

National Children's Study Federal Advisory
Committee Meeting:
Behavioral and Social Science

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Four Behavioral and Social Science Research Endeavors

- Assessment Instrument Development
 - Bayley -3 Short Form for the National Children's Study
 - Assessment of Executive Function for the National Children's Study
- Sampling Methodologies
 - Using Community Level Indicators in the National Children's Study
 - Successful Lessons Learned for Ensuring Ethnic Representation in the NCS

Bayley -3 Short Form for the National Children's Study

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University of Texas Health Science Center-SA

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Westat

Marsha Gerdes & Sofia Baglivo

Children's Hospital of Philadelphia

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Bayley-III Short Form Research Goals

To create a measure of children's developmental status that will:

- serve as an anchor measure for comparison with other outcome measures in the National Children's Study
- evaluate the cognitive outcomes of at-risk children with negative exposure histories
- compare NCS children's outcomes to other studies of child development

Selecting a Measure

- Bayley Scales of Infant and Toddler Development, 3rd edition is the gold standard for child assessment.
- Measures 5 ADA domains: cognition, communication, motor, socio-emotional, and adaptive functioning
- Widely used and psychometrically robust
- Requires training; respondent burden is high
- Need to develop age-specific short forms

Goals of a Short Form

- Psychometric Goals
 - Target ages 6-, 12-, 18-, 24- and 36-months
 - Psychometrically rigorous and the equivalent of full Bayley administration
 - Measure performance across the full ability distribution
- Administration Goals
 - Simplify basal and ceiling rules (as a developmental test, children only receive age-appropriate items)
 - Reduce burden to participants and data collectors
 - Operational feasibility in the field

Procedures for Developing a Short Form

- Obtain publisher agreement to develop short form
- Obtain standardization data set from Bayley-3
- Conduct Item Response Theory (IRT) analysis on standardization data set to obtain item parameters (ability, discrimination, and adjustment for “guessing”)
- Conduct qualitative item review to eliminate cumbersome items & maximize operational ease

Psychometric Challenges

- Eliminate Interdependent items
 - Select one item and eliminate the rest
 - Example (3 items assess child's ability to find a hidden object, just one item is sufficient)
- Streamline basal and ceiling rules
 - All children are given a core item set
 - If child obtains score of less than 3 correct on core item set then basal (easier items) are given.
 - If after completing the core items, the number of core items correct is $k-3$ or greater , then the child is given ceiling item set.

Item Response Theory Results

	IRT Forecast Reliabilities		
Target Age	Cognitive Scale	Language Scale	Motor Scale
6-Month	.93	.86	.94
12-Month	.94	.93	.90
18-Month	.94	.94	.89
24-Month	.94	.94	.90
36-Month	.92	.93	.90

Planned Standardization Study

- Sample size: 1000+ includes test-retest sample
- Sample design emulates 2010 American Community Survey (census) data
 - Stratified by age, gender, parent education level and race/ethnicity
- Four field sites: San Antonio, TX; Rockville, MD; Philadelphia, PA, and Washington state

NCS Formative Project

Assessment of Executive Function for



Ann S. Masten, Stephanie M. Carlson,
Philip David Zelazo, Amanda Wenzel, Jacob E. Anderson,
Maya Buckner, & Patricia McGovern

University of Minnesota

August 24, 2011
NCS Research Day



Executive Function

- Processes involved in top-down control of thought, action, and emotion
- Including working memory, inhibitory control, and cognitive flexibility
- Manifested in attention, rule-use, planning, and delay of gratification
- Most conspicuous in its absence or delay
 - Neuropsychiatric patients
 - Children

Importance of EF Skills

- Predict health and other important developmental outcomes
- Develop over the life course
- Burgeoning area of research in developmental neuroscience
- Implicated as protective factor in studies of high-risk children
- Show malleability in prevention and training studies

(Blair & Razza, 2007; Carlson 2005, 2011; Diamond et al., 2007, Masten et al., 2008 CURA article; Obradović, 2010; Sapienza & Masten, 2011; Zelazo et al., 2003, 2008)



Project Aims

Adapt measures of EF for NCS to improve usability and validity with diverse preschool children and their parents for whom EF may be an important vulnerability or protective factor.

- Developing brief EF measures suitable for NCS
- Downward extension of NIH Toolbox EF tasks
- Adapting and extending the CBQ

Executive Function Tasks

EF Domain assessed and instrument employed

- Cognitive flexibility /set shifting
 - Dimensional Change Card Sort Test
- Inhibition
 - Flanker Test

Modification of instrument

- Items too difficult for 3-5 year olds
- Addition of downward extension
- Flanker adapted to make direction of middle fish more salient with color, border, and spacing

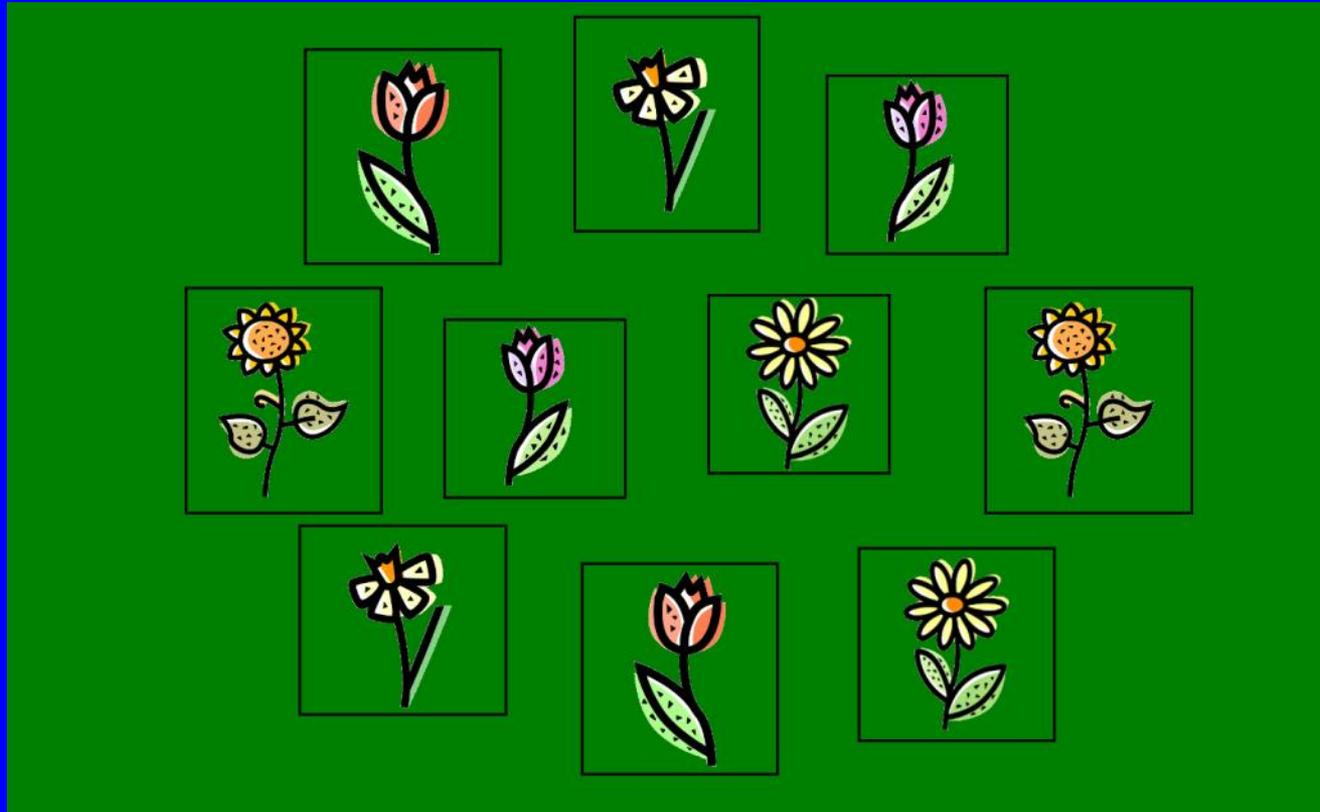
Study Design

- Participants recruited for targeted diversity: families living in emergency shelter; community-based, low-income families with a preschool child; and a university participant pool. Data collected from child, parent, and teacher.

Phase 1: Adapt measures and conduct preliminary pilot testing

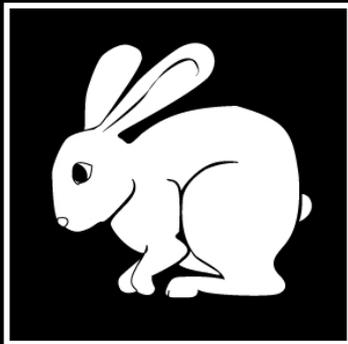
- Create the Flanker-Dext and DCCS-Dext to lower the floor of the tasks
- Adapt the CBQ-VSF (36 items); Create the CBQ-VSF-EF question pool
- Evaluate appeal, time burden, usability, preliminary validity
- Modify the adapted measures based on piloting

Touch screen Training screen example



Toolbox DCCS instruction screen example

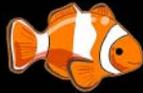
We'll play the SHAPE game first. In the SHAPE game, choose the picture that's the same SHAPE as the picture in the middle of the screen. If it's a BOAT, choose this picture.



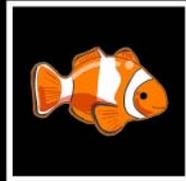
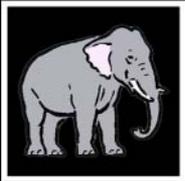
DCCS-Dext test screen examples

DCCS Dext Level 1

Now, we're going to play a different game. Look who I have here! I have a fish!



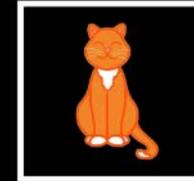
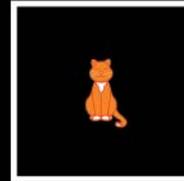
Now, I have these boxes here.



This box has an elephant on it, and this box has a fish on it. I'm going to put the fish in the fish box because that's where they belong!

DCCS Dext Level 2

Can you show me where the big kitties go in this silly game?



DCCS Dext Level 3

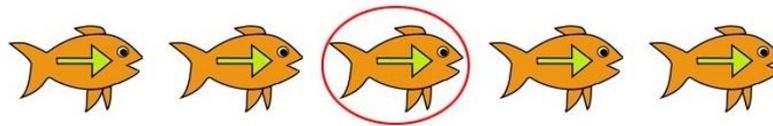


Here's a truck.



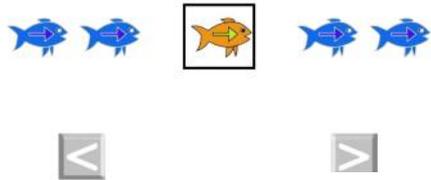
Toolbox Flanker instruction screen example

Here the MIDDLE fish is circled. Can you point to the MIDDLE fish?

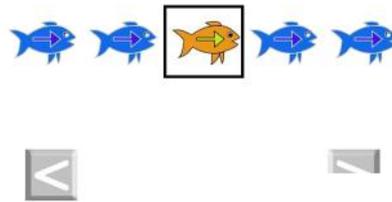


Flanker-Dext test screen examples

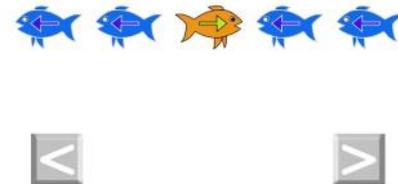
Flanker Dext Level 1



Flanker Dext Level 2



Flanker Dext Level 3



Results from Phase 1

- Pre-pilot of about 10 families (age 3-5; low SES)
- Time burden
 - New measures are low burden and could be shortened further
 - Flanker-Dext and DCCS-Dext: about 6 min each
 - CBQ-VSF with EF test item pool added: about 10 min
 - NIH Toolbox Flanker and DCCS for parents: under 5 min each
- Appeal and usability
 - Parents and children enjoyed and understood EF measures

Children's Behavior Questionnaire

- Adapted in consultation with Mary Rothbart and Samuel Putnam
 - Clarified the language used on the CBQ-VSF (36 items) for accessibility (removed double negatives & adjectives; replaced confusing item)
 - Wrote pool of 14 new items to expand the assessment of EF beyond effortful control and attention focusing (e.g., “Can take turns in a game even when excited.”)
- Promising results
 - Teacher CBQ-EF scores correlated w/ Flanker ($r = .41$) and DCCS ($r = .55$)

Conclusions

New measures are very promising

- Usability, time burden, appeal
- Continuity with Toolbox measures
- Inclusiveness for low-skill children

Next Steps

Phase 2: Validity study ($N = 150$)

- Assess construct validity for child EF in relation to EF measures (new tests; Peg Tapping; Forward-Backward Word Span), school readiness (WJ Applied Problems, Bracken), traditional IQ subscales (Stanford Binet; Early SB5)
- Assess test-retest reliability, time burden, appeal
- Develop training materials

Using Community Level Indicators in the National Children's Study:

Assessing segment representativeness, evaluating recruitment performance, and building multi-level analytic models quantifying the impact on developmental outcomes of interactions between individual and community-level risk factors

Howard F. Andrews¹

James Quinn², Suzy Allen³, Regina Zimmerman⁴, Cynthia Lendor³, Joseph Gilbert³, Kimberly Mantilla³, Shahnaz Alimokhtari⁶, Leonardo Trasande⁵, Perry Sheffield³, Andrew Rundle¹, Virginia Rauh¹, Ezra Susser¹, Philip Landrigan³

¹Columbia University Mailman School of Public Health ²Columbia Center for International Earth Science Information Network, ³Mount Sinai School of Medicine ⁴New York City Department of Health & Mental Hygiene, ⁵New York University, ⁶University of Medicine and Dentistry of NJ Environmental and Occupational Health Sciences Institute



NCS Research Day: 8/24/2011



Community Characterization: Purpose

- ⦿ Selecting NCS study segments representative of the county
- ⦿ Informing stake-holders of the nature of the selected communities (segments)
- ⦿ Developing tailored recruitment and outreach strategies
- ⦿ Assessing the representativeness of a broad range of community characteristics, beyond those used in segment selection
- ⦿ Determining predictors of recruitment and retention success
- ⦿ In terms of the ultimate goal of the NCS: Determining the extent to which community-level risk factors interact with individual exposures to impact developmental outcomes

Assessing Segment Representativeness

- Segment selection was based on limited number of key birth-related and census-based characteristics
- Goal is to define segments that are representative of the study location (PSU) as a whole
- Does planned representativeness with respect to one set of domains reflect representativeness with respect to a larger set of community domains?

Nine Community Domains, 56 Indicators

- **Demographics** (14 indicators)
- **Socio-economics** (5 indicators)
- **Household Composition** (3 indicators)
- **Maternal/ Birth** (7 indicators)
- **Transit-related** (7 indicators)
- **Parks and Greenery** (4 indicators)
- **Safety and Social Disorder** (6 indicators)
- **Pollution Sources** (4 indicators)
- **Land Use** (6 indicators)

Conclusions

- ⦿ Communities in which NCS Queens Vanguard Center segments are located are representative of Queens communities as a whole, with respect to more than 50 indicators in 9 domains of interest.
- ⦿ The NY/NNJ NCS Consortium has established a robust GIS/informational infrastructure for using community-level information in all phases of the NCS Study
- ⦿ This infrastructure and associated statistical methods could provide a model for other NCS Sites, and could be leveraged to operate at the national level, at relatively low cost

Successful Lessons Learned for Ensuring Ethnic Representation in the NCS Sample

J Postma, N Adame, K Lamb, LR Younglove, TM Burbacher, PW Butterfield,
J Lane, T Odom-Maryon, P Butterfield, NM Cederblom, KS Grant, SA Beresford,
EM Faustman

About Grant County, WA

Large (over 2,600 mi²), diverse rural region 1 of 26 rural sites

Low population density (population: 81, 229; density: 30.8 persons/sq mi)

Agriculture is primary industry

Challenges:

Low density rural

Diversity of population including migrant populations

Winter Weather challenges poor roads

Field office location is separate from PNWNCS and WSU



About Grant County, WA

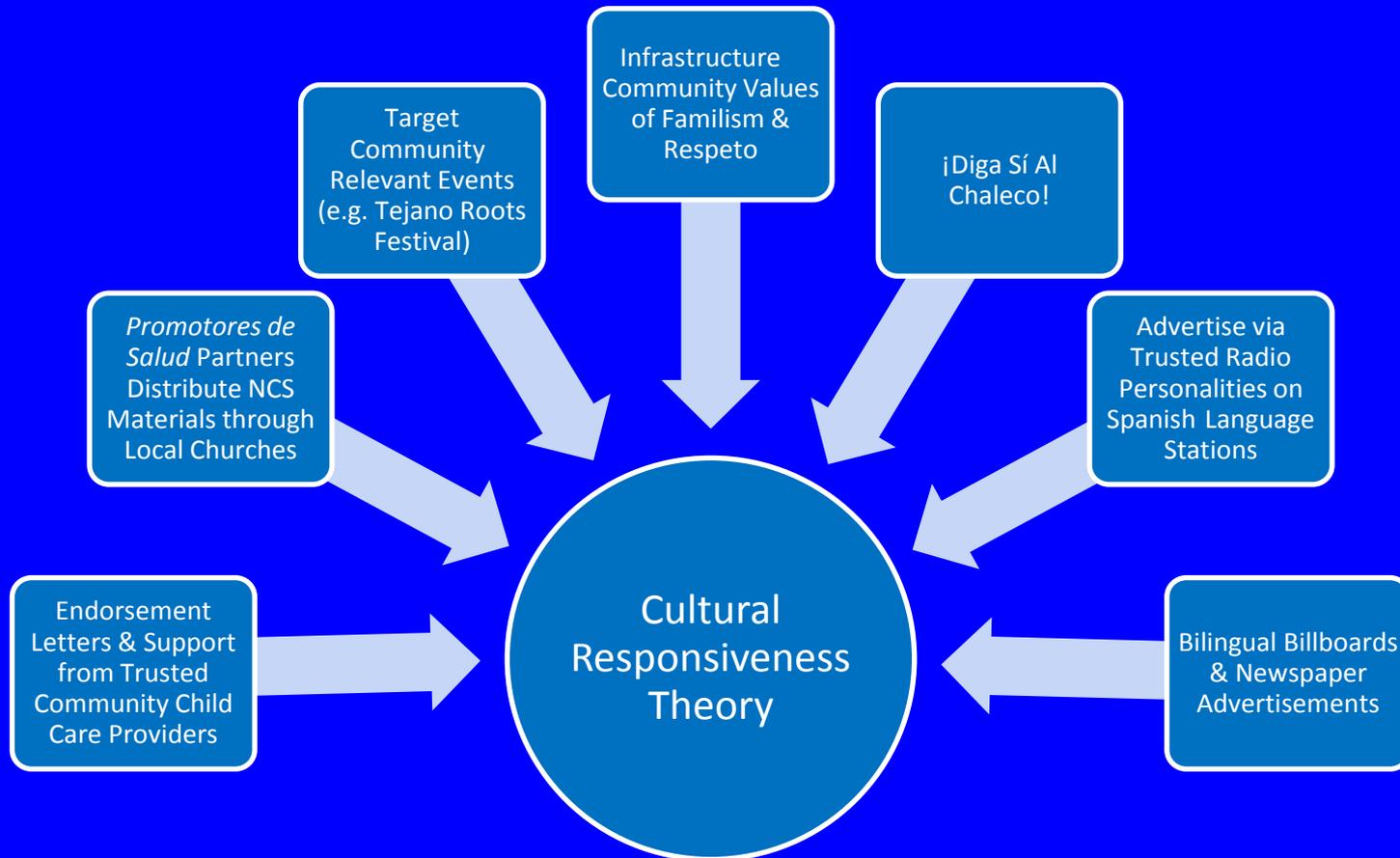
High number of Hispanic migrant farm workers (38% population Hispanic)

Between 2000 and 2010, GC experienced large population growth, with a 19% increase in the overall population (89,120) and a 51% increase in the Hispanic population (34,132).

There was an avg of 1,528 births/yr to GC residents between '04 & '08
54% of births are of Latino ethnicity
30% of the births were to women < age 20
47% of births were to women with < a high school diploma or GED
78% of infants born were enrolled in the WIC program (2007)



Outreach Strategy



Component 1. Culturally Competent Staff and Advisors

- The community advisory committee includes Hispanic representatives.
- 16 members, represent participants & community
- Local teacher and social worker serve as outreach team
- Our locally hired home interviewers represent the cultural diversity of GC. They participate in local outreach activities (i.e. marching in parades) to facilitate a connection between the Study, the community and our potential participants.

Select members of the CAC

Component 2. Targeted Outreach

- Through collaboration with community based organizations, the GC team created an infrastructure for recruitment and retention that incorporates the values of the community and population being served (i.e. Familism, Respeto).^{1, 8, 9}
- Examples include:
 - Meeting with family outreach workers at the *Migrant Council*, with consequent presentations made to parents at all 4 Migrant Council sites

Component 3. Personalized Marketing & Media Campaign

- Tailored marketing and media messages are another enhancement to recruitment, such that by the time field personnel enumerate, potential participants have heard about the NCS. We use a variety of strategies to personalize our marketing and media campaign
- The “Red Vest Campaign” creates consistency between our marketing materials and NCS staff. Home interviewers wear the red vests featured in our materials. We feature one of our outreach workers on the materials asking people to “Say Yes to the Vest!” (*¡Diga Sí Al Chaleco!*)

Participe en el Estudio Nacional de los Niños!

El Estudio Nacional de los Niños será el estudio más amplio que se haya realizado en los Estados Unidos sobre la salud de los niños. El Condado Grant fue seleccionado para formar parte de este proyecto histórico e importante.

Cuando toquemos su puerta, dedique un momento para decir “Sí” al señor o la señora del chaleco, y responder una breve encuesta.

Para obtener más información acerca del Estudio Nacional de los Niños, llame por teléfono a nuestro número gratuito o visite el Centro local del Estudio en Moses Lake:

Oficina del Condado Grant del Estudio Nacional de los Niños
321 South Beech Street, Suite A
Moses Lake, WA 98837

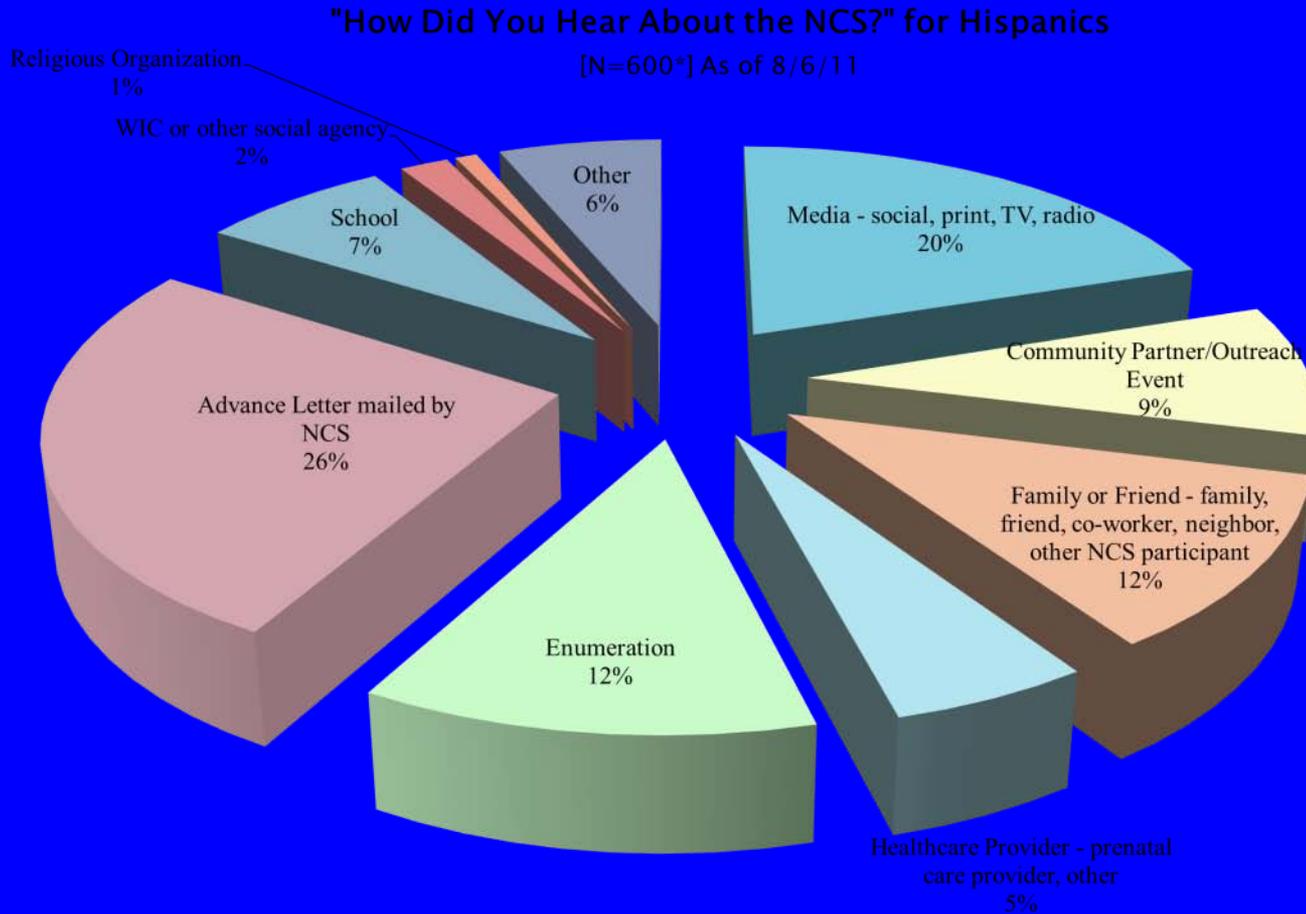
Llame al número gratuito 1-855-RED-VEST (1-855-733-8378)

O visite el sitio Web del Estudio Nacional de los Niños en:
GrantCounty.nationalchildrensstudy.gov

DIGA SÍ AL CHALECO

GRANT COUNTY
THE NATIONAL CHILDREN'S STUDY
PACIFIC NORTHWEST CENTER

How did you hear about the NCS?



Summary of Results

- In addition to hearing about the NCS through the advance letter (26%) or enumeration (12%), most Hispanic respondents reported hearing about the NCS through media (20%), family or friends (12%) and community partners/outreach events (9%).

Conclusion

- A primary goal of the outreach programs for the NCS was to ensure that potential participants heard about the NCS prior to our knocking on their door for enumeration.
- Our results indicate that our outreach activities were successful, for nearly 90% of Hispanic respondents heard of the NCS prior to our initial home contact.
- These successes, experienced in EHBR-based Vanguard protocols, address critical OMB questions: (1) how effective is the recruitment strategy per location and per schema and (2) is the population recruited representative of the target population?