have a presence on these social networking sites because this phenomenon is still growing rapidly.*** Therefore, the current statistics may not be so important. If the use of such applications draws viewers to other NsN-related products that they *do* find educational or engaging, perhaps the use of these sites is less negligible than the data suggest.

NsN's word-of-mouth promotion is a clear program strength.

While most activities led to similar activities, they also led to individuals having conversations with someone else about a science topic or about NsN itself. Sharing of information among family and friends was high. While higher in those already interested in NsN (NsN Enthusiasts and those who watched more NsN segments), more than 60% of NsN Novices also indicated discussing NsN topics with others.

The newer TV-related promotional strategies used by NsN are effectively reaching potential users. For instance, primetime and late night promotions are particularly effective.

Placement of NsN directly after NOVA on television effectively brings viewers to NsN on television. This is true even without viewers' direct knowledge of the term "Super Science Tuesdays." Promotional spots during primetime programming were seen by more participants than were those during daytime or

children's programming. Similarly, Neil Degrasse Tyson's appearances on late night TV were seen by more participants than his appearances on morning talk shows or his radio spots. Beyond the direct promotional strategies, many are still learning about NsN through word of mouth.

GRG recommends NsN further enhance new promotional strategies by using and highlighting specific terminology consistently across media. Knowing that many potential NsN users are reached during primetime or evening hours, promotion should continue to target those areas and introduce terminology that prospective users will recognize, remember, and act on.

GRG recommends that NsN also consider the promotion of science cafés and/or the sciencecafes.org website on TV, since promotions during primetime TV appear to be quite effective. Along these lines, given the popularity of Neil DeGrasse Tyson's appearances on late night TV, promotion in these venues may be especially useful.

APPENDICES