



# Brevity

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# Writing an NIH grant

The Old Way – filling a series of pots:

- The Specific Aims pot
- The Background pot
- The Preliminary data pot
- The Methods pot (subjects, measurements, data analysis, power calculation, timeline — all in mini pots)

The New Ideal – creating an organic whole, identifying an important scientific issue and the approach that you will take in tackling it.

# New NIH Format: Suggested Page Allocations

- Specific Aims (1 page)
- Research Strategy (12 pages)
  - Significance
  - Innovation > 1-3 pages
  - Approach (includes Preliminary Studies/Progress Report) (9-11 pages)
- K-awards: 1+12 p for Candidate Background, Career Devel Plan, and Research Strategy
- For R03s, R21s: 1+6 p

“I have made this letter longer than usual, because I lack the time to make it short.” –

Originally attributed (by me) to Thomas Jefferson, but others (my wife) tell me it was Blaise Pascal.

# Implications of shorter proposals

1. Use all components of the proposal to their maximum potential (e.g. biosketches, Human subjects, resources, budget justification).
2. Clear thinking and writing will be rewarded.
3. Simple compelling ideas will be rewarded.
4. Excellent figures and tables become more important.
5. Cutting and pasting from other proposals is a very bad idea.

# Implications of shorter proposals:

- Biosketch
- Budget and budget justification
- Human subjects
- Resources

# Biosketch (Yours)

- Biosketches are the major source of data for reviewers to score the “Investigators” criterion.
- Still four pages
- Suggested limit to publications is 15, (based on recency, importance to the field, and/or the relevance to the application).
- Personal statement: description of your abilities and experiences as they relate to the project is key:
  - Try to be brief (10-15 lines)
  - Be specific, with specific examples. You can refer to the 15 publications
- Think through what you are proposing, and address those competencies in the personal statement (e.g. directing a team, performing a specific analysis, etc)

# Biosketches (Your co-investigators)

- As PI, you should be more motivated to edit/improve their biosketches than they are.
- Get their most recent biosketches and their complete CVs.
- Revise the biosketches. For example, the biosketch you have from Dr. X is from a recent grant where she was PI. In this grant she is a Senior Advisor. Her Personal statement should mention her experience as successful senior advisor/mentor.
- If you can get your co-investigators to do this, that's great. But it is ultimately your responsibility.
- Make sure details in various biosketches do not contradict each other (e.g. other support)
- What previously may have gone at beginning of "C. Preliminary Data" under (for example) "C.1. Investigative team's prior experience relevant to XXXX" now can go to the biosketches as part of the personal statements.



# Budget and budget justification

- Spend some time thinking about why the various individuals are included in the proposal. What do they really do? Drop those with no compelling role.
- In budget justification, be comprehensive and specific about each person's role — what expertise they bring.
- Be specific: a \$20,000 request for supplies may easily be cut. A \$20,000 request itemized into four or five itemized categories probably will not.
- Even with Modular Budgets, justify the expenses. You can do this under “Additional Narrative Justification.”

# Human Subjects

- A surprisingly high number of reviewers comment negatively on the Human Subjects sections, which may color the rest of their review. Words like "boiler plate" are often used.
- The best way to write a good Human Subjects section is to write it de novo. Do not copy and paste from other proposals and try to modify to fit.
- You can dump the descriptions of recruiting and selecting patients, inclusion and exclusion criteria, etc, in this section, but if you do, be concise and specific.
- Read the directions: "Supplemental Instructions for Preparing the Human Subjects Section of the Research Plan"

# Facilities and Resources

- New requirement is a description of how the scientific environment will contribute to the probability of success of the project, unique features of the environment, and, for Early Stage Investigators, the institutional investment in the success of the investigator (e.g. resources, classes, etc).
- Implications:
  - Everyone should have a Facilities and Resources section
  - Copying and pasting is a bad idea

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# Clear Thinking and Writing

- The major struggle in constructing a successful grant is to think clearly.
- The benefit of writing clearly is that it exposes lack of clarity in thinking, thus allowing us to focus on and improve our thinking.

# Clear thinking and writing: classical art as a model

Classic (*adj*):

- Relating to the art, literature, and culture of the Ancient Greeks and Romans.
- Having a style that is balanced, formal, objective, restrained, regular, simple.

(Webster's New World Dictionary)















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## Ways to write classically

1. Don't dither; e.g. "It has long been recognized that A affects B"

or

"The preponderance of literature would suggest that A affects B"

vs.

"A inhibits B" (with 3 or 4 citations)

# Ways to write classically

2. Use directional verbs and adjectives.

“Jim and Mary differ by height. Jim is taller than Mary. Jim is 6”2” and Mary is 5”6.”

vs.

“Jim is taller than Mary”

or

“Body fat affects levels of inflammatory cytokines. Higher amounts of fat are associated with increased production and levels of IL-1, IL-6 and IL-74.”

vs.

“Body fat stimulates production of inflammatory cytokines.”

# Ways to write classically

## 3. Expunge adverbs,

- “very, exceptionally, enthusiastically, highly, extremely” – There are almost no good adverbs.
- Adverbs carry no weight in communication.
- Do not make a statement when you can demonstrate it.



“I enthusiastically support this exceptionally creative, very hard working, and extremely intelligent physician.”

vs.

“In 2010, she published first author articles in Annals of Internal Medicine, The American Journal of Public Health and Journal of the American Geriatrics Society, after six months maternity leave in 2009”

“He is very influential and many of his publications have been highly cited by others in the field”

vs.

“His 23 publications have been cited 473 times in the past three years”

# Ways to write classically

## 4. Use simple declarative sentences

- A grant is no place to practice creative writing.
- Do not worry about using the same words and phrases over and over again. (Think about the great religious texts)
- Never ever ever use a word, the meaning of which you are unsure – or the meaning of which you just learned last week.

# Ways to write classically

## 5. Use simple declarative sentences

- Write in simple declarative sentences: subject, verb, object.
- Greatly reduce the use of compound sentences, modifying clauses, etc.
- Avoid colons and semicolons unless they are necessary.
- Present one fact per sentence, one idea per paragraph.

# Use a journalistic style (Hemmingway vs. Proust)

- Never put more than one fact per sentence.
- Avoid compound sentences.
- Avoid introductory clauses – as a general rule, do not start sentences with “If..Because..Although..Whereas.”

# Ways to write classically

## 6. Use an outline

- The secret of good writing is good thinking.
- The primary benefit of an outline is to assist in achieving clarity in thinking; that is, the outline helps you think better.
- This is why making a good outline is often very, very difficult and is worth all the effort devoted to it.
- You can construct an outline at any stage in the writing process. Earlier is better, but later is better than never.

# Some other ways to achieve classical writing

- Write to an informed, interested reader
- Say everything once, in full
- Label every paragraph, with a heading or topic sentence
- Do not cut and paste. Write everything, de novo to specifically address your proposal

# It is Important to Communicate Precision

- Precision is important. Detail is not.
- Bullets, lists, and small tables communicate precision.
- Include sections such as “Here is what we think we know:
  - 1.
  - 2.
  - 3.

In those sections you list conclusions from the current literature, along with citations. These sections do not include experimental design or data.

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# Practice communicating the big picture

- Work to achieve the 30,000 ft perspective
  - Practice your “Big Picture” skills
  - Tell it to your Mom
  - Continually ask yourself: “what is the point?”
- Craft a 30,000 ft and a 5,000 ft summary statement and refer to these as you write
- Practice focusing on:
  - design > methods
  - approach > techniques
- Create the context (big picture) carefully, add details only as needed for clarification (e.g. as examples)

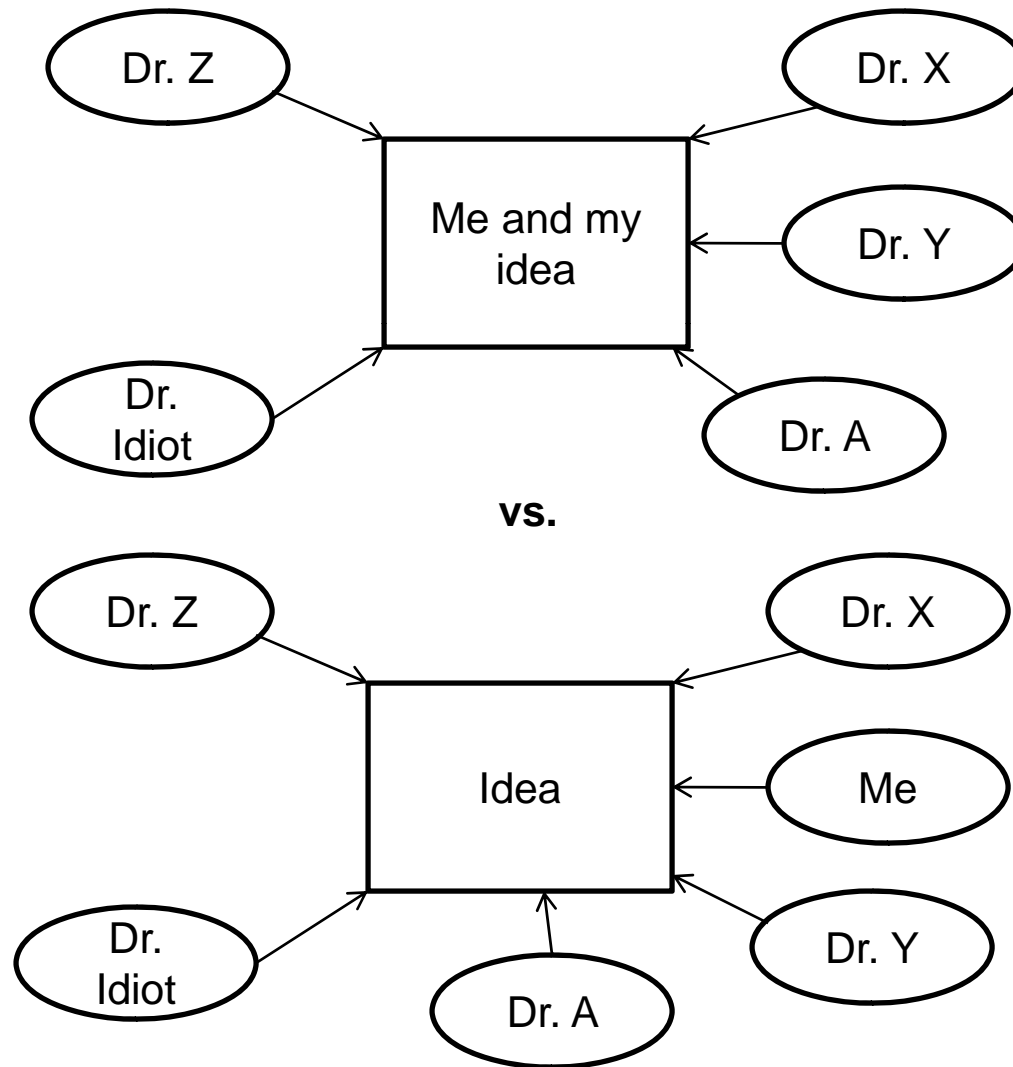
# How do you develop a simple, compelling idea?

- It's difficult; no one is good at it all the time.
- You may have to leave your comfort zone, and be willing to do something new.
- Get help from others.

# How to get help from others

- Two types of help.
  1. Help with formulating ideas
  2. Feedback on written or partially written proposals.
- Themes common to successful requests for help.
  1. They are doing you a favor. Never forget that.
  2. Separate yourself from your proposal.
  3. Listen, listen, listen (do not talk, talk, talk),  
Then say, “Thank you.”

# Two models for brainstorming: Wonder Woman vs. the Zen Master



# Benefits of Brainstorming

- Ideally, a well written proposal should acknowledge, at least tacitly, our inability to completely understand anything. Good science is assisted by an ongoing delineation of the limits of our understanding. This is relatively uncommon in grant proposals but almost always well received.
- Grant writing, if approached correctly (i.e., my way), is a valuable exercise even if it is not funded.

# Implications of shorter proposals

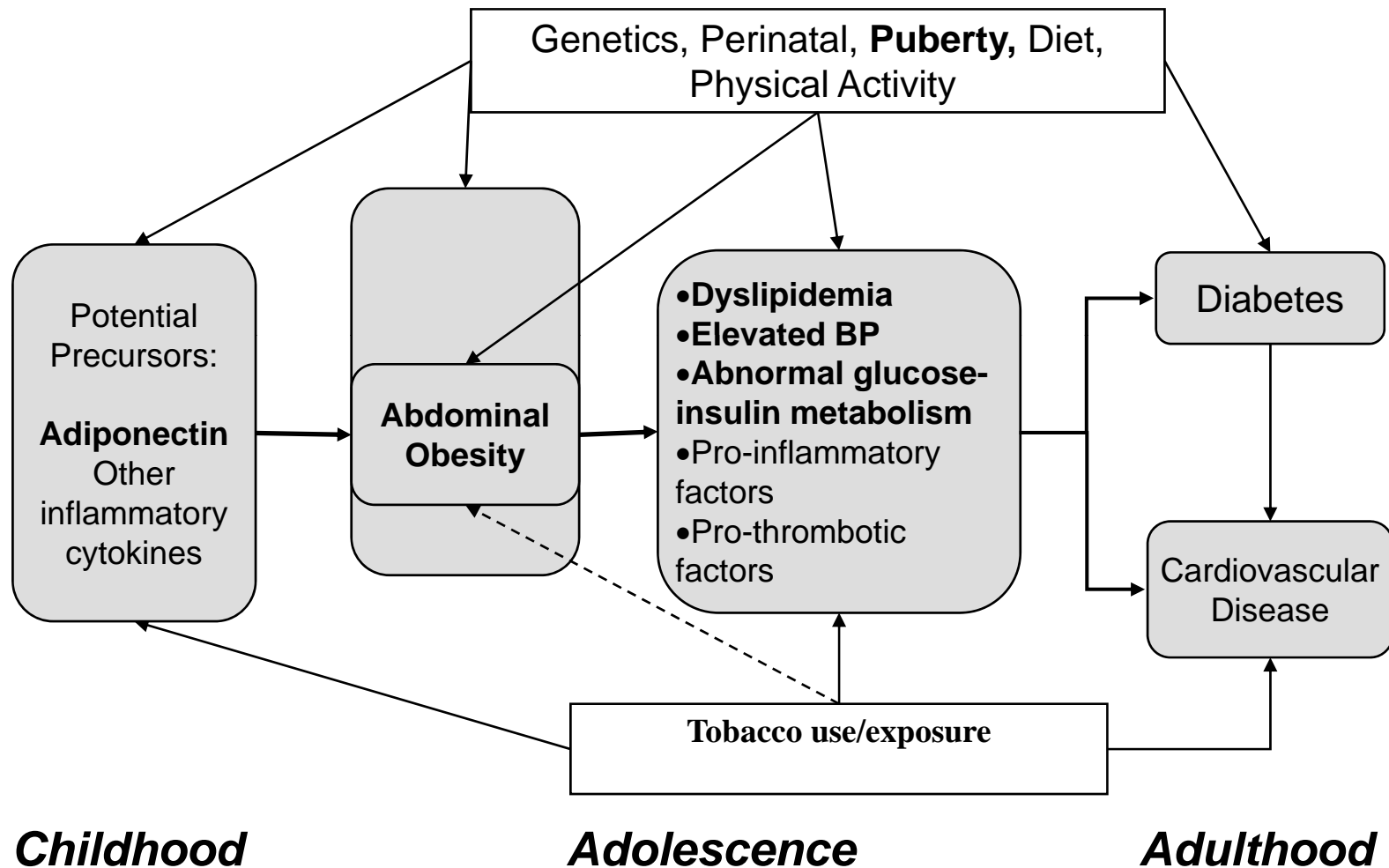
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Figures help you develop, and then communicate, the “big picture.”

Figures and Tables can help you communicate competence, that you know what you are doing.

Figures and Tables can help you communicate the limits of understanding.

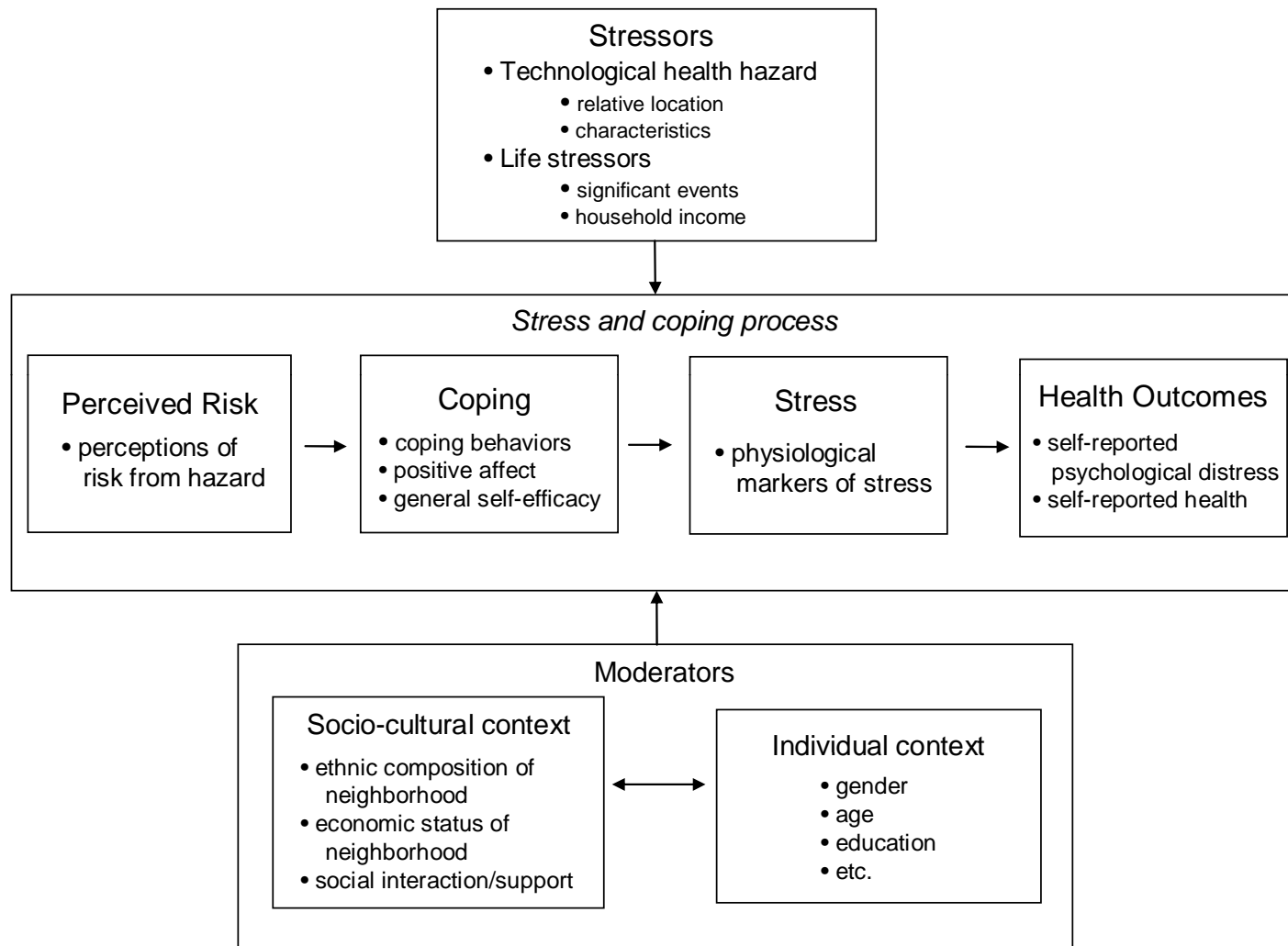
# Proposed Metabolic Syndrome Factors in the Life Course from Obesity to Cardiovascular Disease



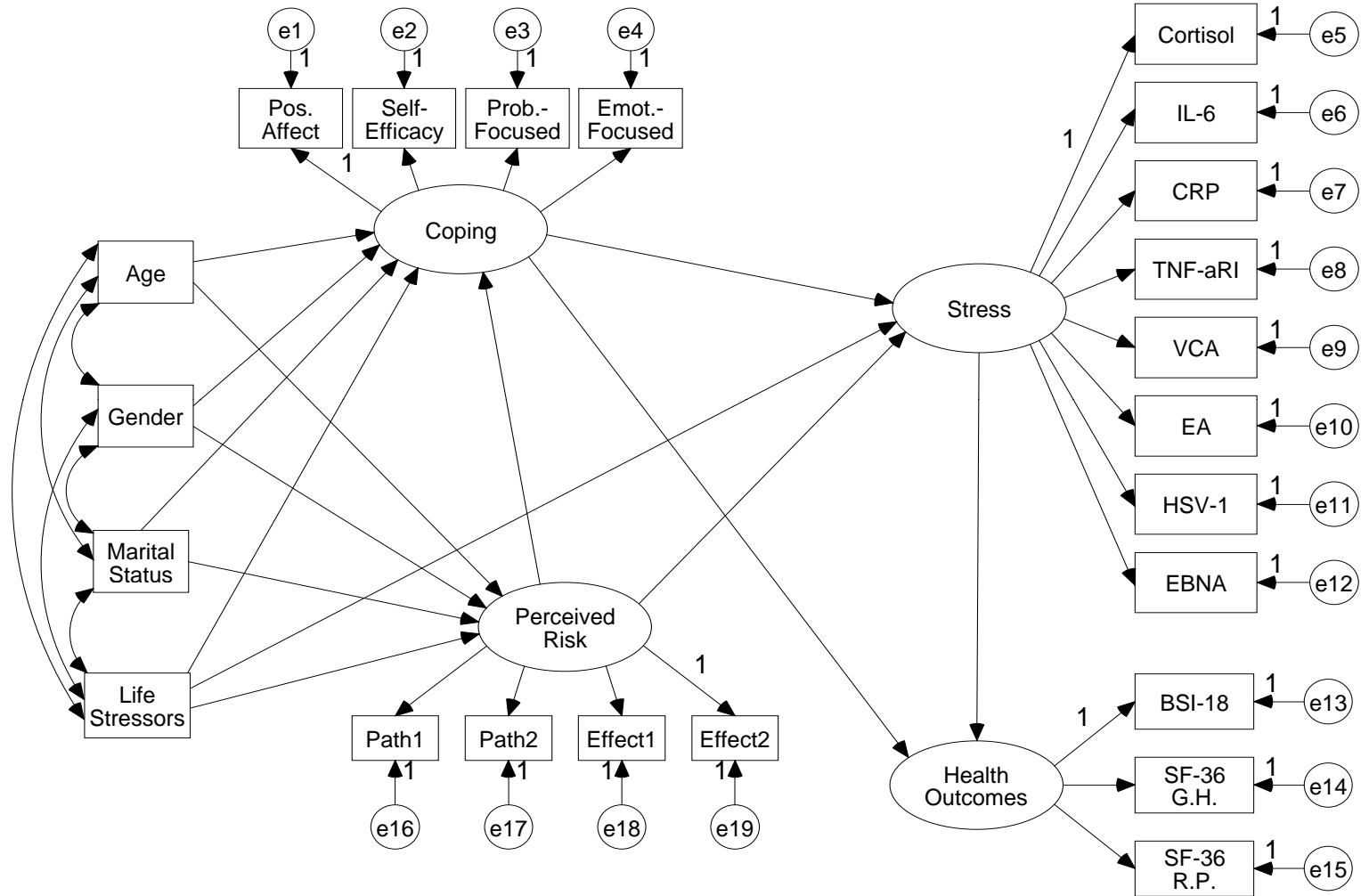
**Bold = factors included in this study**



**Figure 2. Framework for the Study of Environmental Risk, Coping, and Hispanic Health**

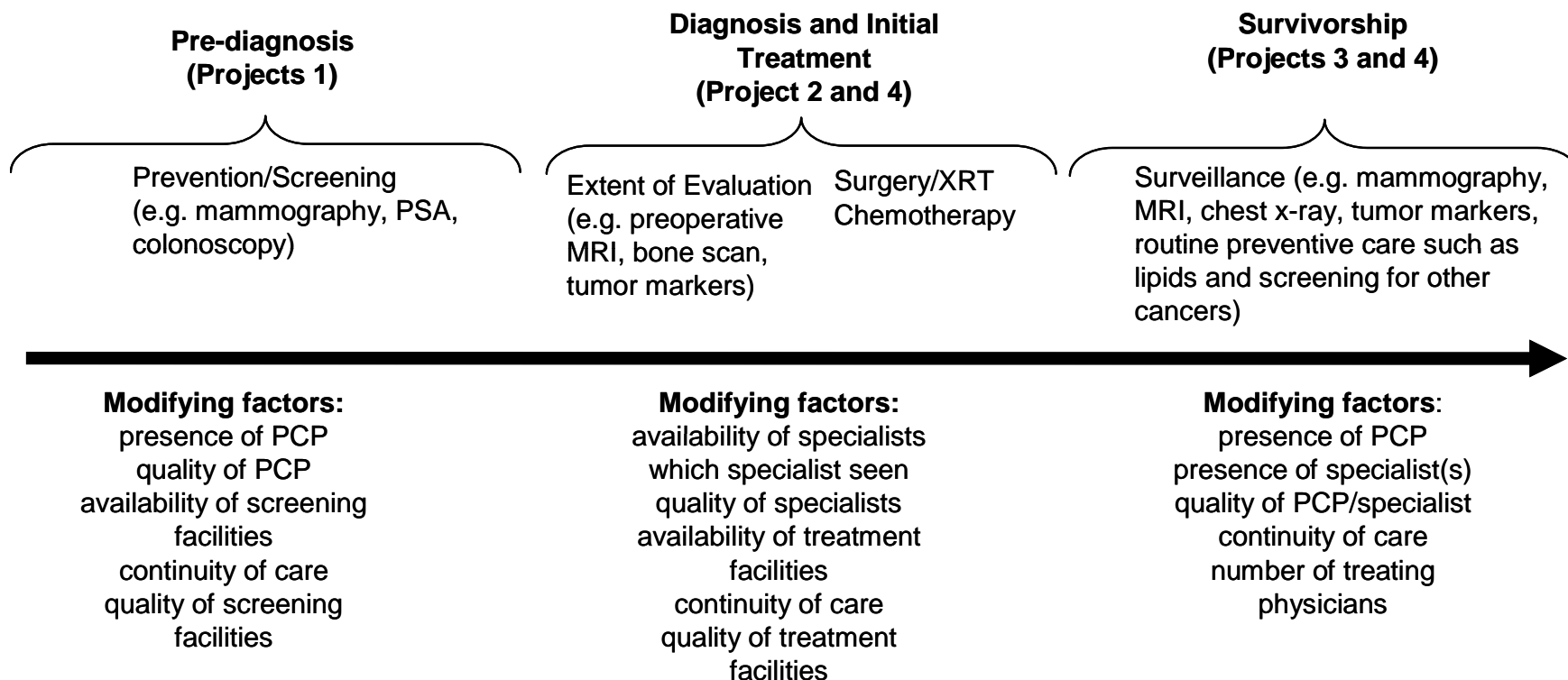


# Structural Model Explaining Health Outcomes



# Example of a “big picture” figure

Figure 1.1 The trajectory of cancer care, listing components of the trajectory and aspects of medical care that might affect those components.



## Example of a Table demonstrating competence

**Table. Definitions of Quality Indicators**

Variable	Source	Definition (ICD9 Diagnosis Code)	Use
Antiemetic drug 5ht3 &NK1 receptor antagonists	INS;MCR Part D	Injectable: J1626,J 2405, J2469, J1453, Oral: J8501; Q0166, Q1279, Q0180; S0091; S0181; S0174; NDC codes for antiemetics obtained from <a href="http://www.fda.gov/Drugs">www.fda.gov/Drugs</a>	Quality indicator – emesis prevention
Granulocyte growth factor (filgrastim, pegfilgrastim, sargramostim)	INS	J1440; J1441; J2505; J2820	Quality indicator – infection prevention
Bone mineral density test (DEXA Scan)	INS	CPT/HCPCCS 76075 prior to 1/1/2007 77080 after 1/1/2007	Quality indicator – bone health
Cardiac test (Echo, MUGA)	INS	CPT/HCPCS 93303, 93304, 93307, 93308, 93320, 93321, 93325; 78472-78478, 78483	Quality indicator - cardiac health
Hospice enrollment date	INS	Mo/day/yr of first hospice claim	Quality indicator end of life
Last chemotherapy date	INS	Mo/day/yr last chemo claim before death	Quality indicator end of life

## Other Resources

-Book by Steve Russell/David Morrison,  
“Grant Application Writer’s Workbook”

- NIH website with recent successful grants.

<http://funding.niaid.nih.gov/pages/appsamples.aspx>.

“Why Not Say it Clearly,” by Lester King (out of print but used copies available from Amazon.

# Final Thoughts

- This is a big, new thing.
- It will be difficult to succeed by using the same approach as before and cutting by 50%.
- The successful applicants will adopt a new approach to an integrated proposal, focusing on the underlying ideas and the approaches to addressing them.
- This focuses all the attention on the ideas – precisely the motivation behind the new format.