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Richard D. Roberts & Jennifer Minsky (Eds.)

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Volume I

Sessions I and II

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FOREWORD

In November, 2003, ETS and ARI convened a workshop on emotional intelligence. The attendees were individuals from the government, private sector, and academic research communities. The workshop participants were carefully selected to reflect a variety of perspectives on emotions, emotional intelligence, and related constructs.

We saw several justifications for holding this workshop. First, there appeared an *opportunity*. Over the last 20 years or so, considerable progress has been made in understanding traditional forms of human intelligence, how it may be assessed, its role in applied domains, and whether or not it can be enhanced. However, little attention has been paid to providing a rigorous scientific account of emotional intelligence (EI), the theme of the workshop. Perhaps because of this deficiency, there are a number of competing models of EI, none of which appears as full-blown as do current accounts of traditional forms of intelligence. The workshop provided a medium of exchange between experts from disparate fields in order to ascertain whether such a model is possible and if so, what the main components of emotional intelligence might look like inside a scientific framework.

Besides opportunity, there appeared a *need*. Claims that EI is a meaningful predictor of job performance, leadership capability, stress-coping, life satisfaction, and the like are standard in the popular literature, yet balanced, critical accounts and empirical data are scant. Although there have been previous symposia on EI, and indeed, the odd conference where this was the general theme, the fact remains that these forums were often predisposed to accepting the existence and positive utility of the concept in advance. The current workshop, in extending on previous research by the co-organizers, represented arguably the first even-handed attempt by a group of scientists to critically evaluate the state-of-the-art in theory, research, assessment, and applications. In doing so, an expected outcome of the workshop was to establish a scientific model of emotional intelligence that would inform further theory and measurement and to identify important applications.

About ETS

ETS is a nonprofit institution with the mission to advance quality and equity in education by providing fair and valid assessments, research and related services for all people worldwide. In serving individuals, educational institutions and government agencies around the world, ETS customizes solutions to meet the need for teacher professional development products and services, classroom and end-of-course assessments, and research-based teaching and learning tools. Founded in 1947, ETS today develops, administers and scores more than 24 million tests annually in more than 180 countries, at over 9,000 locations worldwide.

About ARI

The Army Research Institute for the Behavioral and Social Sciences (ARI) is the Army's primary laboratory conducting research and analysis on personnel performance and training. ARI's work contributes to the entire life cycle of recruiting, selection, assignment, training, and mission performance.

Content and Structure of the Proceeding Volumes

The three volumes that comprise this special report include the transcribed and edited workshop presentations, along with the visuals used by each speaker. Transcriptions of the discussion that took place after each session are also provided. In the final volume, we also include the original program around which this conference was based. The three volumes are organized, along thematic lines, as follows:

Volume I:	Opening Remarks
	Emotions: Multi-disciplinary Perspectives
	Emotions: Psychological Perspectives
Volume II:	Emotion Intelligence: Related Constructs
	Emotional Intelligence: Assessment
Volume III:	Emotional Intelligence: Applications
	Closing Remarks
	Appendix: Initial Conference Program

Referencing Works in this Proceeding

We suggest the following as an example for referencing works contained in these volumes (that is consistent with standard guidelines):

Picard, R. (2005). Affective computing: Toward machines with emotional intelligence. In R. D. Roberts & J. Minsky (Eds.), *Proceedings of the ETS and ARI Emotional Intelligence Workshop, Vol. I* (pp. 136-178). Princeton, NJ: Educational Testing Service.

Disclaimer

The views, opinions, and/or findings contained in these volumes are those of the contributors and should not be construed as an official position, policy, or decision of ETS, ARI, or HumRRO, unless so designated by other documentation.

Acknowledgements

As always, there are many entities that make such an event possible. Chief among them are the following organizations, which have variously provided institutional, logistical, and financial support: Educational Testing Service, Army Research Institute, and the Human Resources Research Organization.

Many individuals also gave up much of their time, both in organizing the conference and in various duties, related to producing these proceedings. Special thanks are thus extended to Cristina Aicher, Anthony Betancourt, Kim Fryer, Matthew Herbster, Kathy Howell, Sue Martin, Pippa Markham, Andrew Maul, Emily Midouhas, Venus Mifsud, William Monaghan, William Petzinger, Vicky Pszonka, Matthew Roberts, Ralf Schulze, and Manuel Voelkle. Each of you, in your own way, has been highly instrumental in making this possible. Thanks also to all of the participants, each of our fellow organizers, and especially Drew Gitomer (former Senior VP, ETS) and Paul Gade (Chief Psychologist, ARI) for agreeing to open and close the workshop. Finally, a special thank you to Kurt Landgraf (CEO, ETS) and Ida Lawrence (Senior VP, ETS), whose continuing support of this research program (and the Center for New Constructs) made these proceedings possible.

Richard D. Roberts & Jennifer Minsky

Princeton, NJ, July 2005

VOLUME I

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OPENING REMARKS

DR. ROBERTS: Hello everyone, or g'day as we say in Australia. Distinguished guests, scientists, practitioners, skeptics and believers alike; from as far away as Lawrenceville, New Jersey, Sydney, Australia, San Francisco, California to Oslo, Norway, I want to welcome you to this Emotional Intelligence Workshop. We are happy to be at the Chauncey Conference Center in Princeton, New Jersey, and I don't want to belabor this introduction because I've got two very distinguished gentlemen who are going to give opening addresses. I'm not going to spend a long time going through and telling you about their considerable career achievements either, this is more of an English thing than an Australian thing. I'm just going to introduce them. However, in the programs that we have compiled for this conference, you can actually find out a good deal about these gentlemen's considerable career accomplishments.

Before doing so, I want to offer my sincere thanks to the various organizations that are sponsoring this event: the Educational Testing Service; the Army Research Institute; and HumRRO. OK, I said too much already, so without further ado, it gives me great pleasure to hand over to Dr. Drew Gitomer who is the Senior Vice President of Research and Development here at the Educational Testing Service, Princeton New Jersey. Thanks a lot, Drew.

DR. GITOMER: Thank you and welcome everybody, it's a pleasure to have you all here. It's a pleasure to host this conference. I'd very much like to thank the Army Research Institute for supporting this work and HumRRO as well for working with us to coordinate this conference. A special thanks to the entire organizing team and especially Rich Roberts and all the ETS folks who have worked so hard to plan for a successful conference, and what I think is in record time. This thing came together in just an amazing amount of time to see such an ambitious kind of program and they worked tremendously hard to plan for this successful conference and make sure that all the visitors have a very good time.

This is a very significant conference for ETS to be hosting. Because it moves us ahead in areas that are of great importance to this entire organization, to our board of trustees, and to how we all think about human ability. Of course, ETS is well known for its expertise in looking at verbal skills and mathematical skills, all sorts of reasoning skills, academic accomplishment, but this paints a much broader picture.

And I wanted to take a few minutes to just talk a little bit in more detail why this so important, and how it breaks new ground for us. And some of these things I anticipated in developing and supporting this conference, but some things I didn't anticipate.

One of things I didn't anticipate is, it came to me when I looked at the program, specifically on page 22, and if you'll look at that, there is a category there called "Night Life in Princeton." Now never have those two terms been juxtaposed and some may call it an oxymoron. So one of the things I'd like you to do by the end of this conference, in true multiple choice format, is to decide is whether this category actually reflects some sort of emotional intelligence, or creative thinking, or just outright delusion.

We created the Center for New Constructs about four years ago, and Pat Kyllonen heads that center up and Richard is a member, and many of the folks that you will meet throughout the conference are part of this organization. And we did that for a couple of reasons.

One is that we wanted to recognize a much broader range of human abilities, and when we called it New Constructs we took a very egocentric view on this. It wasn't necessarily in the psychological literature, but they were new constructs in terms of what we looked at seriously at ETS. And so we wanted to broaden the range of human abilities, how we conceived of that, how we talked about that, and we also wanted to really use this research as a basis for developing tools that could be used much beyond sort of high stakes testing. So as we got into the realm of really supporting people in their career endeavors, in their learning endeavors, we needed to address constructs that went far beyond the traditional kinds of measurers that we've really focused on.

And Emotional Intelligence obviously represents one of these new constructs or maybe it's not a construct. But EI represents and raises issues that are critical for our understanding of human performance, and so we are really excited to have this here.

The program itself, I think is so impressive and provocative because any classification with the term intelligence immediately gets one's attention, in both the popular and scientific realms. But I think the program is specifically impressive in that it avoids some of the pitfalls of the traditional intelligence discussions, and moves us forward in at least three ways from my perspective.

One, is that all the work that is going to be presented here is really contextually grounded, this theory is connected to performance and context. So when we think about the early approaches to intelligence, whether they emerged out of differential psychology, or behavioral psychology, or cognitive psychology, much of that work was disconnected from context. We had sort of puzzles and interesting activities that were trying to get at mind, I guess that's not quite what the behaviors were trying to do, but this idea of getting at something abstracted from interactions with real important contexts; Emotional Intelligence by definition is how these things manifest themselves in real world performances.

I think another thing that is critically important is that there is a focus on malleability here. In the end, we're here not to just name things, as the way they are, but to try to effect change and I think the papers that are going to presented here help us move in that direction in very significant kinds of ways.

And the third thing that is notable in terms of thinking about intelligence, is that there is an avoidance of group differences that I think have really served to be a distraction from understanding the constructs that we're trying to look at. So, I think avoiding that distraction is in fact is going to help us move ahead and really understand what this whole thing is about. So I want to close by just letting you know that I am very confident that you will all be stimulated by the presenters and by discussions over the next three days and perhaps even by the night life. We are thrilled you are here and have a wonderful conference, and so I'd like to turn this over to Paul Gade.

DR. GADE: Good morning. I hope you are as excited about participating in this workshop as I am. For me, this is the culmination of about three years of work, to pull together, New Issues in Selection Classification.

First of all, I'd like to thank Drew Gitomer and the Educational Testing Service for hosting this event, here at the Chauncey Conference Center. When I saw the triple C on the elevator, I was a little concerned because I'm old enough to remember the civilian conservation corps, I thought maybe they had constructed this, but that wasn't the case. These facilities are really marvelous and make an already interesting event even more appealing, and apparently there is a night life to go along with it.

Secondly, I want to tell you how much Dr. Zitas Simutis, the director of ARI, regrets not being here and giving this opening talk herself. One of the sad things I think she's discovered since she has become the new director of ARI, since she took over for the former director Ed Johnson, is how little control she has over her own schedule even as a director. I was also pleased to see that I'd been promoted in the program, to the Chief of the Army Research Institute, I'm not actually that, I am the Chief of the Basic Research Office in the Army Research Institute.

Zita also asked me to welcome you all and wish you a successful workshop and results as promising as we had in Washington, in February for the last workshop. When Zita opened that workshop with her remarks on the new directions and selection and classification of the workshop last February, she opened that with a little bit of history about testing in the army. I wanted to do a little of the same here.

In many ways it's fitting that ETS and the United States Army jointly sponsor this meeting about Emotional Intelligence, since we share common origins and heritage in the study of human abilities. For example, Carl Brigham who wrote the first SAT test, worked for Robert Yerkes administering the Army Alpha-Beta during World War I. Presumably, the first SAT test that was given in 1926 was pretty much an Army Alpha test, at least so Nicholas Lemann implied in his book "The Big Test," if you've read that.

I also want to give you a brief history, from the army's perspective, of why we are here at this particular workshop. As I think most of you know, our US Army has been in a transition period in which how we organize, select, and train our soldiers, is rapidly changing to meet the needs of minor military operations and technology. As part of this process, ARI is the army's chief laboratory for the behavioral sciences, has been looking for new and promising selection measures to select human abilities that might be applied in the recruiting and assignment of our soldiers. Last February, as I mentioned earlier, we sponsored, and HumRRO helped us plan and run a workshop in DC, on new directions and selection and classification. Some of you were participants in that particular workshop.

As part of that, we, ARI and HumRRO, had planned to follow on workshop to develop promising new approaches that emerged from that first workshop. While we were considering how we might conduct that second workshop, fortuitously, Rich Roberts and Pat Kyllonen who were both participants in that earlier workshop, submitted a proposal for this EI workshop. Bill Strickland of HumRRO, Mike Rumsey of ARI, and I, thought this proposal was a good one and was on target to cover much of what we had been talking about for our follow on workshop. In short, we joined forces and thanks to Rich Roberts and Bill Strickland, we are here today and ready to engage in a very important effort.

Let me close by saying that the study of the role of emotions in human behavior has proved to be a tough, but important, nut to crack. A recent American Psychological Society human capital initiative on basic research, called for more research on human emotions and their role in initiating and controlling behavior. As the head of the ARI's basic research office, I certainly hope that this workshop and the resulting book, will go a long way to providing a good foundation for doing that. Now when I was substituted for Zita she said "you really ought to close this with a funny joke or a story." And she said it had to be clean, so that narrowed it down somewhat, especially when I started to think about what I could talk about that would involve emotions, education, and psychology.

So I'm down to one story, if you've heard this story, please don't blurt out the punch line, and more importantly please laugh at the end. It seems that a mother was trying to wake her son for school; she was having a difficult time doing this. She went into his room once, twice, three times. Each time she went in, her son pulled the covers up over her head, rolled over and ignored her. Finally she went in, in frustration, pulled the covers back and said son you've got to get up and go to school. He said mother I'll give you two good reasons why I can't do that. Number one, the kids all hate me, and two, the teachers all hate me. And his mother said, I will give you two even better reasons why you need to go. First, you're fifty years-old, secondly, you're the principal. Again, thank you.

SESSION I: EMOTIONS: MULTI-DISCIPLINARY PERSPECTIVES

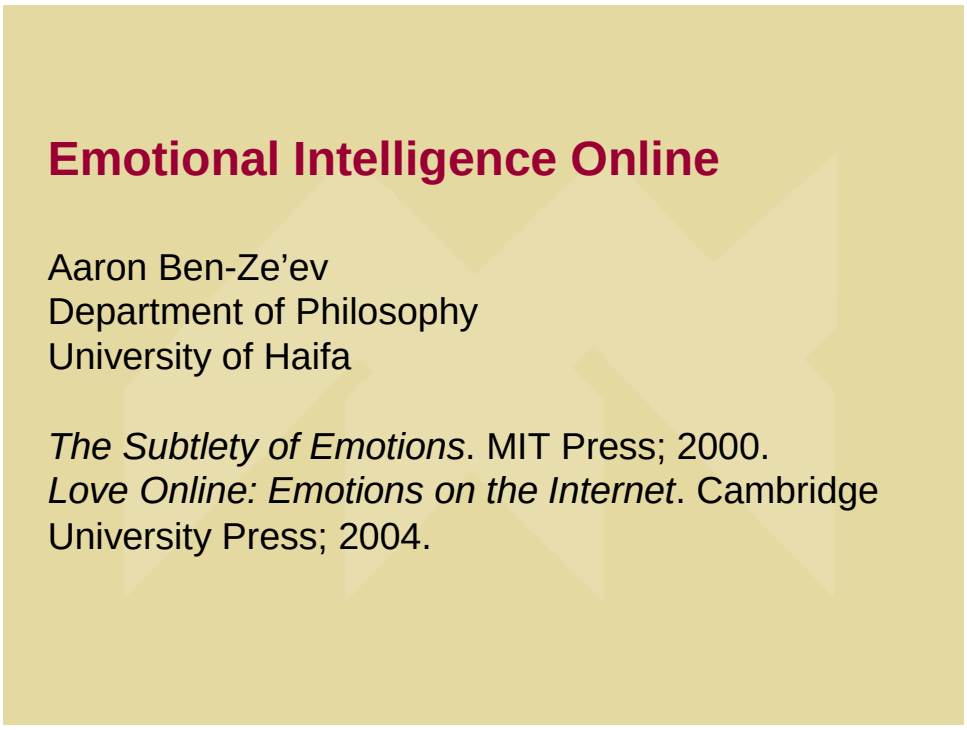
OPENING REMARKS

DR. ZEIDNER: Good morning, ladies and gentleman, I'll be your host for this morning's session focusing on emotions, multi-disciplinary perspectives.

The domain of emotions lends itself admirably well to interdisciplinary and cross disciplinary scrutiny and investigation. Emotions, as one of the most basic of human phenomena, give us an on-line indication of how well we fare in our day to day interactions with the environment (particularly changing environments and challenging or threatening environments) and have clear biological substrata. And they also beckon neuroscientific investigation. Emotions often go amuck, they can go awry, as we often know from own experience. They can become much too intense, much too frequent, of great duration, and cause untold suffering and impairment to one's mental and physical health, thus requiring serious psychiatric and medial scrutiny and investigation. Emotions tend to evolve, as a result of a complex appraisal process, and a person-environment interaction, thus, requiring some form of philosophical analysis of these relational meanings in person-environment interaction. Understanding the unique critical features with specific emotions and how they are differentiated from other emotions and transactions between person and the environment and, of course, cognitive analysis is the most helpful here.

Research, including that conducted by many of the participants attending this conference, has shown that a number of emotions have universal characteristics, but specific antecedents, forms of expression, the display rules, if you will, are forged by social factors and determined, in part, by one's cultural milieu, as are self-regulatory factors. When one is angry, does one apologize to the person who's angry after having transmitted some transgression, or does one pay him off with a certain amount of money? This is basically culturally determined. So this would require, to understand these phenomena, would require both anthropological and sociological investigation.

I could go on and on to show the relevance of linguistic inquiry, economics, evaluation of emotion, how much are people willing to pay to decrease anxiety or depression by half? This is an interesting question; economists have actually developed contingency willing to pay procedures to handle these types of questions. And show how a host of other disciplines are also relevant to the study of emotions. But I think the point is already appreciated, and I would like to move on to the topic of today's session. Our first speaker is a colleague of mine from the University of Haifa; he is also the director of our University. Professor Aaron Ben Ze'ev, internationally well known and respected emotions researcher whose recent book by MIT Press, *The Subtlety Emotions*, has become a classic reference in the field, and has been recently working emotions on-line, tele-emotions, if you will. Professor Ben Ze'ev will talk on Emotional Intelligence Online.



EMOTIONAL INTELLIGENCE ONLINE

DR. BEN ZE'EV: This lecture is based on my two books: The Subtlety of Emotions (MIT Press, 2000), and Love Online: Emotions on the Internet (Cambridge University Press, 2004).

Two claims:

(a) Emotional reasoning is not identical with intellectual reasoning,

(b) The integration of the two types of reasoning is beneficial.

Emotional intelligence expresses an optimal level of such integration.

The notion of Emotional Intelligence presupposes two basic assumptions. One assumption is that emotional reasoning is not identical with intellectual reasoning. The other assumption is that the integration of the two types of reasoning is beneficial. I will discuss each of these claims and explore the consequences for online relationships. First, I will address the uniqueness of emotional reasoning.

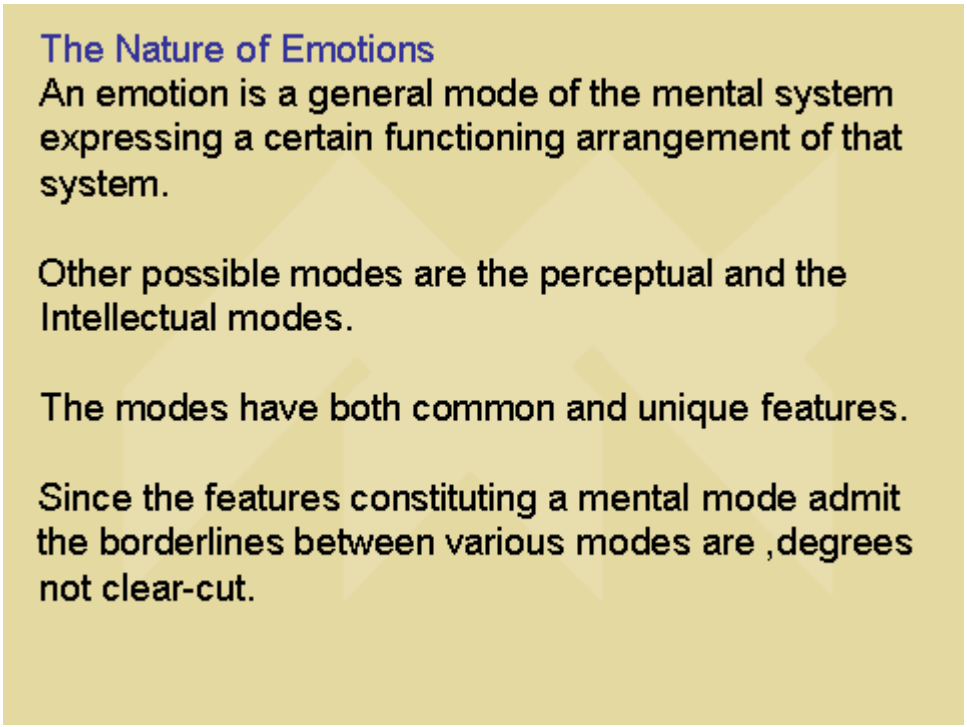
The uniqueness of emotional reasoning

Blaise Pascal: “The heart has its reasons which reason does not understand.”

Connie Francis: “My Heart has a Mind of its Own”

Renee to Ally McBeal: “Emotionally, you’re an idiot.”

Various people have claimed that emotional reasoning is unique. Thus, Pascal said, “the heart has its reason which reason does not understand”. Connie Frances in her wonderful song “My heart has a mind of its own,” makes a similar claim. And in the TV drama, "Ally McBeal," Renee said to Ally: “emotionally you are an idiot”. Now let us see the uniqueness of emotional reasoning by briefly considering the nature of emotions.



There are many disputes about the question: "What is an emotion?" Many people identify emotion with a certain element, such as feeling, evaluation, motivation, or a certain capacity. I believe that we should consider emotion to be a kind of general mode of the mental system, expressing a certain functioning arrangement of that system. An emotion is a mode of the whole mental system; it is not an element of the mind and it is not a single mental capacity. An emotion is a mental mode which includes various elements, components, and capacities.

Other possible modes are the perceptual and the intellectual modes. All modes have both common and unique features. For example, feeling is common to both the emotional mode and the perceptual mode. It is less important in the intellectual mode. Thinking is very important in the intellectual mode, but also in the emotional mode we find thinking. As features constituting a mental mode admit degrees, the borderlines between various modes are not clear cut. When we say that a certain person is now in a certain mode, it means that at that moment this mode is the most appropriate for describing her situation; it does not mean that features characteristics of other modes are completely absent from her present situation.

The Logic of Emotions

Following Kant's distinction between formal and transcendental logic, we can distinguish between analytic rules of valid arguments and synthetic principles of reasoning.

Formal logic consists of analytic rules, such as the rules of contradiction and identity.

Synthetic rules of reasoning are principles dealing with content; they bestow meaning upon the events around us.

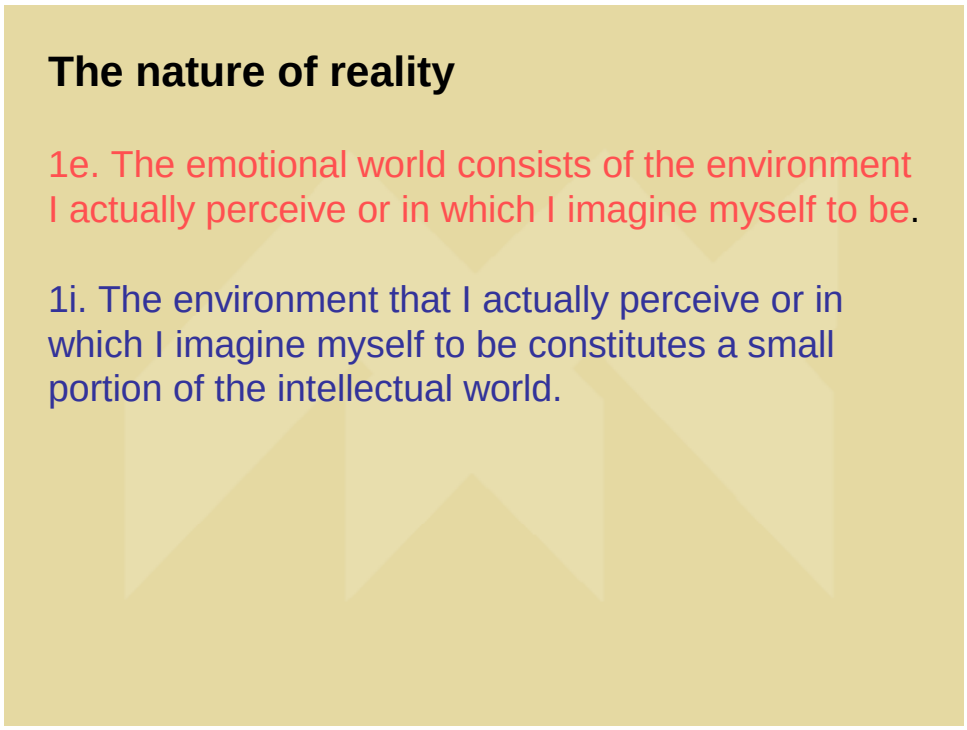
I would like to claim that emotions have their own logic. Following Kant's distinction between formal and transcendental logic, we can distinguish between analytic rules of valid arguments and synthetic principles of reasoning. Formal logic consists of analytic rules, such as the rules of contradiction and identity. Synthetic principles of reasoning are not merely formal, but they bestow meaning upon the events around us. The formal rules of emotional reasoning may be similar to those of the intellectual reasoning, but the principles concerning the content of the reasoning are quite different.

Some synthetic principles underlying emotional reasoning are absent from intellectual reasoning.

The two types of logic are not entirely contradictory: they share analytical rules and some, but not all, synthetic principles.

The logical principles underlying emotional and intellectual principles can be divided into three groups that refer to: (a) the nature of reality, (b) the impact of the given event upon the agent, and (c) the background circumstances of the agent.

Some synthetic principles underlining emotional reasoning are absent for intellectual reasoning. The two types of logic are not entirely contradictory; they share analytic rules, and some, but not all, synthetic principles. The logical principles underlining emotional and intellectual reasoning can be divided into three groups that refer to the nature of reality, the impact of the given event upon the agent, and the circumstances of the agent.



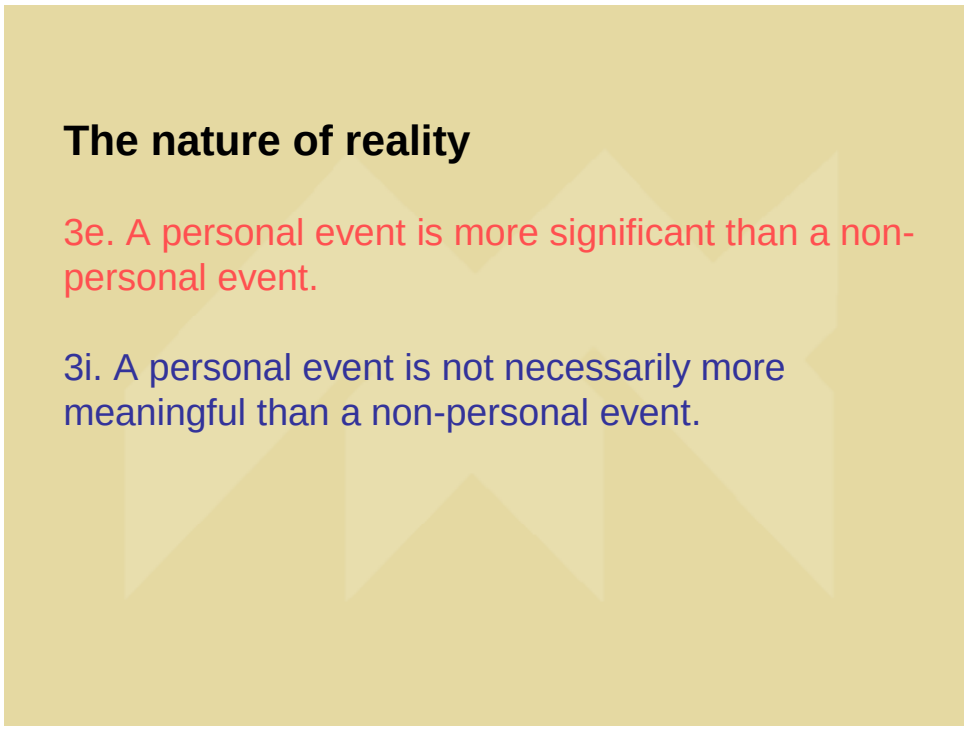
The first principle of the emotional reasoning assumes that the emotional world consists of the environment I actually perceive or in which I imagine myself to be. The emotional world is the world or environment that is close to us. The emotional world constitutes a small portion of the intellectual world. (The principles painted in red are part of the emotional reasoning; those in blue belong to the intellectual reasoning.)

2e. Changes are more significant than stability.

2i. Changes are not more significant than stability; on the contrary, we should assume that there are stable regularities in the world.

The second principle of emotional reasoning is that changes are more significant than stability. Emotions are generated when we perceive a significant change in our situation. Therefore, changes are more meaningful for our emotional system. Just to give one example, sexual desire is stronger toward a new partner than toward a familiar one. So the frequency of a sexual relationship after one year of marriage, is about half of what it was one month after marriage. The intellectual reasoning does not consider changes to be so significant. On the contrary, the intellectual system looks for stable regularities in the world.

The French philosopher Henri Bergson criticized the intellectual system exactly on this point. He said that reality is constantly changing; therefore, the intellectual system, which works with stable laws, cannot understand reality. Only intuition, which is a kind of emotional cognition, can understand reality.



A third principle of the emotional system: a personal event is more significant than a non-personal event. In the intellectual system, a personal event is not necessarily more meaningful than a non-personal event. What is of interest to the emotional system is our immediate personal situation. The intellectual system has a much broader interest. Unlike an intellectual attitude, an emotion cannot be a theoretical attitude.

The impact of the given event

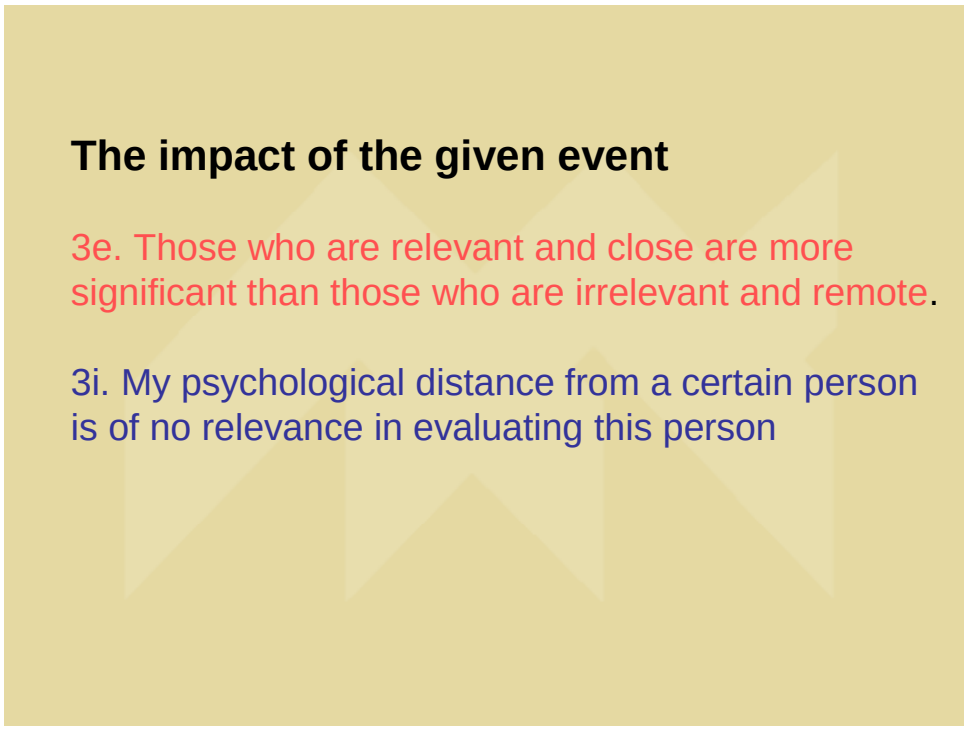
1e. The perceived strength of an event is most significant in determining its impact.

1i. The objective strength of an event is what is most significant.

2e. The more real an event is perceived to be, the more significant it is.

2i. The significance of an event is not always connected to its perceived reality.

The perceived strength, rather than the objective strength, of an event is quite significant in determining its impact. For intellectual reasoning, the objective strength of an event is more significant. Similarly, for emotional reasoning, the more real an event is perceived to be, the more significant it is. In intellectual reasoning, the significance of an event is not always connected to its perceived reality; it is connected more to its objective reality.



From an emotional point of view, those who are relevant and close to us are more significant than those who are irrelevant and remote. In the intellectual system, the psychological distance from a certain person is of no relevance in evaluating this person. Emotions are concerned with personal, relevant, and close events. Those who are irrelevant and remote are of no emotional concern.

Background circumstances of the agent

1e. The more responsible I am for a certain event, the more significant the event is.

1i. My responsibility for a certain event is in many cases irrelevant to its present significance.

2e. The less prepared I am for a certain event, the more significant the event is.

2i. My preparedness for a certain event is in many cases irrelevant to its present significance.

The third group of principles refers to background circumstances of the agent. From an emotional viewpoint, the more responsible I am for a certain event, the more significant the event is for me. In intellectual reasoning, my responsibility for a certain event is in many cases irrelevant to its present significance. Another principle of emotional reasoning: the less prepared I am for a certain event, the more significant the event is. In intellectual reasoning, my preparedness for a certain event is in many cases irrelevant to its present significance.

3e. The issue of whether the agent deserves a certain event is greatly significant in evaluating this event.

3i. The issue of whether the agent deserves a certain event is not always significant in evaluating this event.

In emotional reasoning, the issue of whether the agent deserves a certain event is greatly significant in evaluating this event. The question of deservingness is crucial in generating emotions. We will not be upset if we would have little, but will be very much upset if we get less than what other people get. The deservingness is mainly a comparative issue. In intellectual reasoning, the issue of whether the agent deserves a certain event is not always significant in evaluating this event.

The value of emotional reasoning

There is a long tradition separating emotional experience from intellectual considerations and accordingly criticizing the rationality and functionality of emotions.

I consider this criticism to be unfounded as emotions are highly functional and are rational in the sense of being the most optimal response in many – although, of course, not in all – circumstances.

I turn now to discuss the value of emotional reasoning. There is a long tradition criticizing the rationality and functionality of emotions. I consider this criticism to be unfounded, as emotions are highly functional and rational in the sense of being the most optimal response in many, also of course not in all, circumstances. To reinforce this point, let us briefly consider the nature of rationality.

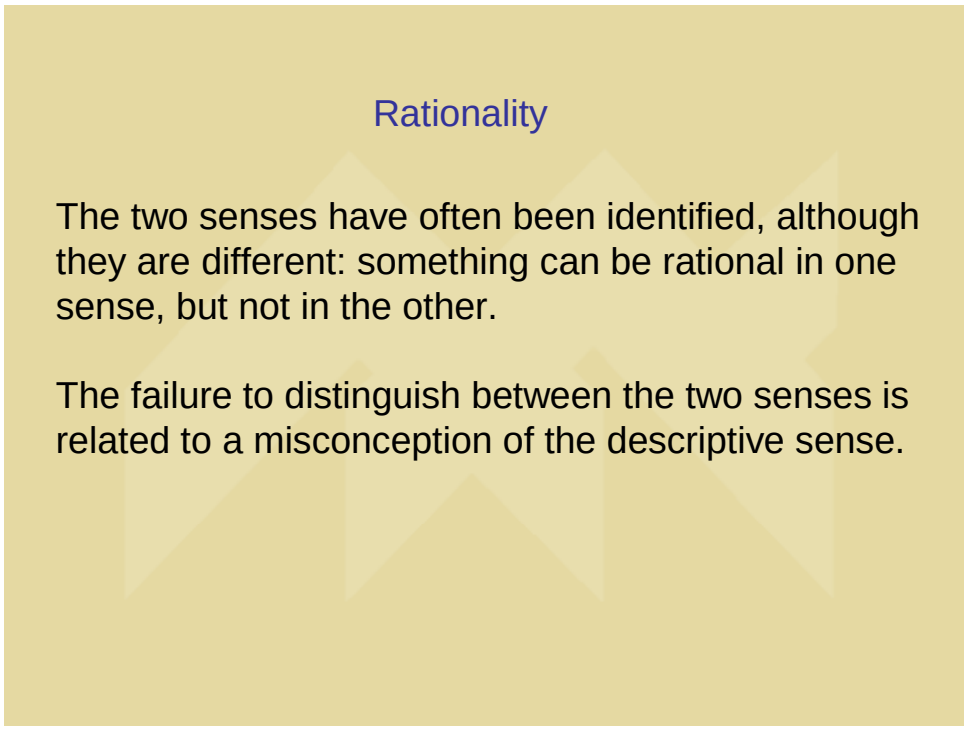
Rationality

Traditionally, something would be considered to be rational in light of one of the following two senses:

(a) A descriptive sense, in that the generation of X involves intellectual calculations,

(b) A normative sense, in that X may express an appropriate response in the given circumstances.

Traditionally, something would be considered rational in light of one of the following two senses – descriptive and normative. In light of the descriptive sense, X is rational if the generation of X involves intellectual calculations. The presence of intellectual calculations makes the response rational. In light of the normative sense, X is rational if it expresses an appropriate response in the given circumstances.



Although the two senses are different, many people have often identified them. Something can be rational in one sense, but not in the other. The failure to distinguish between the two senses is related to the mistaken assumption that only intellectual calculations can generate optimal solutions.

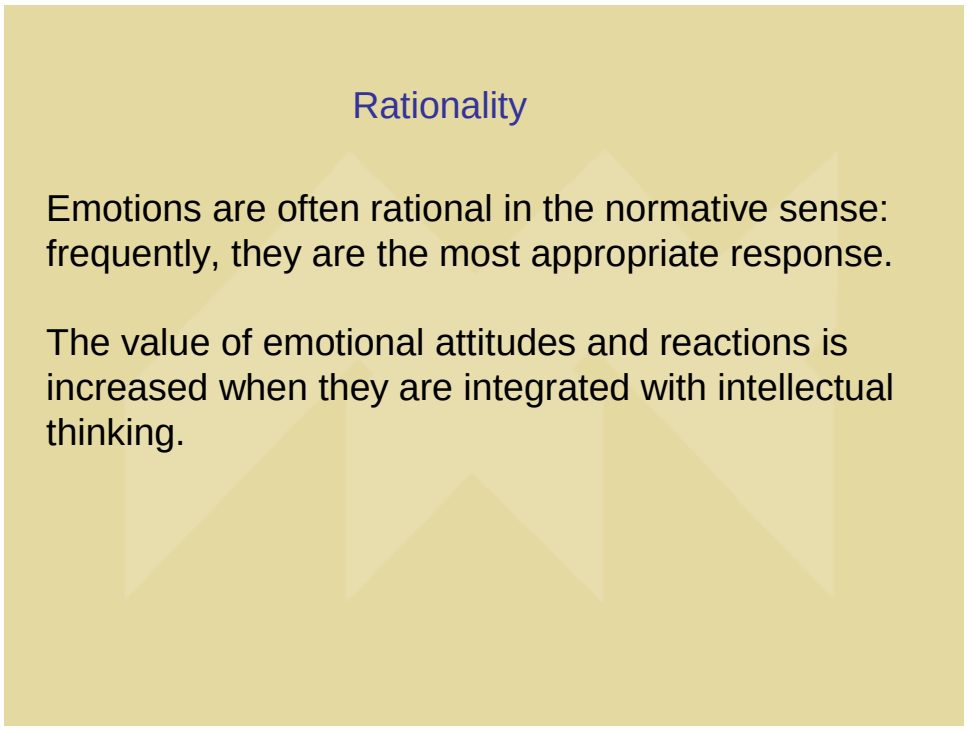
Rationality

Identifying the descriptive sense of rationality with intellectual calculations stems from the assumption that only the intellect can express a consistent pattern of appropriate responses.

There are circumstances in which using intellectual calculations typically renders inappropriate responses.

Examples: cases of sudden changes - where the agent is not calm, much relevant data is missing, and speed is more important than accuracy.

The descriptive identification of rationality with intellectual calculations stems from the assumption that only the intellect can express a consistent pattern of appropriate responses. There are circumstances in which using intellectual calculations typically renders inappropriate responses; this is in contrast to this identification. Examples: cases of sudden changes when the agent is not calm, cases where much relevant information is missing, and cases where speed is more important than accuracy. In those circumstances emotional responses may be appropriate than intellectual responses.



Emotions are often rational in the normative sense; frequently they are the most appropriate response in the given circumstances. The value of emotional attitudes and reactions is increased when they are integrated with intellectual thinking. Such cases express the presence of emotional intelligence.

Emotional Intelligence

Intellectual intelligence is an intellectual ability to function in an optimal manner in complex situations.

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Neither type of intelligence is adequate in itself for optimal behavior in most everyday circumstances.

Emotionally intelligent behavior is behavior in which emotions play a major, but not an exclusive role

Intellectual intelligence is an intellectual ability to function in an optimal manner in complex situations. Similarly, emotional intelligence is an emotional ability to function in an optimal manner in complex situations. Neither type of intelligence is sufficient for most everyday circumstances. Emotionally intelligent behavior is behavior in which emotions play a major, but not an exclusive, role.

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La Rochefoucauld: “The head is always fooled by the heart.”

Why should the heart bother to fool the head?

An important part of our self-image is that we believe ourselves to be swayed by reason rather than by passion.

Elster terms this tendency “addiction to reason”.

As La Rochefoucauld said, “the head is always fooled by the heart.” Why should the heart bother to fool the head? An important part of our self- image is that we believe ourselves to be swayed by reason rather than by passion. Elster terms this tendency “addiction to reason.”

The opposite tendency is evident as well: the head attempts to fool the heart.

In light of the sincere and profound nature of emotions, behavior governed by the heart is perceived to be more sincere and profound than that governed by the head. Therefore, in many circumstances politicians would like us to view their decisions as coming from the heart.

The need of the heart to fool the head and the need of the head to fool the heart indicate a significant feature of the mental system: the importance of the connection between the two and hence of emotional intelligence.

The opposite tendency is evident as well, the head attempts to fool the heart. In light of the sincere profound nature of emotions, the area governed by the heart is perceived to be more sincere and profound than that governed by the head. Therefore, in many circumstances people, such as politicians for example, would like us to believe that their decisions are coming from their heart. The need of the heart to fool the head and the need of the head to fool the heart indicate a significant feature of the mental system: the importance of the connection between the two, and hence, of emotional intelligence.

Integrating the emotions with intellectual thinking is particular important in cases where one of these capacities is overwhelmingly dominant.

In times of intense anger, we are advised to count to ten in order to give ten seconds for intellectual thinking to operate.

Similarly, when we make calculated decisions concerning other people, we should use compassion and remember that we are dealing with vulnerable and emotional people.

Integrating the emotions with intellectual thinking is particularly important in cases where one of these capacities is overwhelmingly dominant. In times of intense anger, we are advised to count to ten, in order to give ten seconds for the intellectual system to introduce its input. We are not advised to count to 1000, why not? Because, if we shall count to 1000, we may fall asleep and in any case, we would exclude the emotional system from participating in the decision making process. We give only 10 seconds to the intellectual reasoning to introduce its input, and in this way, we still leave a considerable role for emotional reasoning. Similarly, when we decide upon the fate of other people, we should use compassion and remember that we are dealing with vulnerable and emotional people.

Emotional reasoning is more partial and personal; it gives more weight to immediate needs and events that are perceived now and less weight to long-term objectives calculated through intellectual reasoning. Perceived transient changes are more significant than stable regularities.

Intellectual reasoning is broader and less personal than emotional reasoning; it is less influenced by current psychological events. Intellectual reasoning gives more weight to practical objectives and tries not to be overwhelmed by perceived temporary events. The agent's personal role is less significant in interpreting various events.

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The different perspectives adopted by intellectual and emotional reasoning make the integration between the two difficult to achieve.

Nevertheless, in most circumstances there is evidence of some integration between our emotional and intellectual capacities.

The question is whether the relative weight accorded to each type of capacity is the optimal one for the given situation.

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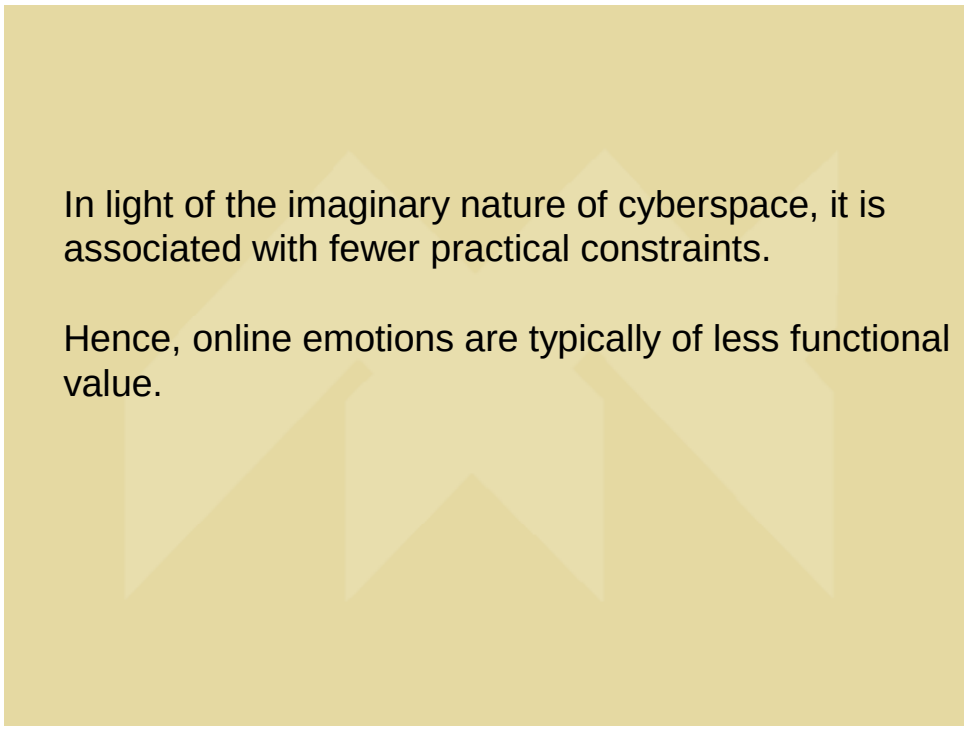
Emotions and intelligence in cyberspace

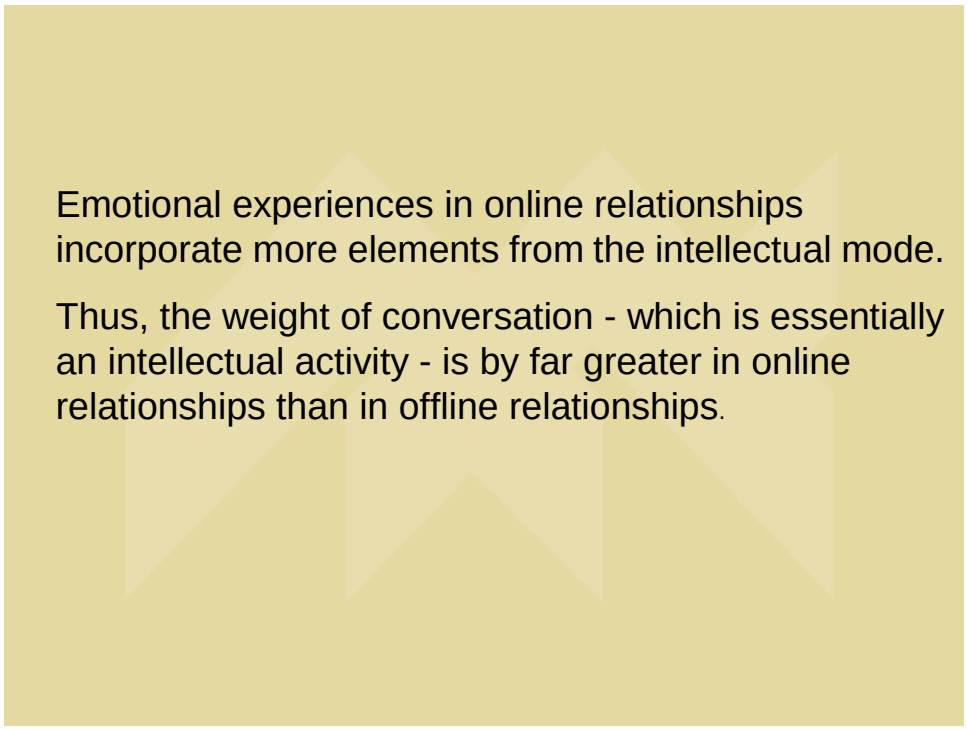
Online relationships are based upon written conversations and accordingly intellectual capacities play greater role in them.

Cyberspace also generates more intense emotions as it is more dynamic and involves many exciting and highly available romantic opportunities (many of them are imaginary).

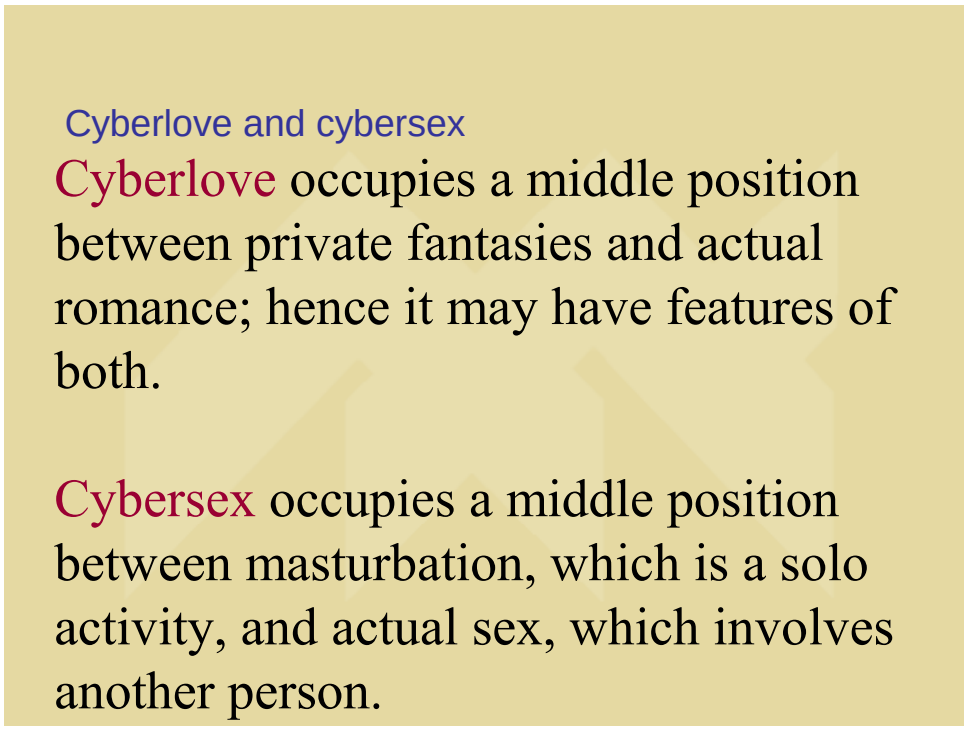
I turn now to examine the issue of emotional intelligence in cyberspace. Online relationships are based upon written conversations and accordingly, intellectual capacities play a greater role in them. Cyberspace also generates more intense emotions, as events are more dynamic and involve exciting and highly available romantic opportunities. Many of such opportunities are, of course, imaginary.



In light of the imaginary nature of cyberspace it is associated with fewer practical constraints. Hence, online emotions typically have reduced functional value.



Emotional experiences in online relationships incorporate more elements from the intellectual mode. Thus, the weight of conversation which is essentially, an intellectual activity, is far greater in online relationships than in offline relationships.



Cyberlove occupies a middle position between private fantasies and actual romance; hence it may have features of both. Cybersex occupies a middle position between masturbation, which is a solo activity, and actual sex, which involves another person.

A woman who has participated in cybersex writes: "The best sex, obviously, is with someone literate enough to 'paint a picture' describing activities or thoughts. I suppose that in face-to-face activities, someone stupid could still be extraordinarily sexy. But stupid doesn't work online, at least not for me."

Another woman described how, after a very intense online love affair, she married her online lover and discovered that their love deepened even more after their marriage: "I think being able to get to know someone deeply on an intellectual level makes a huge difference in how a relationship grows."

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Consider, for example, the following statement by a 41-year-old male:
"I think intellect becomes a much larger player in this sort of communication. You can really connect with a woman very quickly and really rock her world, because you can use your full ability to communicate (if you have the head to do it)… Visual is good; I'm tall and generally considered quite handsome, but I have a much greater advantage here. I did VERY well as a single man chasing women. Still have a much greater edge here."

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Falling in love consists of two basic evaluative patterns. One is an attraction and is mainly directed at external appearance and the second is praiseworthiness of personality traits. In offline relationships, we first fall in love in light of the external appearance, and then get to know the person. In online relationships, we first get to know the other person through conversations. We know his or her personality, sense of humor, and other character traits, and only then fall in love with this person.

In a sense, this type of relationship goes back to the "good old days" in which people talked before they had sex. This type of acquaintance seems to be advantageous in the long run where external appearance is less important than personality traits. So, if the relationship is based upon personal traits, which are more profound, their survival prospects are better. The prospects of online relationships also depend upon the first face-to-face meeting in which attraction to external appearance is first fully revealed. Many romantic relationships that started online end at this meeting. If the couple survives the first face-to-face meeting, then the probability of the relationship to endure for a long time is quite high.

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A married woman recounts the pain she felt when her husband said that, although he loves her (the wife) and would never leave her, his online partner is "the most intelligent woman he's ever talked to."

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In our modern society, we don't have time to speak with each other, since we are so busy in work and elsewhere. But in online relationships what people do is merely talking. So, they don't have another venue of being with someone. Unlike watching TV in offline circumstances, in cyberspace people cannot just sit silently beside each other. A blank monitor doesn't do the "work" in cyberspace; the two need to speak in order to be with each other.

From another perspective, online relationships may be considered to be more emotional than offline relationships.

The great availability of exciting alternatives and the lack of practical considerations enable people to go with their emotional drives and instincts when visiting cyberspace.

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The other direction of influence is evident as well: emotional features influence intellectual attitudes.

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One woman writes: “I don’t know what it’s like to touch this man, yet he has touched me a thousand times in my dreams.” Accordingly, the two partners often describe each other as part of their soul, as “soul mates.”

Another woman says: “I believe he is my soul mate, even though I can’t see him, I feel him near me.”

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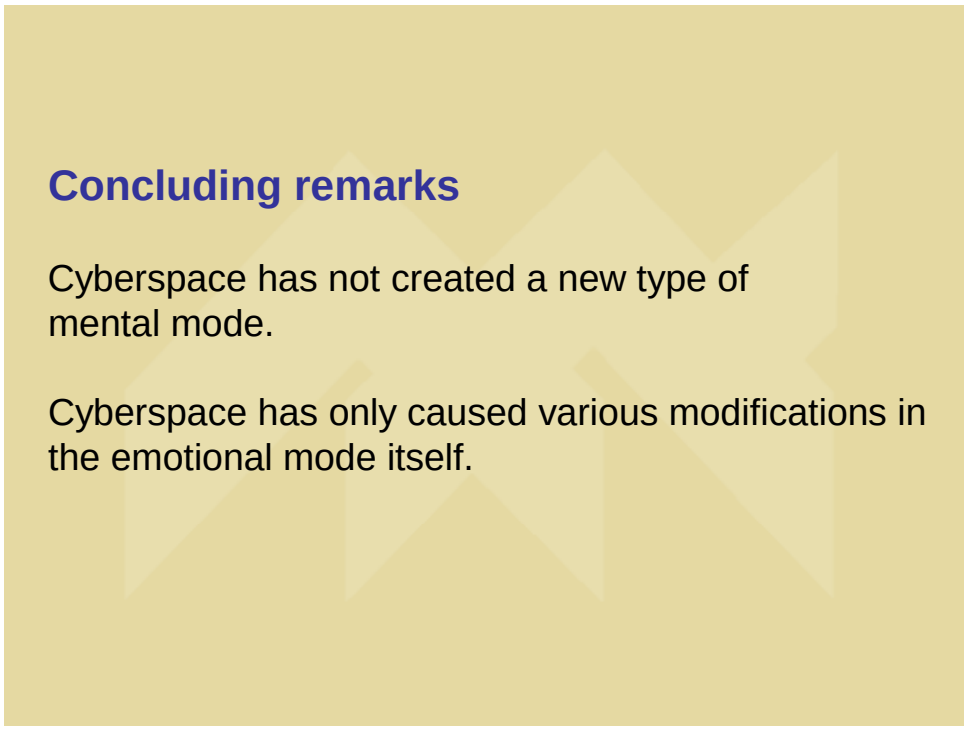
Despite the great emotional and intellectual satisfaction in these relationships, their participants want such successful relationships to be transformed into an offline relationship.

In this sense, these relationships are incomplete.

Despite the great emotional and intellectual satisfaction in online relationships, their participants want these relationships to be transformed into offline relationships. In this sense, online relationships are incomplete. People testify that their online relationship is the most intense love of their life involving the wildest sex they have ever experienced. Nevertheless, they still want to transform these relationships into an offline relationship. In a sense, this is like killing the thing we love. The great advantage of the online relationships is that they miss some elements of offline relationships (for example, the distorted impact of external relationship) and that they have unique features not to be found in offline relationships (such as the extended and open conversations). Moreover, these people know that the attempt to transfer their online relationship to an offline relationship will in most cases kill the relationship.

This seemingly irrational action stems from our failure to be satisfied with our own lot. It is not enough for us that we are happy; we always want to be happier. Such a search for being happier often destroys our happiness. This action can also be explained in light of our tendency to further deepen a good relationship. Similarly, two lovers may have a pleasant nonsexual relationship but still want to deepen their relationship by adding the sexual aspect, although they know that this may ruin their relationship.



Cyberspace has not created a new type of mental mode. Cyberspace has only caused various modifications in the emotional mode itself.

Online romantic relationships have to a great extent succeeded the integration between intellectual and emotional capacities; such integration lies at the basis of emotional intelligence.

Such relationships are characterized by extremely intense enjoyable intellectual and emotional experiences. It is our task to try to approach this level of beneficial integration in offline circumstances as well.

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It should be noted, however, that the integration between emotional and intellectual capacities is done in an environment that is to a large extent imaginary and hence having very few actual practical limitations.

Society faces a great challenge if it is to integrate cyberspace successfully into our romantic relationships.

The integration between emotional and intellectual capacities is done, however, in an environment that is to a large extent, imaginary and, hence, having very few actual practical limitations. Another risk in this regard, is the risk of addiction and the risk of destroying offline relationships. We can describe online relationships as getting an emotional salary without working. And since there is no free lunch, someone must pay for this lunch. In online relationships, the one who pays for the lunch is the offline partner and the offline relationship.

Society faces a great challenge if it is to integrate cyberspace successfully into our romantic relationships.

DISCUSSION

DR. ZEIDNER: Thanks to Professor Ben-Ze'ev for a very spirited and engaging talk. We have about 10 minutes for questions and answers please.

DR. ROBERTS: Don't be shy.

DR. MAYER: So is online relationships really a sign of emotional and intellectual integration or it is perhaps a way that very shy people have of finding another conduit for their relationship.

DR. BEN-ZE'EV: Online relationships are not merely for shy people, although shy people can take great advantage of it. All types of people participate in online relationships. For example, attractive women are having online relationship in order to ensure that their partner love them not because of their beauty but because of their personality.

It should be noted, however, that the integration between emotional and intellectual capacities is done in an environment that is to a large extent imaginary and hence having very few actual practical limitations.

Society faces a great challenge if it is to integrate cyberspace successfully into our romantic relationships.

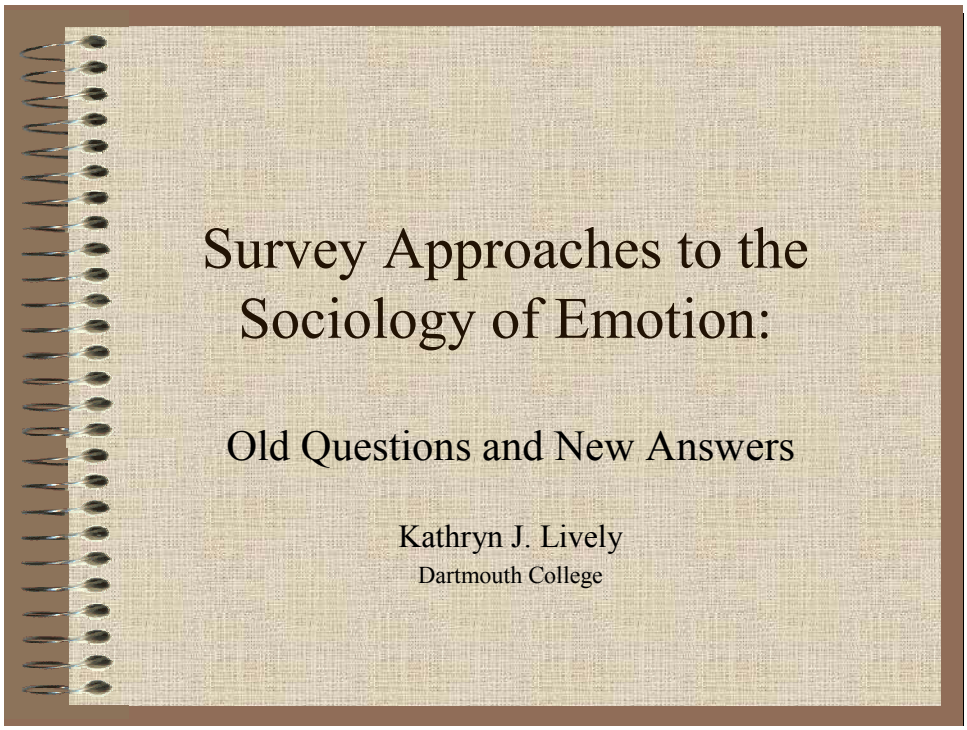
PARTICIPANT: So one thing which I see as interesting is the advent of text-based communication during the past decade or so. Do you care to comment on this?

DR. BEN-ZE'EV: The lack of nonverbal information in text-based online communication led some researchers to claim that such communication is leaner and hence online relationships are less involving, less rich, and less personal than offline relationships. It is true that not all types of information available in face-to-face communication are also available in online communication; in this sense, the latter is leaner. However, this does not mean that online relationships are necessarily less involving, less rich, or less personal than offline relationships. Text-based communication with a sincere person may provide richer information than a face-to-face meeting with another person. Indeed, as compared to face-to-face communication, online communication involves higher proportions of more intimate questions and lower proportions of peripheral questions. Despite the usually lean nature of online communication, it gives rise to profound personal relationships.

DR. BEN ZE'EV: I didn't mention many of the disadvantages of an online relationship. We should be aware of the downsides of online relationships—in particular, of the possibility of becoming addicted to cyberspace, in the way that people can become addicted to drugs. In both cases, there is artificial stimulation of the pleasure centers, and the distinction between reality and illusion is blurred. Online relationships also involve the dangers of meeting unscrupulous people and of experiencing disappointments that could shatter the dreams of the people involved.

DR. GRANDEY: I'm very interested in psychosomatics and the work that you may heard from Pennebaker suggesting that when people write down emotional experiences they actually have better health. And I was wondering if anyone looked at that online, that is the development of relationships in terms of the mental or physical health of individuals.

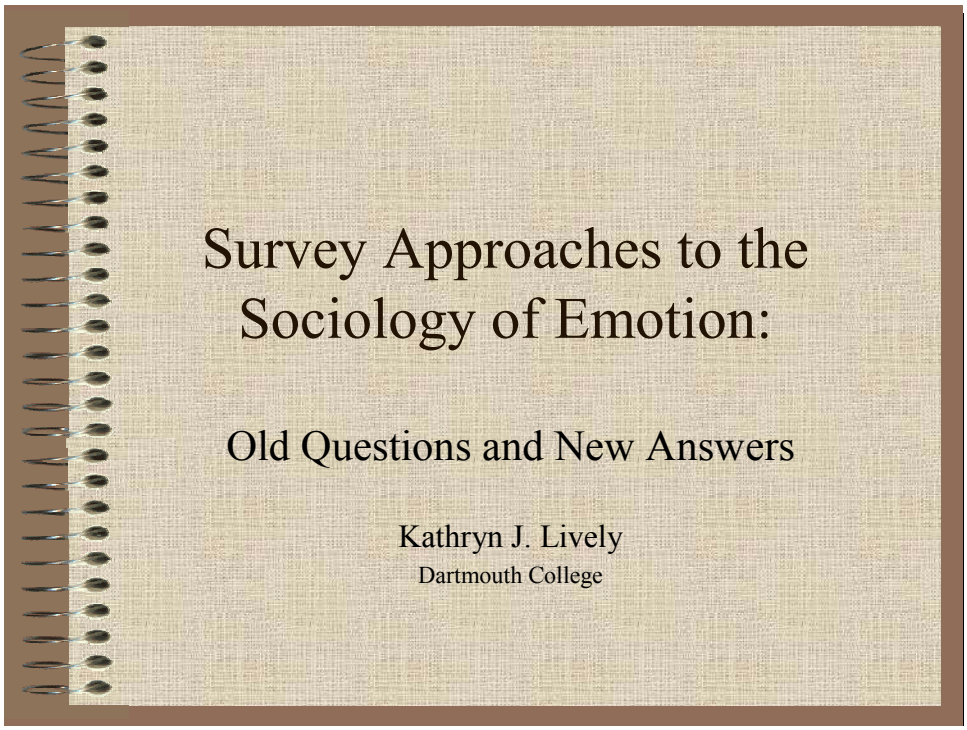
DR. BEN ZE'EV: Empirical research on online relationships is just beginning. I am not aware of a specific study along the lines that you are suggesting; however, I believe that people describing their emotional experiences to their online partners will not enjoy similar positive results.



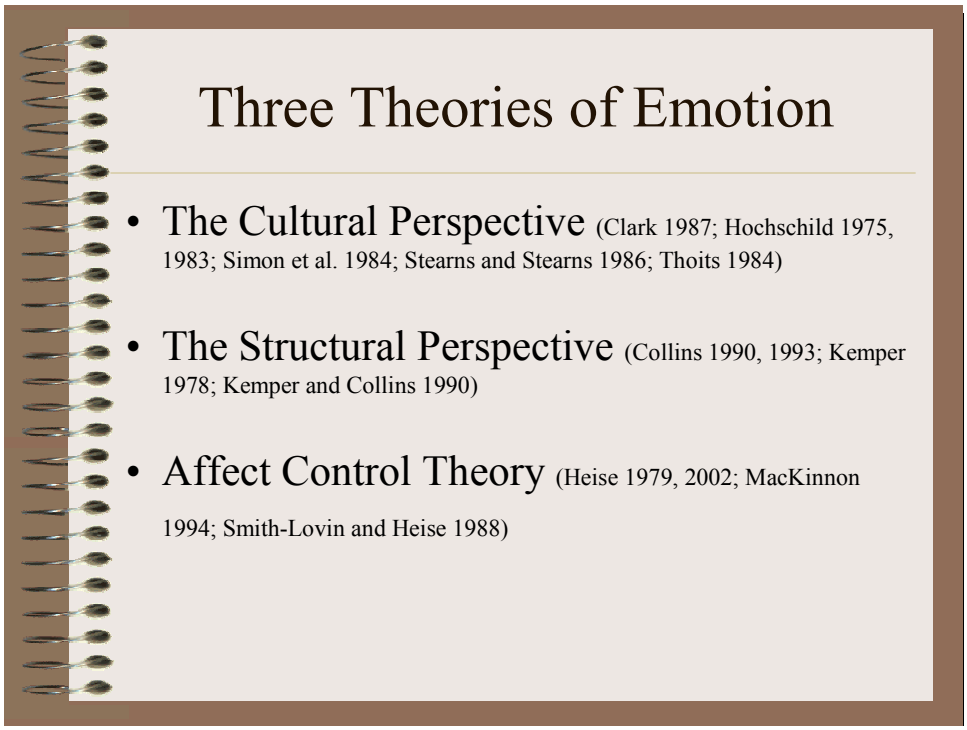
SURVEY APPROACHES TO THE SOCIOLOGY OF EMOTION: OLD QUESTIONS AND NEW ANSWERS

DR. LIVELY: Unfortunately we're going from cybersex to sex differences, so I apologize now. Today I would like to discuss a number of recent projects in the area of sociology of emotion. These studies, some of which are my own, represent a relatively new trend in the sociology of emotion to the degree that we finally have data available that will allow us to test with a nationally representative survey sample what we've been observing in both particularistic settings and small groups.

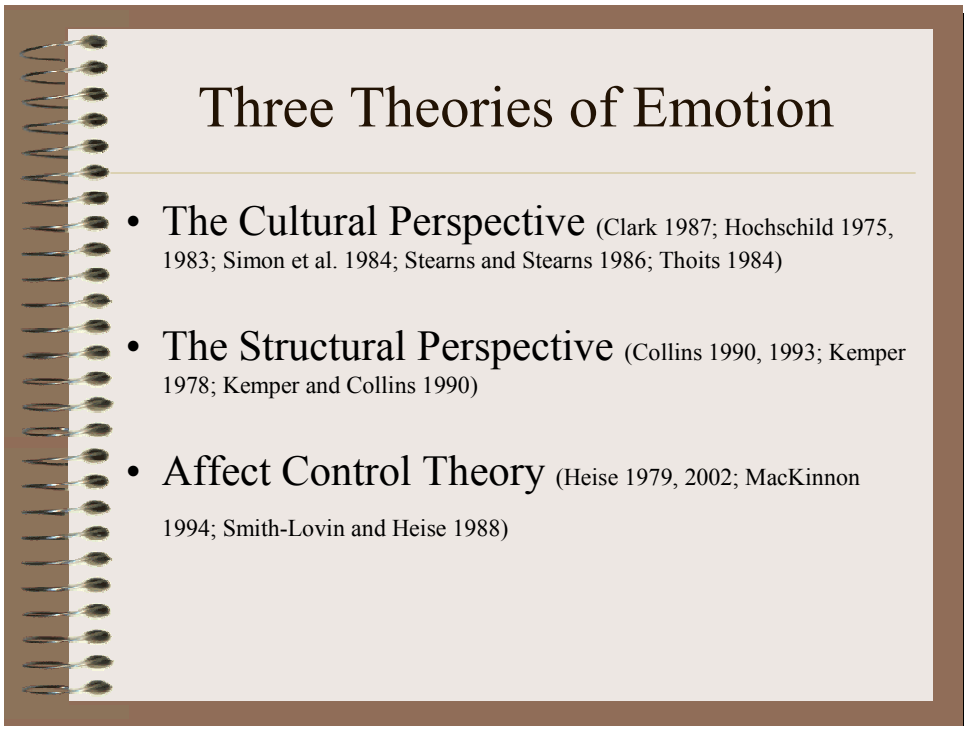
As a sociologist, my interest in emotion is not routed necessarily in the physiological underpinning of emotion, but rather in the external forces that shape emotion once that somatic experience has occurred and been subsequently labeled as such. As a sociologist, I tend to be interested in the conditions under which people experience emotion, as well as the conditions under which people feel free to express their emotions. As a sociologist, I'm interested in the degree that which actors are constrained by the domains in which their emotions are activated and to what extent they're bound by their hierarchal positions that they occupy or by their status as a function of their race, class and particularly their gender. And finally, as a sociologist, I'm interested in determining whether there is a structure within felt emotion that can be ascertained, and, if so, how might this structure relate to identity as well as to emotion processes more generally.



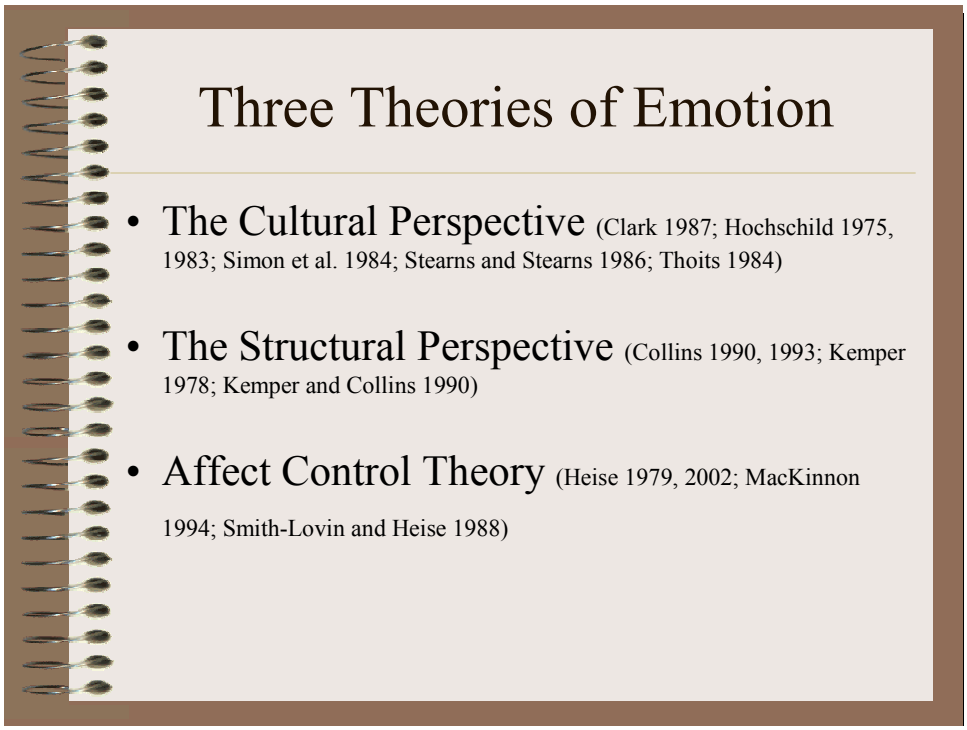
While it may not be immediately apparent how these broader sociological questions relate to the more psychological construct of emotional intelligence, all of the studies that I discuss today speak to the degree to which individuals are aware of their emotional reactions, the conditions under which they are likely to manage their own emotions, the degree to which individuals segue through pathways designed to manage their own emotions as well as the emotions of other people –all necessary components of emotional intelligence. As a secondary goal, these studies also illustrate the degree to which the General Social Surveys (GSS) module on emotion, which was collected in 1996, is a valuable if not underutilized resource in understanding how emotion operates within the general U.S. population.



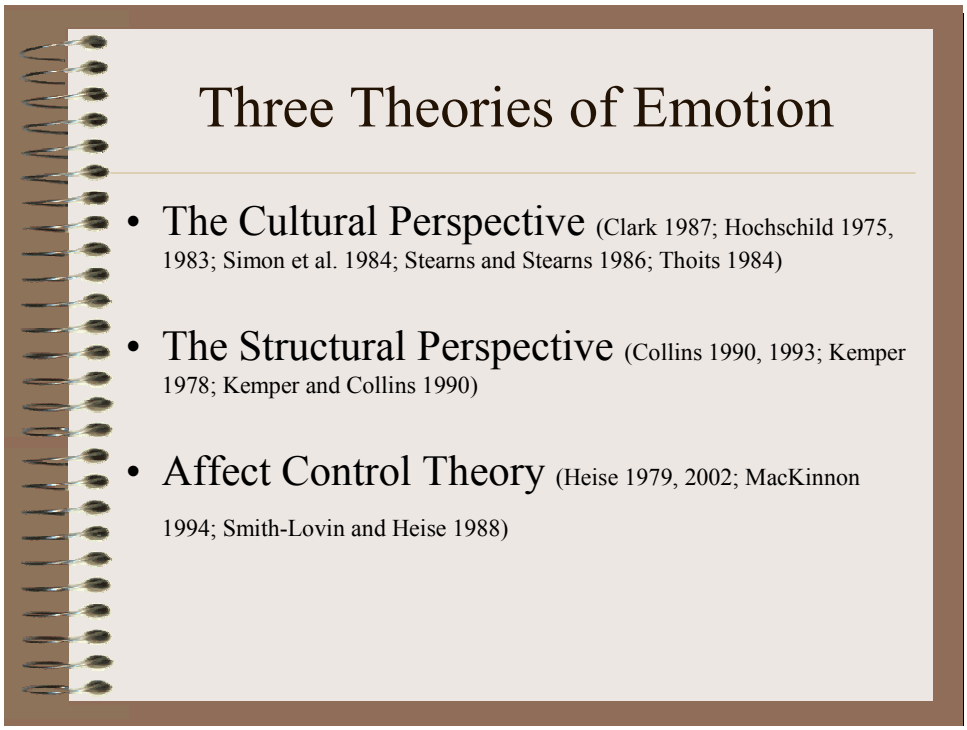
Before I begin, I would like to orient you to the three theoretical perspectives on which these studies are based. While a number of theoretical lenses have been brought to bear to the sociological study of emotion, I am limiting my discussion to three: the cultural perspective (Clark, 1987, 1997; Hochschild, 1975, 1983; Stearns, 1999; Stearns and Stearns, 1986), the structural perspective (Collins, 1990, Kemper, 1978; Kemper and Collins, 1990), and Affect Control Theory (Heise, 1979, MacKinnon, 1994; Smith-Lovin and Heise, 1988). It is important to acknowledge that these three perspectives do not exhaust the important theoretical contributions within the sociology of emotion. But in fact, they do lay the cornerstone of the sub-discipline and do provide the groundwork for which much of this talk is based.



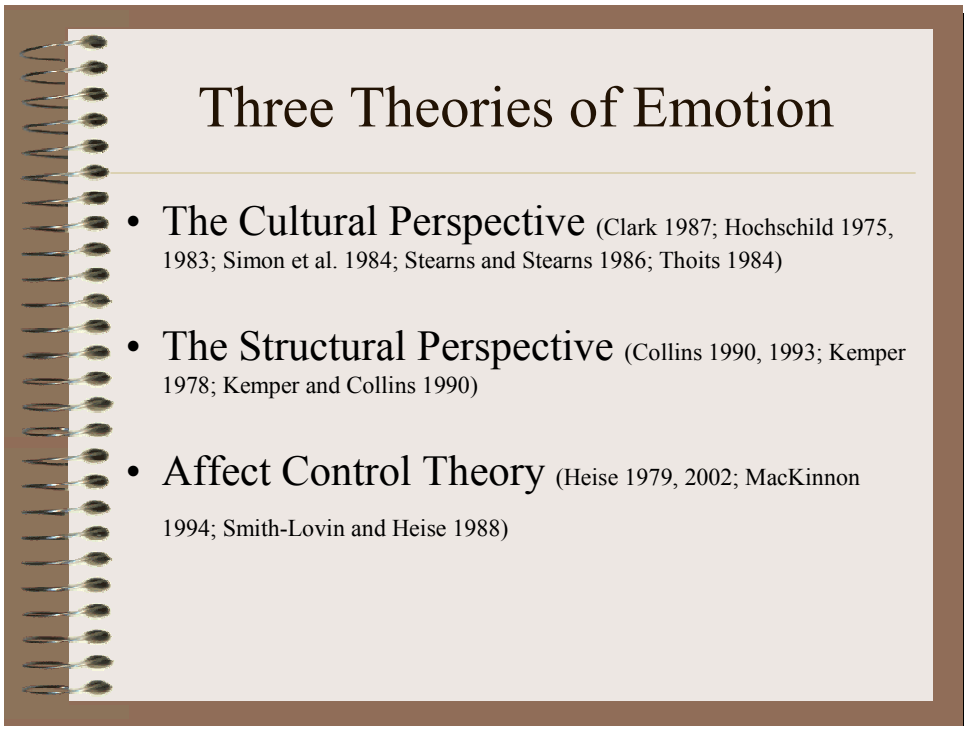
In many respects, Arlie Hochschild's (1975, 1979, 1983) early work is representative of the cultural tradition of the sociology of emotion. Building in large part on the work Erving Goffman (1959) and Paul Ekman (1973), among others, Hochschild introduced the notion of feeling rules or cultural norms that specify the types of emotion, the extent of emotion and the duration of emotion or feelings that are appropriate within a particular situation (also see Thoits 1990). This approach to emotion and emotional expression underscores that each domain may have its own emotion culture, which determines what emotions are appropriate to feel or to display under what conditions. Without discounting the physiological component of felt emotion (see Hochschild, 1983: Appendix "A"), the cultural perspective also highlights differences in norms regarding emotional displays that result from social structure characteristics, such as race, education, and most especially gender (see Simon, Eder, and Davis, 1992 and Simon and Nath, 2004).



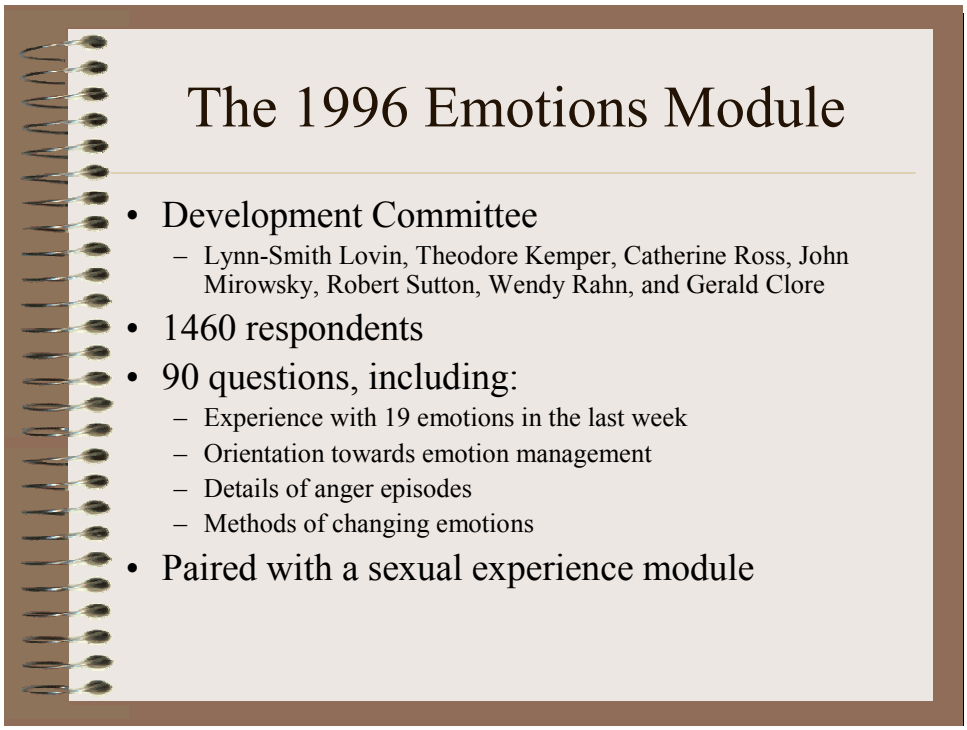
Structural explanations of emotion are typically attributed to Kemper and Collins, although Hochschild's (1983) and Clark (1990, 1997)work contains structural elements, too, to the degree that emotion norms apply differentially to those people with more or less advantageous social positions. Kemper's (1987) social relational theory of emotion argues that two dimensions of social relationships, status and power, are universal and cause particular emotional experiences. Although he speaks to actual experience, instead of the expression of emotion, Kemper's work has influenced later studies regarding emotional expression. Collins (1990), in particular, has argued that actors who occupied social positions by virtue of their title or organization memberships, such as a paralegal or an attorney, enact ritual chains or enact chains of action that allow actors to maintain shared beliefs regarding their relative standing within a particular hierarchical setting (also see Lively, 2000). The structural approach mirrors Hochschild's (1979) theoretical arguments about structure and emotion: that positive emotions routinely flow up status hierarchies (from lower to higher status actors) and that when negative emotions are displaced from their rightful target, they are more likely to flow down (from higher to lower status actors).



Blending elements from both the cultural and structural perspective, Affect Control theory proposes that emotions reveal how an individual is fairing within a particular social interaction, both absolutely and relatively compared to the individual's role identity (Heise, 1979, 2002). For example, someone who realizes he looks foolish in an interaction will experience an unpleasant emotion. Moreover, that emotion will be more unpleasant if the role is highly esteemed (Lively and Heise, 2004) or occurs in a particular setting (Lively and Powell, forthcoming; Smith-Lovin and Heise, 1988). Recurrent emotions reflect an individual's station in life in terms of their prevailing role, such as being a spouse, as well as ongoing processes, such as getting a divorce (see Lively and Heise, 2004 for a more detailed discussion).

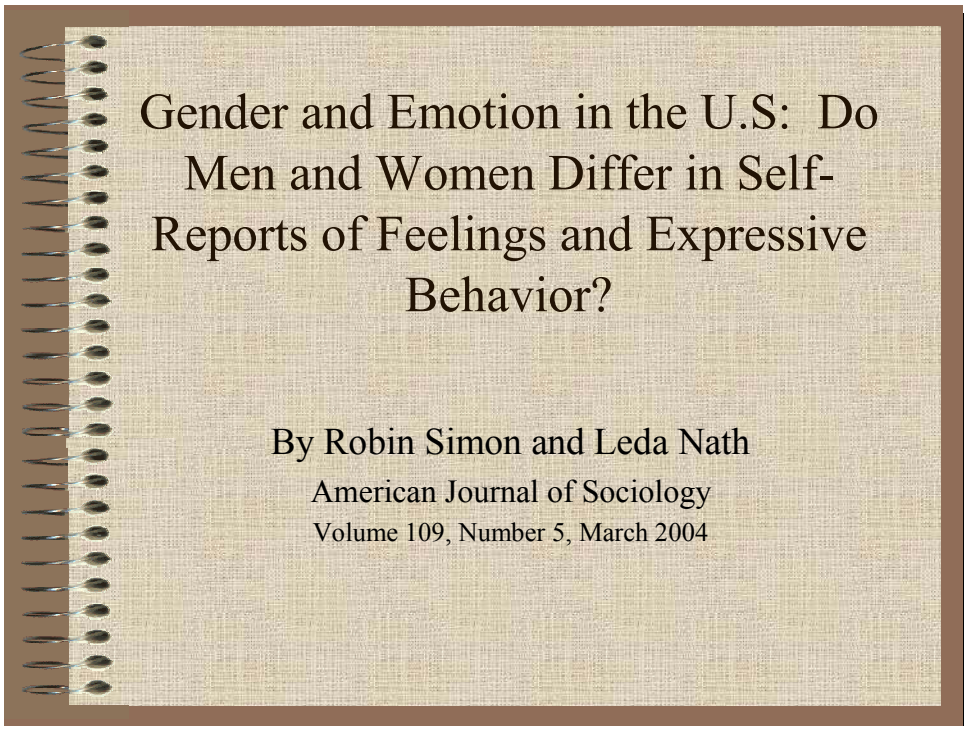


According to Affect Control theory, emotions like other elements in an interaction, such as identities, behaviors, settings, and attributes, are all distinguishable in terms of three universal dimensions of affective meaning, identified through research across dozens of cultures (Osgood, May, and Miron, 1975; also see Morgan and Heise, 1988; ;MacKinnon and Keating, 1989). Evaluation assesses the degree toward something perceived to be good or bad. Activity refers to the degree which something is perceived to be lively or quite. And Potency speaks to whether something is deemed to be powerful versus powerless. Evaluation and Activity constitute the pleasantness and activation dimensions of emotionality, recognized by both sociologists and well as psychologists (see Barrett, this volume). The Potency dimension of affective meaning becomes a dimension of dominance vulnerability in matters of emotion. While a contentious departure from the two dimensional psychological conception of emotion, it is a conception that seems natural to most sociologists. Indeed, as noted before, Kemper (1978) proposed that gains versus losses in relational power trigger feelings of security versus feelings of fear or anxiety.

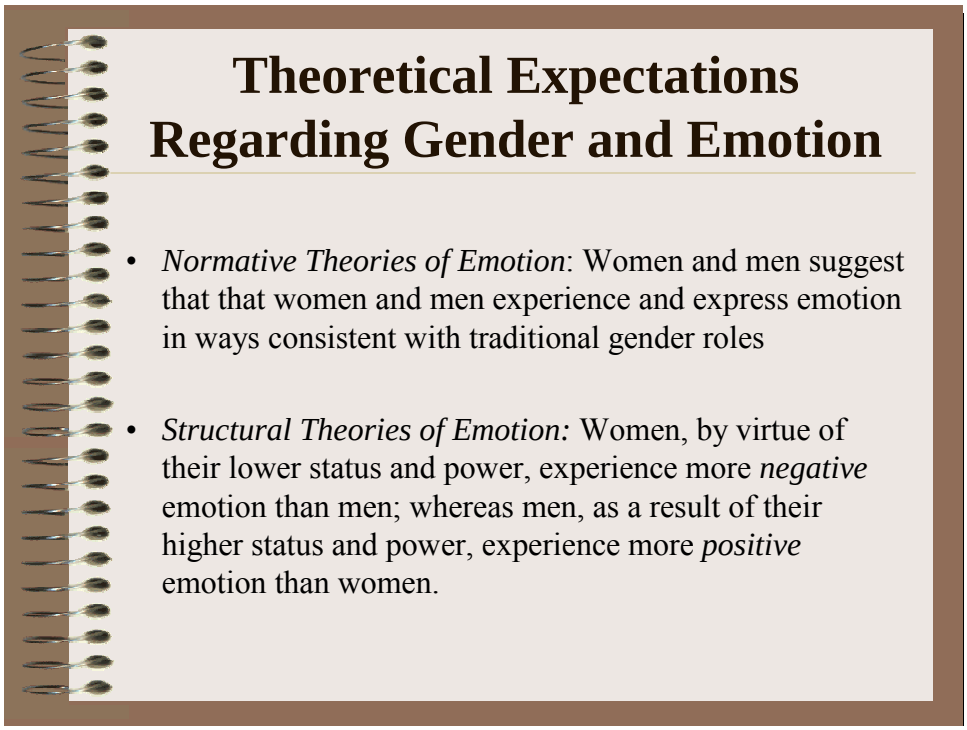


As noted, all of the studies here today are based on the 1996 General Social Survey: a probability sample of 2904 English speaking adults, living freely in the United States (Smith and Davis, 1996). A random subset of 1460 respondents were asked questions about the emotions module, which included 90 questions, including experience with 19 specific emotions within the last seven days - orientation towards emotion management, details of anger episodes as well as methods of changing emotions. The emotions module was paired with the modules on sexual experience and gender (see Lively, Steelman, and Powell, 2004)

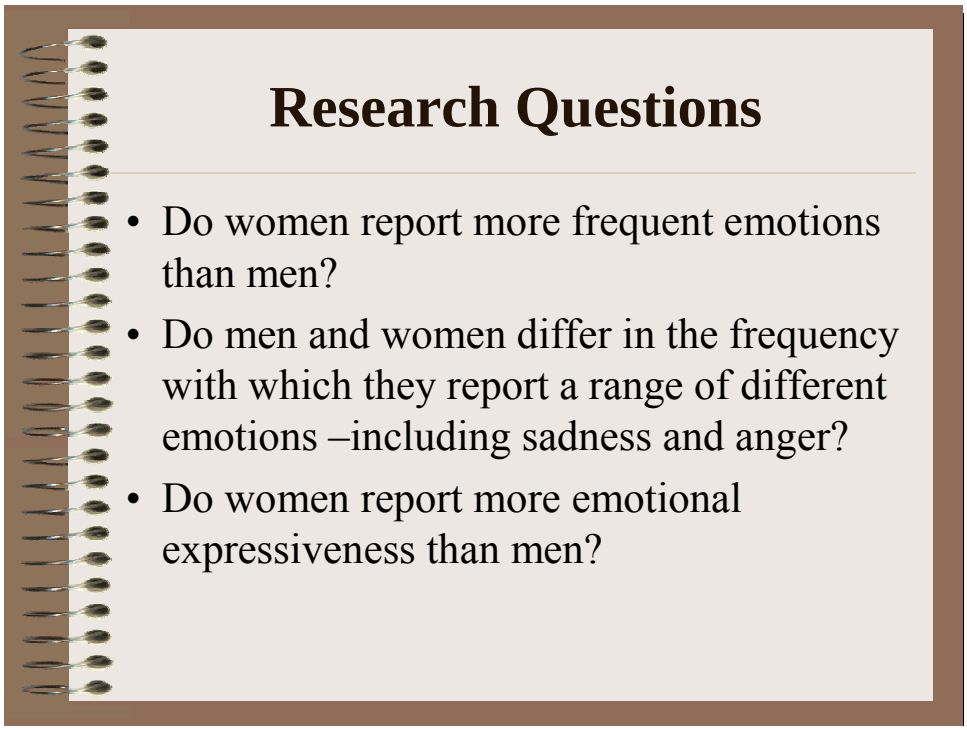
The 19 states identified in the GSS were selected to represent the evaluation and activity dimensions of emotion typically accepted among cognitive psychologists, as well as to correspond with the items for the center of the epidemiological study's depression scale, otherwise known as the CES-D. The GSS module also includes a number of emotions regarding orientation towards emotion management. Finally, there is a much more detailed discussion regarding anger and emotion management.



The first study, Simon and Nath's (2004) "Gender and Emotion in the US: Do Men and Women Differ in Self Reports in Feelings and Expressive Behavior?" examines men's and women's self-reports of experienced and expressed emotion. Despite our prevailing view of women as being more emotional than men, social scientists have surprisingly very little epidemiological understanding of the way that emotion is distributed or operates within the broader U.S. population.

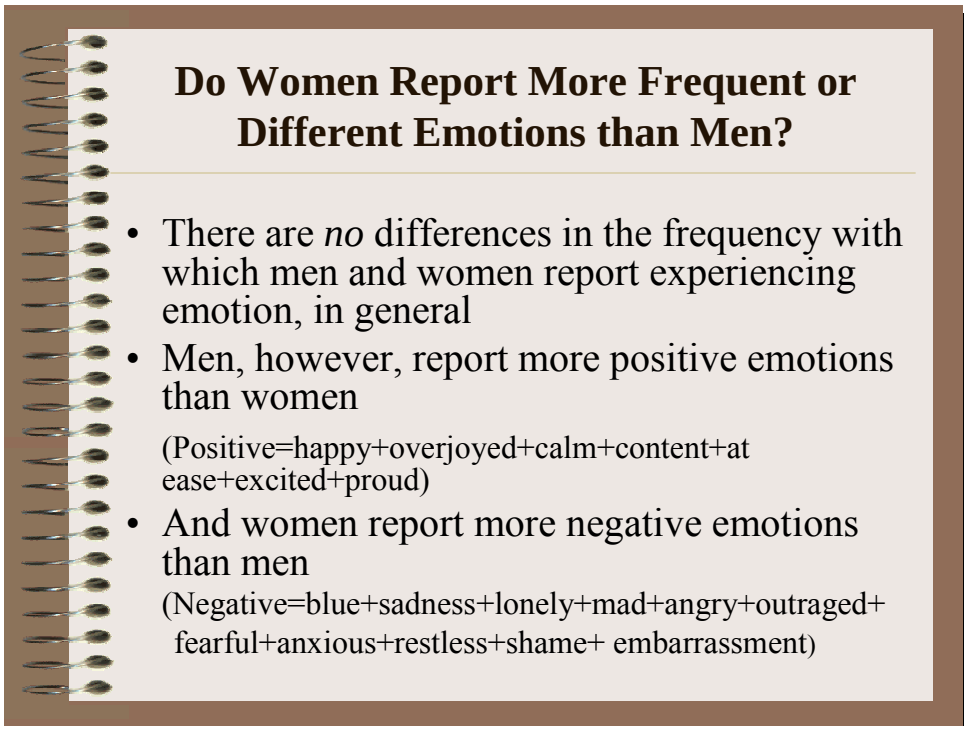


Using individual emotion items, as well as data regarding anger, coping, and emotional expression, Simon and Nath (2004) set out to test sociological theories of emotion as well as sociological theories of gender. Normative theories of emotion, of which the cultural perspective is one, suggests that women and men experience and express emotions in ways that are consistent with traditional gender stereotypes or gender roles. Whereas structural explanations predict that individuals in lower positions of power and status are likely to experience more negative emotions than those in higher positions of power and status. Although women are usually viewed as being subordinate to men, the cultural and the structural perspectives predict slightly different outcome pertaining to the relationship between gender and emotion (see Simon and Nath, 2004 for a more detailed discussion).

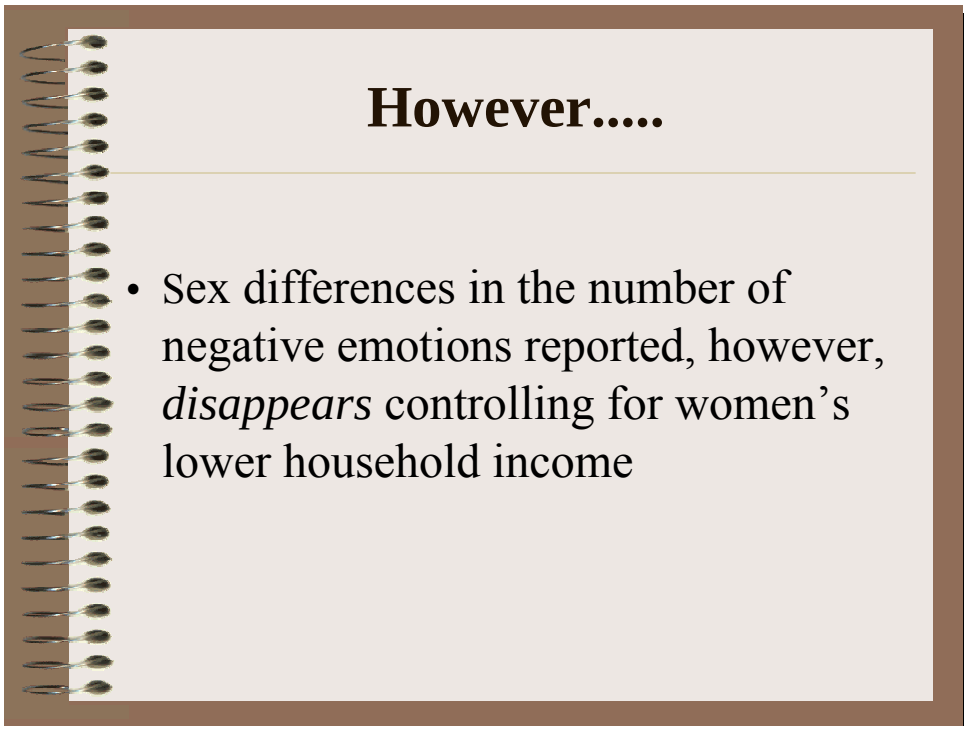


Using this as their starting point, Simon and Nath (2004) asked the following three questions: do women report more frequent emotions than men? Do men and women differ with the frequency with which they report a range of different emotions, including sadness and anger? And do women report more emotional expressiveness than men?

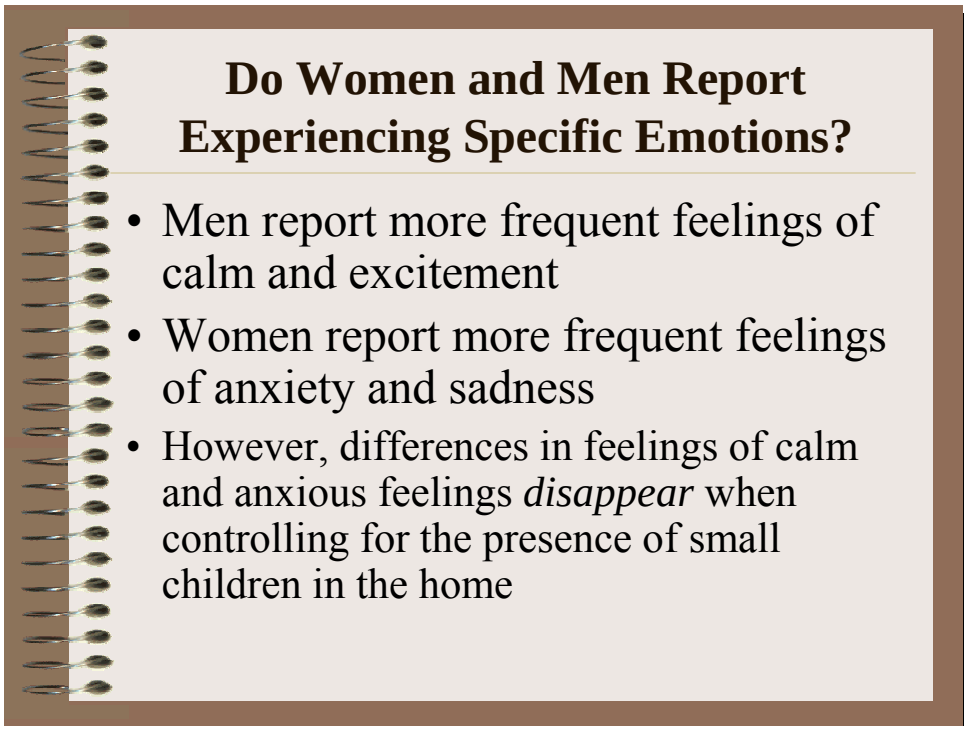
A cultural explanation of emotion would predict that women would report more frequent emotions than men, that women would be more likely to report stereotypically feminine emotions, such as sadness, and less likely to report stereotypically masculine emotions, such as anger. A structural perspective, on the other hand, would predict that women are more likely than men to experience negative emotions, including anger, because of their lower status position. They would also assume that women with lower status characteristic, such as low education or low income, will experience significantly more negative emotion than women who have higher status characteristics, such as high income or higher education.



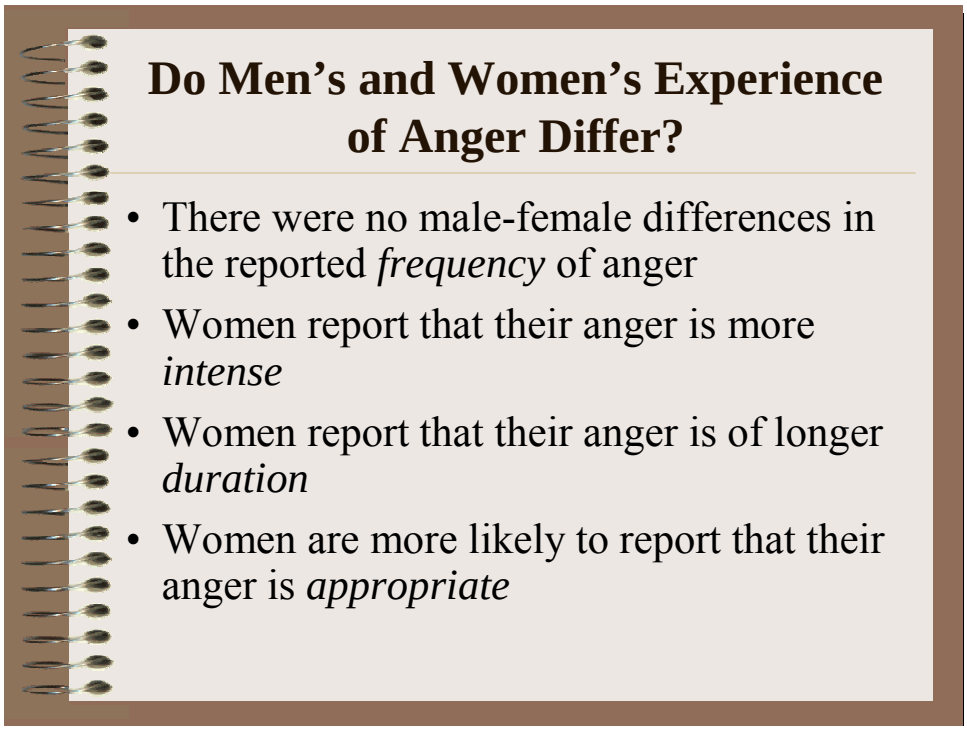
Simon and Nath's (2004) analyses found very little support for the cultural expectations regarding gender and emotion. Specifically, their study illustrates that there is no difference in the frequency in which men and women reported experiencing emotion in general, and that is the emotions summed in the 19 indicator latent variable. Looking specifically at particular types of emotion, they find that men do report significantly more positive emotions than women, and those are the positive emotions on the indicator. And women do report more negative emotions than men, a finding that is consistent with structural explanations.



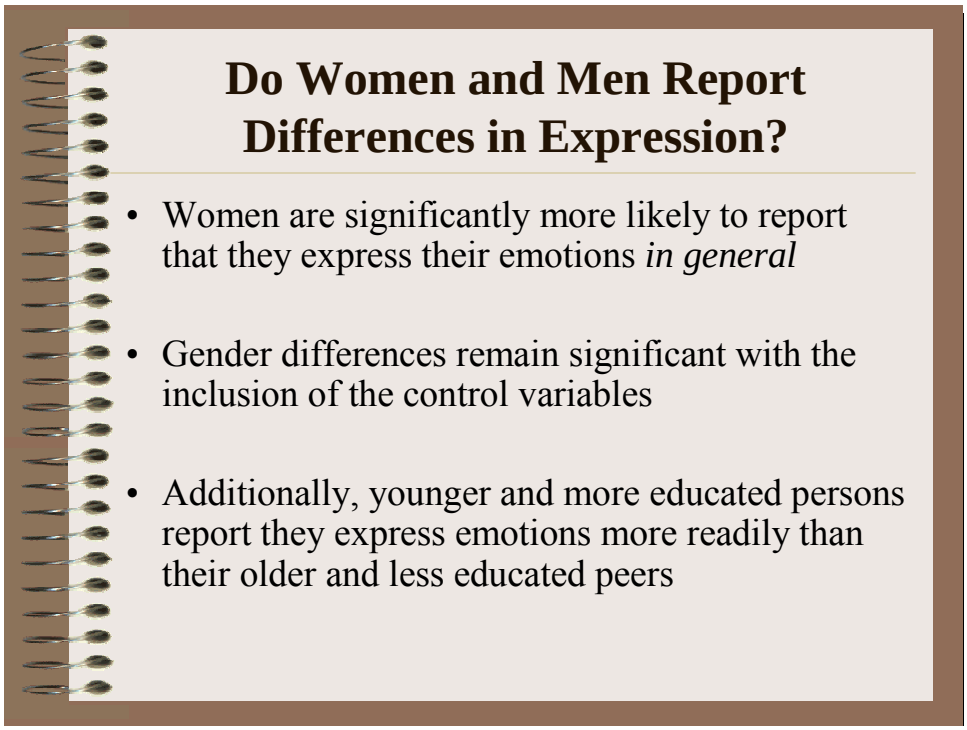
However, Simon and Nath (2004) found that sex differences and the number of negative emotions reported disappears when controlling for women's lower household income, another finding which supports the structural concept of emotion.



They next asked to see whether men and women differed in their report of experiencing specific emotions. They found that men report more frequent feelings of *calm* and *excitement* and women report more frequent feelings of *anxiety* and *sadness*. However, differences in feelings of *calm* and *anxious* disappear when controlling for the presence of small children in the home, while women's greater reporting of *sadness* and men's greater reporting of *excitement* remain significant even when controlling for other individual level characteristics. The propensity for women to experience more sadness is consistent with cultural normative expectations about women and sadness and also coincides with the vast literature on stress and mental health and the fact that women consistently have higher rates of depression than men (but see Simon and Lively, 2005).

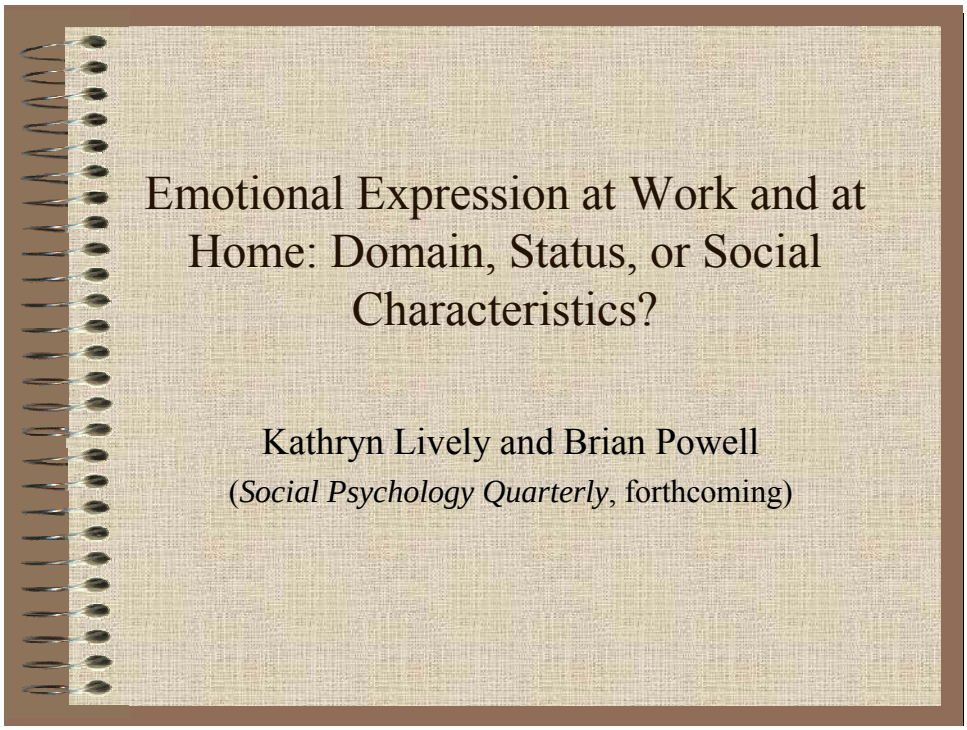


Turning specifically to the experience of anger, Simon and Nath (2004) also explored whether men's and women's experience of anger (i.e., in terms of its frequency, its intensity, duration, and appropriateness) differed in significant ways. While there were no sex differences in the frequency of anger, women reported that they anger as more intense, of longer duration, and more appropriate than men. This finding suggests that despite the greater intensity and duration of women's anger, they would be less likely to label themselves as emotionally deviant in light of an anger provoking event (Thoits, 1990).



While very few sex differences in felt emotion were reported, Simon and Nath (2004) found that women were significantly more likely to report that they express their emotions, and these differences remained significant with the inclusion of the control variables (e.g., race, age, education, family income, presence of small children in the home). Additionally, young and more educated persons report that they express emotions more readily than their older and less educated peers. It is probably important that we take these findings with a bit of caution, because the summary expression variables were general and not time specific. Research indicates that self-report measures based on questions that did not include specific emotions or that are not time specific as in the last seven days, tend to be more vulnerable to social desirability than those types of questions that do have a time limit or are limited to a specific emotion (see Lively and Powell, forthcoming and Simon and Nath, 2004 for detailed discussions of the limitations of survey data)

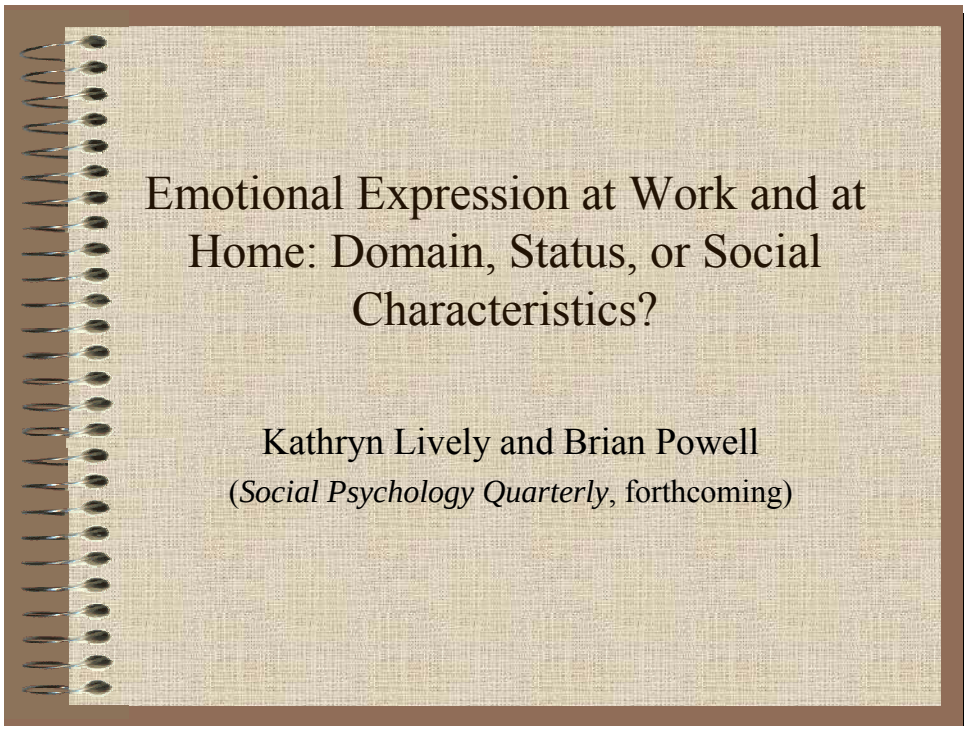
Although Simon and Nath's (2004) study is really a study of non-findings, it is a provocative paper in the sense that it contradicts many of the prevailing understandings about women's and men's emotionality, both those held culturally as well as those held sociologically. Indeed, their findings suggest that men and women's experience of felt emotion may not as be as dissimilar as lay persons and sociologists alike have held them to be. Moreover, many of their findings, particularly those that relate to anger, contradict our culture expectations about women and anger, particularly the finding that women experience anger as frequently as men and that women they are more likely to be their own emotional experience as appropriate.



While Simon and Nath (2004) set the cultural and structural perspectives against one another, Brian Powell and I also used the GSS emotions module to unpack the relative effects of domain (i.e., culture), relative status (i.e., structure) and individual characteristics (i.e., diffuse status characteristics [Ridgeway and Walker year]) on emotional expression. Relative status, here, refers to the status difference, or social distance, between the respondent who experienced anger within the last month and the target of that anger (i.e., spouse, boss, child, colleague, etc.)

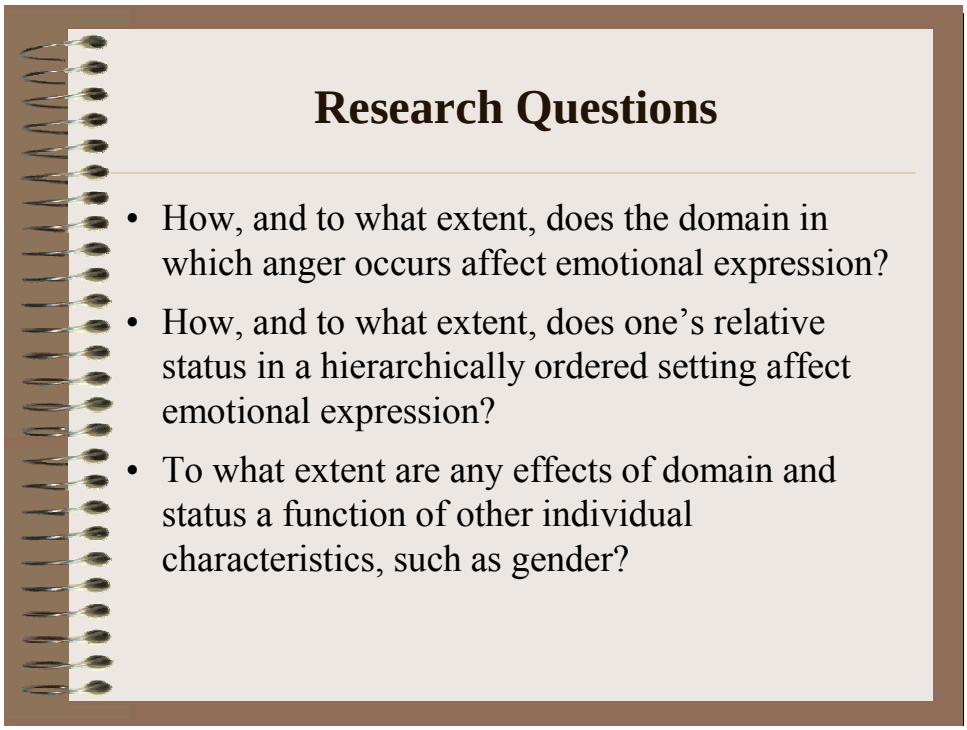
Although all emotions are subject to acts of management, we limit our analysis to the expression of anger within the hierarchal ordered domain of work and family (N=495). Unlike previous studies of emotional expression at work or at home, we are able to provide a systematic comparison of emotional expression in both domains simultaneously (also see Scheiman, 2000).

Qualitative studies of emotional expression at work suggest that the work place is often governed by norms of professionalism, of which effective neutrality is an important part (see Lively, 2001 for a recent example). Despite historical changes in both the workplace and the home, most scholars tend to view the family as an emotional sanctuary that protects men and women from the abuses of the workplace and is marked by the experience and display of genuine emotion and caring (Stearns and Stearns, 1986; Stearns, 1999).

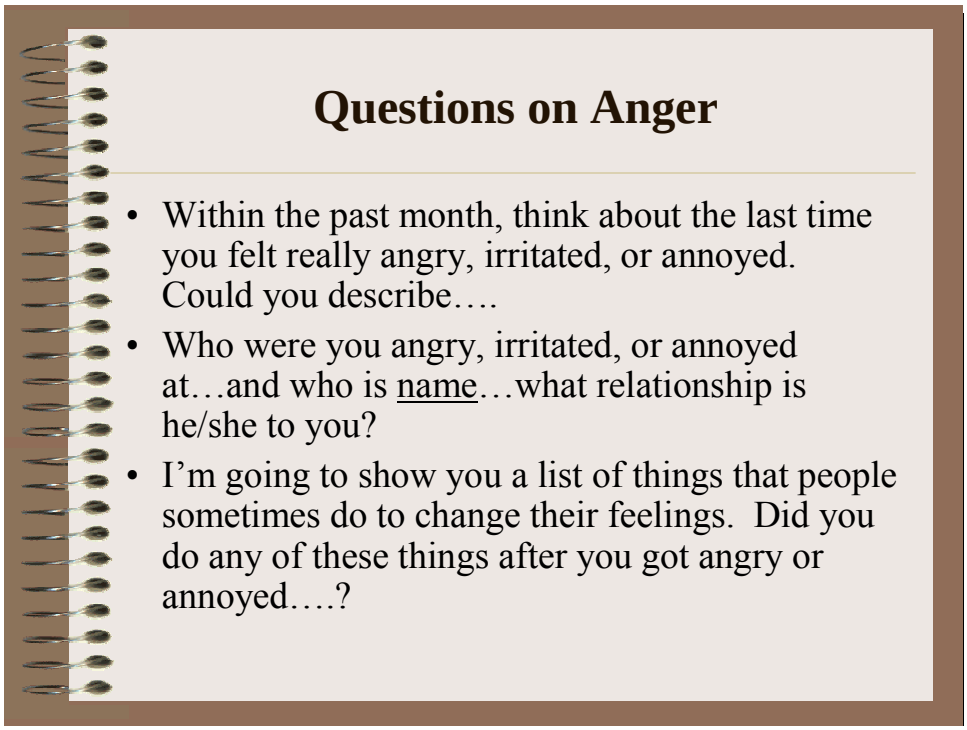


Scholars who've examined the link between emotion and hierarchy, within these particular contexts (Hochschild, 1983, 1989; Lively, 2000; Pierce, 1995) or within in small groups (Lovaglia and Houser, 1996; Ridgeway and Walker, 1995; Ridgeway and Johnson, 1990; Ridgeway and Smith-Lovin, 1999) have argued that individuals occupying higher status characteristics are freer in their range of behaviors and expressions than are those occupying lower status positions or with lower status characteristics.

Unfortunately in most qualitative studies, as in real life, occupational and structural position is often conflated with personal characteristics, most notably gender. Indeed, Hochschild (1983) has posited that women by virtue of their subordinate status as women have lower or weaker status shields than men, which place them at an interactional disadvantage.



With these theoretical assumptions in mind, we asked the following three questions: How and to what extent does the domain in which the anger occurs effect emotional expression? How and to what extent does one's relative status in a hierarchically ordered setting effect emotional expression? And, to what extent are the effects of domain and status, the function of other individual characteristics, such as gender?

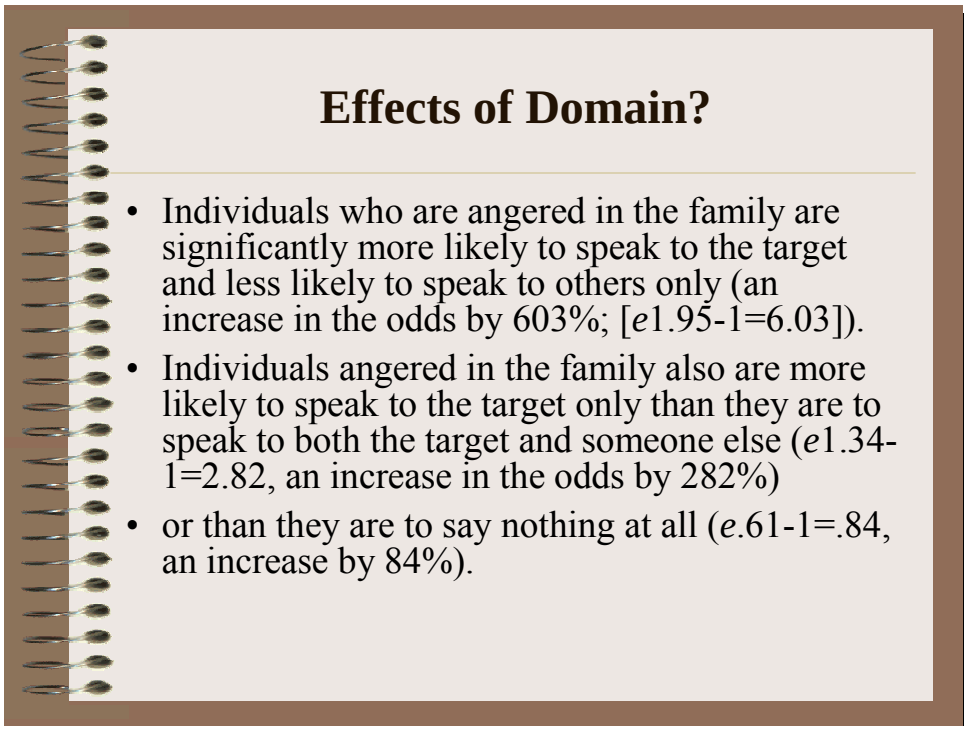


To address these questions, we turned to the section of the GSS emotions module (1996) that dealt specifically with anger. Is this set of questions, respondents were asked to recall a time within the last month that they felt really angry, irritated or annoyed. They were then asked to identify a target or targets of that anger, as well as coping strategies that they used in order to manage their emotions.

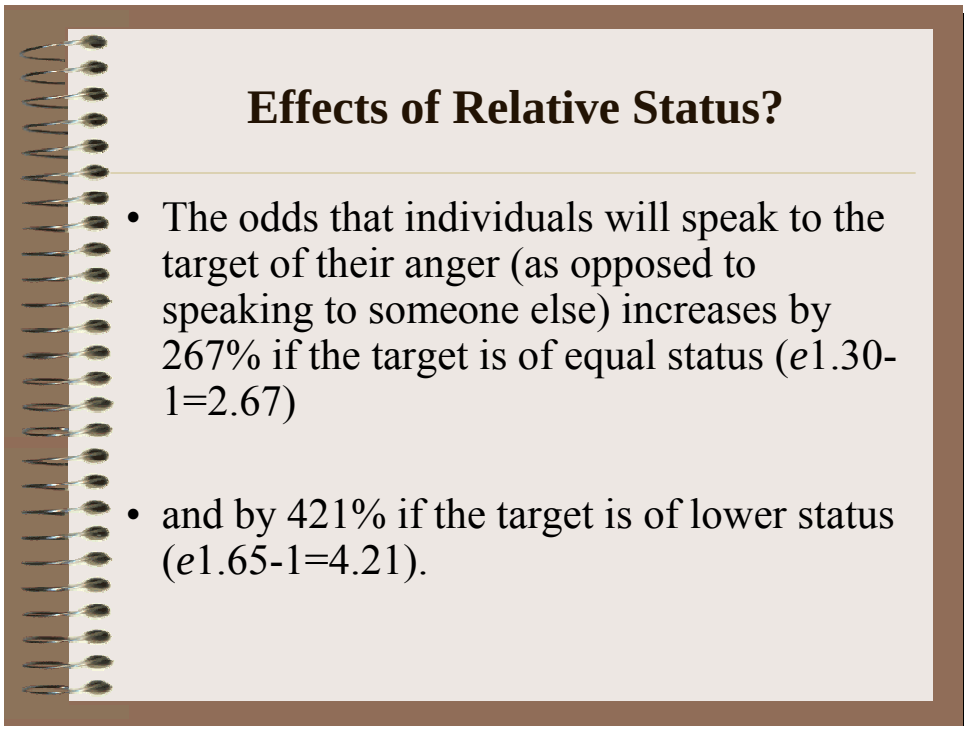
Description of the Dependent Variable:
Emotional Expression (N=495)

Outcome	*Mean*	*S.D.*
Spoke Directly to Target	.19	.39
Spoke to Someone Else	.36	.48
Spoke to Both Target *and* Someone Else	.28	.45
Spoke to No One	.18	.39

For the purposes of using a variety of statistical models, including multinomial logistic models (Long and Freese, 2001), we created four discrete outcomes in order to simultaneous comparisons between types of emotional expression: *spoke directly the target*, *spoke to someone else only*, *spoke to both the target and someone else*, and *spoke to no one*. We found that both the domain in which the anger originates (e.g. work or family) and the relative status the target (e.g. target had higher, equal, or lower status than that of the respondent) significantly affected the likelihood of emotional expression.

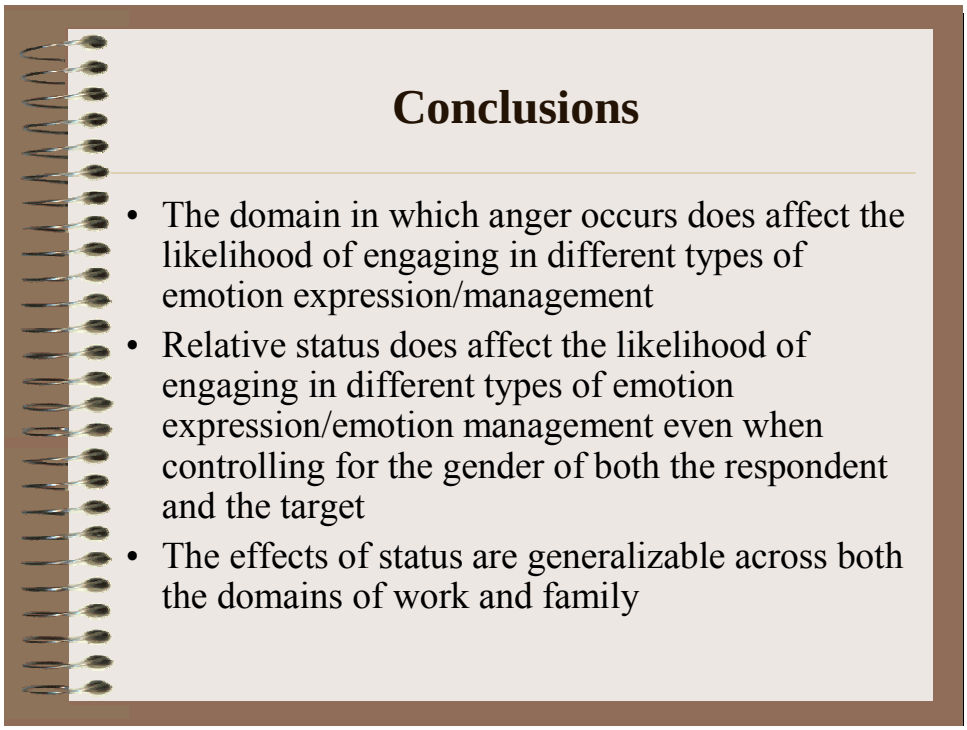


Specifically, our analyses revealed that compared to those who are angered at work, individuals who are angered in the family are significantly more likely to speak to the target only and less likely to speak to others only, an increase in the odds by 603%. We also found that individuals angered in the family are also more likely to speak to the target only, than they are to speak to both the target and to someone else, an increase in the odds by almost 300%. And individuals who are angered in the family are more likely to speak to the target than they are to say nothing at all, an increase by 84%. Although there a few statistically significant characteristics, mainly age, education and intensity of anger, the relative effects are much less impressive than those for domain. For example, the strongest effect, that of education, reduces the odds of speaking to both, as opposed to speaking to the target only, by a mere 16%



In order to determine the effect of relative status for the likelihood of emotional expression, we ran yet another model in which we included the categories representing targets of higher, equal, and lower status. First, it is important to note the main effects for domain remained relatively unchanged with the inclusion of the target variables. Second, the key differences lie in whether or not the target has higher status as opposed to equal or lower status.

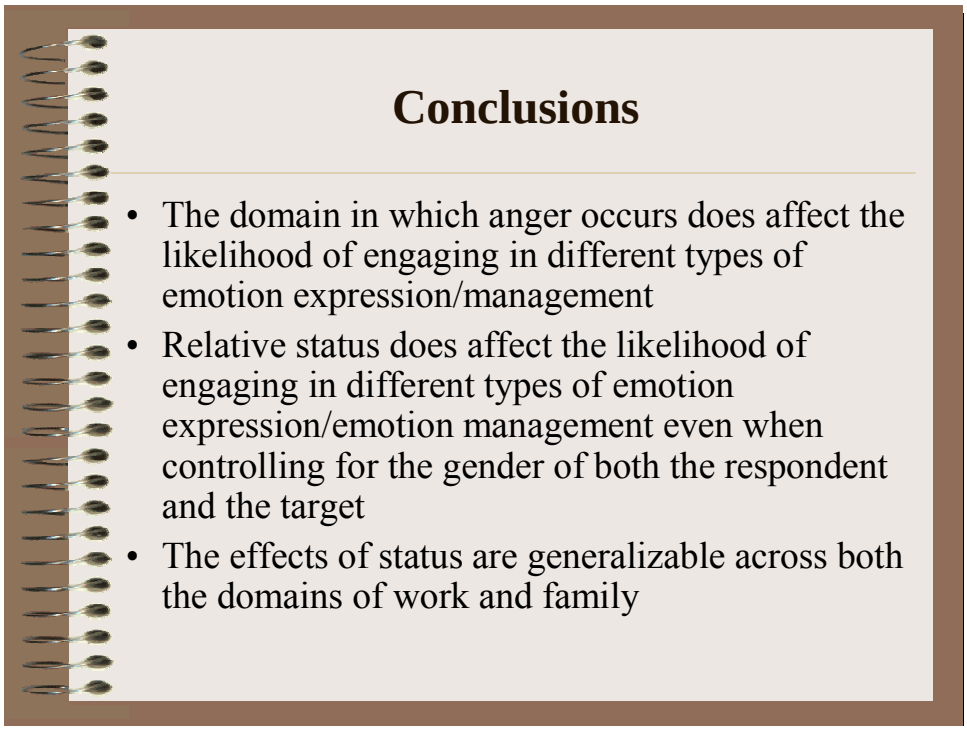
In particular, we found that the odds that an individual will speak to the target of their anger as opposed to speaking to someone else, increases by almost 300% if the target is equal status, compared to those people he spoke to someone of higher status. Moreover, the odds that an individual would speak to the target of his or her anger, as opposed to speaking to someone else increased by 421% if the target was of lower status, compared to if the target had higher status.



In order to see whether status operates differently across the two domains, we included an interaction effect which turned out to be non significant. This suggests that the status mechanism operates the same way in both working family. Moreover, we find that the amount of variance in the emotional expressivities explained by domain and relative status are actually comparable, though domain has a slightly larger effect than that of relative status.

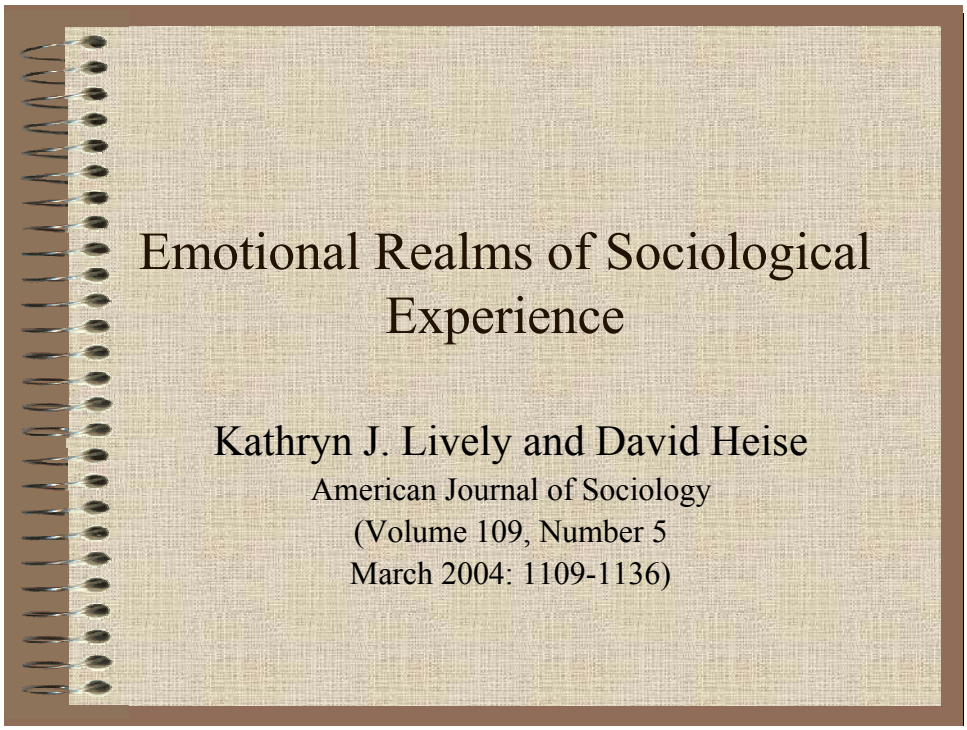
Despite the absence of specific questions about the target's personal characteristics in the GSS, we were also able to infer information regarding the target's sex in a sub sample of 260 cases. Despite theoretical expectations to the contrary (Hochschild, 1983), neither the target's gender nor the interaction between the target's and respondent's sex were not significant predictors of emotional expression (see Lively and Powell, 2004 for more information regarding this ancillary analysis).

Based on our analyses, we concluded that the domain in which the anger occurs and the relative status of the interactants do affect the likelihood of emotional expression, and the effects are fairly comparable, even when controlling for the sex of both the target and the respondent. And by examining the interaction of status and domain, we also concluded that the effects of status do not differ appreciably among work and family.

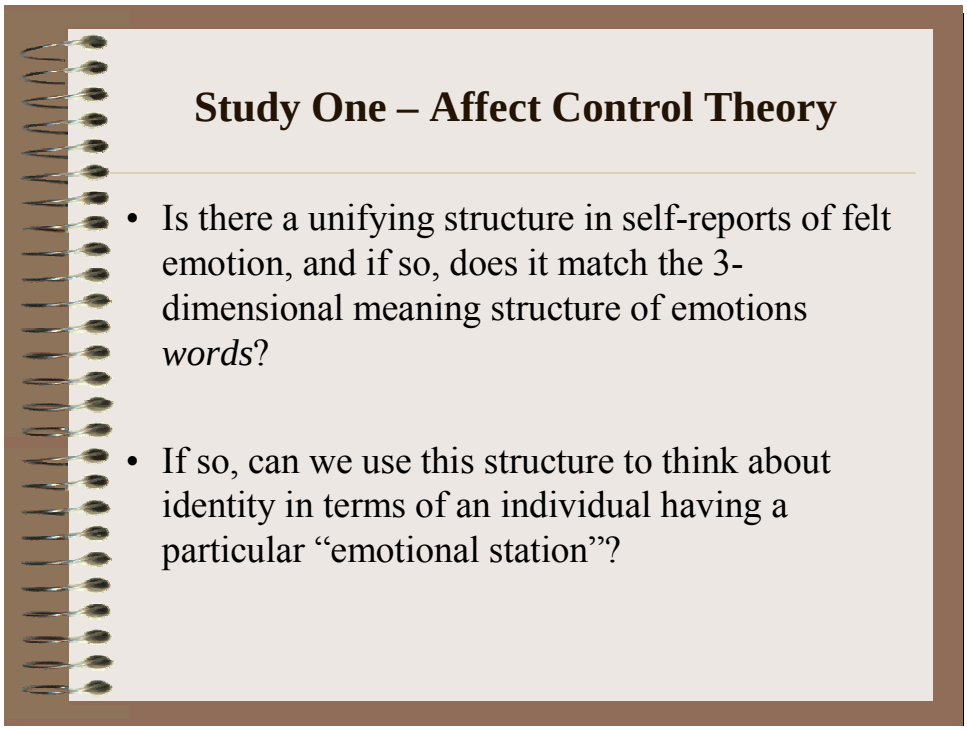


This study, therefore, suggests that men and women's expressions of anger may be more a factor of their relative status in terms of social roles, than their status as men or women per se (see Ridgeway and Smith-Lovin 1999).

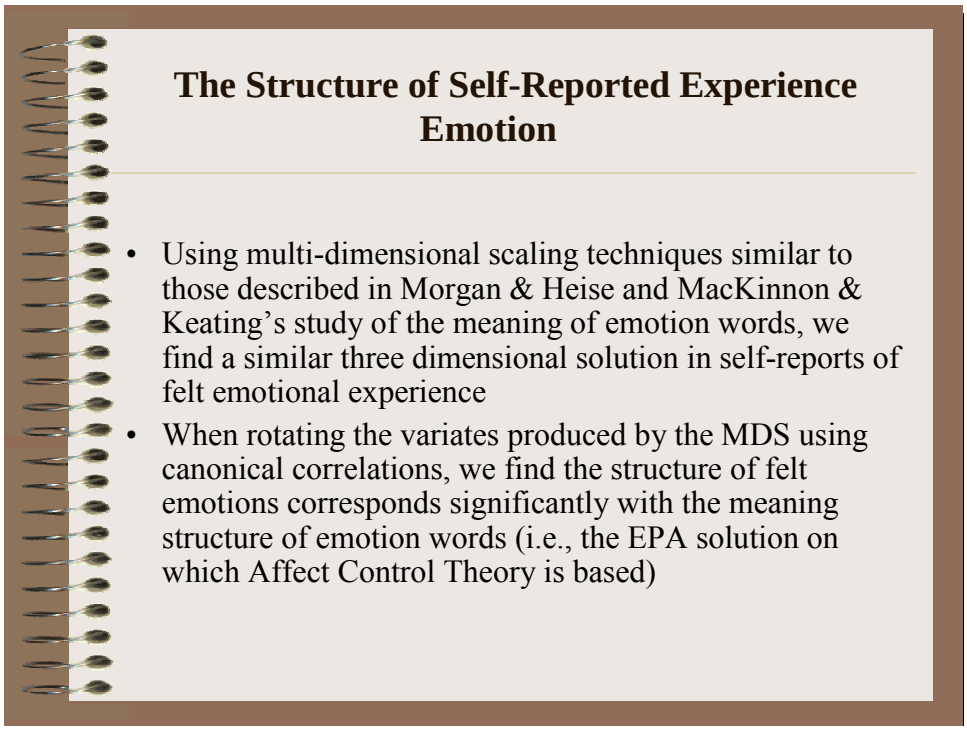
Whereas Simon and Nath (2004) found little support for cultural explanations, regarding gender and emotion, we found considerable support for the cultural perspective regarding to the effects of domain on emotional expressivity. However, although our findings speak to the importance of considering the effects of domain when studying emotion, it also paradoxically, lends support to small group researchers in field of emotion who have been criticized historically as being acontextual and therefore not applicable to real world settings, given that the status mechanism works the same way in both work and family.



The third study that I would like to introduce was in collaboration with David Heise (Lively and Heise, 2004) and it is actually comprised of two sub-studies, if you will. Like Simon and Nath (2004), we, too utilized the 19 emotion indicators asking respondents to identify the number of days they felt a particular emotion out of the last seven. Out of the 19 items that were included in the GSS, we only focused on the 18 that Ortony, Clore, and Foss (1987), argued are real emotions as opposed to cognitive behavioral states such as feeling *restless*. It is worth noting that these 18 indicators sample the populated regions of the three dimensional emotion space ascertained by both Morgan and Heise (1988) using U.S. data and MacKinnon and Keating (1989) using Canadian data, with the exception of the unpleasant dominant quiescent region which would contain emotions like being bitter or disgusted.

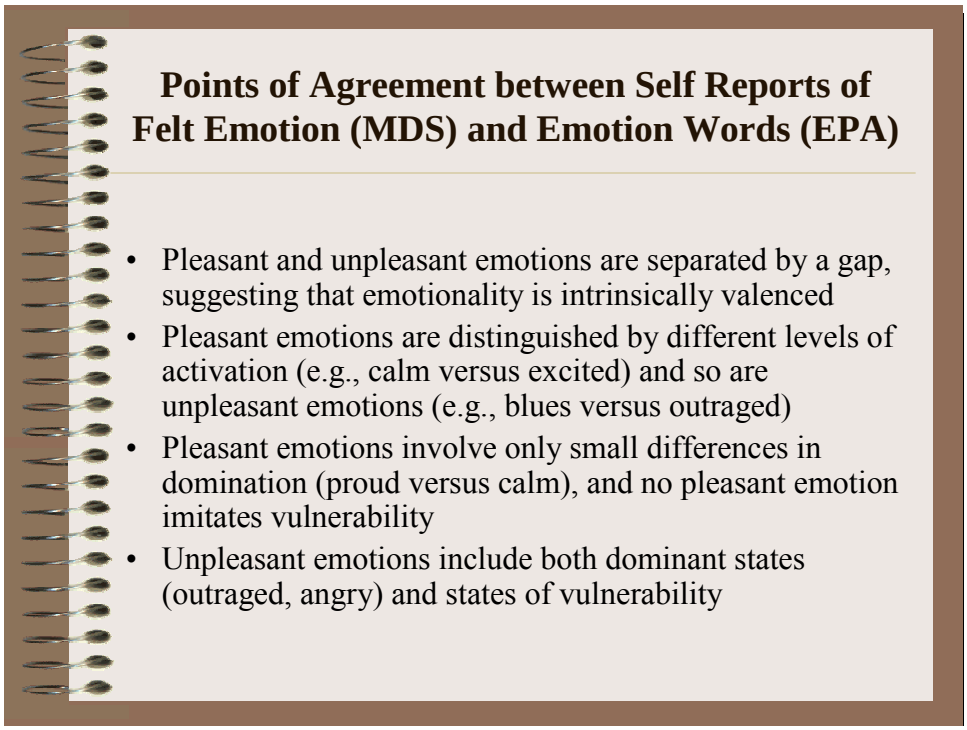


Coming primarily from an Affect Control theory perspective, we began our analysis with the following two questions: Is there unifying structure in self reports of felt emotion and if so, does it match the three dimensional structure of emotion words? If so, can we use this structure to think about identity in terms of an individual having a particular emotion station within the last week?

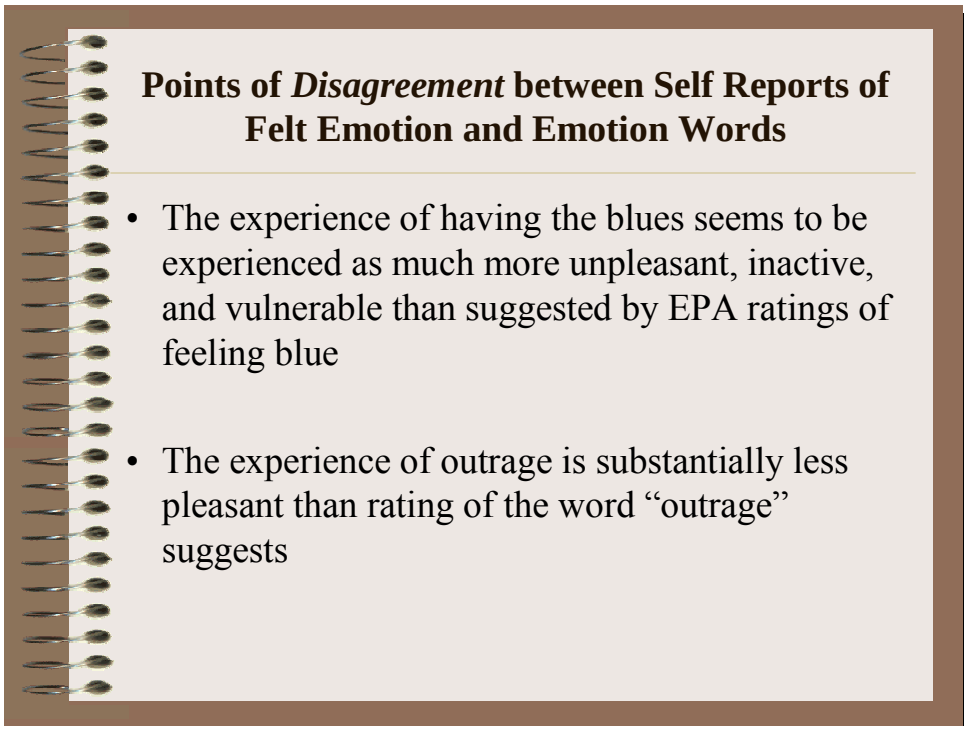


Using multi dimensional scaling techniques similar to described in existing studies of emotions words, we computed MDS solutions for reductions in one, two, three, and four dimensional spaces (see Lively and Heise, 2004 for a complete presentation of the analyses). A two dimension solution maintains the distance between emotions much better than the one dimension solution, and a three dimension solution is substantially better than the two dimension solution. A four dimension solution, however, does not offer enough improvement to justify the additional complexity in the solution. We obtain the overall three dimensional solution by treating the male and female distances as data from two individuals in an end scale MDS analysis.

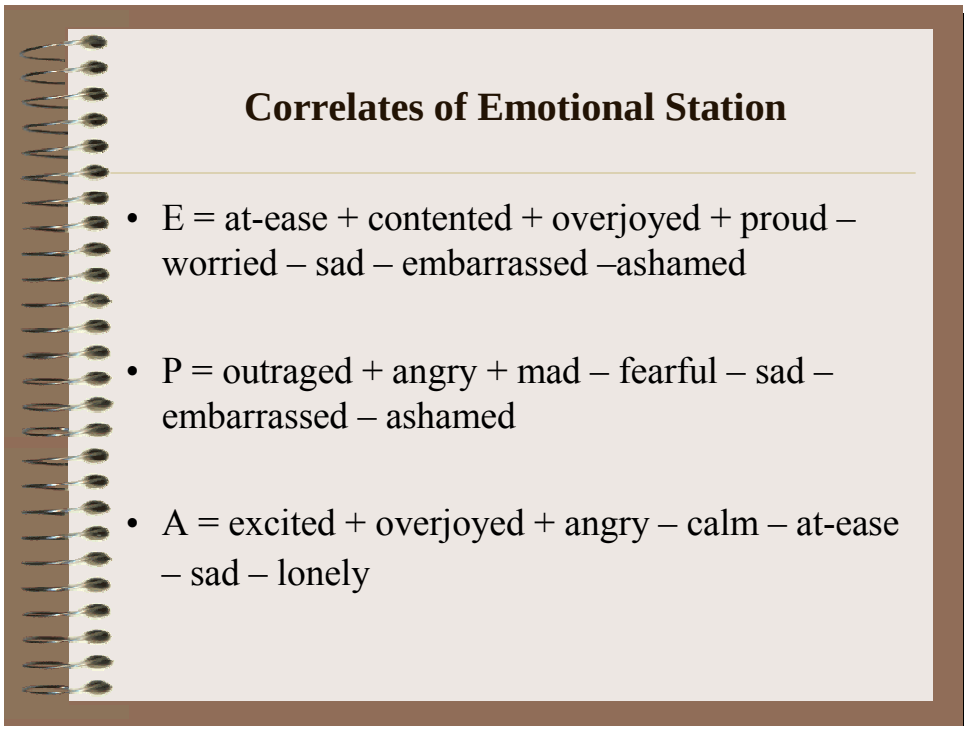
The analysis produced a single solution applying to both sexes under the assumption that any dimension might be expanded more for one sex than another. And for any of you that are interested I have the details in the paper. Having ascertained the three dimensional solution, the next important question becomes do these three dimensions found in self-reports correspond to the emotion structure emerging from measurement of emotional meaning, in terms of evaluation, potency and activation (Heise, 1979; Smith-Lovin and Heise, 1988). We determined the extent in which the two numerical structures correspond through a canonical correlation analysis relating the EPA values of emotion words to the MDS coordinates of the end scale analysis. Our findings, all of which were significant at a .05 level, indicate that the experiential dimensions of emotion are largely the same as the meaning dimensions of emotion.



The points of agreement between the two structures are major. One, pleasant and unpleasant emotions are separated by a gap, suggesting that emotionality is intrinsically valenced. Pleasant emotions are distinguished by different levels of activation, *calm* versus *excited*, and so are unpleasant emotions, for example, feeling *blue* versus feeling *outraged*. Also, pleasant emotions involve small differences in domination feeling *proud* versus feeling *calm*, and that there was no pleasant emotion imitating vulnerability, which is a finding that has been found before in studies dealing with emotion semantics. And finally, unpleasant emotions include both dominant states - being *outranged* and *angry*, and states of vulnerability, including *lonely*, feeling *ashamed* and being *fearful*.

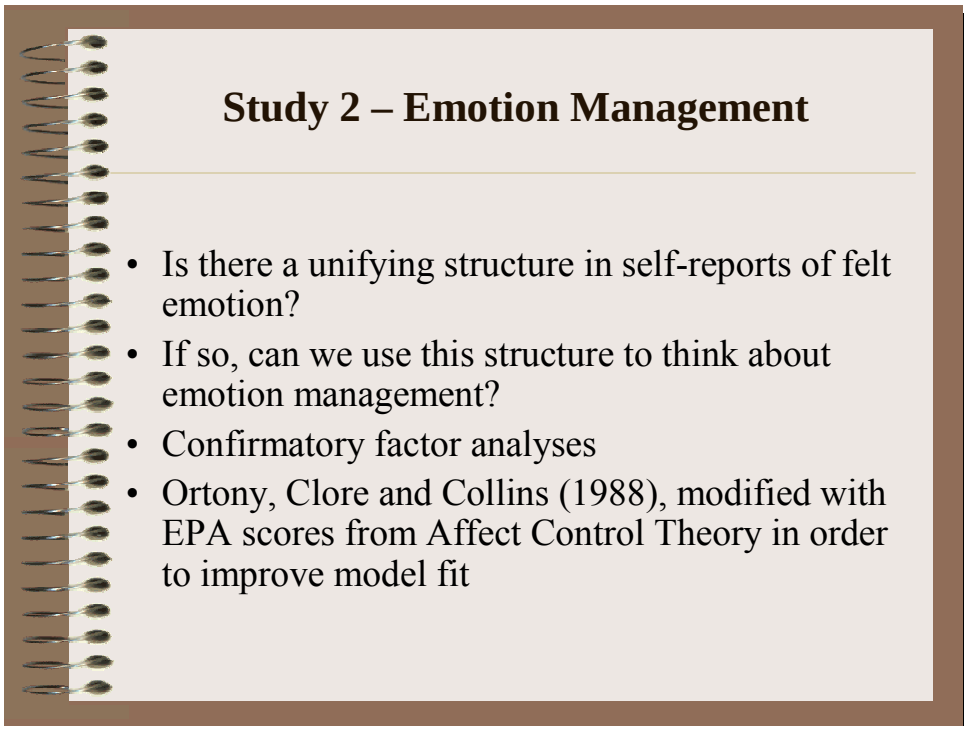


There were, however, some points of disagreement between the self reports of felt emotions and emotion words. The first thing of is the experience having the *blues*, seems to be experienced as much more unpleasant, inactive, and vulnerable, than suggested by the EPA ratings of the word "feeling blue." The experience of *outrage* is substantially less pleasant than ratings of the word "outrage" suggests. So it may that experiencing *rage* may be less aversive than actually thinking about it and a similar pattern holds for *anger*.

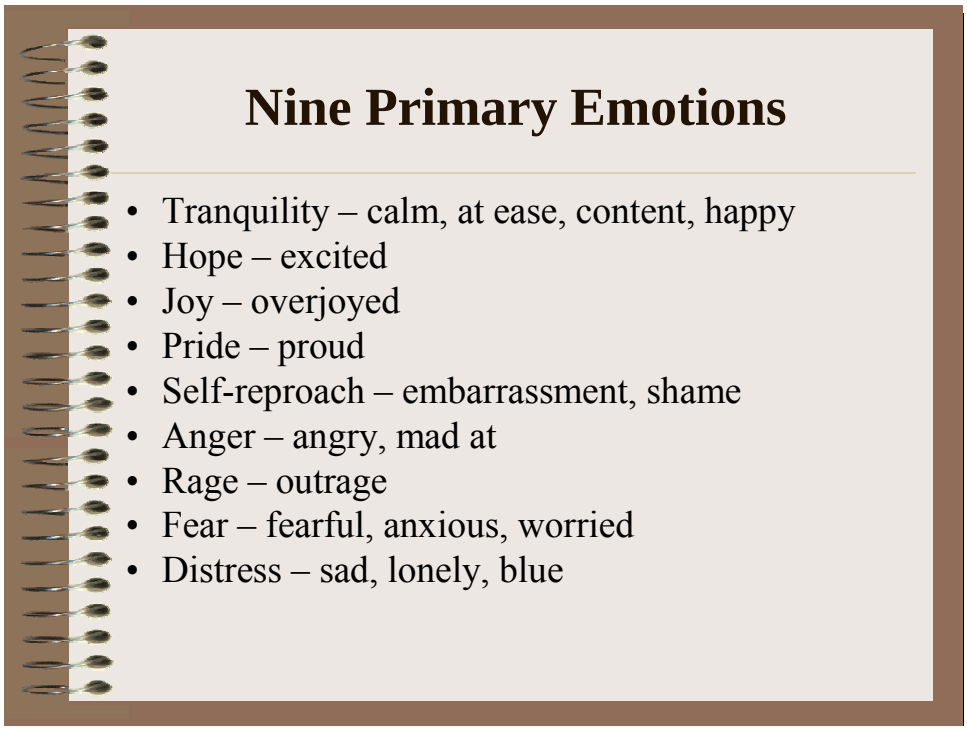


The dimensions of emotional experience can be used to distill an individual's emotional station during the prior week, by characterizing the individual's overall emotionality as being pleasant or unpleasant, activated or quiescent, or dominating or vulnerable (again, see Lively and Heise 2004 for compete details).

Further analyses revealed statistically significant correlations between the emotional stations and other variables within the GSS (e.g., age, occupational prestige, family income, health, crowdedness, sexual activity; see Lively and Heise, 2004, Table 2 for a more complete list). Congruent with Isaacowitz's research (this proceedings), age predicts emotional quiescence; and the effect is substantial with age accounting for more than six percent of the variance in emotional quiescence (Activation). Moreover, it turns out that not only do older people experience more quiescent emotions; they also experience more pleasant (Evaluation) emotionality as well as more vulnerable (Potency) emotionality. Age accounts for four percent of the variance in the pleasantness of emotionality, a greater effect than any other structural variable considered here. Age also accounts for somewhat less than one percent of the variance in emotional dominance, a small effect, but one that is still statistically significant.

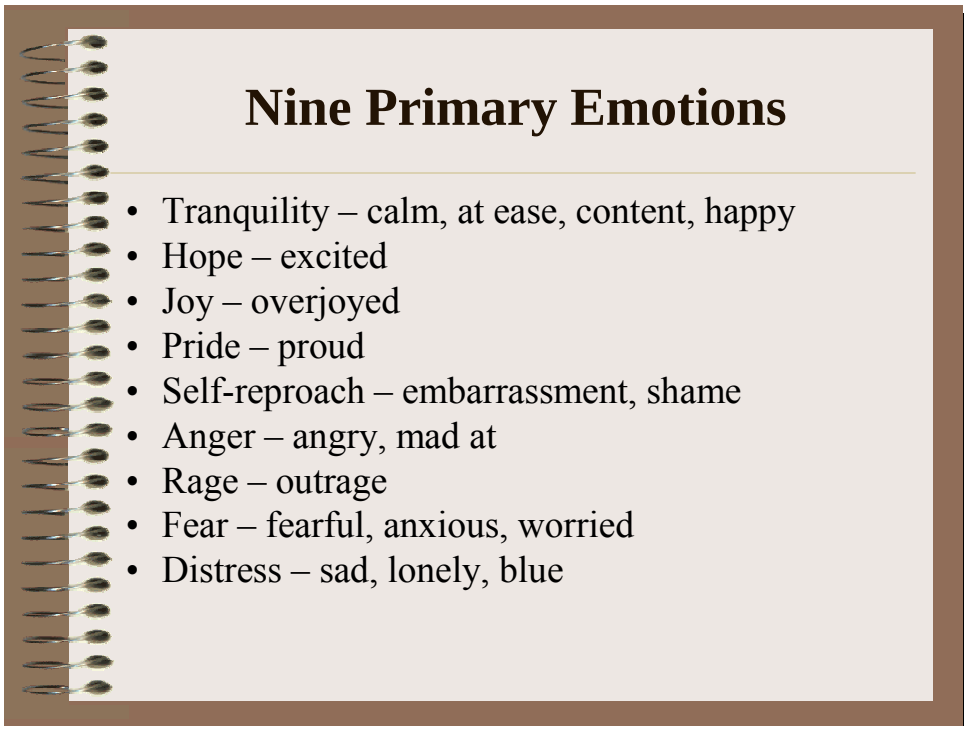


Still interested in the underlying structure of emotion, Heise and I returned to the 18 emotion states, albeit this time using different (if not, in some cases, opposing methodological and theoretical perspectives. Coming from a strictly normative perspective (Hochschild, 1979), we asked once again: is there a unifying structure of self report? If so, can we use this to think about, this time, emotion management? In this study we identified nine primary emotions through confirmatory factor analysis: *tranquility, hope, joy, excitement, self-reproach, anger, rage, fear,* and *distress*. (The initial model of seven latent variables was derived from Ortony, Clore, and Collins classification system of emotion. They distinguished emotional reactions to events, agents, or objects, and they proposed that each reaction might be characterized by a different emotion tokens, which then became the basis for our measurement model. However, our initial model did not fit the data in a meaningful way. We did modify some of factors by looking at the Evaluation, Potency, and Activation scores of the individual emotions and separating out those emotions that were high on Potency, the one dimension of affective meaning that Ortony, Clore, and Collins did not take into consideration, yielding a model that fit the data reasonably well (Bollen 1989; Hoyle and Panter 1995; Hu and Bentler 1995; see Lively and Heise 2004 for complete details about the measurement model)).

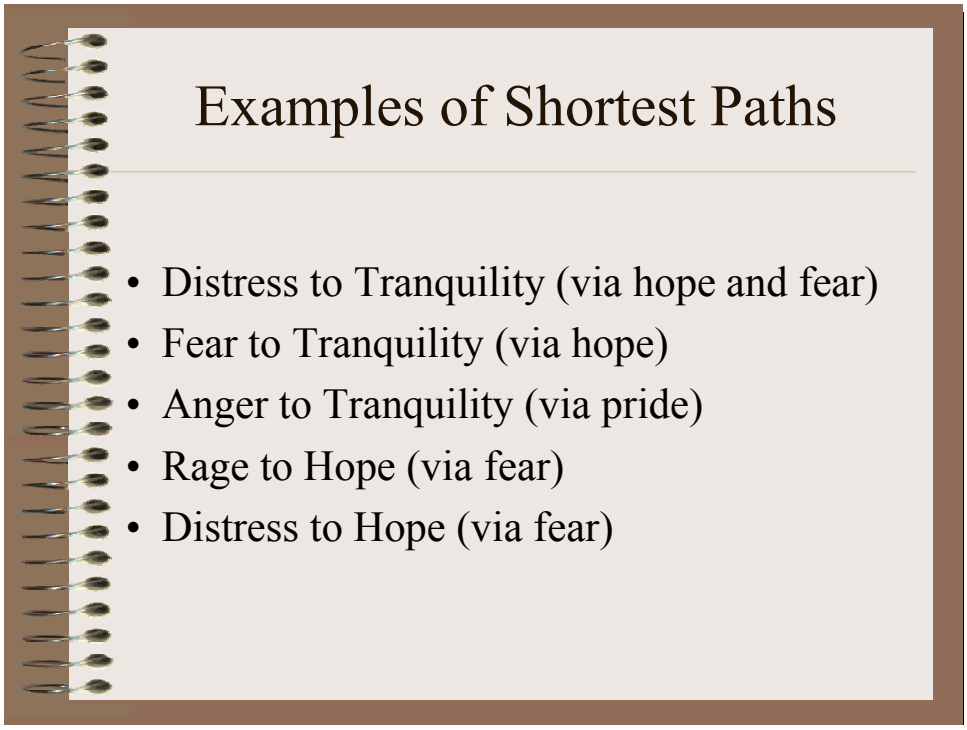


We allowed that the primary emotional states may also be interrelated, so all of our emotional variables were allowed to correlate. We also proposed that the difficulties in moving between emotions are related to the correlations that exist among their factors. In other words we posited that it is easier to move between two emotion states that are positively correlated than it is to move between two emotion states that are negatively correlated. We developed this idea by applying short path analysis developed by Rosen (1988) to the correlations among the factors.

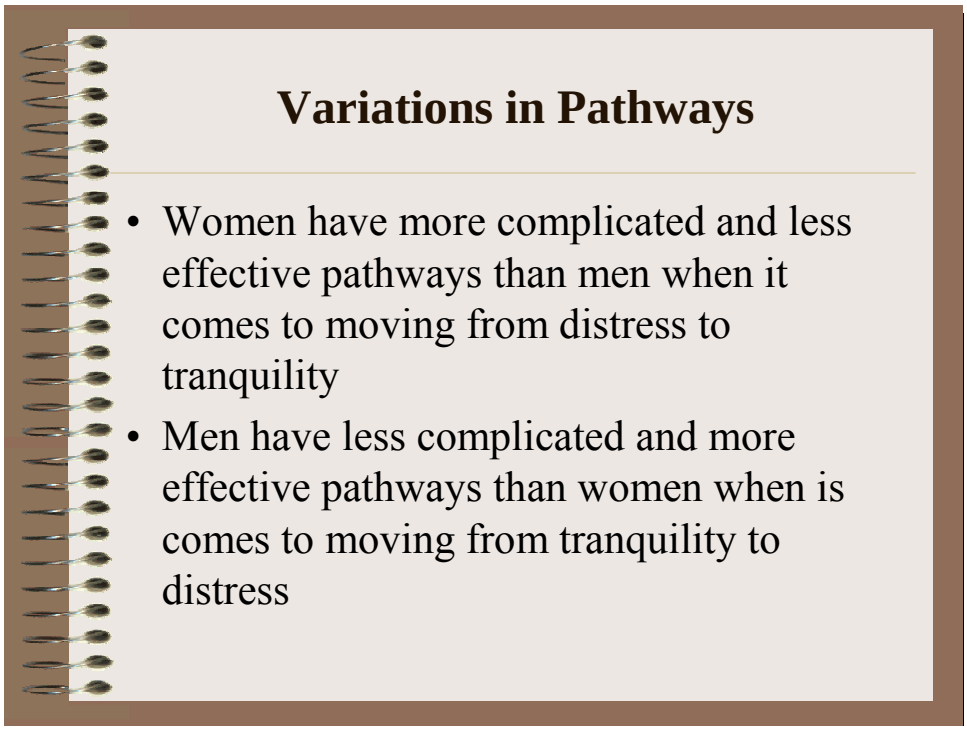
As one might expect, the correlations within unpleasant emotions and correlations within pleasant emotions, generally are higher than the correlations between pleasant and unpleasant emotions. However, correlations between pleasant and unpleasant emotions are not simply negative. *Joy* and *pride* for example, correlate positively to a small degree with each of the unpleasant emotions. And *hope* is also positively correlated with some of the unpleasant emotions, *fear*, *anger* and *self-reproach*. The positive correlations between the pleasant and the unpleasant emotions provide paths for segueing between unpleasant feelings and between pleasant feelings according to the theoretical perspective that we outlined before.



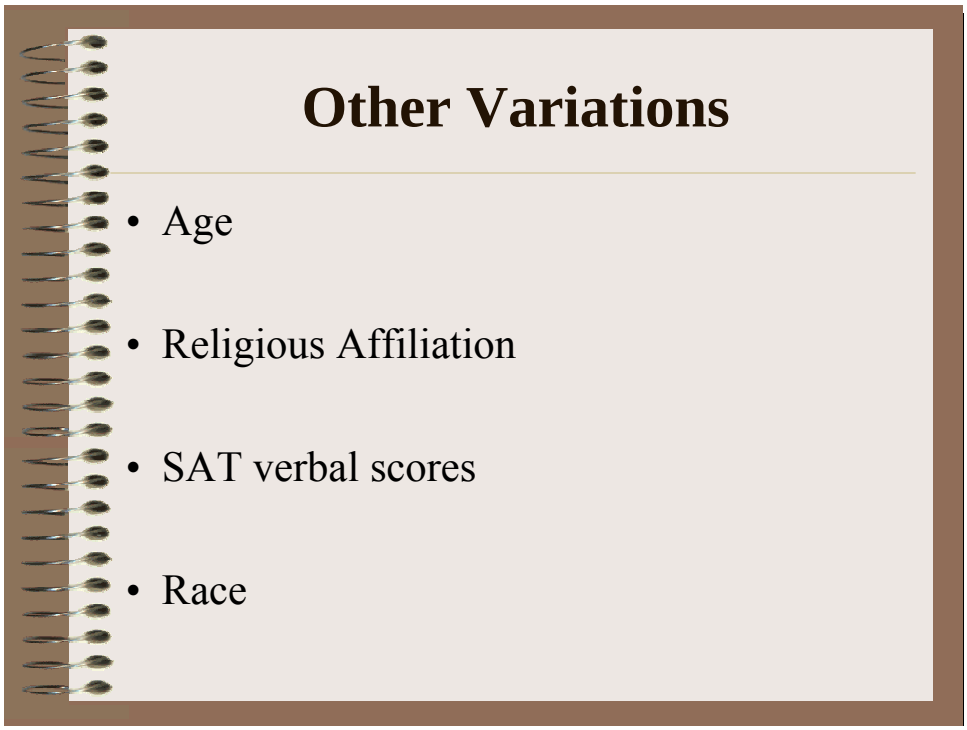
Building on this assumption that emotions correlating positively during a week long period may be relatively accessible to each other and that emotions correlating negatively may be relatively inaccessible from one another, we offer an index of remoteness based on correlation coefficients to quantify this notion more exactly (see Lively and Heise, 2004, Table 5). Our choice of transformation was actually pragmatic, in that it yields results that correspond with observations within the qualitative data and sociology of emotion (Britt and Heise, 2000; Francis, 1997; Thoits, 1996).



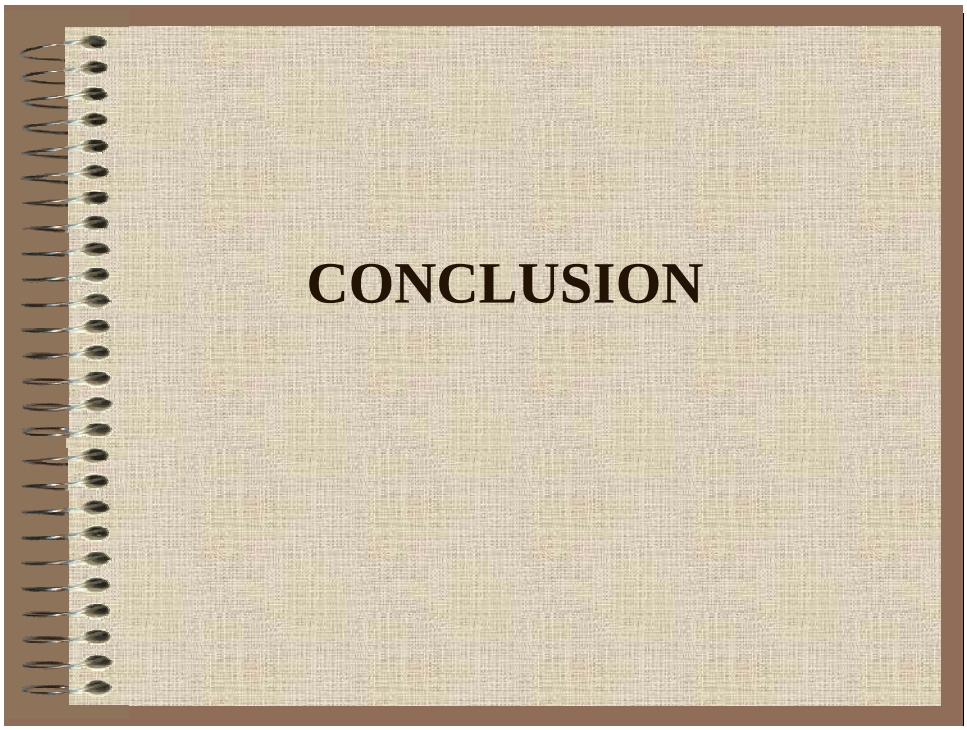
One of the practical implications of this model is the implication that individuals seeking support in order to deal with *distress*, *self-reproach*, or *fear*, are going to be more likely helped through the introduction of *hope*, whereas people who feel *anger* or *rage*, will be more likely to respond to feelings of *pride* or *joy*. Another practical implication is by providing insight as to more efficient ways to manage individuals' entrances into, and subsequent participation in, social movement organizations (see Britt and Heise, 2000).



Although Simon and Nath (2004) and Lively and Powell (forthcoming) find relatively few sex differences in either the experience or the expression of emotion, preliminary group differences of the shortest pathways between latent emotions suggest that there are subtle sex differences. In particular, a split sample revealed that women have more complicated and less effective pathways then men when it comes to segueing between distress and tranquility (or vice versa). Conversely, men have less complicated and more effective pathways when it comes to moving back and forth between positive and negative emotions (Lively, 2004).



Other significant group differences include age, religious affiliation, SAT verbal scores, and race. While these variations are interesting, future research will be necessary in order to tease out the theoretical implications of such differences.



Although not strictly tied to emotional intelligence, per se, these studies, collectively, speak to the importance of both social and cognitive structures on emotional experience. While emotional intelligence is often considered a psychological construct, or an individual trait, sociological approaches to the study of emotion stress the importance of also examining social categories and other forms of social structural arrangements. Moreover, these findings suggest that the concept of emotional intelligence must be expanded to include one's ability to locate him or herself within a social interaction and to recognize how emotion norms apply not only to the actors within a particular interaction, but also the setting in which the interaction occurs.

The study of emotion has long been an interdisciplinary topic. Therefore, it makes perfect sense that the study of emotional intelligence should be as well. As sociologists studying of emotion continue to expand both their theoretical and methodological arsenals, they should be poised and ready to contribute to this ongoing effort.

DISCUSSION

DR. ZEIDNER: Thank you Dr. Lively for the lively talk, and very informative talk. And questions from the audience, you've got a number of minutes for that, please.

DR. GRANDEY: Firstly, it seems to me you are actually approaching one of the big issues; understanding group differences in emotional intelligence, I think that's maybe one way of seeing how this research fits into this program. Secondly, I would like clarification concerning your study. You presented data and talked about expression/management. I wasn't clear whether this was one dimension ranging from expression to management, two dimensions, or something else.

DR. LIVELY: The questions respondents were asked to fill out, which of course, were all constrained by the nature of the survey data, were, "What were some of the things that you did to manage your emotion?" And talking to the person directly was one of the strategies. So actually, I could not discern what that would really mean. Was with this emotion that they did this? To me, it was more an expressive type of emotion … obviously speaking to no one at all is the more straight cognitive approach (as typified in Hookshield's study). So obviously there is a range between emotional expressions and management. Our categories were discrete categories, so if you did one that means you didn't do the other. Though, there were people who did engage in coping in addition to speaking to the target or coping and speaking to someone else. So we were able to make those discrete outcomes.

DR. GRANDEY: So mainly you used the phrase expressions / management because you didn't really know which one …

DR. LIVELY: No, actually I talk about it that way. The outcome was either talk to the person, and we again we don't know what they did. We don't know if they pled with them, don't know if they yelled at them, we don't know if they threw a trash can at them. We were constrained by, you talked to the person period, you talked to someone else period, you talked both the person and someone else, or you talked to no one at all and engaged in some other sort of cognitive or behavioral coping strategy. So when I talked about it in terms of the findings when I say that it would effect emotional management/emotional expression, so it's what your outcome would be. Does that make sense?

DR. GRANDEY: I think it did, I'll talk about emotion labor later; we did it quite differently from you …

PARTICIPANT: You may have mentioned this, but so, did you look at different expressions of emotions in the family/gender?

DR. LIVELY: Yes, and actually I didn't mention in the talk but it is actually in the paper. We did run gender interactions for all the targets and the domains and we found none, we were surprised by that as well. Actually there were no significant gender differences at all in terms of coping, with the exception that women are more likely to talk to other people than they are to do nothing at all. Which again supported in the stress and coping literature.

DR. ZEIDNER: Maybe I will take the opportunity to ask a question or two. Various researchers have made a distinction between anger in and anger out, talking about anger expression; I just wonder if you use this distinction for differentiation for looking at gender differences. My hunch would be that perhaps women are higher on anger in but males may be higher on anger out; and this may be tied to, for instance, heart disease among men, depression among women, and tying this into the rebound time, you mentioned, is greater in women than men it could very well be, that women simply women cope with this anger in by ruminating more and rumination just keeps them from restoring their positive affect.

DR. LIVELY: Actually I didn't really talk about this but there were some significant differences in the types of individual coping strategies that men and women did use. When Simon and Nath actually looked at the individual indicators instead of clumping them together the way we did in our survey approach, in that women are more likely to seek social support from others as well as to pray, which suggests that there is a rumination factor going on in the act of praying. Whereas men were much more significantly more likely, the only thing they were more significantly more likely to do, was to use drugs or alcohol. I imagine this was in order to manage the physiological component of emotional arousal and so, in effect probably just by nature block their ability to ruminate by changing the balance.

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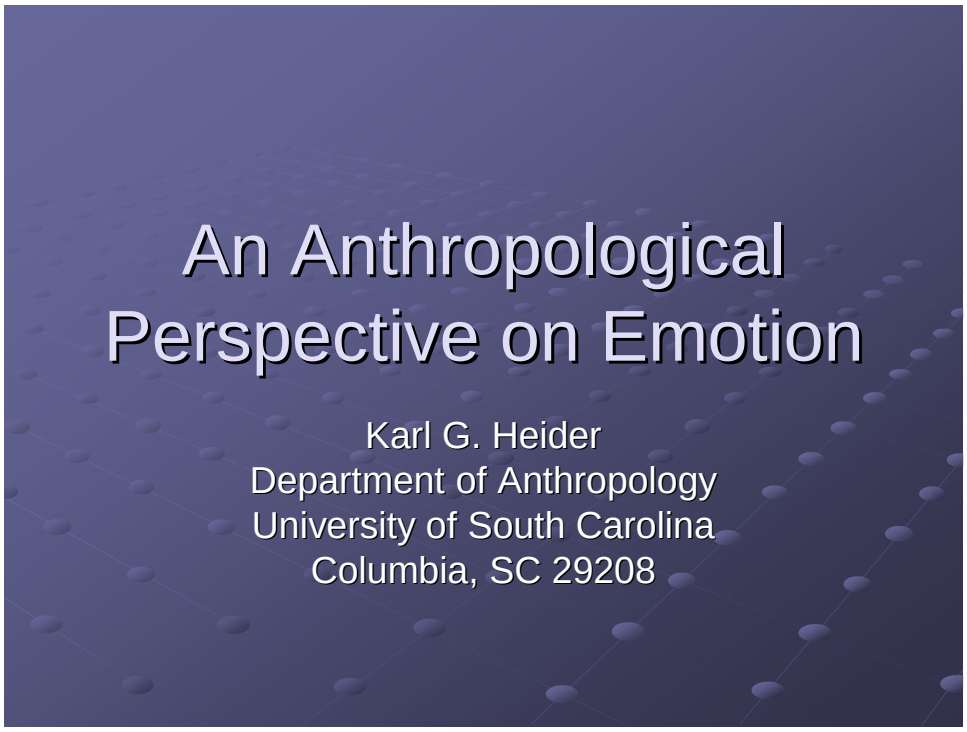
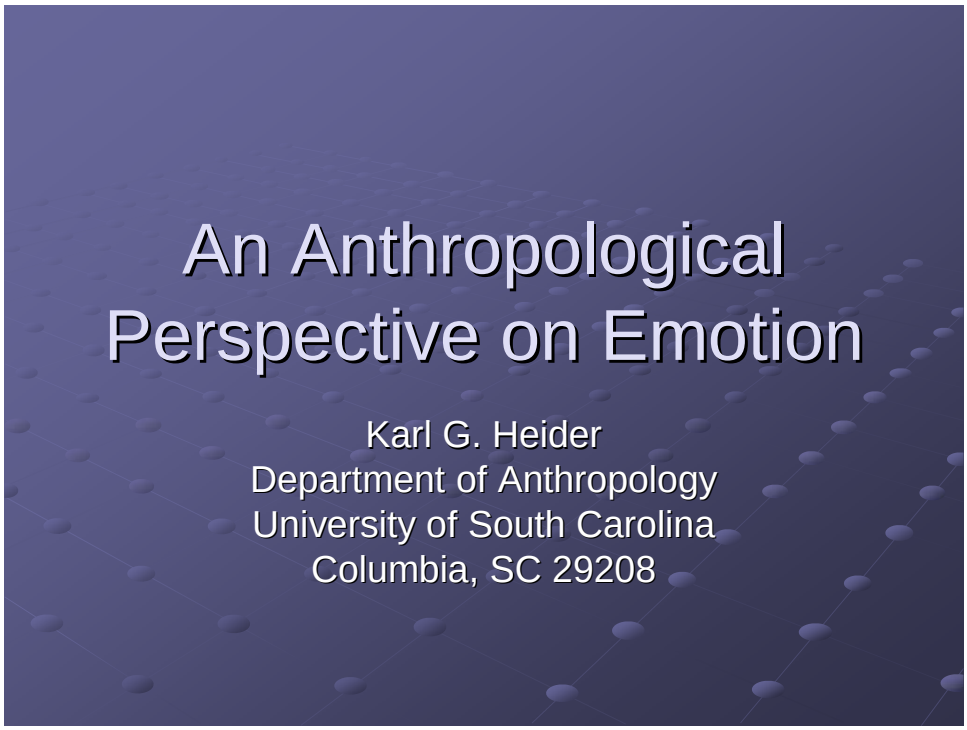


AN ANTHROPOLOGICAL PERSPECTIVE ON EMOTION

DR. HEIDER: I would like to address some concerns that I, as an anthropologist, have had in studying emotion. These concerns have to do with the concept of culture; with our actual unit of study; and finally, with two aspects of "emotional intelligence", as it is understood by the Minanghkabau of West Sumatra, Indonesia.

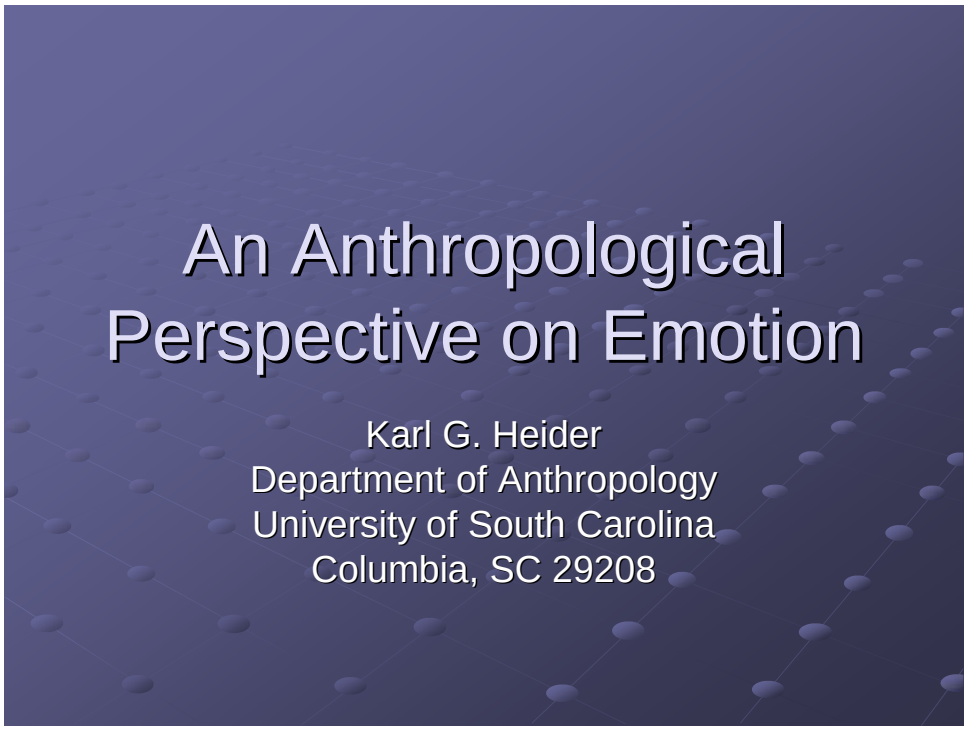
Let me first situate myself as the token Anthropologist. I started out in archeology doing field work in South Dakota, Thailand, France, and Guatemala, while gradually slipping across the line into cultural anthropology, where I did fieldwork in Arizona, New Guinea and Sumatra. I should say in the United States unlike most of the rest of the world, academic departments are usually four-field, including archaeology, biological anthropology, linguistic anthropology and cultural anthropology, making it easy to move from one field to another.

I take this fairly traditional anthropological view that culture is central to our concerns. I have many post-modern colleagues who, overwhelmed by many problems of grappling with the culture concept, have simply rejected it, but that is another problem.



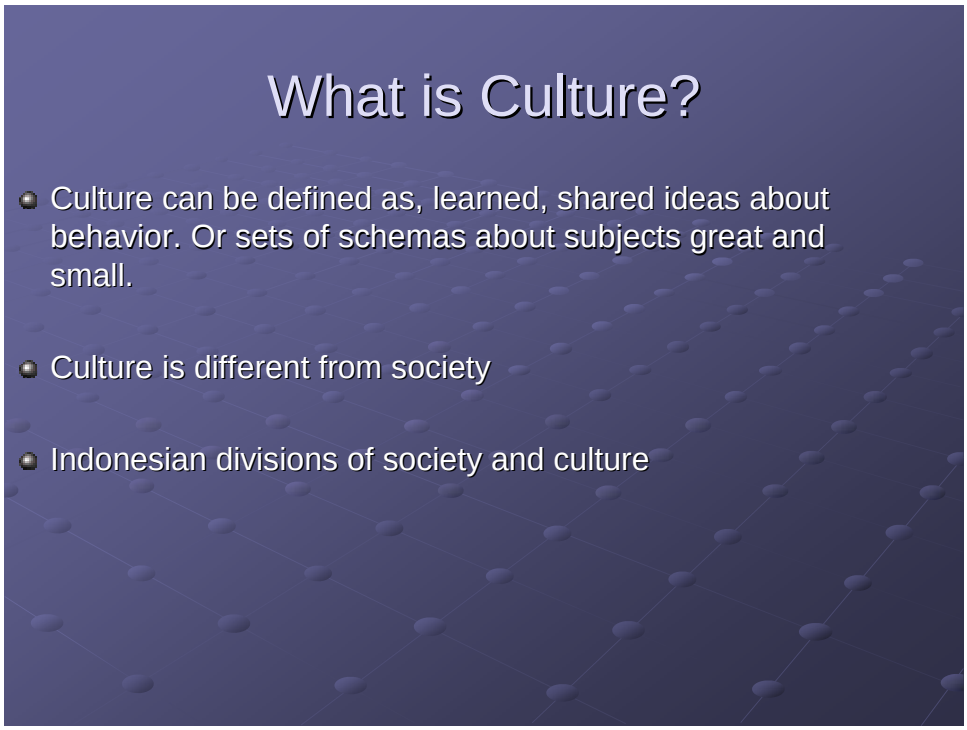
What this means, for our present interest, is that I am particularly concerned with culture-specific aspects of emotion. I have talked about “cultural influences on emotion,” and “the cultural shaping of emotion,” but both of these phrases suggest that emotion is some ideal essence that can be reformed by culture. I really prefer to emphasize the bio-cultural models where the biological givens and the external cultural environment interact to produce a particular “culture of emotion.” These cultures of emotions are not unique. They certainly don’t vary as much as do the languages of the world, yet are more varied than, say, the kinship systems of the world.

Since the 1960’s I have collaborated with psychologists in the field: with Eleanor Rosch studying the Dani in West New Guinea and later with Paul Ekman and Robert Levenson who came out to West Sumatra to look at the Minangkabau. These have been useful collaborations. Where the psychologists look for Pan-human constants, I look for culture-specifics. Let me give you an example. In 1970, when we were with the Dani of West New Guinea, Rosch and I replicated a facial expression task that Ekman and Sorenson had done with in Eastern New Guinea, and I had agreed to do the replication despite my extreme skepticism at the time of Ekman’s claim for pan Homo sapiens facial expressions of emotion.



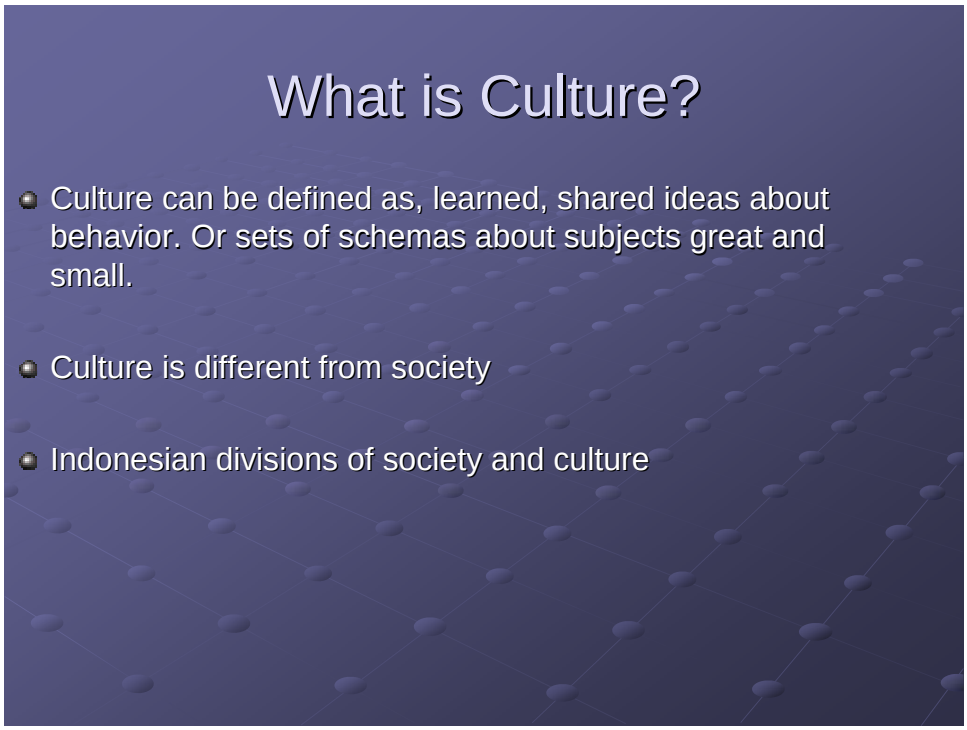
As it turns out to my surprise the Dani did very well in supporting Ekman's hypothesis. Their only error was their failure to reliably distinguish between anger and disgust, when given an anger story and shown both pictures of anger and disgust. This "error" (from the Pan-human point of view) was actually a point for the cultural argument. And, it turned out I was already committed in print saying that withdrawal is the usual means the Dani used to resolve conflict. And later, when Rosch and I asked Dani men to pose facial expressions, when we gave them an anger story, the majority of them made the nose wrinkle, head averted disgust face for the anger story. Thus our experimental data had supported my earlier ethnographic observations.

In short I've had very good experiences working with psychologists. I came to expect the rewards of research, results and such collaborations, to be divided about 80% to the Pan-cultural psychologists, and 20% to the culture-specific anthropologists, and I figure this is a pretty good deal, all things considered.

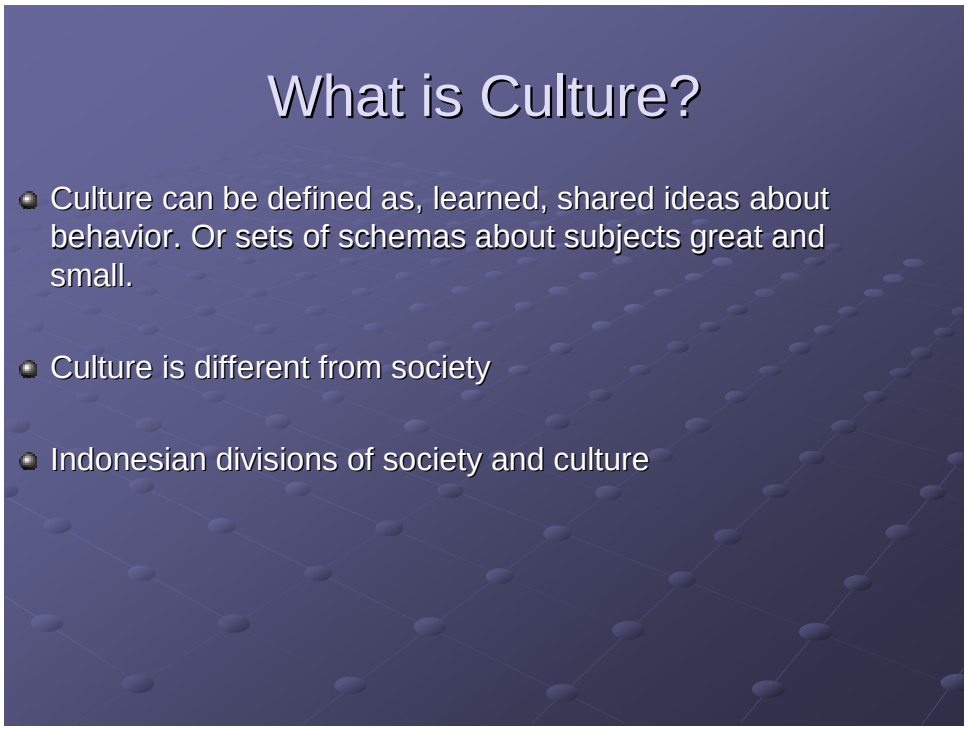


Since researchers are increasingly bringing the concept of culture into their consideration, it's worthwhile being very specific about what is meant by culture. Culture can be defined as learned, shared ideas about behavior. Further, these are sets of ideas, or schemas, about subjects great and small. In fact there are problems with each part of this definition and above all culture is a fuzzy category not having clear geographical bounds at any of its possible levels. Yet despite these problems most anthropologists base their research on culture. Now culture is very different from society. A social unit is an organized set of individuals, a bounded, easily definable entity, with explicit boundaries and specific membership. In short, social units, those defined groups of individuals, are quite different from those shared sets of ideas that we call culture.

For those who wish to study the influence of culture on emotion, the social units that individuals belong to are likely to be irrelevant, or at best misleading. In traditional anthropological research we didn't have to worry much about this culture/society distinction. In my own work with the Dani, which was literally using stone tools, living in the central mountains of New Guinea when I first went in 1961, it was simple. I could define the social units beginning from the family, to the neighborhood, to the confederation, and up to the maximal unity, the alliance, and every member shared the same culture.



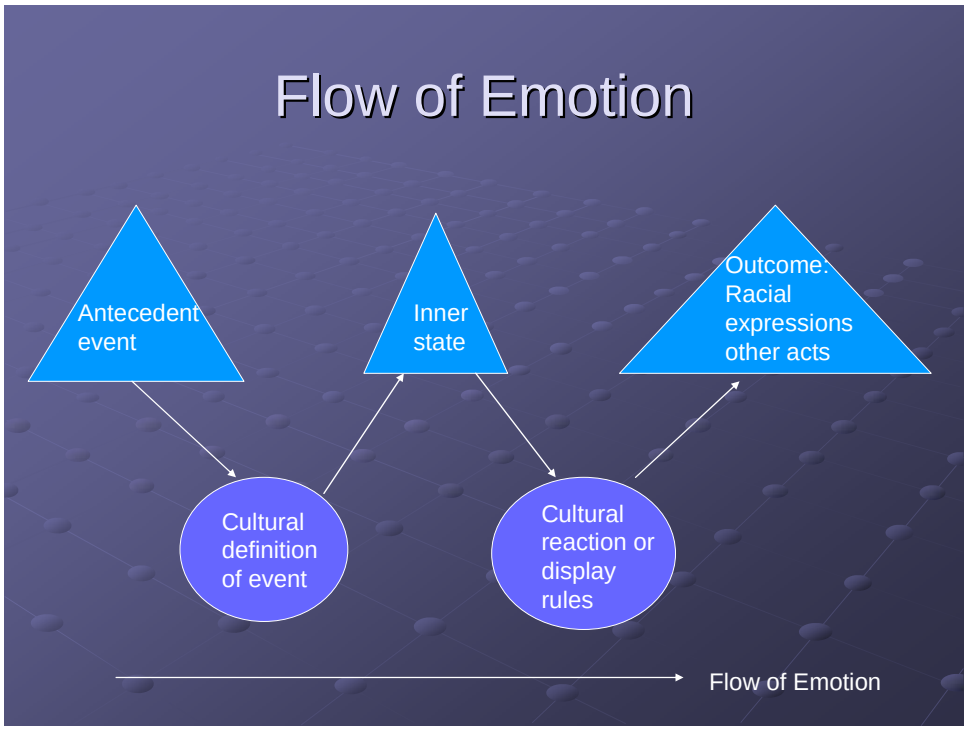
But we are running out of there homogenous tribal cultures. In my present work I do have problems. I work in the Republic of Indonesia, but that is a maximal social unit. Knowing that someone carries an Indonesian passport is not at all a certain indication of their culture. Within Indonesia there are many very different cultures with mutually unintelligible languages of at least 3 three totally unrelated language families. An “Indonesian” label is comparable to “Chinese” or ”European” in that it’s a societal label that includes a variety of cultures. Even specifying the provinces as “West Sumatrans” includes under one label, people of several different cultures. As it happens, this is a political gambit that the former Suharto government was tried to avoid using cultural labels (e.g. Minangkabau) in favor of provincial labels like West Sumatra. This was a deliberate strategy to lessen the grip of local cultures by emphasizing the nation and its administrative subdivisions. Indeed actually on the side I studied Indonesian Cinema and it turned out that these Indonesian produced in Jakarta distributed throughout the whole archipelago were actually a medium for depicting and propagating a national culture that was meant to be absorbed and enacted by people from all the various ethnic groups. But, it’s a long way to this national culture.



Even though there is a national language, Indonesian, in my earlier research in the 80's I demonstrated how Minangkabau people and central Javanese have nuanced differences in their emotion discourse, when speaking Indonesian, which is the same language wherever you are speaking it. Depending on what your first language is, you have a slightly different culture of emotion, when speaking Indonesian. And the Minangkabau has somewhat different cultures of emotions, whether they are speaking Minangkabau, the language of the home, their first language, or Indonesian, the language of school and office.

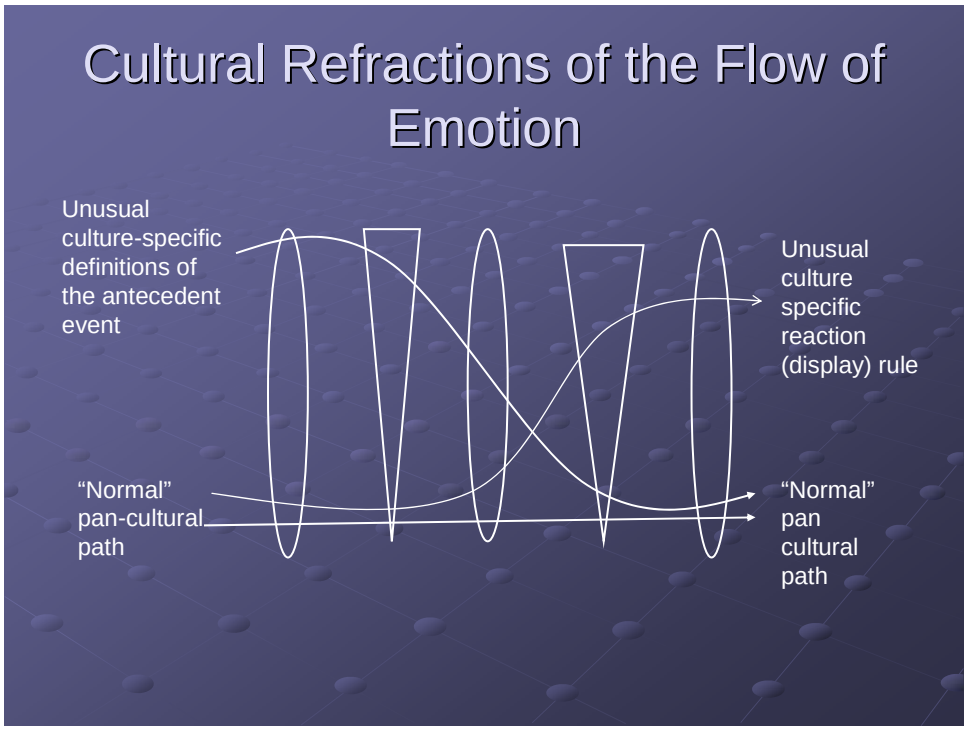
In the 1980's I was content to describe my subjects as Minangkabau, ages about 18 to 60, but now I have become more conscious of class, age and regional differences among the 5 million Minangkabau. In my latest research in 2000, 2001, I carried out extensive interviews with 21 people that I specified as middle aged, middle class Minangkabau living in and around one city, and most of them in the same neighborhoods, in other words, fairly limiting my cultural definition. And still it won't surprise any of you that there is still some variation, but I don't want to go into individuals differences here.

Please pardon the Anthropology 102 lecture, but all of this does make a difference. My data have been challenged by others whose data come from "Indonesians" or even "Malays" on the assumption that we are all looking at the same culture, and so our data should coincide and, if not, then, their data are accurate and mine are not. This shows ignorance, compounded by arrogance.



The point should be obvious by now: when a study looking for "culture variation" or "cultural influences" describes its subject or informants as students at a particular university, or nationals of a particular country, this is the equivalent of looking under the street lamp for the keys you lost down the block in the dark. It's easier, but not necessarily the most effective approach. More specifically in the case of these studies, by aggregating the subjects on the basis of their passports or their matriculation fees, the very cultural effect that's being looked for has most likely been flattened out beyond recognition. Under these circumstances the discovery of any cultural differences at all is significant indeed; the absence of cultural differences is to be expected.

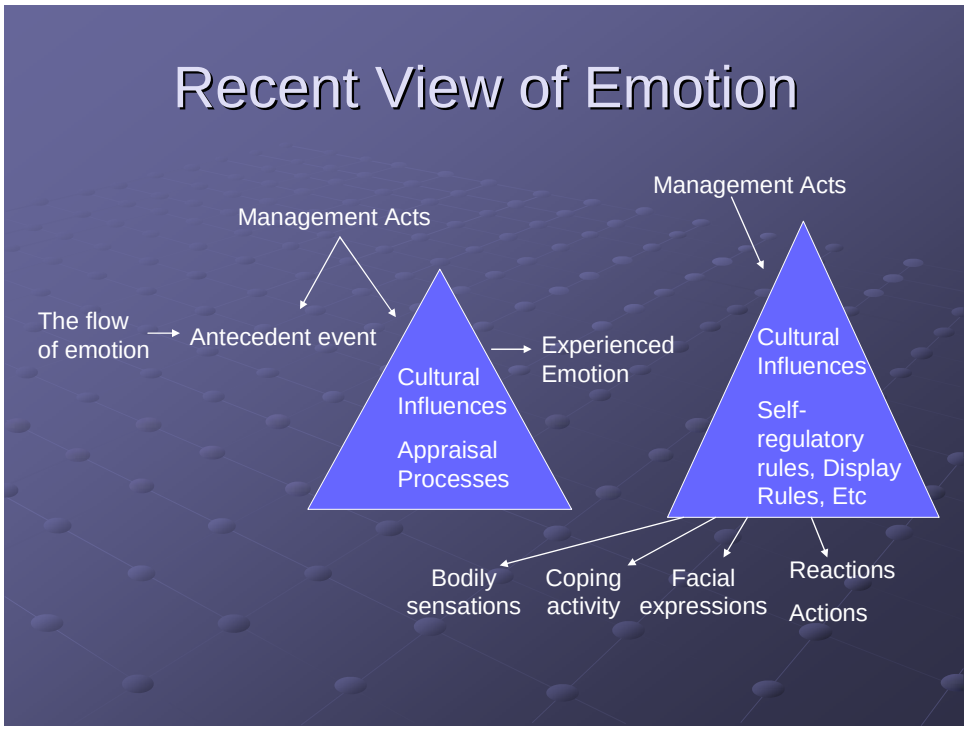
Another issue that moves us toward the Minangkabau, in the study of emotions we usually begin from the word, anger, shame or the like. These words are succinct, well-known to all, and offer convenient access to the incredibly complex world of emotion. When doing cross language research, the dictionaries give us apparently accurate translations that take us into other cultures of emotions. We don't have to get into the notorious inaccuracy of translation, an inaccuracy that all of us tend to blithely skip over in our eagerness to pursue our research goals on distant shores. But that is another topic, and I will follow up on the subject of words as research units.



We begin with a word supposedly standing for emotion and guided by a set of features we could expect to discover about that emotion, describe that emotion. This set of features is a sort of conceptual guide to what constitutes an adequate description of an emotion. Here is an example from my own work. It's sort of theoretical declaration includes a grant proposal or the introductory chapter of a book. Actually, we can consider two diagrams. The first represents my understandings based on the state of emotion research in the early 1980s, when I first began research with the Minangkabau.

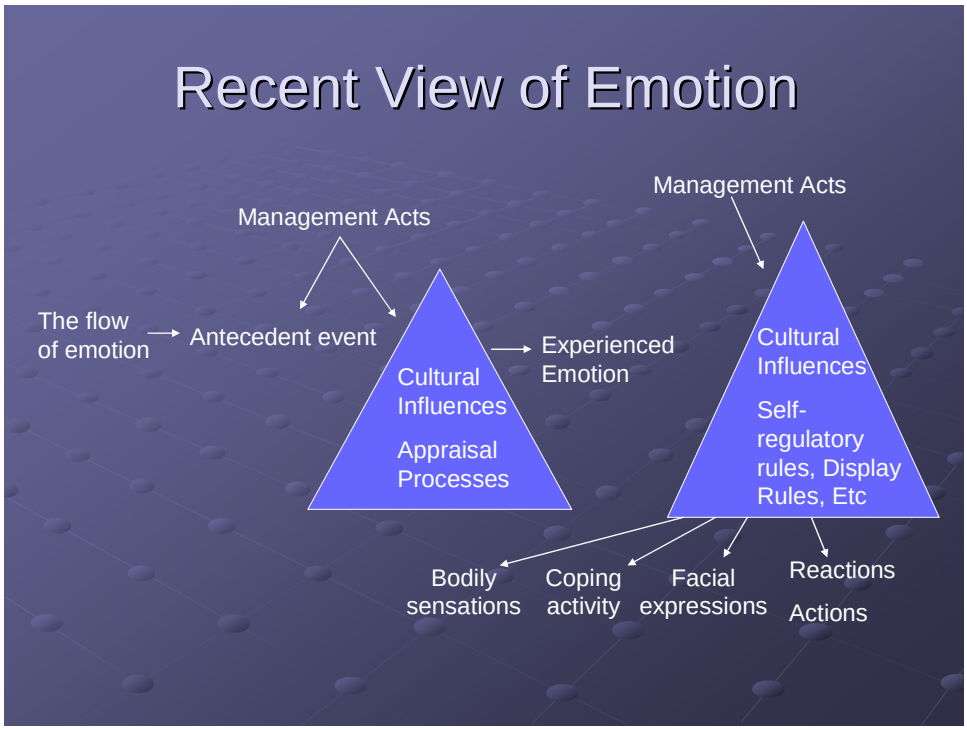
The diagram indicates the flow of emotion from the antecedent act to the behavioral outcome. Especially important for my anthropological interests were the two points of cultural intervention in the flow. The antecedent events are defined culturally, sometimes counter-intuitively from the standpoint of Western logic. For example, the loss of a loved one may not be a matter of sadness but of rejoicing (for certain Christians), or of fear (for certain believers in witchcraft). Then, as a second cultural intervention, there are behavioral or display rules that may modulate facial expressions and other sorts of behavior arising out of a felt emotion.

However, by the time I began the second stage of this research, twenty years later, in 2000 and 2001, twenty years of emotion research had raised the requirements for an adequate account of an emotion. The model had grown much more complex.



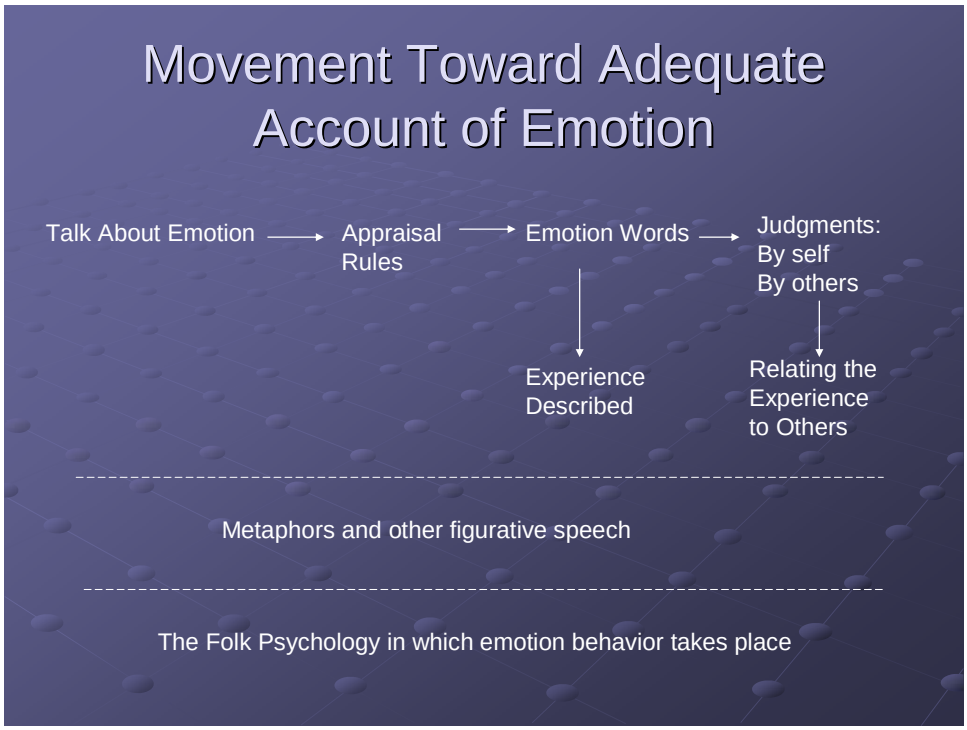
In comparison to the first diagram some things haven't changed. We are no further on in understanding the culture interventions. For example, as far as I know, no one has ever worked out the complete repertoire of display rules for any culture. We the interpretation of the other antecedent events has been developed by much research into the appraisal process, and it seems best to distinguish between the flow of emotion itself and the talk about emotion. And in my own research I'm now using extended interviewing instead of the more limited questionnaires, and am finding out how Minangkabau locate their schemas of emotions in their broader folk psychology.

Now such diagrams are useful to inventory various aspects of emotion, but taken alone they create an artificially isolated picture of emotion. As an alternative, or compliment, we need to think of the phenomenon of groups of near-synonyms of emotion terms. Thus, we have not just anger, but anger plus fury, plus annoyance and such. These clusters of similar words cover a space that might be considered the real emotion.



The words themselves are epiphenomenal markings naming subtly graded variations within the space of any emotion cluster. With this in mind, the "adequate description" of an emotion suggested by the features of diagram 3, become more differentiating. We are not just attempting to describe anger, or even anger in contrast to sadness. We are specifying the internal structure of a cluster and distinguishing anger from fury. In my 1980s research on Minangkabau emotions I worked on that goal by first establishing the members of the emotion clusters and then using the questionnaires to ask people to distinguish between the antecedents and then the outcomes of pairs of closely related emotion words in the same cluster.

Following this line of research we have recognized categories (clusters, or families) of emotion words, or have created branching tree diagrams that place emotion words in relation to each other based on increasing levels of similarities. It is a matter of categorizing on the basis of similar attributes. Such categorical thinking seems quite obvious to us, and we don't often question its validity. However it is a particular cultural way of organizing thought, and the Minangkabau evidence suggests an alternative, namely, a concern with emotions in processing sequences rather than formal categories. But I have to stress that Minangkabau informants were quite willing to respond to my own category-based questions. They were comfortable with this way of thinking, however, embedded in their responses to my questions of the 1980's as well as my interviews of 2000/2001, was this other processual model, of emotions.

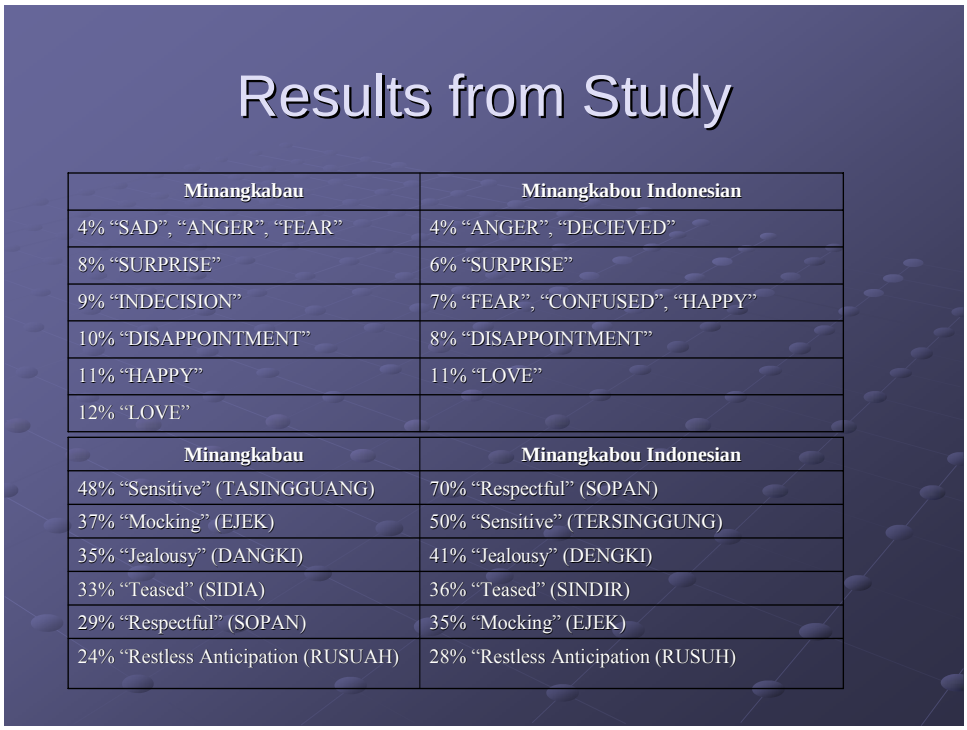


In order to build scenarios for emotions, I had asked for antecedents and outcomes of emotion words with sentence completion questions:

"Someone is X because…"

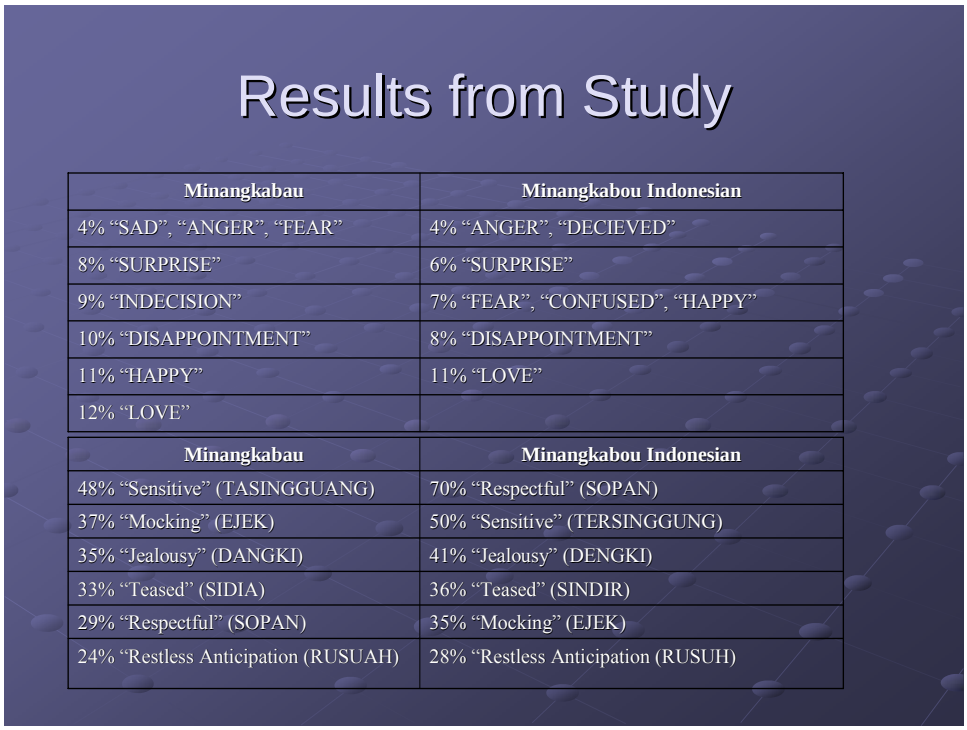
"When someone is XXX, they…."

It turned out many people gave the emotion words as antecedents or as outcomes for particular emotions. That is, some emotions were seen as producing other emotions. And some emotions were seen as products of other emotions. Those that led to other emotions I called "way station emotions." Those that were produced by other emotions I called "end point emotions."



The percentage of responses that gave an emotion word as antecedent was the emotion-genic score, and what's very interesting is the difference between the End Points and those with lowest emotion-genic scores or those with the highest emotion-genic scores. Virtually all Minangkabau are fluent in the national language, Indonesian, and the local language, Minangkabau. I collected comparable sets of data from them in each language, and the two languages produced quite similar results. Another surprise emerges from these two sets of lists. The strongest End Point clusters include just those emotions that are figured in the list of basic emotions, by people in this room, or, for those who deny basic emotions; these are still the words that are chosen for research. The strongest Way Station clusters are not considered basic emotions and are rarely singled out for study.

Of course, by asking for antecedents and outcomes of emotion words I was directing people towards the scenarios of behavior, towards processual thinking. Most people, most of the time answered with events of one sort or another, but the frequent reference to other emotion words as outcomes, suggesting what I am calling the Way Station phenomenon, indicates the processual thinking.



The sequential linkage of emotion words showed up in the second phase of my Minangkabau research in 2000/2001.

People often pointed out sequences:

- Bangga, a good sort of pride, could become sombong, the bad or arrogant sort of pride.

- Kesal, a sort of peevishness, could become marah, the prototypical anger; and one man described Kesal as the younger brother of marah, below marah, and gentler than marah

- Anger could lead to revenge

- Horrified could lead to fear (and one man explained, "ngeri is sort of like a ladder rung, the first rung to get to takut. It begins with ngeri.")

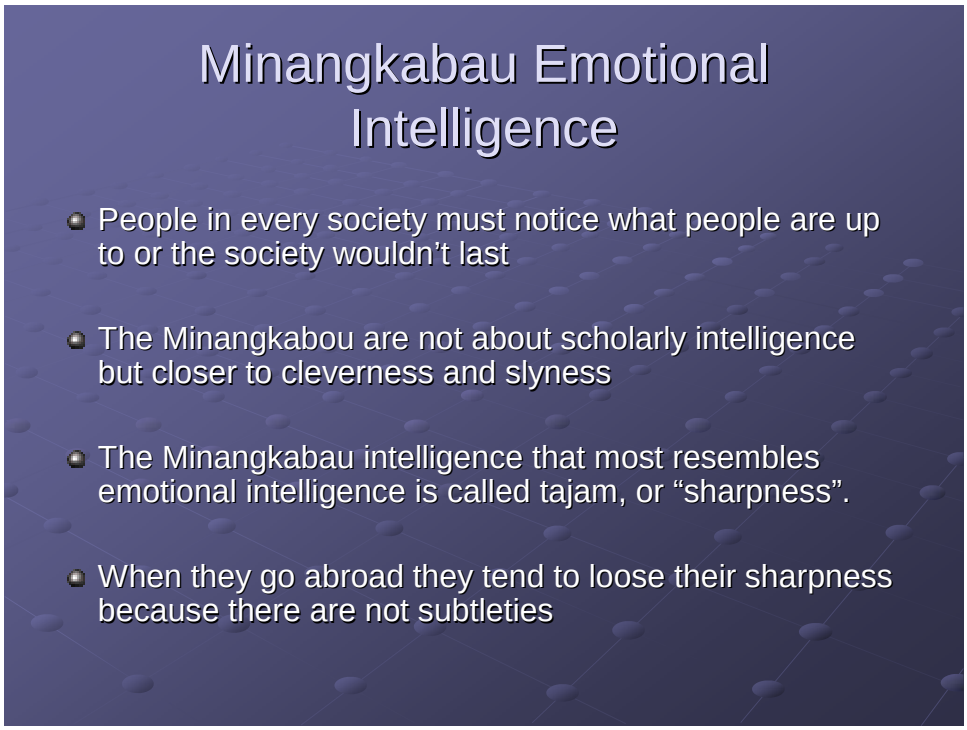
Results from Study

Minangkabau	Minangkabou Indonesian
4% "SAD", "ANGER", "FEAR"	4% "ANGER", "DECIEVED"
8% "SURPRISE"	6% "SURPRISE"
9% "INDECISION"	7% "FEAR", "CONFUSED", "HAPPY"
10% "DISAPPOINTMENT"	8% "DISAPPOINTMENT"
11% "HAPPY"	11% "LOVE"
12% "LOVE"	

Minangkabau	Minangkabou Indonesian
48% "Sensitive" (TASINGGUANG)	70% "Respectful" (SOPAN)
37% "Mocking" (EJEK)	50% "Sensitive" (TERSINGGUNG)
35% "Jealousy" (DANGKI)	41% "Jealousy" (DENGKI)
33% "Teased" (SIDIA)	36% "Teased" (SINDIR)
29% "Respectful" (SOPAN)	35% "Mocking" (EJEK)
24% "Restless Anticipation (RUSUAH)	28% "Restless Anticipation (RUSUH)

Let me make a highly speculative detour for a moment: It is interesting that Rasa theory, the first millennium of Christian error in Hindu poetics is such a processual theory of emotions. It explains how certain emotions that are enacted on stage, produce certain other emotions in the audience. Hinduism, and presumably much else in Indian Culture, came to Sumatra from India at the same time, and the Hindu religion lasted among the Minangkabau until the Wahabi Muslin revolution in the early 19th Century. Several Minangkabau words concerning emotion are derived from Sanskrit, most notably the root for emotion itself, rasa. Is it possible this Minangkabau interest in sequential linking of emotions was stimulated by Rasa theory? It is much too soon to be certain, but this is a tantalizing thought.

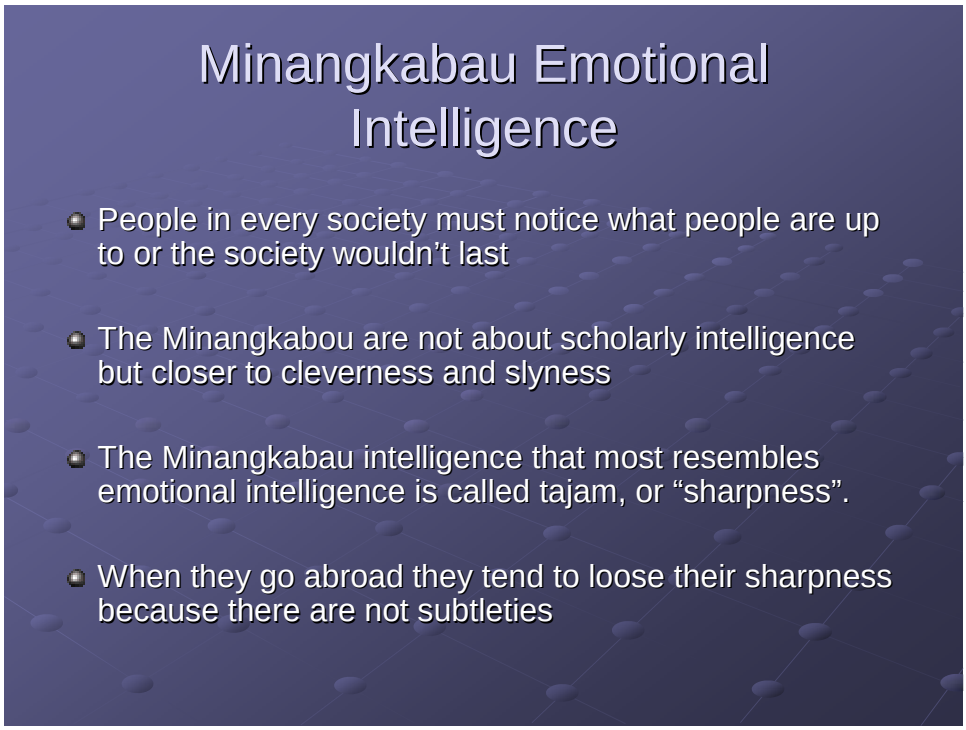
To summarize this line of thought: the Minangkabau seem to be comfortable with the categorizing and processual models of emotion. But the processual model, which emerged so unexpectedly in the course of this research needs more attention.



Surely people of every society must take notice of what their fellows are up to, and what we call Emotional Intelligence must exist to some degree everywhere. It's hard to imagine a group whose members are ignorant of or indifferent to each other. Such a group would not long survive. In this section I wanted to describe how Minangkabau talked about their version of emotional intelligence.

Minangkabau are known as the intellectuals individual of Indonesia. Especially as compared to the charismatic mystical Javaneese. They have many concepts of intelligence and wisdom. These are not so much as scholarly intelligence but generally closer to cleverness (and sometimes push the line into an inappropriate slyness). The general tone is nicely captured by the most famous and most often cited story about how they got the name "Minangkabau."

Once, a Javanese army invaded Sumatra and threatened to conquer them. It was agreed that instead of a battle, each side would send its champion water buffalo (kerbau) to fight for the victory (minang). The Javaneese sent a huge water buffalo. The Minangkabau sent a hungry nursing calf with sharp knives tied to its horns. The calf raced to the Javanese water buffalo and as it tried to nurse, its knives gutted the Javanese champion. Thus, "Minang Kabau," "Victorious Water Buffalo."



This story is told even by Minangkabau who doubt its historical accuracy, for it embodies two of the prime virtues of Minangkabau: indirection and cleverness.

The Minangkabau are also known for their pattern of temporary migration to lands beyond their three home provinces. A migration called merantau. When people talked about this merantau, they gave two reasons for it: to gain wisdom was almost always mentioned before the desire to seek wealth.

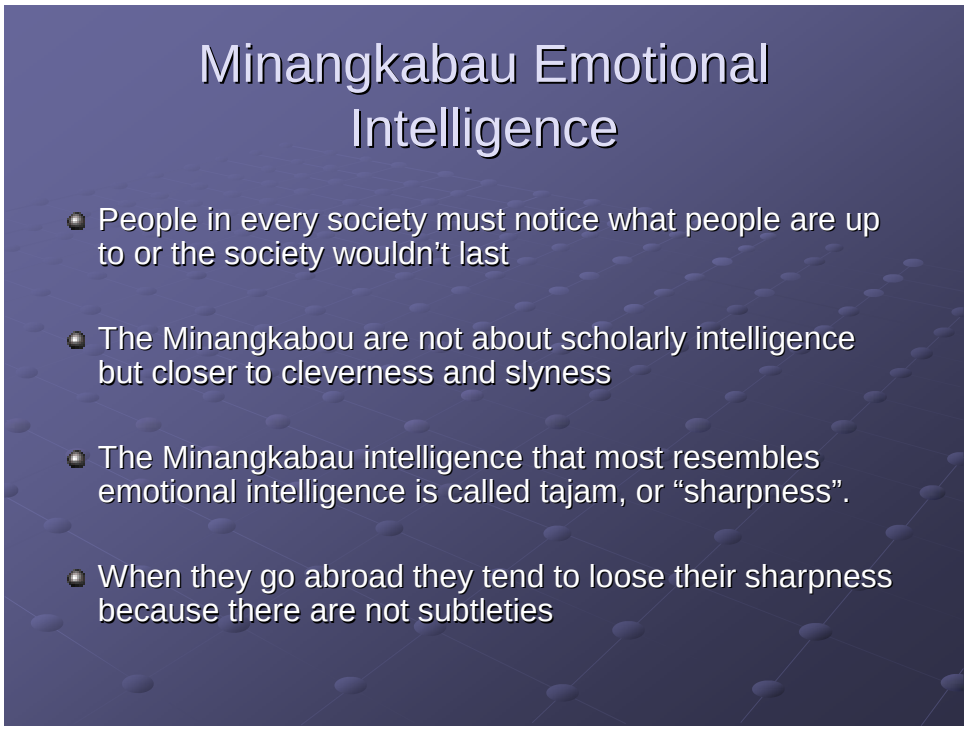
The Minangkabau intelligence that most resembles emotional intelligence is call tajam, or sharpness. Knives can also be tajam.

This is the ability to read for people, to read the emotions and intentions of another. It is a direct, immediate, intuitive understanding of another. It's referred to in the saying, roughly translated:

"A flash in the water

One knows male and female."

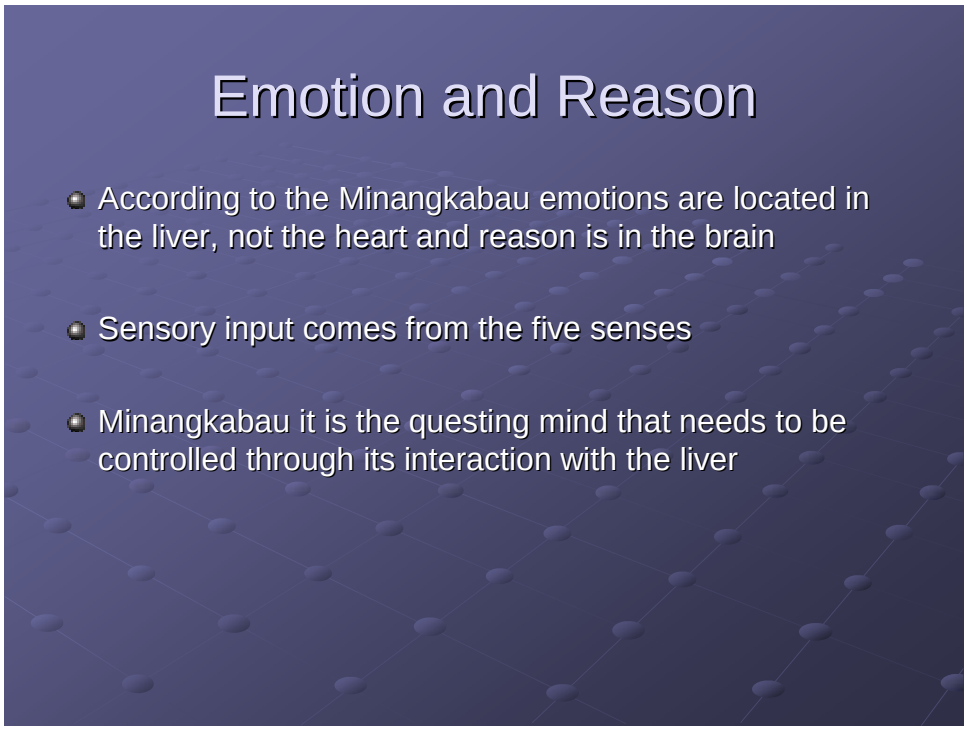
The idea is that you just see it flash in the water, and you immediately know if it's male or female. In this matrilineal society, mother's brothers are responsible for the upbringing of their sisters' children, and it is up to these uncles to sharpen their siblings. They sharpen the children by challenging them with riddles, with allusive couplets and other forms of indirect speech. Playing dominoes and similar traditional board games also sharpen the ability to read others.



Sharpness is maintained in traditional village life, with its constant challenges of indirect speech and games of concealment like dominoes. But people say, the edge is lost when Minangkabua go abroad, for there people speak without the subtleties of Minangkabua speech, and so there is no need to cultivate sharpness. (Objectively I would venture to say that this is not true – subtle as Minangkabua are, they cannot compete with even the more subtly masked Javanese).

Truly this is a village-based emotional intelligence. It is profoundly Minangkabua. It has nothing to do with academic intelligence. More surprisingly, it has nothing to do with Islam. Although Minangkabua have been staunch Muslims for two centuries and have been the archipelago's strongest supporters of the European-style educational system for over a hundred years, neither mosque nor school came up in our discussions of Minangkabua intelligences.

It's proudly proclaimed as the product of traditional village life, and they complain the children today who are drawn to the cities are loosing not only Minangkabua culture in general, but Minangkabua intelligence in particular. They are not sharp, but they are dull.

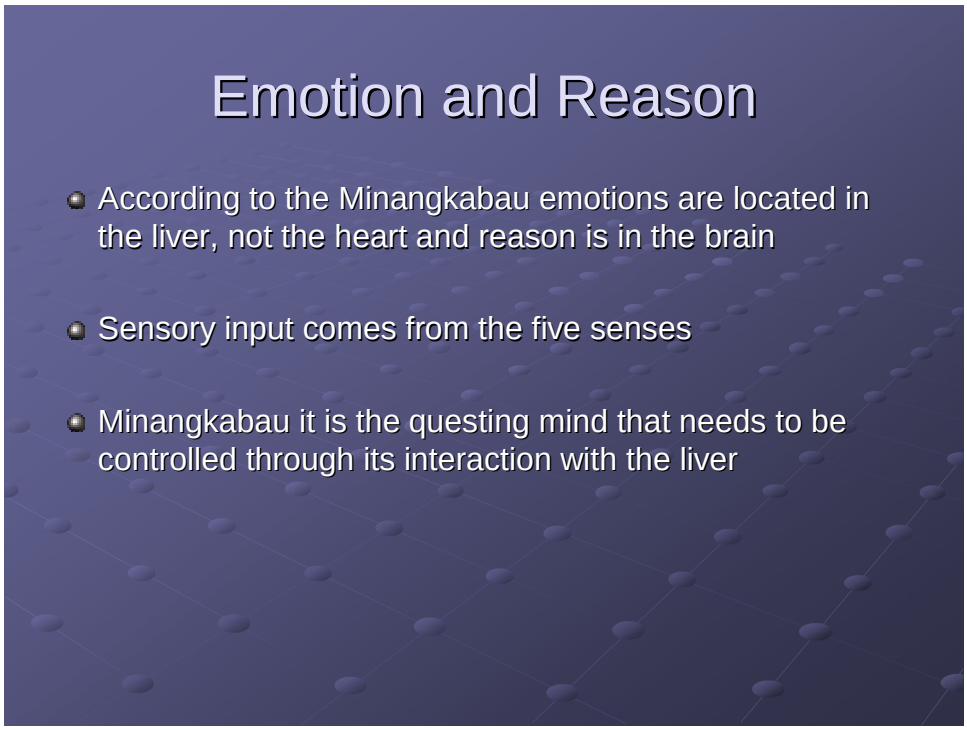


In a revised definition of emotional intelligence, Mayer and Salovey include “the ability to regulate an emotion, to promote emotional and intellectual growth.” This seems directly relevant to Minangkabua thinking. As people located emotional behavior in terms of their folk psychology, one of the concepts that everyone knew was raso jo pareso. In Indonesian, this can be called rasa dan periksa. This can be called emotion and reason, or inspection. Actually, reason usually is translated by the Arabic word, akal. And pareso is more of an inspection, or examination, or even a questing search of something. According to Minangkabua (and throughout most of Asia), emotions are located in the liver, and not the heart, and the reason is located in the brain.

Sensory input comes through the five senses of vision, touch, smell, taste and hearing. These are collectively by the Sanskrit term, pancaindera. (Interestingly enough, Aristotle, in De Anima, discusses the same five senses). Following the perceptions, there is a sort of appraisal process, in the form of a balancing or exchange that takes place between the raso and the pareso:

Reason is carried down (to the raso),

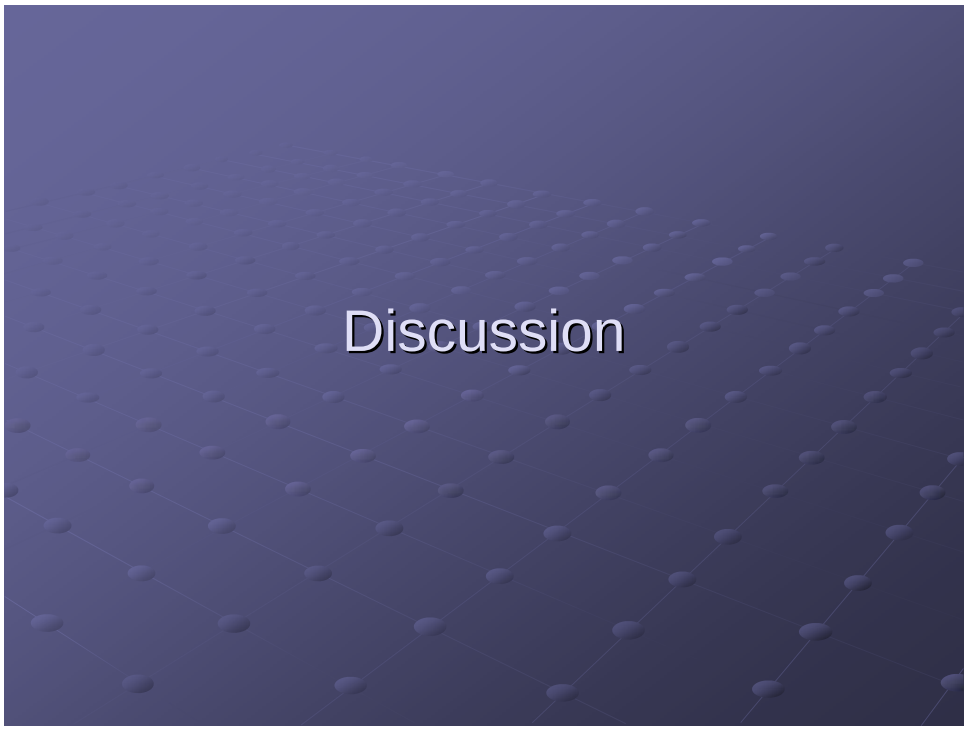
Emotion is carried up (to the pareso).



Further, Minangkabua are much concerned with patuik jo mungkin. Patuik is what is proper, but mungkin refers to anything that is imaginable and possible. The brain thinks of all things, even what is not proper. So, it is the task of the liver, the seta of emotions and of propriety, to control the brain and to allow only what is proper.

Obviously this is different than what most of us in this room take for granted in our own folk psychologies, namely that the rational mind controls the impetuous heart. For Minangkabua it is the questing mind that needs to be controlled through its interactions with the liver. I don't want to take this bit of folk psychology too far. It is really a vague notion for my informants. Although everyone had some ideas of raso jo pareso, no one put forward a really concise total picture of how it worked. I really did try to explore it, but with mixed success. For example, one of my favorite examples is if one saw a tiger enter the room, would raso and pareso have time to work things out, to make that balance? No, people explained, then the danger would be obvious and you just run away, but if a person laughs in your presence, it is not clear; you don't know what his intentions are or whether or not he is deceiving you, and then you use raso jo pareso. This approaches the ideas of appraisal, but in a very general way. Finally, let me lay out one of my current concerns or dilemmas. As I said, try as I could, I was often unsuccessful in eliciting neat systems of emotions or folk psychology from my Minangkabua informants. I suppose Aristotle was presenting an elaborate and elegant version of the Greek folk psychology of two and a half millennia ago. But, I had no Aristotles among my informants. And I resist the temptation to improve on what my informants did say.

So what I've given you is a bit of folk psychology straight from the field. Thank you.



DISCUSSION

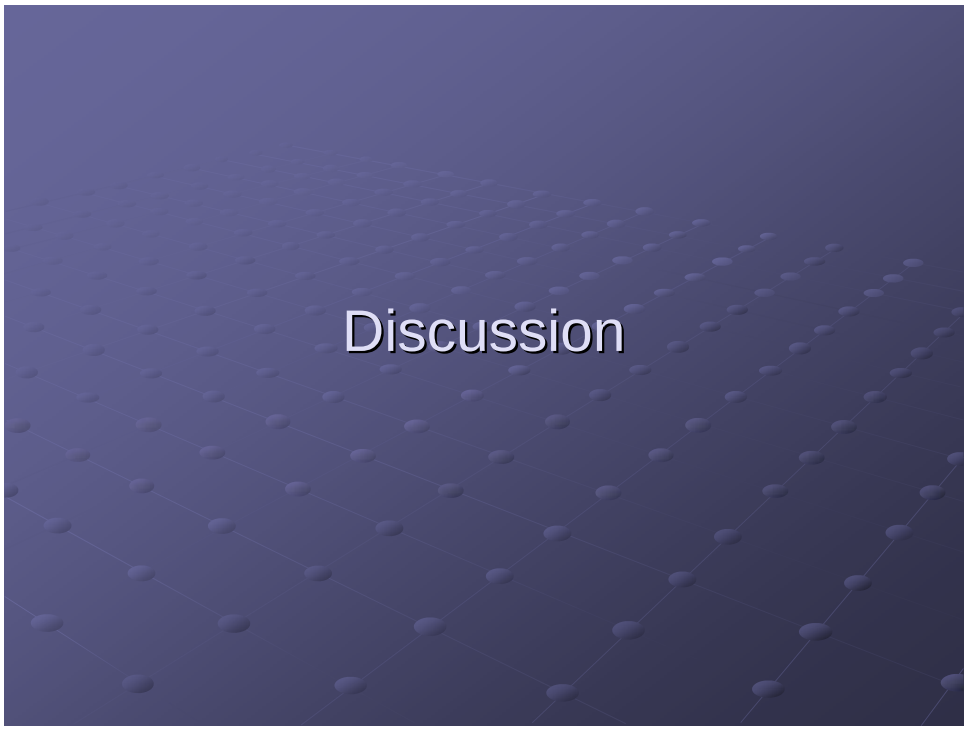
DR. ZEIDNER: Thank you very much for an intriguing and very exciting talk. We have some time for a couple of questions from the audience.

DR. IRVINE: How much did study of the proverbs in the culture inform your ideas of emotions?

DR. HEIDER: A tremendous amount. That's another paper. Our categories of metaphors and proverbs and so forth don't really fit there's. But their use of traditional little sayings, are very extensive and very analytic and very important.

DR. IRVINE: The Shawna of Zimbabwe have a large collection of proverbs, which are translated, and they distinguish between two kinds of intelligence. One is Ewap which is an idiophone meaning alertness and the other one which is Uchingere, which means acquired or traditional wisdom. Do you find the same kind of division in your own studies?

DR. HEIDER: No. One of my favorite is the wisdom of the rice. And that is the wisdom of the rice is the fuller the lower. And that is when a rice plant is ripe, the rice kernels hold down the rice plant and this refers to the wise man who is full of wisdom but very humble. I'm sure we could go on matching, I'm sure we could match folk wisdom for a long time.



DR. LEN WHITE: You were making a distinction between culture and society, seems like that kind of distinction could be made in American or any other Western Nations.

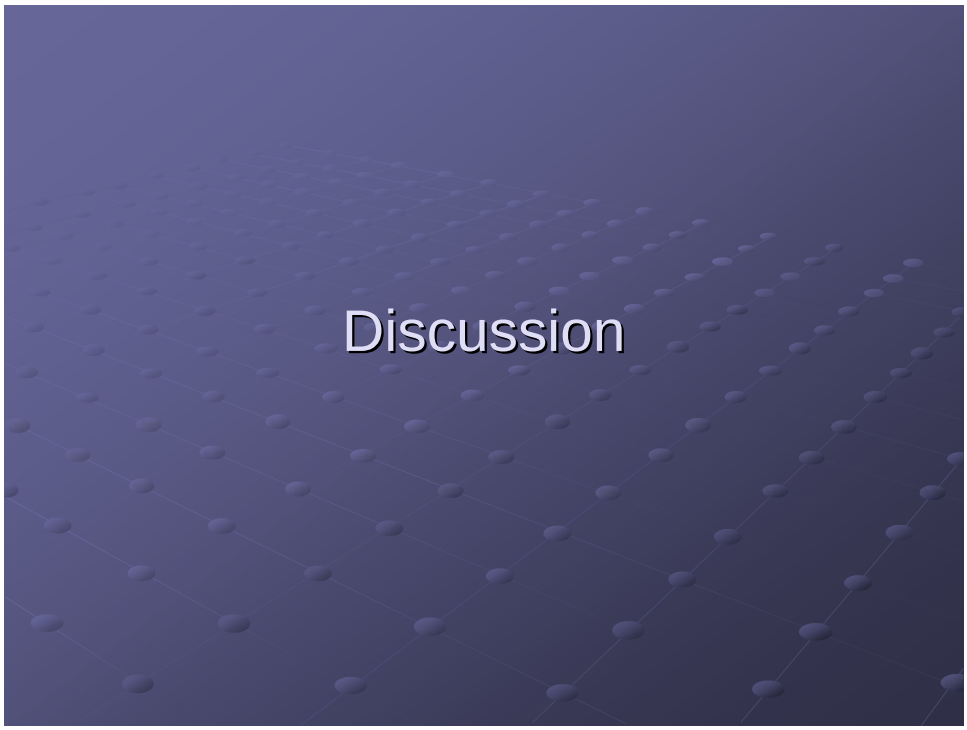
DR. HEIDER: I stayed away from America. It is one society of many cultures.

DR. LEN WHITE: So I wonder if you have any suggestions on how we can distinguish cultures with that or a stance or know what category of culture a participant of research should be?

DR. HEIDER: Let me put it to you, what do you mean by culture? What are the five questions you could ask someone to limit there to specify their culture.

DR. LEN WHITE: I'm going off of your …

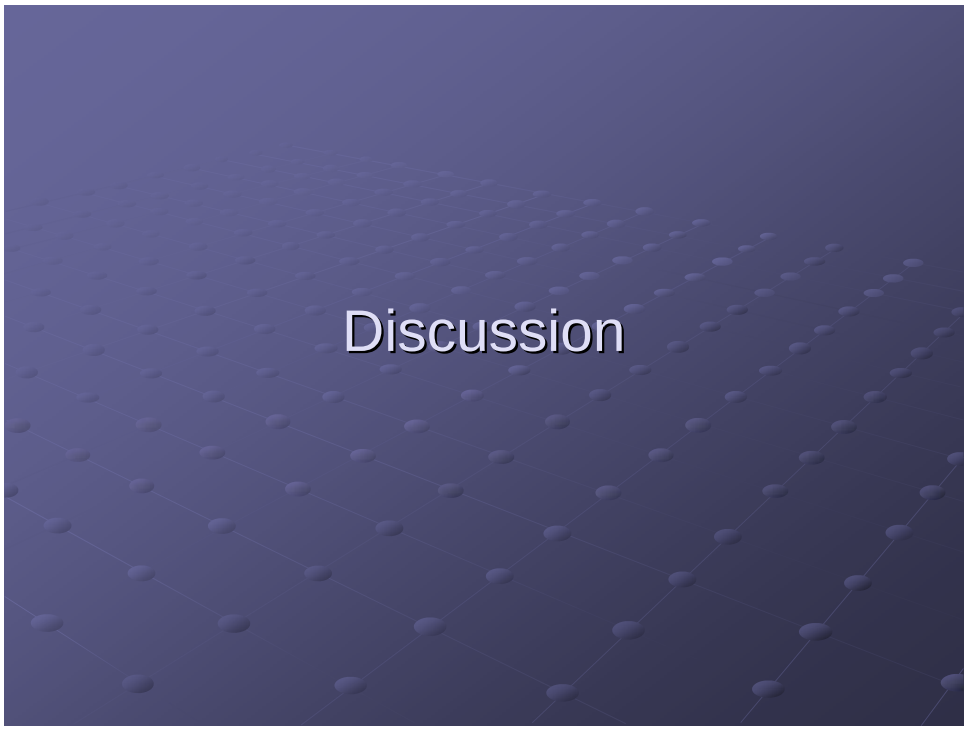
DR. HEIDER: I started this a little bit in South Carolina. Thinking how can I get two samples from South Carolina., the low country and the up country. And the first thing I do is have the people live there for a while. And the second thing is religion, Baptists in the low country and Presbyterian or something in the up country. It depends on the situation. But native language, first language, is certainly. There are a lot of people in our introductory courses whose native language is not English. And it's stretching things to think people in our introductory courses share the same culture.



DR. HEIDER (CONT'D): But one can ask about language, about religion, about food ways, about where the parents came from, depends on the situation. With Minangkabua it was, I started out assuming they were all Muslim, they all eat rice and that kind of that thing, and they all live in West Sumatra. That's pretty easy. It turned out that there, I think are quite significant differences between people born in the 1930's and people who are now teenagers in terms of their cultures of emotions, very, very different. I kept looking for differences in gender that was more ambiguous, but it really depends where you're working and what you're aiming for. It's fairly easy to think of the kinds of questions you'd ask someone to get a pretty rough estimate of what their culture is.

DR. LIVELY: You mentioned Religion as one possible differentiating characteristic, makes me wonder about the transition you described from Hinduism to Islam. And I wonder if there is something about, if you have speculated how it is that this transition came about?

DR. HEIDER: It came about by armed conflict. And the Muslims have wiped out all memory of the Hindu period. And it is very hard, there are no written records. Marco Polo may have come through the Minangkabua area, on one of his trips to and from China. Yes, I speculated at great length and that's a fascinating problem. And to what extent and that's why I'm so and that's a really difficult problem and I don't' know.



DR. LIVELY: Let me make sure I understood what you said. I thought you were saying that a form of being, like Hindu has persisted despite the religious orientation.

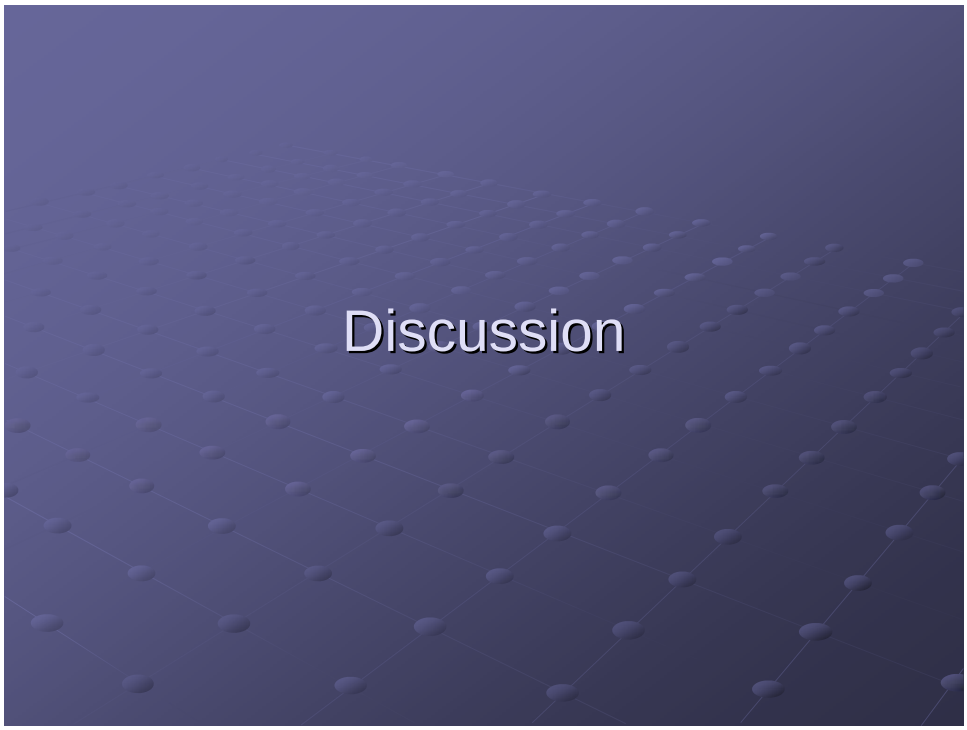
DR. HEIDER: Lots of sanscrit words in modern Indonesian. There are lots of designs, most of the cloth, most of the batik it can be traced right back to Gooder on the West Coast of India. To what extent the poetics of the Hindu philosophers on the Gange's of 150 – 100 years ago is still working. I don't know, I'm speculating.

DR. LIVELY: I think what you are saying that to the extent it is still there, it's covert.

DR. HEIDER: Very covert, yes.

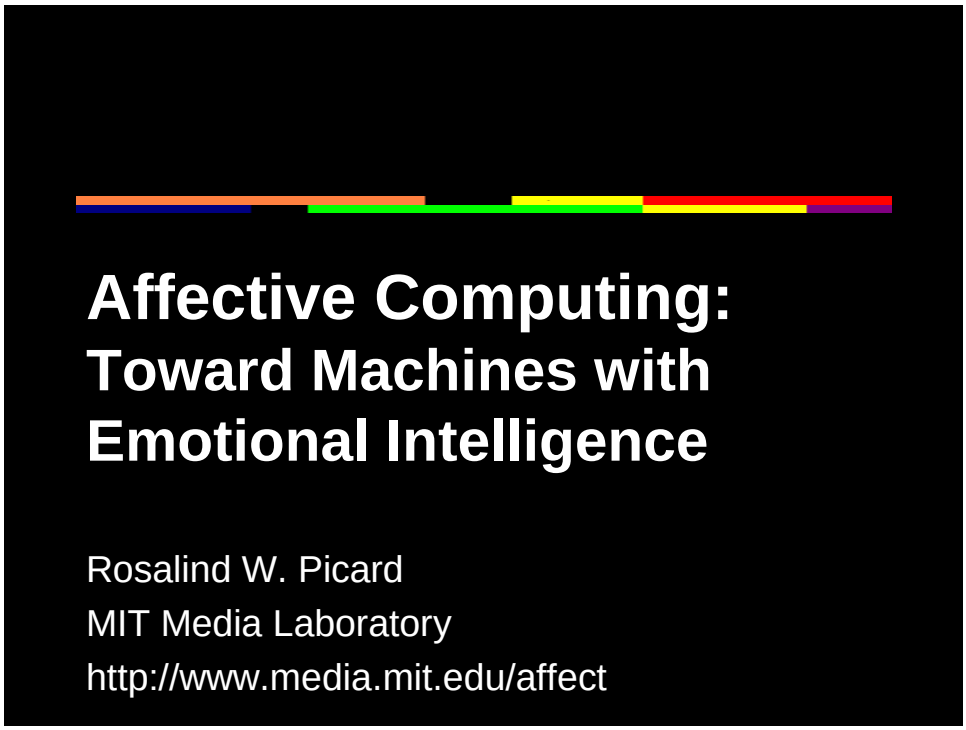
DR. ZEIDNER: This being one last question. I think you were talking about multiple intelligences rather than a multiple intelligence. Maybe we should be thinking about multiple intelligences, but do you really need multiple intelligence in respect to understanding emotional intelligence.

DR. HEIDER: Do you mean culturally different?



DR. ZEIDNER: Yeah, is the content basically different or the process different. In other words, perhaps we have the same emotionally intelligent processes across cultures, the ability to identify different emotions or understand or label them, to manage them so forth. But, in one culture you are able to label eight terms and in another culture 250 terms. In other words, the processes may be constant across culture, no?

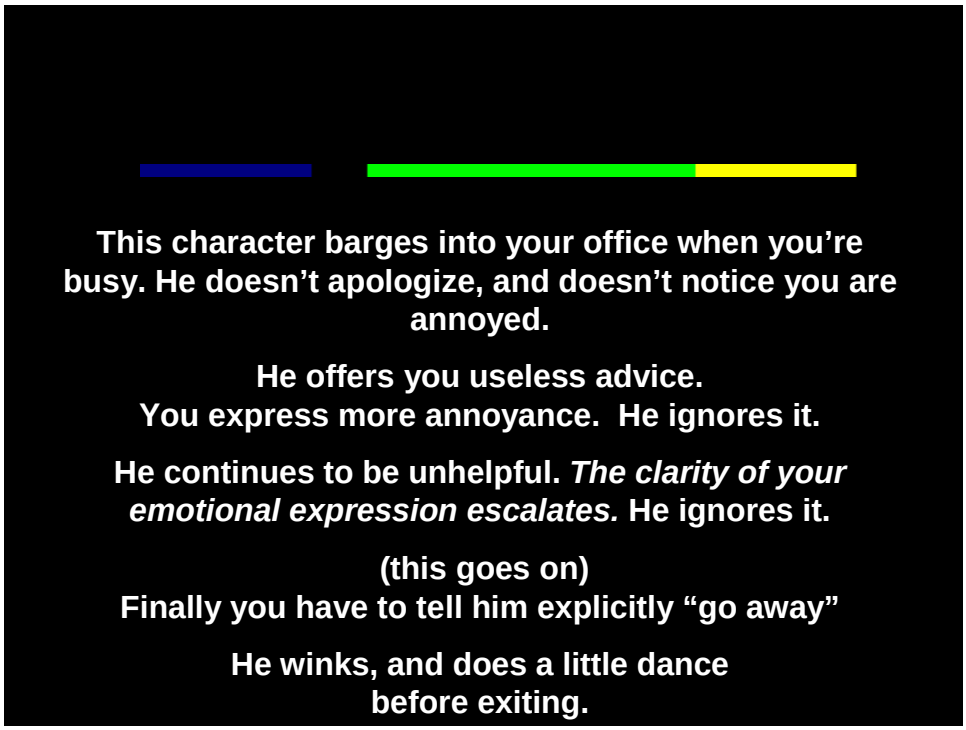
DR. HEIDER: Yeah, that's something for an anthropologist and psychologist to work together and go back to West Sumatra to work on.



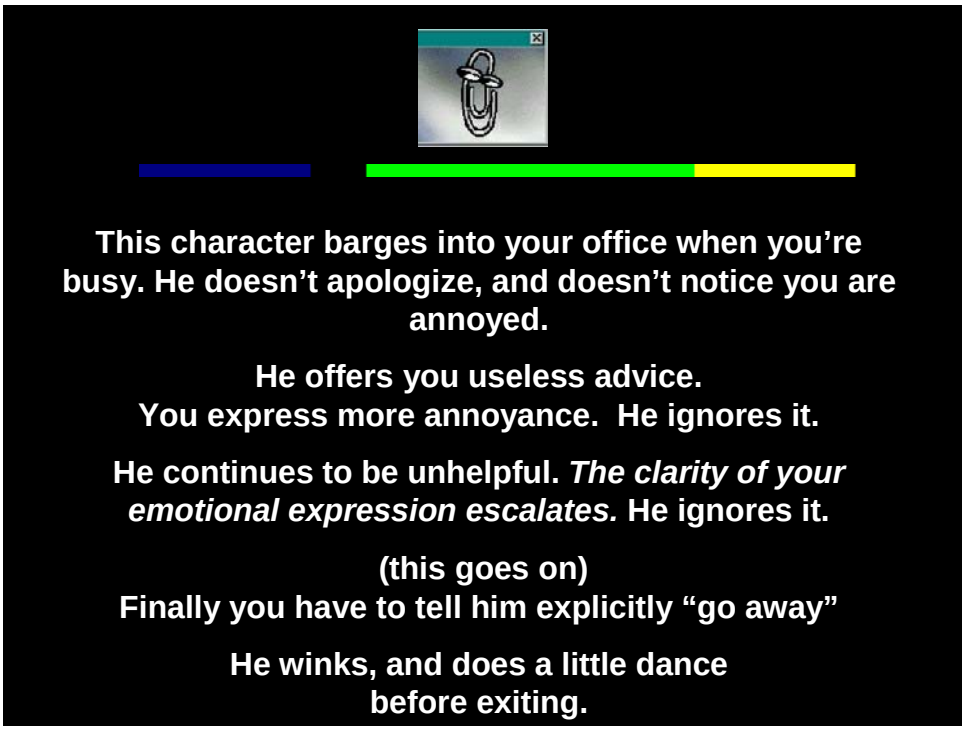
AFFECTIVE COMPUTING: TOWARD MACHINES WITH EMOTIONAL INTELLIGENCE

DR. ZEIDNER: Thank you very much. I must say that we are totally inundated with different kinds of intelligences, in fact the other day at the reception, somebody mentioned that aside from spiritual intelligence, we now have promotional, sexual, cultural, and a host of other intelligences. We will move over to another, better established form of intelligence, in particular artificial intelligence and address the question whether a computer will actually pass the turing test with respect to the ability to express and detect affect in human beings. We have a whole area, with one of the major representatives standing before us, Dr. Rosalind Picard from MIT, who will be talking about Emotional Intelligence and computers.

DR. PICARD: Thank you, it's a pleasure to be here. I have a lot to learn from all of you. I think I'm one of a couple of people here who are more on the computer science side of the fence, and I've drawn a lot from many of you in the audience so it's a real pleasure for me to get a chance to interact with you. I am going to be talking about several highlights of our work at the MIT Media Lab trying to give computers some of the skills of Emotional Intelligence. I'm actually not going to spend too long arguing why I think they should have that, but I'll give you a little story upfront that may help illustrate that point.



The story begins with you and some character that we'll say comes in at a time when you are incredibly busy. The character doesn't apologize and you express a little bit of annoyance but the character doesn't seem to notice. We'll go on. The character offers you advice: it's useless and you express more annoyance. The character continues to ignore it. In fact, it continues to go on, the character is still unhelpful and what happens, well you might have started off very subtle with an expression of negativity, but now *the clarity of your emotional expression escalates*. We'll leave it to your imagination how, but the character ignores it. Finally, you have to tell the character to explicitly go away. And fortunately he does, but first he winks and does a little dance before exiting. I don't know about you, but yeah some of you know my punch line. I would not want to invite *this* character back to my office.

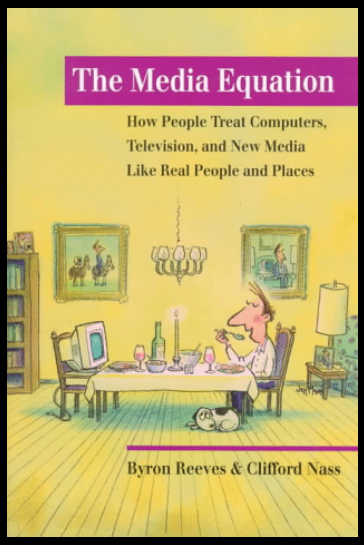


And yet this is the behavior that many of you have seen of what I would call the most successful animated agent out there. This agent *is* intelligent when it comes to things like knowing that you're writing a letter.

The designers of this, however, in trying to make things somewhat anthropomorphic, social, and so forth, missed the critical skills of Emotional Intelligence in their interaction. Although we don't really understand how to make them algorithmically yet, and I think we are really far from that, and some may question whether we ever can, I think there are a lot of things we could do differently that weren't done here. The point is underscored by a whole bunch of other studies: I'll mention one here, this book by Reeves and Nass at Stanford, who argued that the way that people interact with computers and many other forms of media, is inherently natural and social.

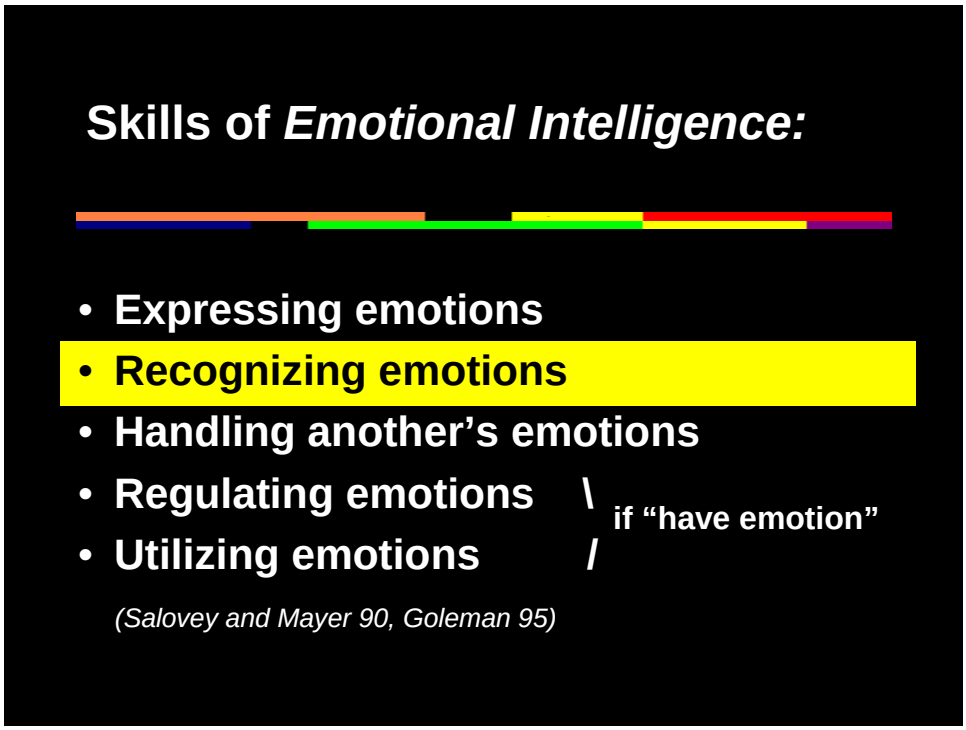
Theory:

Human - computer interaction is natural and social



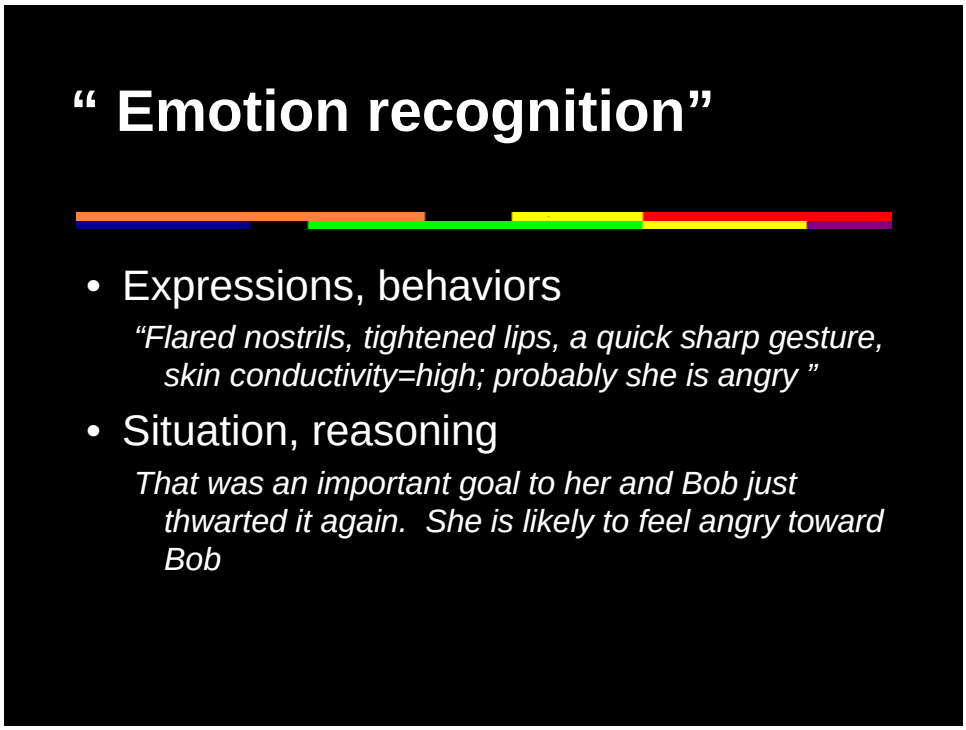
Now the book, “The Media Equation” tries to argue that it’s exactly equal, and I don’t accept that it’s exactly equal. However, I do think that the following exercise is a good one when you’re thinking about the design of technology and how we interact with it. The exercise is to take the situation of the human computer interaction and ask, “What would happen if you took out the computer and put in a human?” And that’s what I just did with that Microsoft paperclip episode if you’ll notice. I started off thinking of it as a human-human interaction; then it was very easy for you to see why it was ridiculous. But when they started off with a human-computer interaction, they weren’t thinking that way, even though actually they were aware of this Reeves and Nass work, and had Reeves and Nass consulting on that project. Somehow they still missed the subtlety and the importance of paying attention to those cues, that which we are calling the skills of Emotional Intelligence.

Theirs is also a set of findings that is predictive of a lot of things. For example, Reeves and Nass have predicted that if you have technology that talks to you, but doesn’t listen to you, then eventually that might not be so welcome either. Imagine putting this in your car. Well imagine putting it in as a person, if a person rides with you in the car and talks and talks and talks to you, but never listens to you, how would that make you feel? Well you can predict what the technology that imitates that behavior might also do in light of people’s feelings.



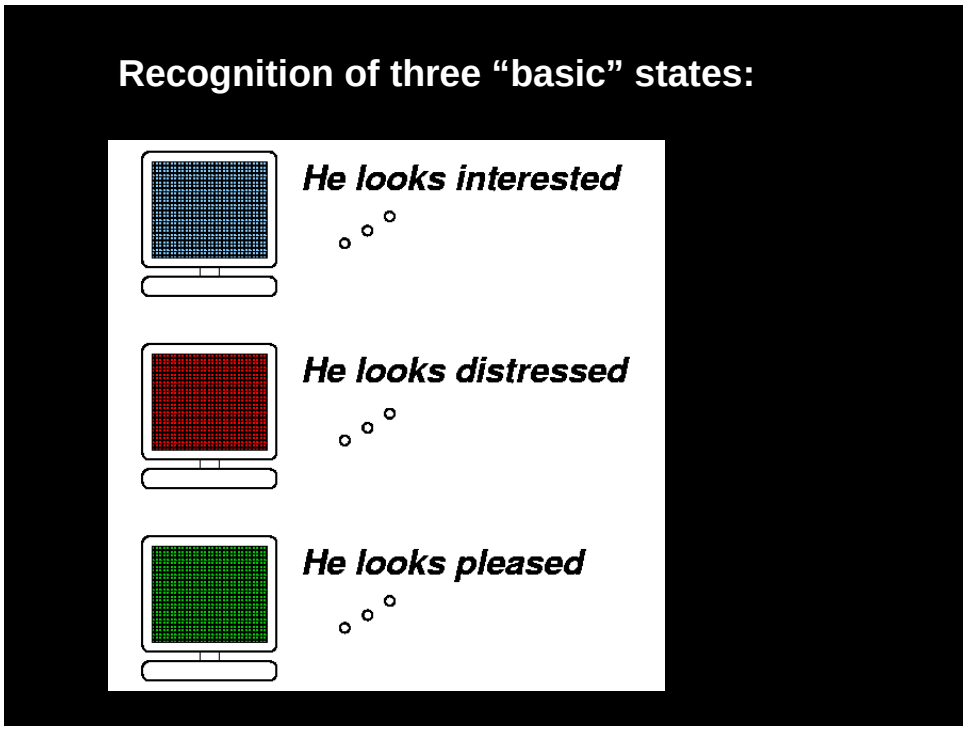
I've been thinking about several of these skills of Emotional Intelligence and how we might build them. By building things we hope to understand them better and also improve the interaction with technology so that it's more productive, more enjoyable, more engaging, and maybe it needs to be more vexing sometimes too. We don't have a preset notion like " make people happy." However,we do want to understand these phenomena better, and building them helps us do that.

In today's talk, I am going to give you some highlights primarily from work we are doing trying to recognize aspects of emotion that are indicated through expression and behavior. The shorthand term is *recognizing emotion*, but that should not be confused with somehow miraculously understanding the internal feeling. I'll also talk a little bit about *handling another's emotio*ns later on.

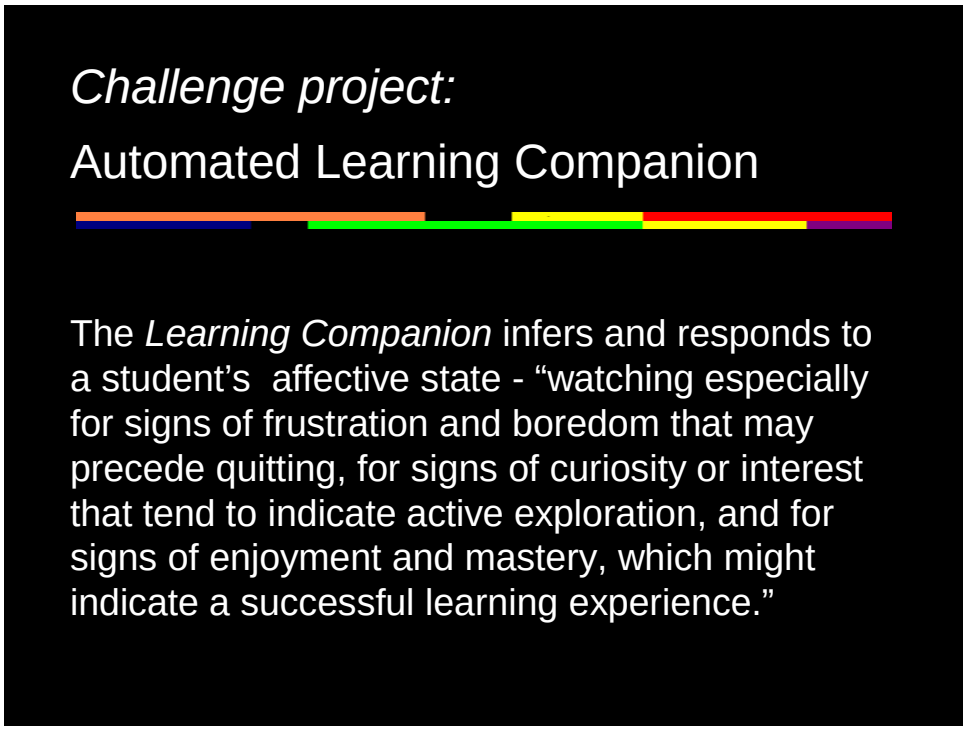


This term “emotion recognition”, we break down into two components. One is the direct sensing of the things we can pick up with cameras, microphones, whatever sensors people are comfortable with. And the other involves some, what you might call “classical AI reasoning.” Or these days, a bit more interesting than classical rule-based AI reasoning, are the “common sense reasoning” techniques that allow computers to also infer things from metaphor and analogy, sort of “reading between the lines” of what’s going on.

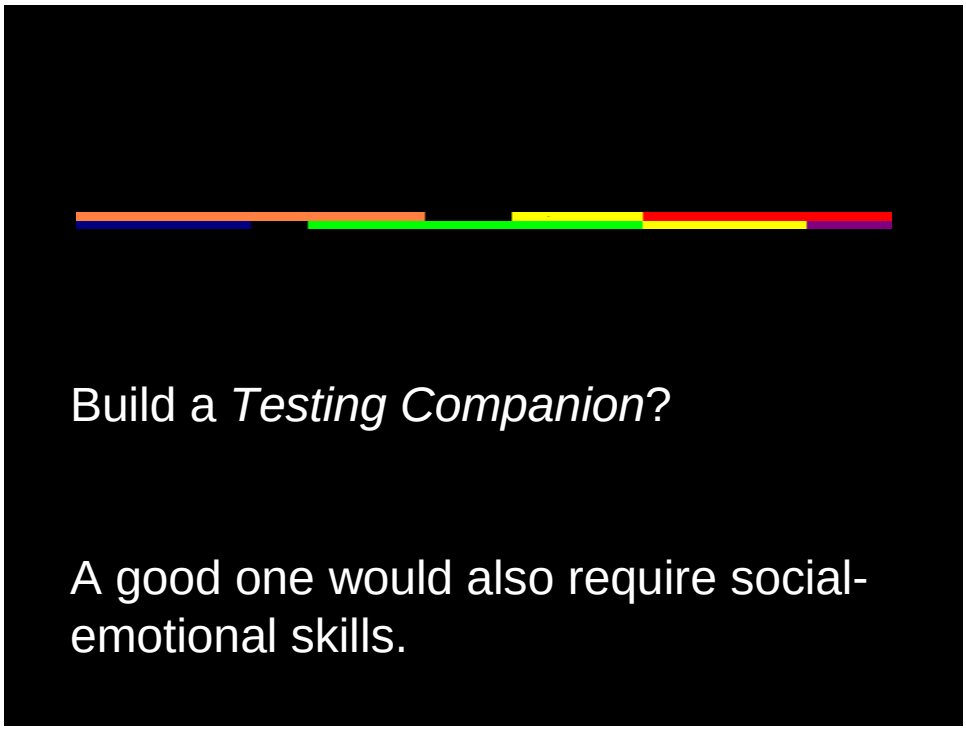
The idea is to combine these pieces of information, which could actually lead separately to different conclusions, and then try to make an inference based on both of those.



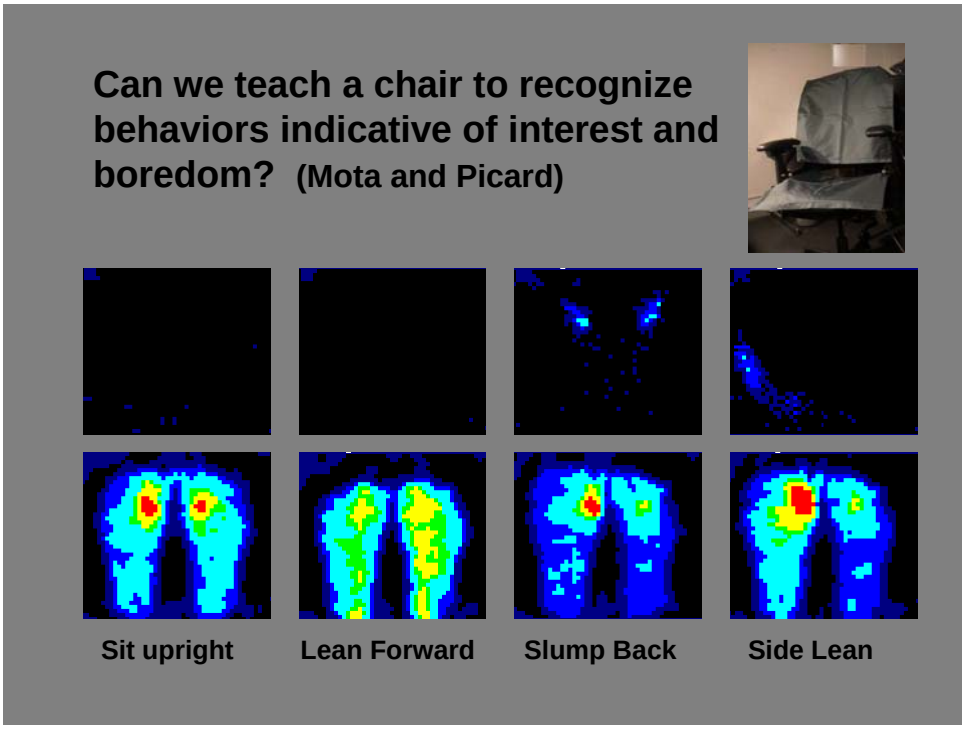
Now, I put the word “basic” in quotes because I know it’s loaded, but the three states I’ve put up here, interest, distress, and pleasure, are three argued by Michael Lewis to be present in all of us when we are born. And just as an exercise we’ve been thinking about what you could do if a computer could even just recognize these three states. I would argue that you could actually go a pretty long way into bootstrapping many of the other important things to recognize just by starting with these.



One of the motivations for recognizing emotion by machine is to build systems like the one described here, an automated learning companion. This is an NSF project in my lab where the companion would be not so much an intelligent tutor, but at the peer level of the student assisting the student by helping to monitor their affect, watching especially for states such as boredom or interest, and for signs of enjoyment. You might argue that just detecting if the student is interested is a prerequisite to the kind of pedagogy that would adapt to help keep the learning experience going. Being able to do things like determine the difference between a student who's making mistakes and being curious and enjoying the process, vs. the student who's making mistakes and is showing increasing signs of frustration like they are ready to quit, is really important to the human in terms of adjusting their response to the student. One student probably needs to be left alone – they're doing fine, it's great to make mistakes and explore, while another student, who is making mistakes and is ready to quit, probably needs some intervention.

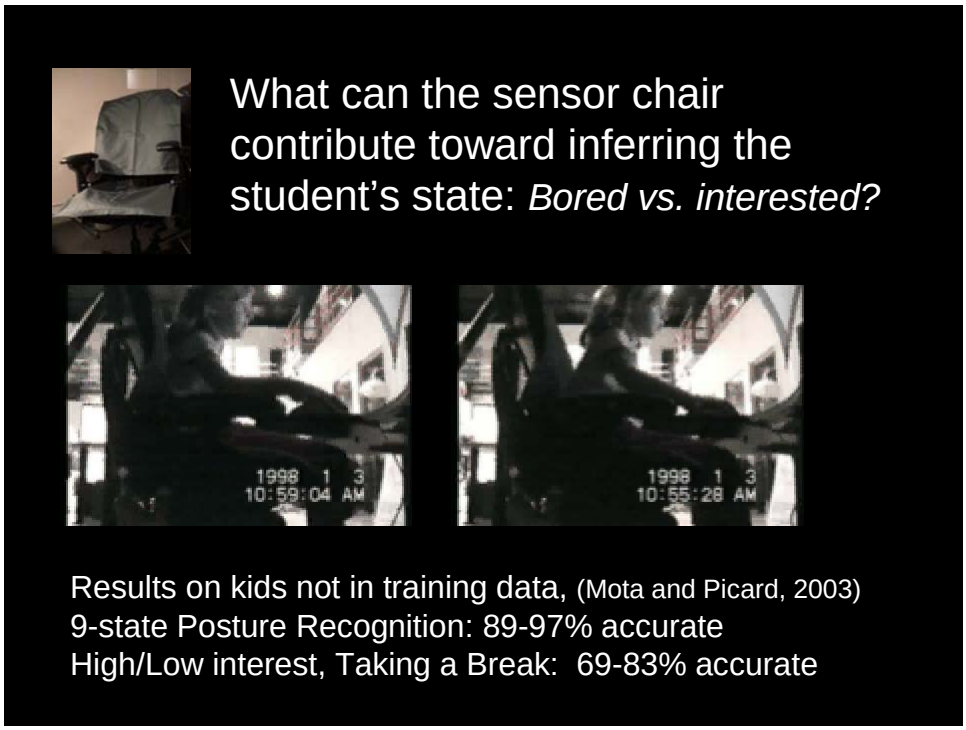


And being invited to come here too, I've had some fun thinking about building a "testing companion" for Emotional Intelligence. There's a lot of really exciting work thinking about games and interactive environments and where you can go with "sort of repeatable" computer interaction. And I would argue that this would also require the kinds of social emotional skills that I'll be showing some bits of shortly.



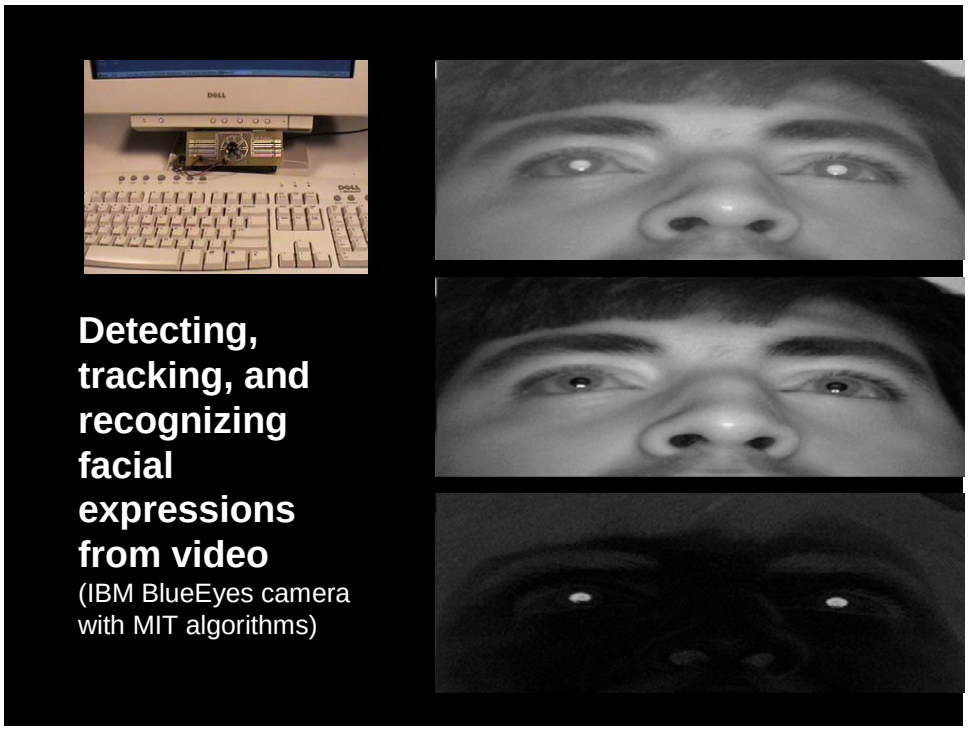
All right, let's dive in and look at some of the different sensors that we've been investigating and what we've learned from them. The first is looking at how children sit at the computer when they are engaged in tasks interacting with a learning program. Here the sensor is a 42 X 48 array of pressure sensors on the back of a chair and on the seat of a chair.

And these are some images from those sensors. I spoke at a brain conference recently and had to explain [pointing to the images at the bottom] "this is not your left and right hemisphere." So when sitting upright, there is no pressure on the back of the chair; when slumping back, you see pressure on the back and the color patterns here, there's a little more pressure to the back of the buttocks. When leaning forward, you see a little bit more toward the front of the knees. Leaning toward the right, [pointing] you can see how to read these. Now how you are sitting *statically*, I don't expect that tells us much about how you're feeling.

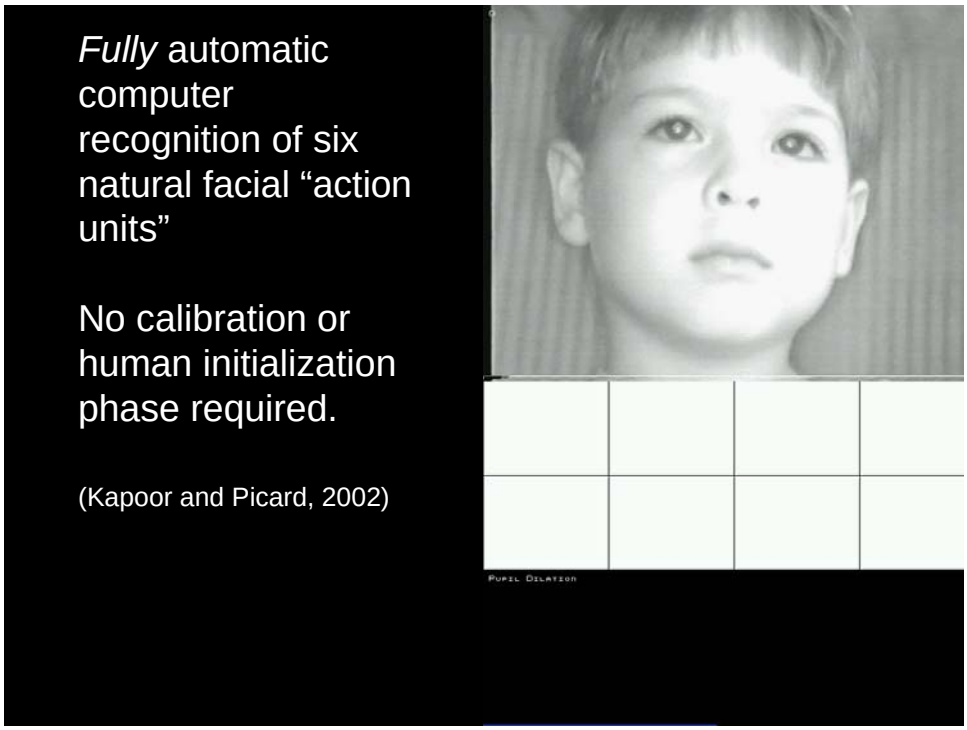


However, when we looked at the movement over time together with how people were sitting, and we asked teachers to code this data, and we went through an elaborate process trying to figure out what were states that could be reliably rated with high inter-coder reliability and so forth, then we did find significant high reliability when rating these states of "high interest," "low interest," and what we call the "taking a break" state, a kind of moving back and forth.

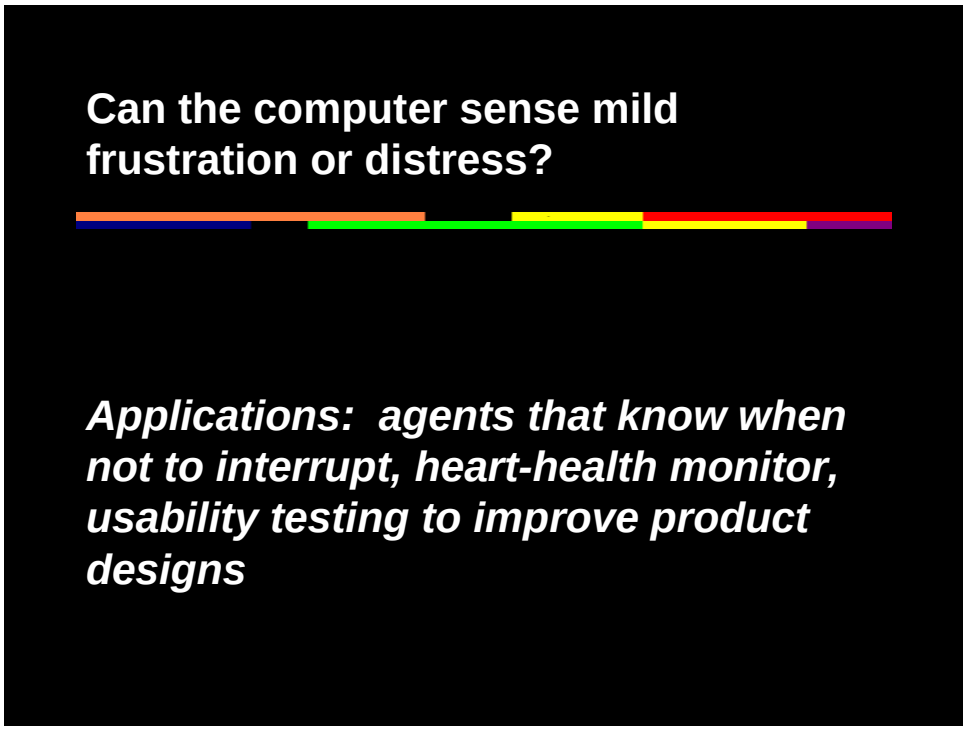
See the learner on the left – she's yawning, moving forward and back – Three out of three of the expert teachers rated her as bored. [Played two movies here.] On the right, three out of three labeled her as in a state of high interest. In both cases, her posture moves forward and back, so just detecting things like leaning forward doesn't tell you that she is interested. However, we found that when we built models that captured the dynamics of the pattern over time, that those models were highly predictive of the labels that the teachers gave her. And when those models were trained on six kids and tested on six other kids, they were 69 to 83% accurate in discriminating these three states. So, although that's nothing close to perfect recognition of an affective state from your posture, it does tell us that machines can extract some useful predictive information about affective state from the dynamics of movement over time, learned from one set of individuals and tested on another.



We've also recently begun some work trying to recognize facial expressions in real time from video, and here our sensor is not just the traditional video but it's Infrared sensitive video. This is the IBM blue eyes camera under the computer monitor. It has infrared sensors in a ring around the camera, "on axis," and has infrared sensors on the side, "off axis," and these diodes are blinking really fast, and you can't see them – it's infrared. And when the on axis ones light up, they light up your pupils, which are good infrared mirrors, and when the off axis ones are on, they light up your face. If you subtract these two images you get a pretty good pupil detector. These days it's also a pretty good facial body jewelry detector – detecting piercings all over the place, and we have all kinds of people walk into our lab, a real colorful student body. It will fire on earrings and braces; we've had girls stick their mouth up really close with braces. So we subsequently built some computer vision algorithms that also try to do some reasoning, not fully about faces, but just about the structure of eyes and movement around them relative to the other things on your face that light up.

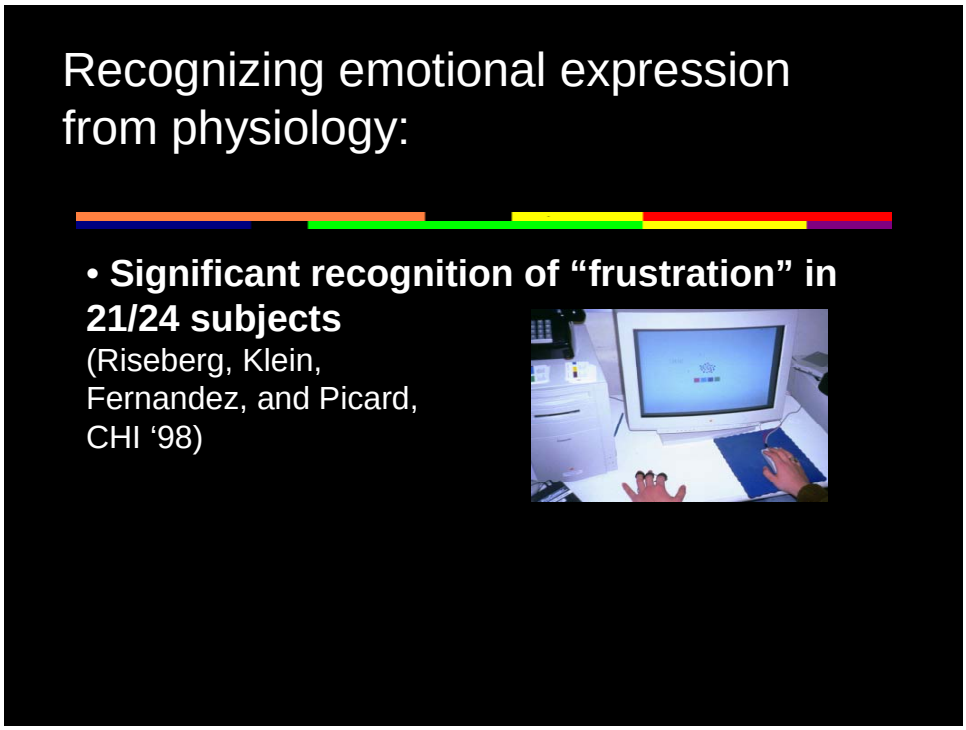


Here is a clip of a boy in one of our learning situations with the action units using Ekman's facial action unit coding system. We had one of his trained experts label the data and then had the computer try to recognize the action units and learn methods of doing this. [Played movie of boy's expressions changing.] Our system, although not as advanced as some of the other ones that are out there with respect to being comprehensive and covering lots of action units, because we've just gotten started, differs in that we have been focusing on recognition of people in real time without any initialization or calibration, so that kids can just plop down. If you come to our lab you can just plop down in front of our system and it will run on you without having to take your data off line and do special things to it. It is no where near as good as people yet, but we think eventually it would have the potential to be more accurate and reliable than human coders because the task can be kind of tedious and so forth and the computer doesn't get bored.



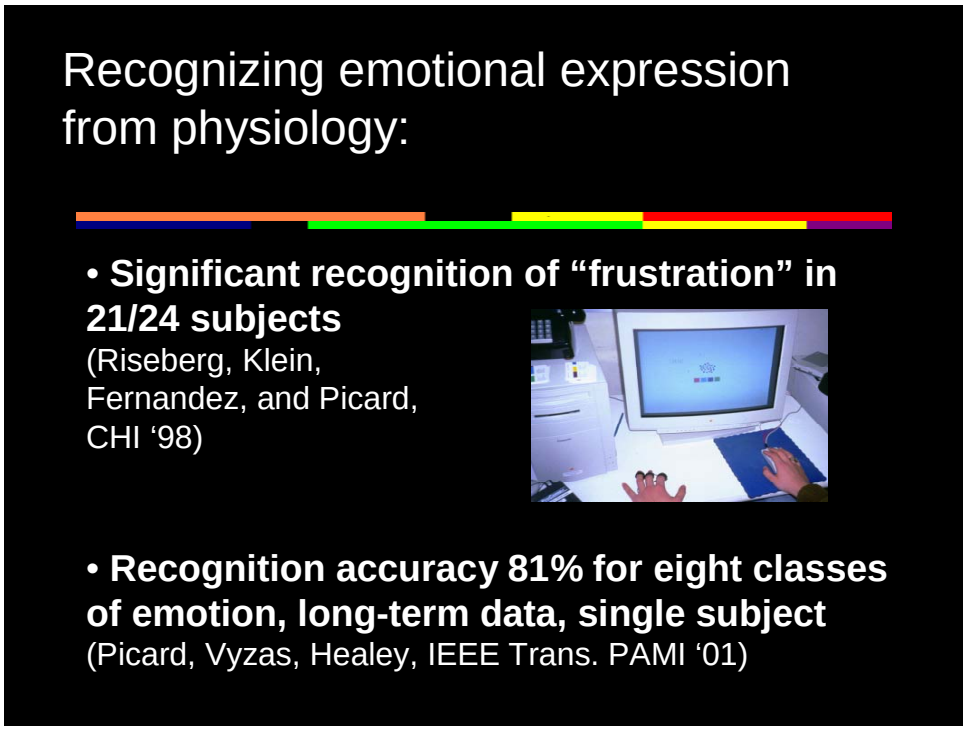
There are a whole lot of other states that we are interested in: I will just highlight a few others. We've been interested in sensing frustration, and very mild frustration at that, because we think it can help inform the design of many interactive systems and help us detect where there might be bugs in the interaction that may be so small that people didn't report them, but cumulatively maybe they contributed to a bad experience, so we would like to try to identify them, and get rid of them.

And we've been developing lots of different applications here from things that allow you to monitor your stress as you go about your daily activities for your own understanding of your health, as well as trying to inform agents to be smarter about when to interrupt, working with cell phone companies, and so forth.



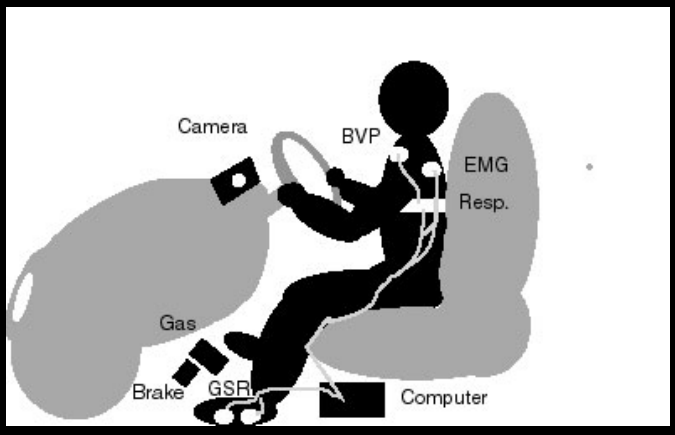
In fact our earliest work started off with measuring various physiological changes in the body. We've been doing a lot of work over the years with wearable systems, systems that are integrated with your clothing, your shoes, your jewelry, ... As you go about your daily activities, they go with you and have the opportunity to monitor you in a long term way. And here we've looked at things like skin conductance, blood volume pulse, respiration, ECG, electromyogram, temperature and so forth. Using various combinations of these we have done things like detect mildly frustrating events in computer use where people think they are playing a game, but things go wrong and it wrecks their score, which wrecks their chance of winning a prize, and other incentives. We measure physiological changes that are indicative of those events, versus events when all seems to be going well.

One of the hard problems in this work is, as you can imagine, we don't know what they are truly feeling and we don't know if we successfully elicited the emotion at the times that we think we have. In fact, frustration may arise in the middle of the experiment because they suddenly remembered they were supposed to be somewhere else, right, so we have no ultimate control over that. But, we still try our best to identify these events and look at lots of subjects to average out over those.



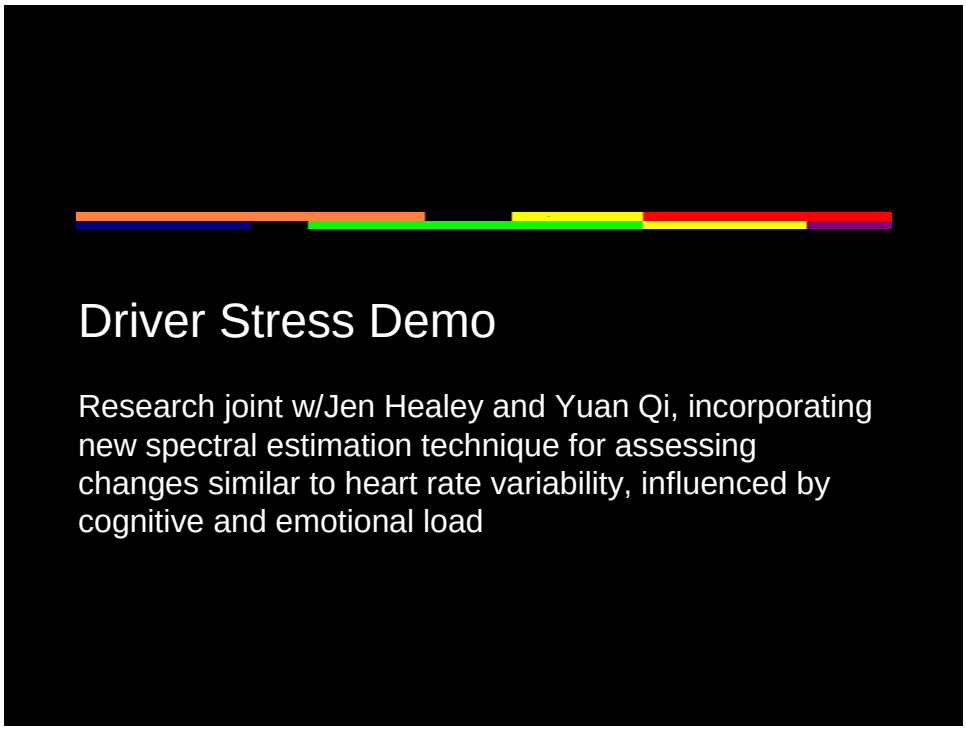
We have also taken an approach of looking at one person over a long period of time, which is very different and I think it's more interesting for many reasons. We think there are a lot of individual patterns; we've seen evidence of them ourselves. You guys know of them in the literature as well.

We have been trying to figure out how to build a wearable system that would characterize your states over long periods of time, and we've had some success with this looking at individual persons patterns over six weeks of data and 81% recognition of eight classes. Now, this does not mean that the computer can recognize your emotions with 81% accuracy: I want to underscore that. The work is more like may be comparable to speech recognition, when it first got started in the 50s, when an individual spoke the digits in a separated way into the computer: the digits "1" through "8," with spacing between them, and then the computer was asked "what did you speak, a seven or a three?" So we have a long way to go before we obtain the equivalent of continuous speaker-independent speech recognition. Nonetheless, our findings did show that there was significant discriminatory information in autonomic nervous system signals that went beyond just the arousal level: it was predictive of the valence as well. Those of you familiar with the old Schachter and Singer findings, and so forth, will know that that has been an interesting question.

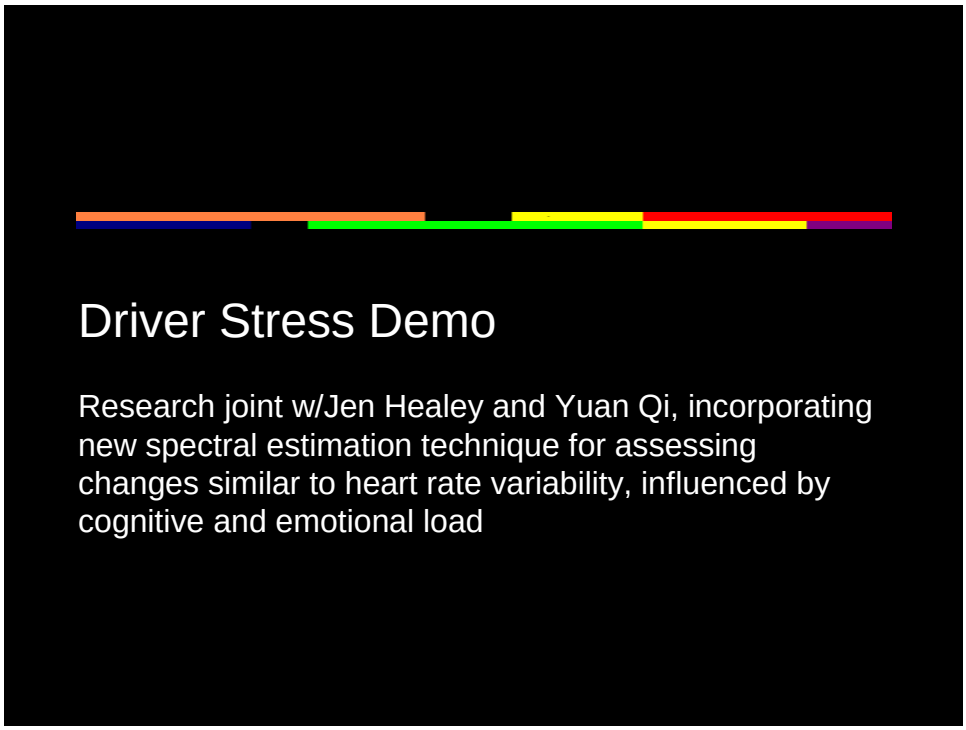


Simultaneously examine physiology and behavior for recognizing level of stress: up to 96% accurate, across 12 drivers.
(Healey and Picard, ICPR 2000)

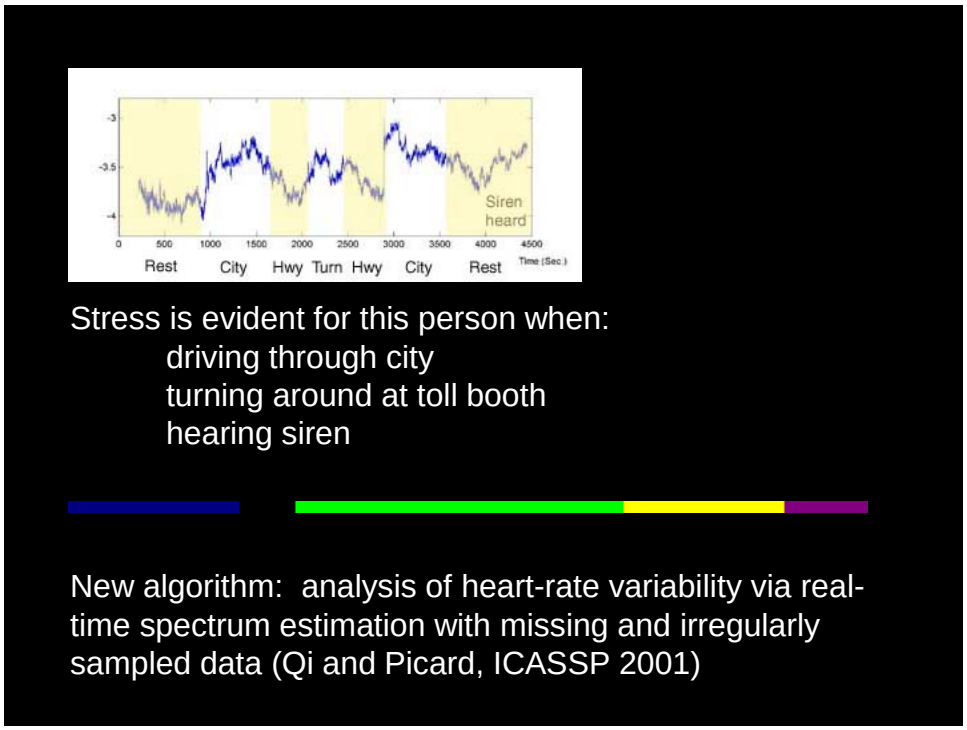
We have been trying to get out of the laboratory with our wearable systems and measure affect as it occurs in daily life. We live in Boston so it makes it very easy to get stress data: We just put people in a car and say drive from here to there and things happen. And we don't even have to do it when there's ice and snow, or put them under time pressure, like you're going to be fined, a dollar a minute if you're late, or whatever. So we gather data. We've built systems that record all kinds of things about you, your behavior and your physiology while you're driving around Boston.



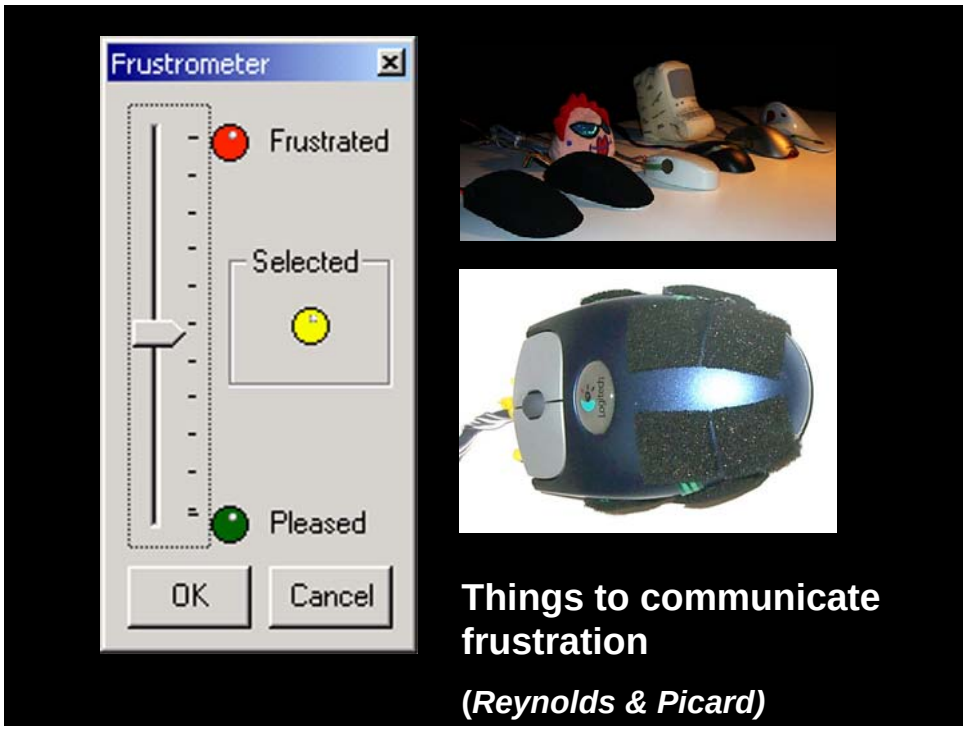
(This slide is a placeholder for movies of a driver under two different driving conditions, and a "live" bar graph showing a possible measure of stress.) Here's a subject who's driving through Central Square. Now stress is not a one-dimensional thing as you can imagine, you have to take this bar graph down here with a grain of salt. But this graph shows one of many proposed measures we've been looking at, which might be predictive of what would be a person's stress level in real time while they're going about daily activities. And here you can see the bar graph changing, maybe it's a little puzzling why when she stops, it gets a little higher. We of course don't know the true reason because we can't see what's going on inside her, but we code stress on lots of different things: the subject's self report, the count of the number of activities going on, the ratings subjects give to the complexity of various activities and so forth. We've looked at many different measures and found a very high correlation between a new measure that's very similar to heart rate variability, but a little different, and some skin conductivity features. These are highly predictive.



The measure you see here is the one related to the ECG, related to the heart rate variability. Look, it maxes out there when that guy runs out in front of her. We think that part of why it's so high when she is stopped here, is she is not stopped at a light that she knows on her commute, which might take 45 seconds where she knows she has time to make a call. But rather, she's being mindful of the one driving rule in Boston which is "don't leave empty space in front of your car." As soon as it opens up you have to be ready to go. Right here every time you get ready to go, somebody runs out in front of you. We'll just contrast that with driving on the Mass Pike at a time of day when there are no bad road conditions, no traffic and the level is noticeably lower. [showed other movie, with low bar graph activity.] We can look at her data over a whole range of conditions.



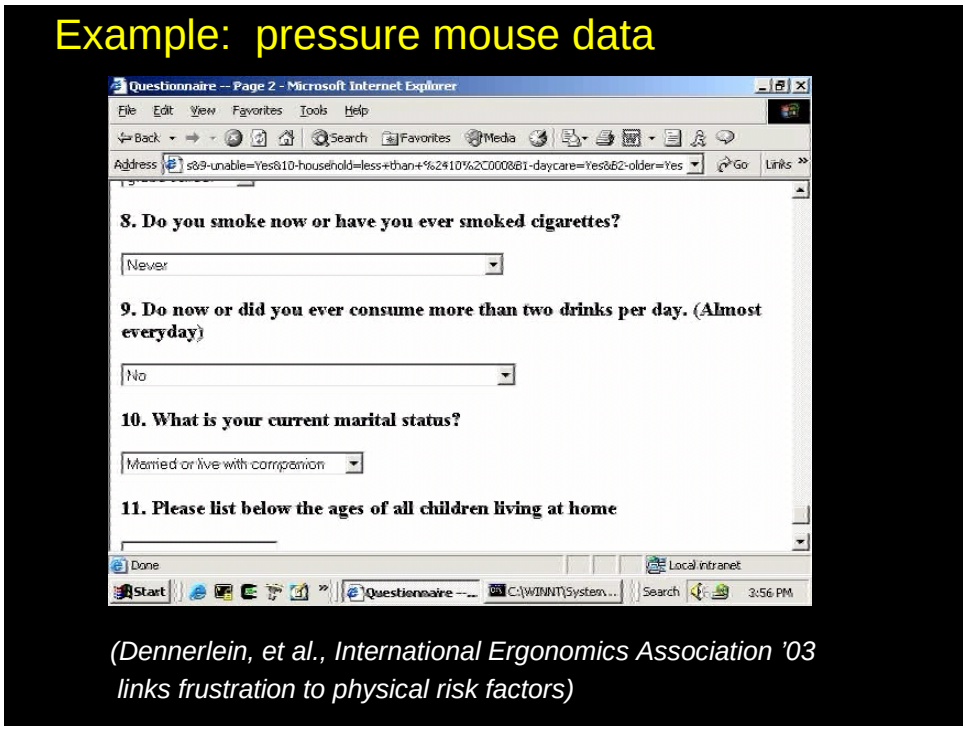
This is the data for the driver you just saw. The horizontal axis is time and the vertical axis is the height of the bar you just saw. In this left-most beige area, she is resting in the garage for 15 minutes to get a baseline. In this next segment, she is driving through Central Square in city driving, next she is going to the highway, gets on the highway, and we see this measure decrease consistent with her report that this was less stressful. This middle white region is where she encountered a toll booth, then we have reversal of the driving route: back on the highway, which is relatively restful, then back in the city with lots of pedestrians and crazy things, then back in the garage, resting. And most of our subjects continue to decline here showing what we would predict for relaxation. In this case, even though she's sitting there looking very relaxed with her eyes closed, we see the signal go up. We went back and played the video and that was the moment an ambulance siren became heard in the distance. It was really interesting, maybe that sound led to this measurable change in her heart, but we don't ultimately know.



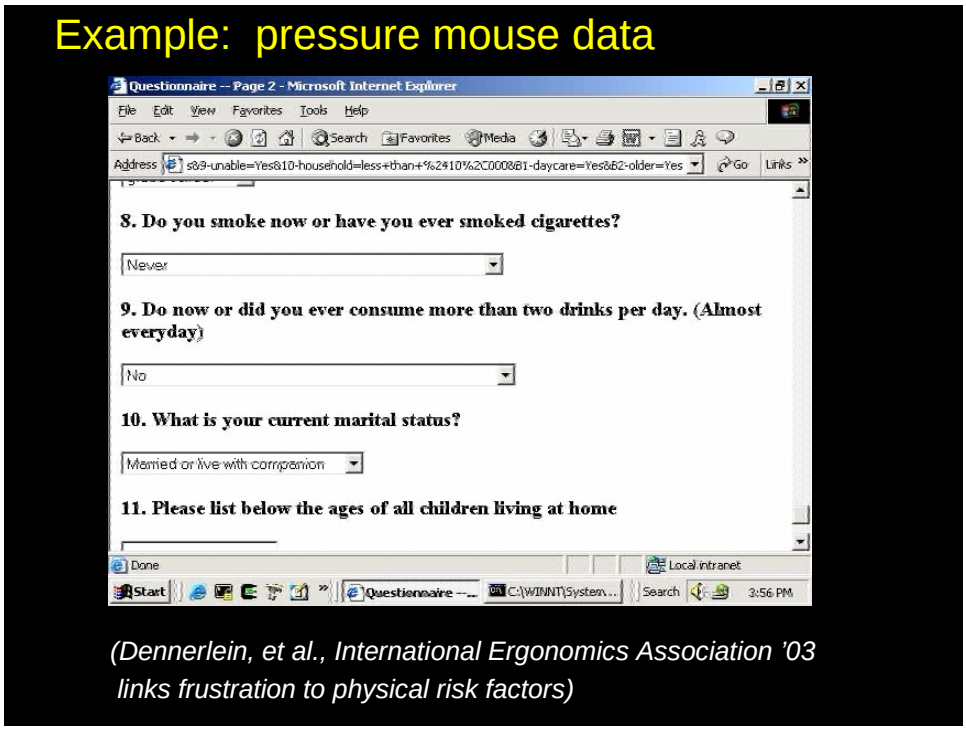
We have also been interested in recognition techniques that don't involve putting electrodes on your body. As you can imagine, it may be important to sense things in your ordinary office environment as well. We have built a number of different sensors and I'll just highlight one of them here.

First, let me mention something about GUI's like this (pointing to the one with the red "frustrated" button at the top). Bill Gates got a lot of attention when he opened his recent talk at the Computer-Human Interaction conference, saying "maybe what we most need to do, is to have a red button and a green button which you can press to indicate your frustration." What we found with things like this, is that people use them a lot in the beginning, but then they sort of forget about it, unless they get some reward for giving this feedback: They know these devices really aren't that useful, and why go out of your way to click on them? However, something like the mouse that doesn't know who you are, that doesn't make you feel like your privacy is being invaded in any way, but that senses how you handle it, is of interest to a lot of the users we've talked with.

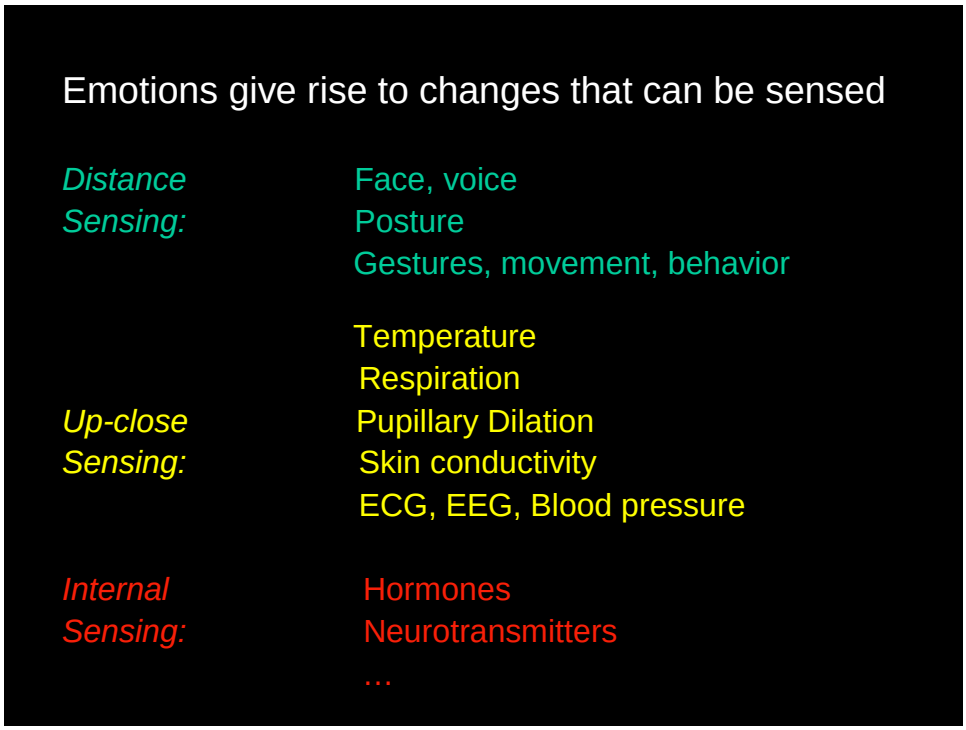
Here is a mouse that we've augmented with eight pressure pads. Actually, we went through a lot of iterations trying to come up with something that is reliable and seemed to get good information and this seems to be a pretty good design. What does this mouse do? It senses not only the usual mouse stuff, like where you click and what you click on and when you clicked on it, but it senses *how* you click. It senses if you're holding the mouse more tensely, or more relaxed. Does that tell us anything? Well, we didn't know, so we designed some studies that would mildly frustrate people to see if they handled the mouse a little differently when they got frustrated.



One of the studies, I'll tell you about here, was replicated in Jack Dennerlein's lab at the Harvard School of Public Health. It involved frustrating the subjects mildly while they were filling out the intake questionnaire about their health history. Then, of course, they began the real experiment and of course, we debrief everybody afterwards, tell them the truth, that we intentionally tried to frustrate them, and they have the right to withdraw their data if they want. So, they fill out this form and unbeknownst to them, we try to make it annoying to fill it out by using bad usability, although I would argue that you guys have all had to use things like this before with pull down menus and having to move over here to operate the questionnaire. So, what you will see in this little movie I'll play is you'll see the movement of the mouse but you will see something maybe you haven't seen before, which is not just how much mouse movement they had to do, but the thickness of the line is the sum of the pressure applied to the sensors on the mouse. So, watch how that thickness changes as they go through this mildly irritating questionnaire. And of course we upped the likelihood of getting a stronger affective response by asking about personal information here -- asking about how much they drink, … see all this extra mousing the person is having to do [audience could see the mouse trail, sort of thin and gray, having to move excessively over the page].

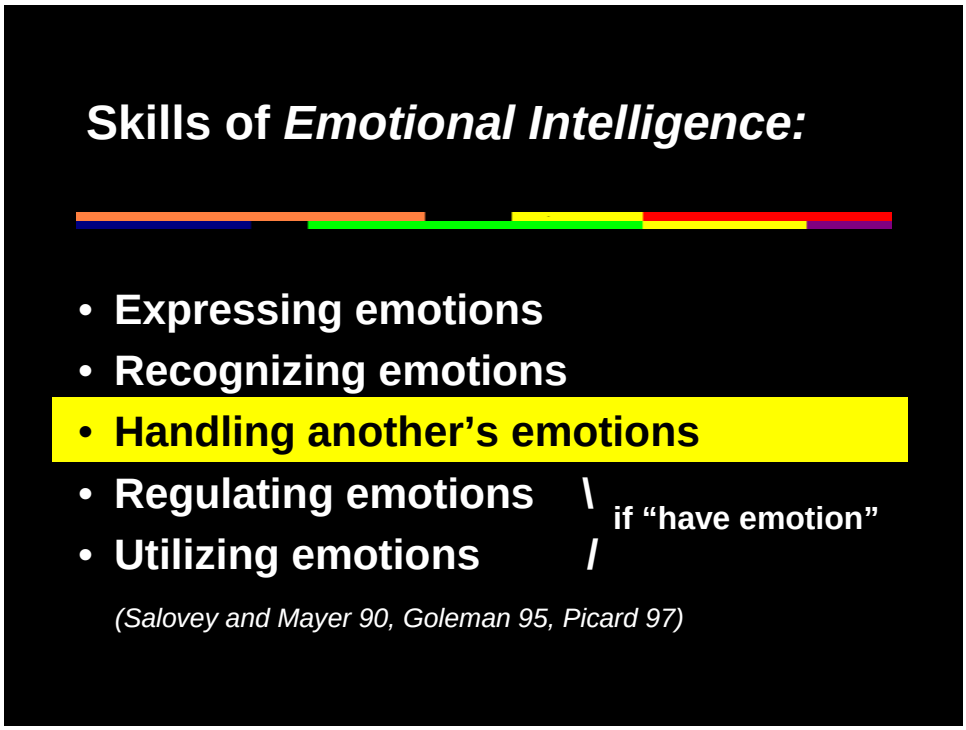


This says "list below all the ages of children living at home." [now audience sees user types three numbers, then an error box pop up, saying:] "Children's ages should be separated by commas, please re-enter information." [audience sees the mouse trail become thick and red.] Jack Dennerlein confirmed that not only did he get increased pressure when people found this experience more frustrating, but the specific increase in pressure was significant at exactly the point in the musculature that is also predictive of wrist injuries. So that was a very interesting health related finding.



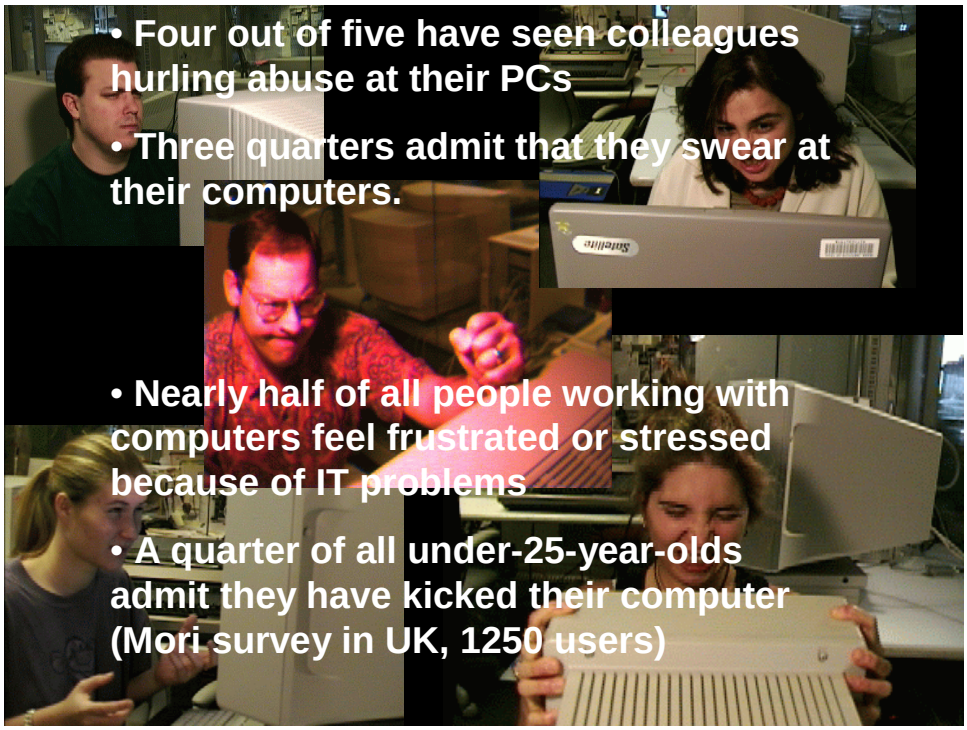
We've been involved in trying to build a variety of different mechanisms from sensing many modalities, such as facial changes. I haven't talked about voice but we have also obtained results trying to recognize affect and speech, an extremely hard area to work in – Klaus Scherer here [at the meeting] is one of the real pioneers in that area. We've also done work recognizing muscle movements and arm movements – gestures and other behaviors.

Basically, my understanding now is that when you are in an affective state, it's capable of modulating just about anything you do: The way you pick up your bottle of water can be modulated by your affect. Whatever it is you are comfortable with having technology sense, we can probably get some clue related to your affective state from that signal. So, we've been open to sensing all kinds of things and building the pattern recognition and signal processing that tries to make inferences from these different modalities.



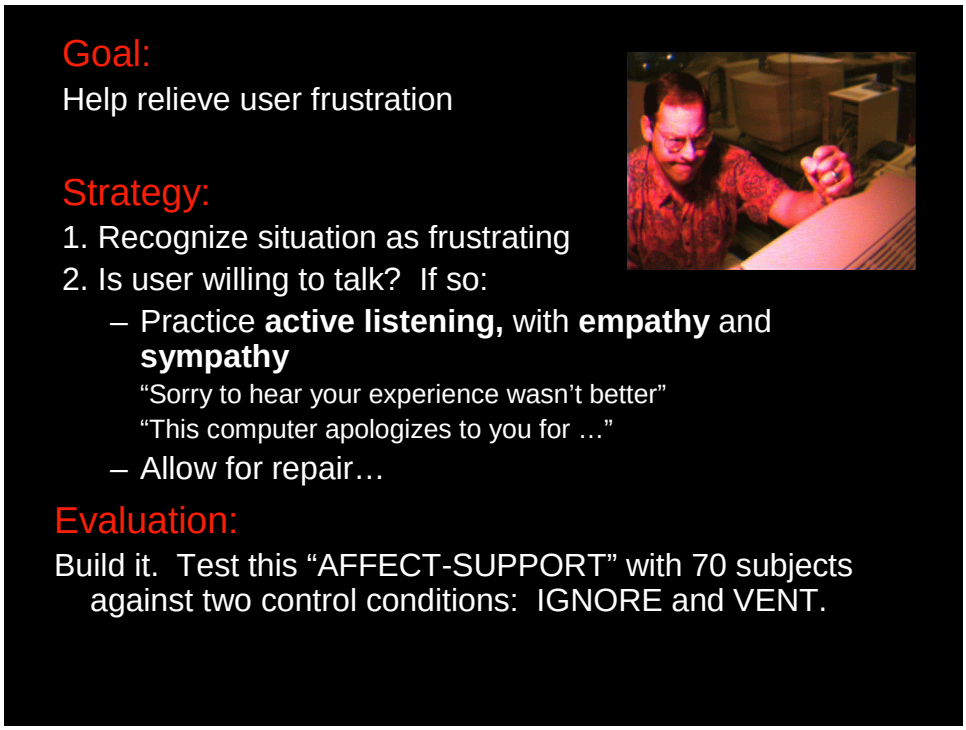
Emotion recognition is only part of the story. I'm completely glossing over building machines that *express emotions,* as it's probably the easiest part technically. You've seen lots of things out there expressing emotions – paper clip agents that smile at you, etc. Knowing *when* and *how* to express them is hard, but the actual portrayal of them is maybe one of the easier things on this list.

Handling the emotions, once you've recognized them, and mind you none of these systems recognize them perfectly, but once maybe it has a high probability of belief that it has observed frustration in its user then what should it do? Here we are going back to the thinking that Reeves and Nass and others like them have inspired, which is to think about what a good human would do in that situation, and see to what extent we can imitate that behavior with the machine. Not to try to make the machines more anthropomorphic, but because we are people using these machines and that's what we subtlety, in some ways, prefer.



So, first a couple of statistics about what an important problem this is and why we focused on frustration so much. I like these statistics from Mori, "4 out of 5.."; I like the wording of this first one: "…have *seen colleagues* hurling abuse at their PCs." "Three quarters admit to swearing at their computers…" Interestingly, this study was done by Mori in the U.K. and the Brits are unemotional, right? "Nearly half report frustration or stress related information, technology problems," and lest you think this problem is going away with the next young generation, "a quarter of the users under the age of 25 admitted to having kicked their computer." I didn't hear the results for the older folks, but I'm curious if actually frustration is escalating. We have brilliant students coming in at MIT and you might think that they wouldn't be frustrated by anything on the machine. And some of the best hackers that we have get more upset than anybody I've seen. And one of them, whom I'd never seen show any emotion about anything, told me that the reason he likes the head of our computer systems in the Media Lab is because when everything goes wrong, the head yells and curses and all, and that makes him feel better.

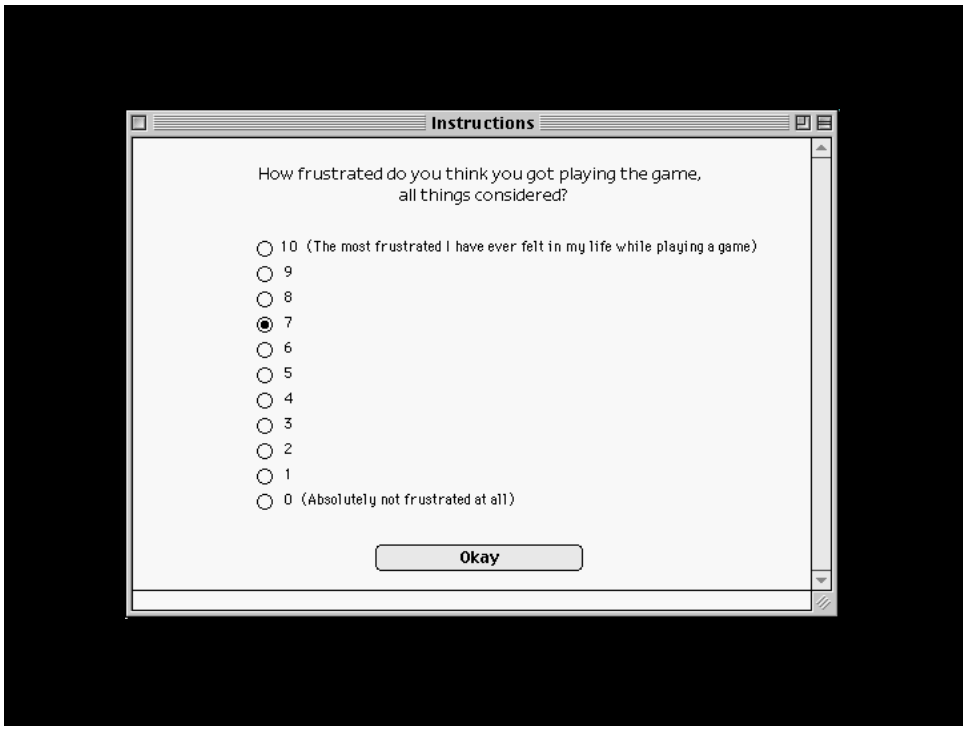
So this [image at center] is my former student Jonathan Klein who is now director of Interactive Toys at I. Robot. Jonathan had this interesting experience on an airline, as I'm sure you all have had too, where just about everything went wrong. And, to make a long story short, after going through all the channels, trying to get things fixed, he finally said, in his very pleasant way, (Jonathan is an absolute delight, it's hard to imagine him even losing his cool), he says to the customer service person, "I could build a *computer program* that handles people's feelings better than you."



So, we aren't obviously as good as people at this, yet, please don't get the wrong impression. But in very limited situations, the computer really can sometimes do what we wish we could do.

And that is, some of these techniques – adaptive listening, empathy and sympathy – that people have shown work very well in certain circumstances, can carry over to the machine. Actually I was very skeptical of this initially, but Jonathan built it, tested it with 70 people, and multiple control conditions, and showed me results that made me think differently.

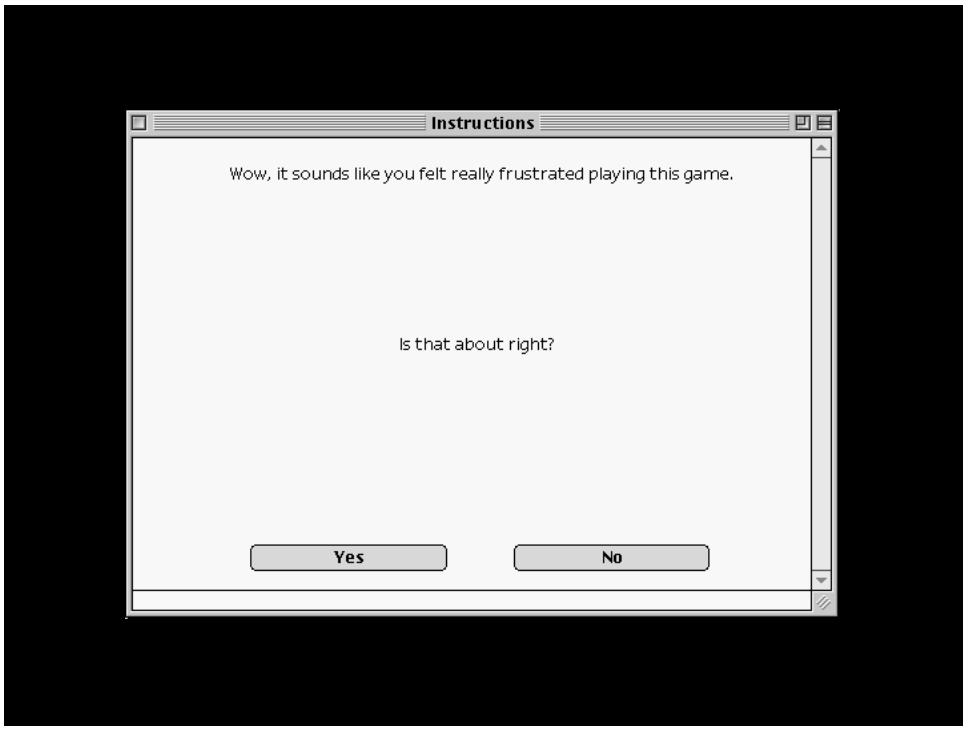
The basic idea was that we would frustrate a lot of people by having them come and test play this incredibly boring game and we weren't sure if they would all be motivated by money and a lot of these people came from Harvard and MIT so we said that the game was designed not to test your game playing ability, and that we'd found that it didn't make any difference how experienced you were at games, but in fact it was a test of your intelligence. We thought that might get them a little more invested. So while they are trying hard to get one of the top two scores on this game hopefully trying hard, we had things go wrong. Like the network appeared to flake out, (we had a fake network cable to make it look like a networked game even though it was under our complete control) and so forth. Their character would just get hung up and the time would lapse and their score would not go up.



And indeed we found, that we induced two different conditions, basically two separate experiments, a very low frustration condition and a very high frustration condition. In fact, we tried to make a no frustration condition, but we didn't seem to be capable of doing that.

Then everybody interacted with a not humanoid agent, just a simple text box, shown here. It was– very low tech, asking "how frustrated do you think you got, all things considered?" and the answers range from "absolutely not frustrated" to "the most I've ever felt in my life."

The person here really got frustrated and clicked "seven," and then they clicked "okay," and it would go to the next screen.



Then there was a little bit of appropriately worded empathy and sympathy and active listening response to whatever it was they clicked. It was different depending what number they assigned to their frustration.

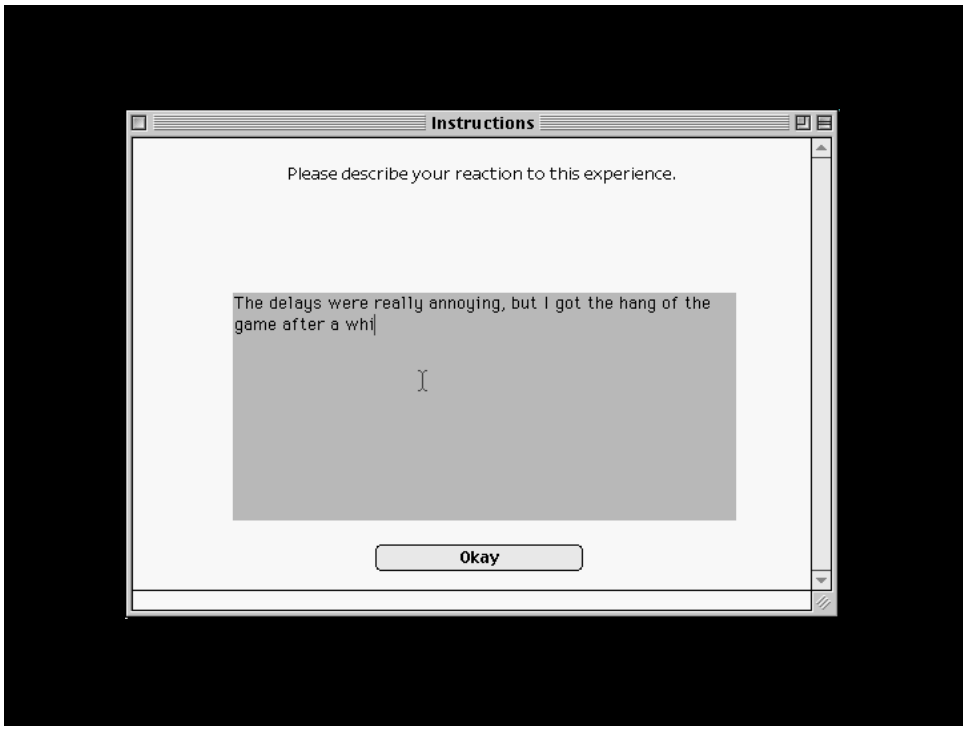
“Wow, sounds like you felt really frustrated playing this game is that about right?”

Had they clicked “no”, it would have tried to repair the communication by asking if it was actually a little worse or better, and trying again to reword an appropriate response.

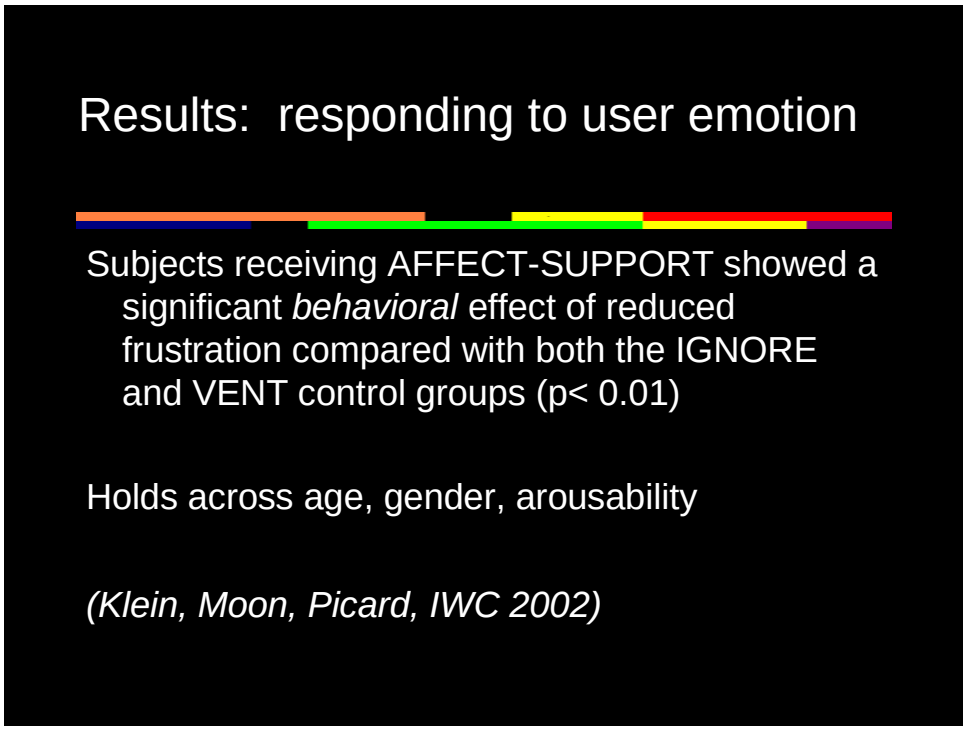
Here the person clicked “yes.”

Then the computer, because the person was so upset, said, “That must feel lousy. It’s no fun trying to play a simple game only to have the whole experience derailed by something out of your control.” And in this case the computer apologizes to you for its part in giving you a crummy experience.

It didn’t always apologize, but if they admitted to being really upset, it did. Now, I thought this would be ridiculous, but our subjects described a very interesting array of responses. This is all written up and I refer you to the paper for details or we can talk afterwards. But, the basic really strong effect we got, was a nice behavioral effect afterwards.

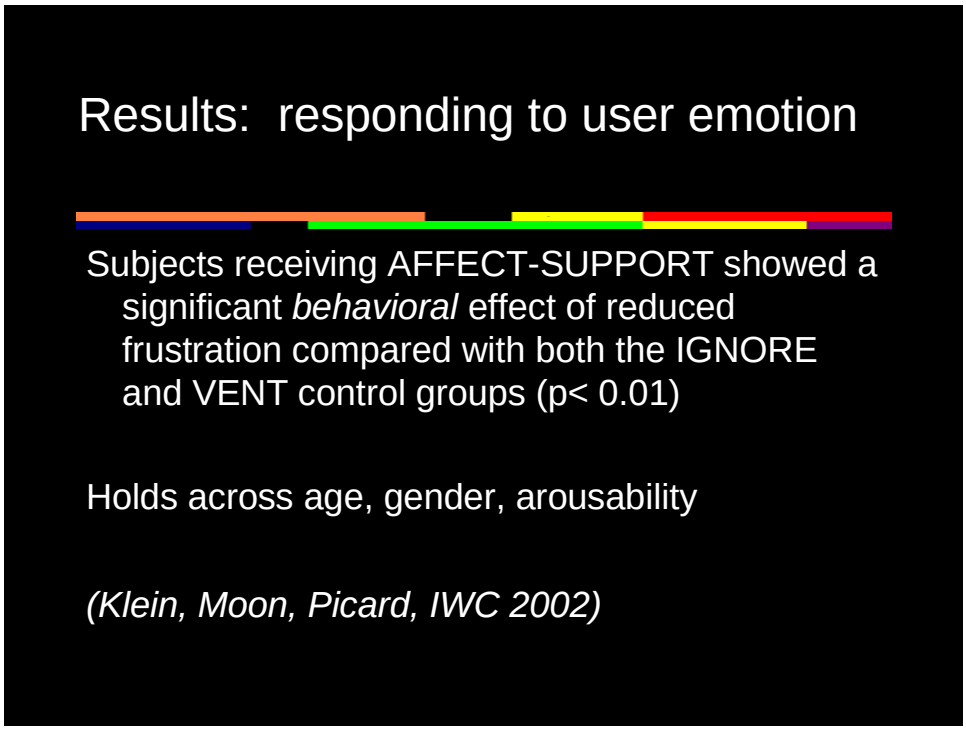


After both the test and control conditions, they also got to answer this open-ended question about their reaction to the experience.



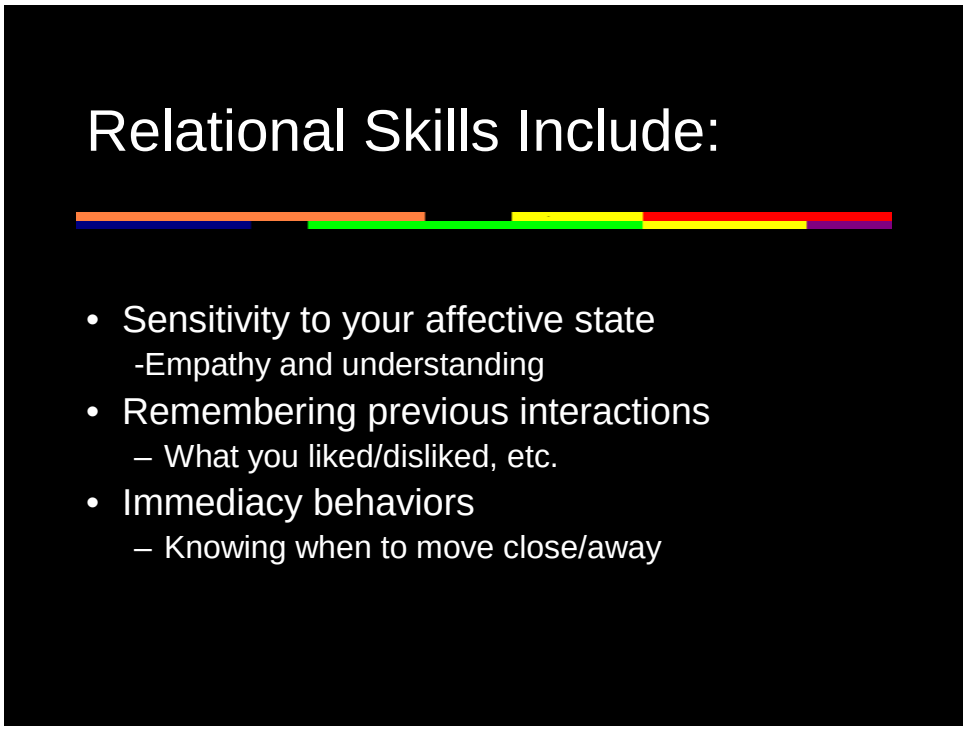
Then, we had them all go back and interact with the original incredibly boring game that was the source of their frustration, and we measured how long they were willing to spend with it, afterwards. You can predict that if somebody's frustration has been alleviated, perhaps by this technique, then they would be much more willing to spend more time with what had originally been the source of frustration, whereas, if they were still frustrated, then given the chance they would get out of there. So we required everybody to hang out for five minutes, then the quit button came one, and they could stay as long as they wanted after that. We got a significant effect with their willingness to hang out. Age, gender, arousability, and game playing experience made no significant difference, but the behavior suggesting reduced frustration was extremely significant.

In short, it looks like the best explanation for this behavioral effect, was that not only could the computer successfully induce frustration, which we knew, but by taking these human skills of handling emotion over to the computer domain, it could also help the person to alleviate their frustration.

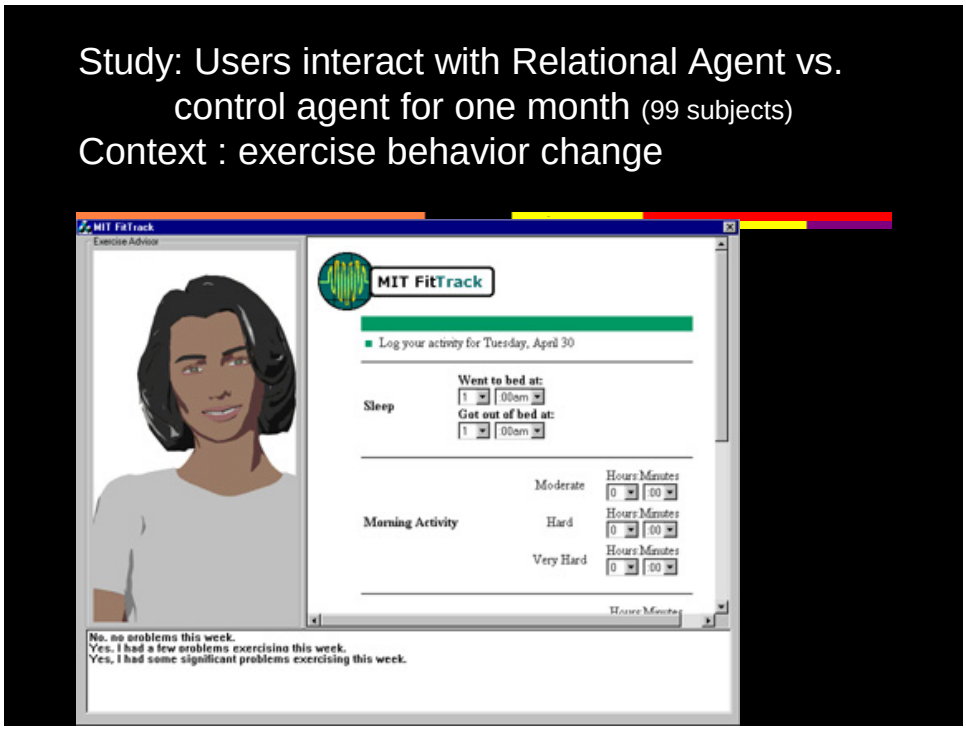


That suggests that we could do a lot more with helping people handle their emotions and we've been extremely interested in how you would do this with *long-term* human computer interaction. Not just these one time short experiment things where empathy might work the first time, but it's not going to *keep* working. You know, saying you're sorry maybe doesn't work the second time, the third and so forth. You need to see a lot more variation and responsiveness than that.

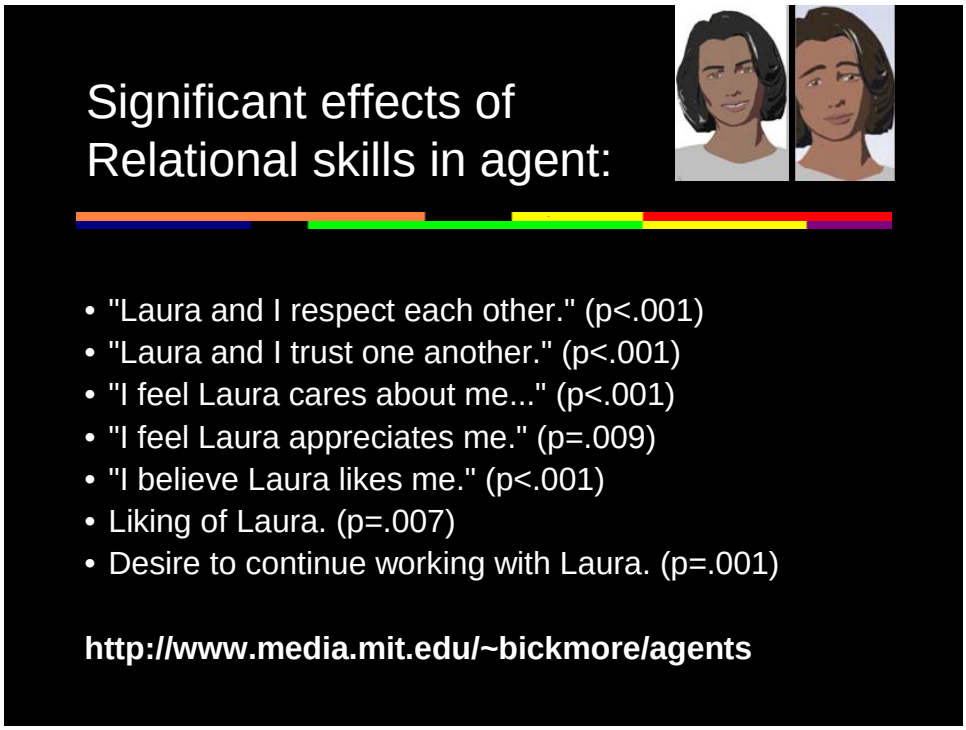
So Tim Bickmore, who just completed his doctorate in my group, has built an agent that interacted with people for a month: they were supposed to log in every day, or at least every other day.



Its goal was to help them monitor exercise behavior, help get them walking 30 minutes a day. Key to our hypothesis was what would happen if it included these *relational skills*, among others: signs of empathy and its own kind of an artificial understanding. It doesn't really understand your feelings, but it kind of looks like it does. It remembers what you talked about, what you said you liked and disliked, and it does things, like moving a little closer to you and displaying a sort of cartoon concerned expression when you say you're really having a bad day and so forth.



Here's a picture of the particular agent that was used. This experiment also had three conditions: There was a "no agent" condition, just looking at effect on behavioral exercise change. There was a "non-relational agent "condition where she did not have the relational skills. And, there was a "relational agent" condition where the character had the relational skills. We found that subjects in all three conditions significantly improved their exercise, and there are a lot of other interesting nuances there. But one of the most important things, I think, for this audience, is that the difference between the anthromorphic agent when she had no relational skills and the anthromorphic agent when she had some relational skills, was highly significant. There were many strong effects that differed between the relational and non-relational conditions.

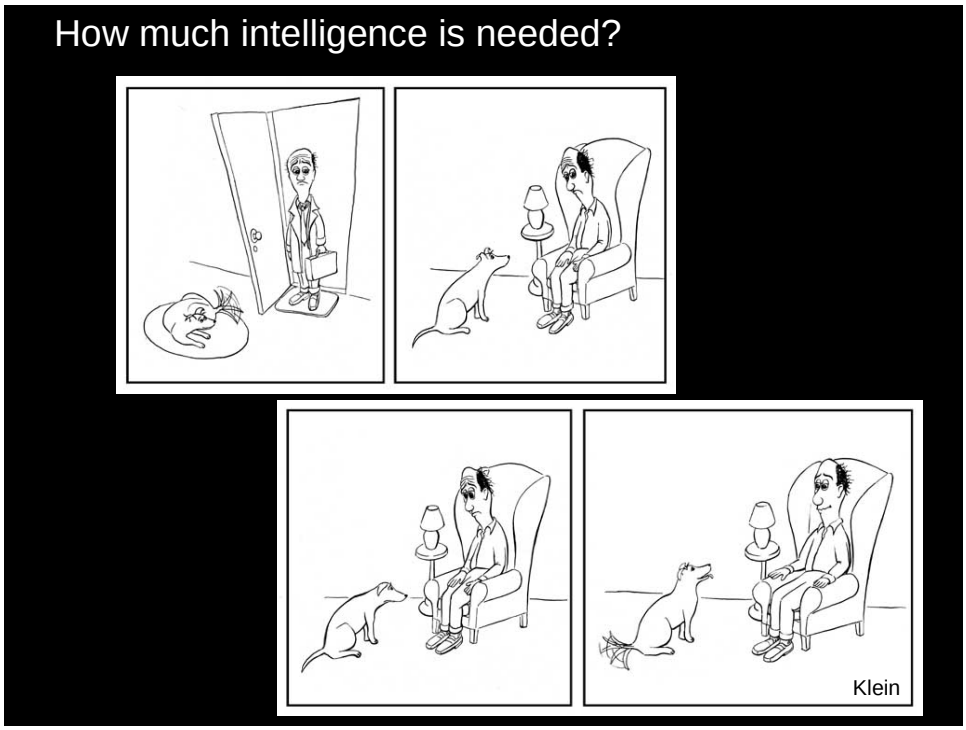


I picked out these results to show you because they are of particular interest to people developing online relationships these days for customer service and usability and whole bunch of other things:

People thought that there was more mutual respect when she had the relational skills. There was more trust, when she had the relational skills.

This one kind of bothered me a little bit: they felt that the character cared more about them. I've been thinking a lot about the science of learning and pedagogy lately, and one of the strongest predictors of learning success is the belief that your teacher or some other person in your life really cares about your learning. Also, one of the big visions that the Computing Research Association has proposed lately is a "teacher for every learner." This would be a kind of a computer companion, teacher, or mentor – it can have many different forms – that would be there for everybody, adapting to you. I think it's actually possible to create such automated teachers that would give the feeling of being cared about, even over a long period of time. It's definitely questionable philosophically and ethically. One might ask if it makes a big difference in learning, and even then, do we want to do that?

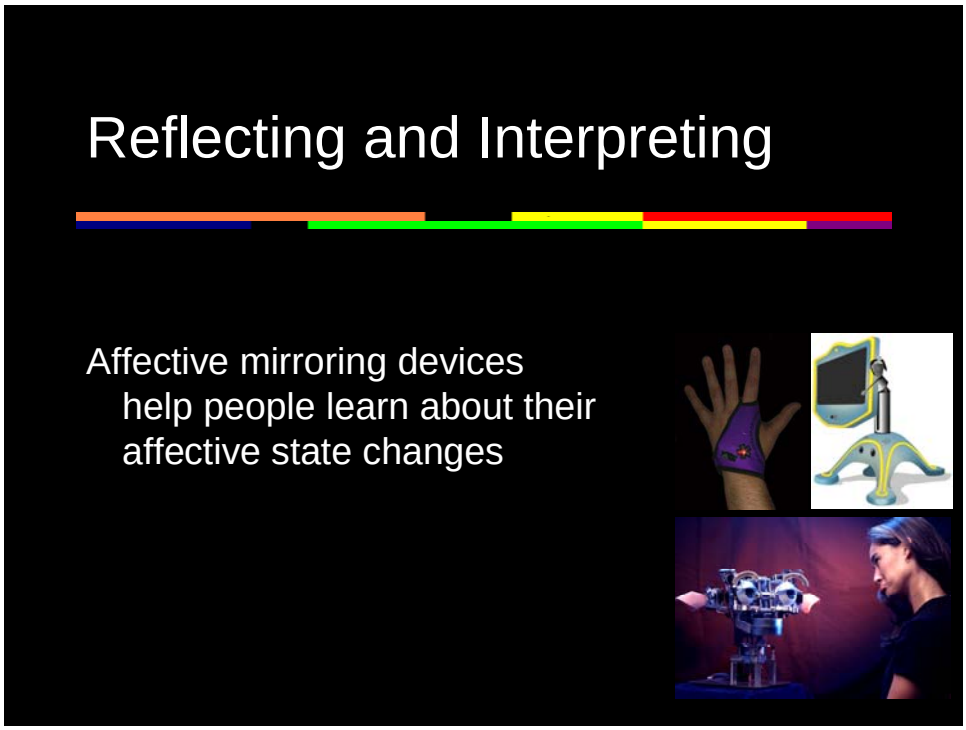
In the one month study we did, people felt appreciated. They believed she liked them. They liked her more. And, they actually significantly desired to continue working with her more. The differences were highly significant for the relational vs. non-relational conditions. The groups also differed strongly in another behavioral measure, choosing to tell the relational agent an emotional farewell message, vs. just telling it "bye," when it was time to log out at the end of the month.



How much intelligence is needed? You know, A.I. is still a holy grail, we don't have really intelligent machines yet, and we continue to look for more understanding of intelligence. I like this cartoon that my student, Jonathan Klein made. Man's best friend here greets you with a happy tail, "thump thump thump" when you come home even when the owner looks like he's had a pretty bad day. And then what happens? Well, the owner looks miserable, and the dog looks at the owner and then the dog reflects some of that negative state. Now, we don't know how dogs recognize our emotional state. I haven't been able to talk anybody into doing these experiments yet: where you blind the dog, or close his ears or block the smell. We don't know how the dog recognizes it, in fact we don't even really know if the dog is recognizing it – maybe he's just learned that this behavior gets him fed, and there's some imitation thing going.

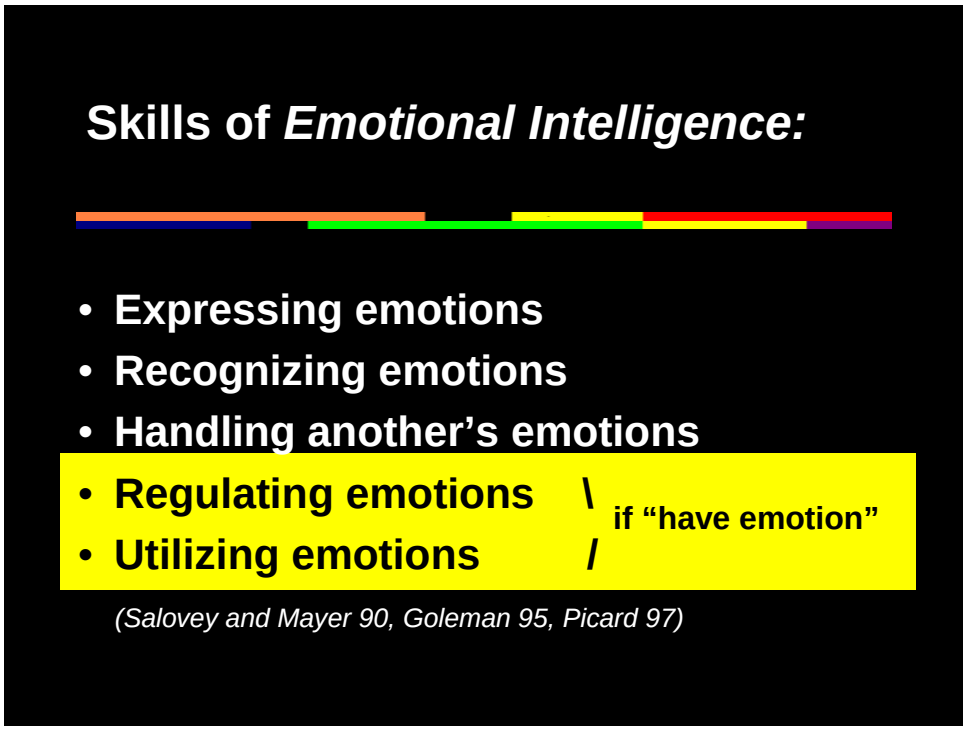
But, what happens is after you are in this negative state and you see the dog reflect this, you tend to feel better and the master looks happy and now the dog is happy again, "thump, thump, thump." Now of course, all of that happens much faster than it takes me time to explain it here. Is this real intelligence or not? Well, I would argue that it's effective in helping the person address their negative feelings and so. Buried in this interaction, is some kind of emotional communication and some kind of what I would call "dog emotional intelligence" because the way the dog responds has observable benefits on its master.

Can we get computers to do something like this? I think we can get computers to do *something* like this. Whether or not it means they really understand what's going on, I don't think we're really anywhere near that yet. But I think we could get some strong effects, even without true understanding.

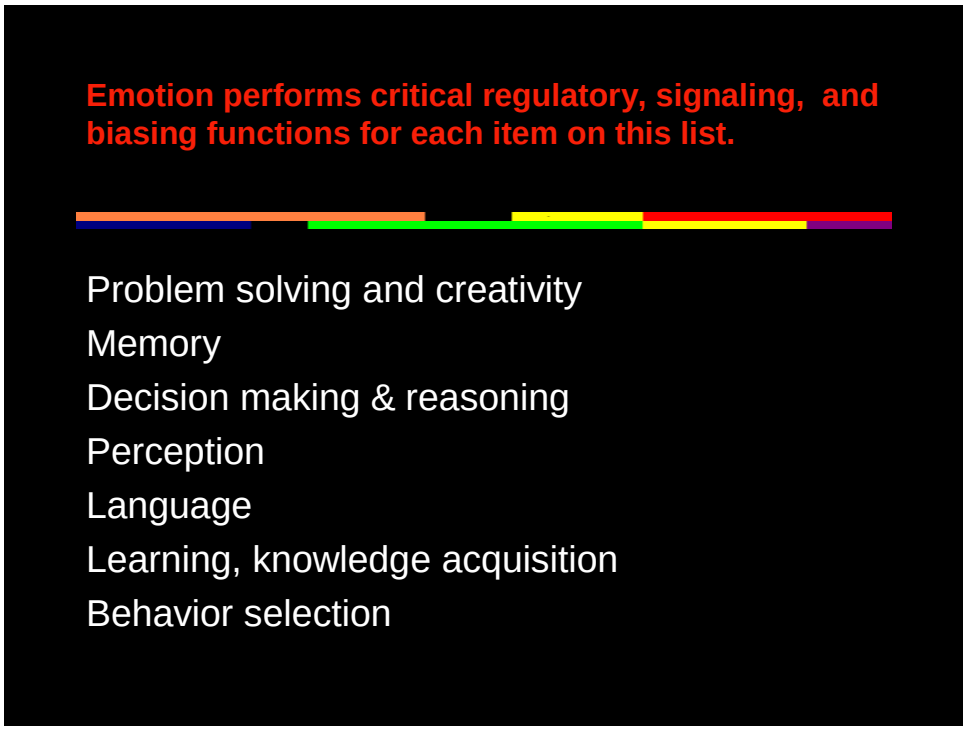


We've been building things to try to help people develop their skills of emotional awareness, devices like the dog that might mirror or reflect your state. In some cases they're animated characters, in some cases they're animated robots: this is Cynthia Breazeal's work with Kismet. Some cases they're simple wearable devices, I'm kicking myself that I forgot to bring my galvactivator (pointing to image of purple glove.) I stopped traveling with this for a while, because I kept getting held up in airport security with my wearable things – they were stealing my screwdrivers and everything and I would try to tell them, "look it could function as a lie detector" and I would glow and I would tell them this. What happens with this particular device is it measures the skin conductivity across the palm and just maps that to the brightness of this LED. We've had kids tell these amazing stories when they're in the classroom, and their teacher's talking and they are going dim, but when they are asked to write about something of interest to them, or construct an experiment, they glow blindingly and when they get angry at their mother, and they start glowing, and she asks, "why are you glowing?", and instead of having their usual slam-the-door fight they wind up having an interesting conversation. There are these wonderful stories about how things change when you insert some mediating technology that helps make even ambiguous affective stuff visible. This isn't telling anyone how you're feeling; rather it's just sort of peeling off a little piece of something that is changing with your feelings, and giving you an excuse to talk about it, if you will. And we're finding that that leads to a lot of interesting interaction. We're also doing some brand new work with computer terminals that will animate and move in ways that are going to be designed to be non-distracting, but perhaps helpful for reflecting postural state and some affective state.

Some people say, “Why are you wasting time teaching computers emotional skills? There are much more important needs out there.” Well, we found that some of the problems we face in trying to teach computers emotional skills are very similar to some of the problems faced by many people working with autistic kids. They’ve come to us and we’ve been designing some work together, where the children are trying to learn facial expressions and situations that give rise to certain affective states, much like the computers. In fact, many of the autistics make this comparison themselves. The famous autistic Temple Grandin talks about her brain functioning like a machine and having to learn the algorithms to recognize emotional things, and so forth. So we hope that by thinking about their problems as well, we might be able to inform one another in this important area.

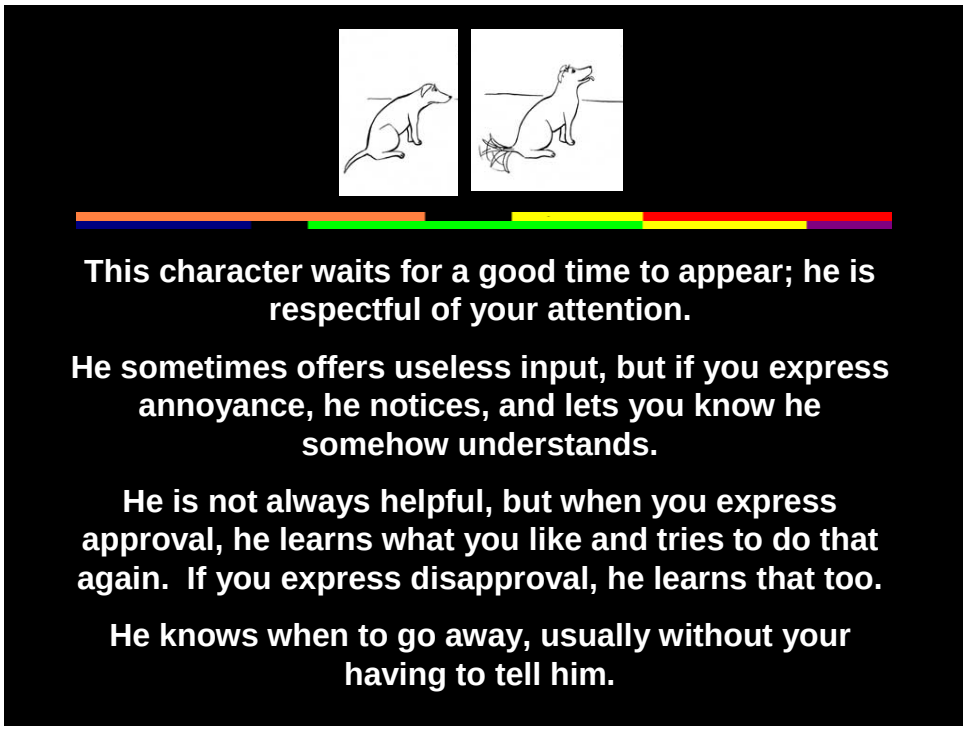


I will just wrap up by saying, I'm not going to say a lot about the regulating and utilizing of emotions, other than that this opens a whole can of worms for what would it mean for machines to "have emotions," which they would sort of have to have before they could regulate and utilize them. Let me say a few words though about why we might want to build machines that would *have* mechanisms like emotion.



Lewis Johnson here (at the meeting) is doing some work building emotion models as are many other people in computer science, and I would argue that this is extremely important. We are not trying to give machines emotions to make them more like people, but there are all these findings lately that the emotions in our brains and bodies are contributing to this list of important activities here, and this list is similar to a list that AI and Interaction researchers have been thinking about for a long time: How do you make machines that are better at perceiving information and that really understand language and know how to choose the right behavior in real time given complex, unpredictable inputs with their limited resources?

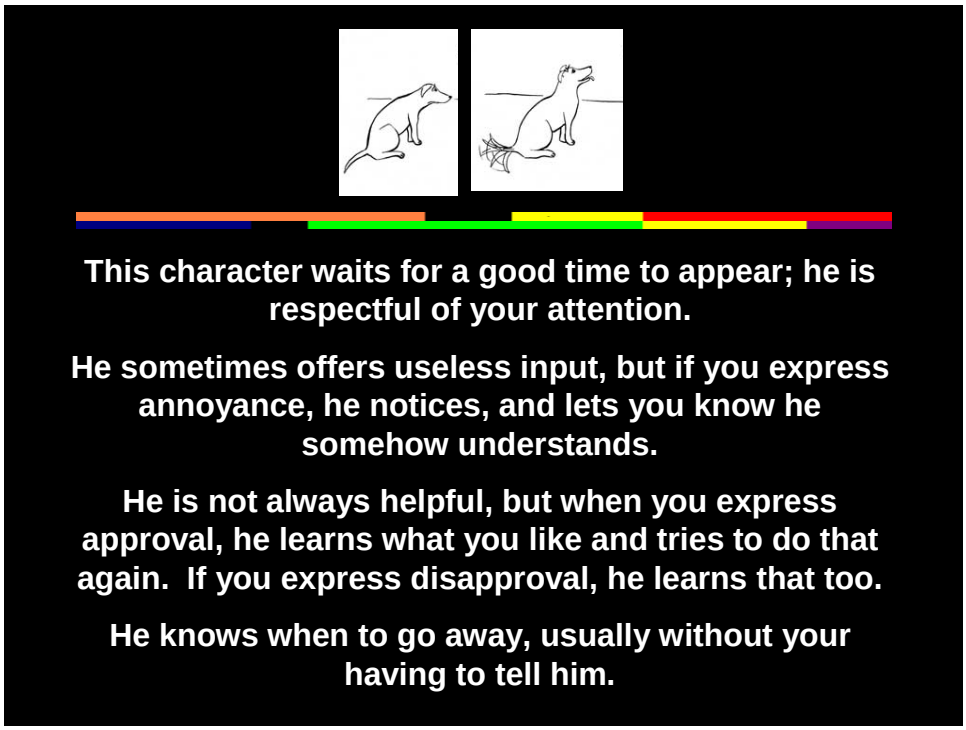
Affect seems to be a critical part of regulating such processes and to the extent that it is in us, we can benefit from studying it, and maybe trying to imitate it, and building machines that would have some of these capabilities.



I'm out of time: I will close with a quick story. I started off with the story of the paper clip and so some people at Yale the other day asked me if I would try to give that same story a before and an after. Well, we're not here yet, but this is maybe a little piece of where we would like to be.

Knowing *when*, is a good time to interrupt you, is important. Knowing *how to appear respectful of your attention* is important. I don't think we're going to build a character that always offers the right help or that always offers useful input. In fact, you could make the human-human equivalent here, right, and do you know anybody that is 100% useful to you when you need help from them? No, but, even people who are maybe not the brightest or not the most helpful, can be really enjoyable to have around if they have some of these Emotional Intelligence skills as well.

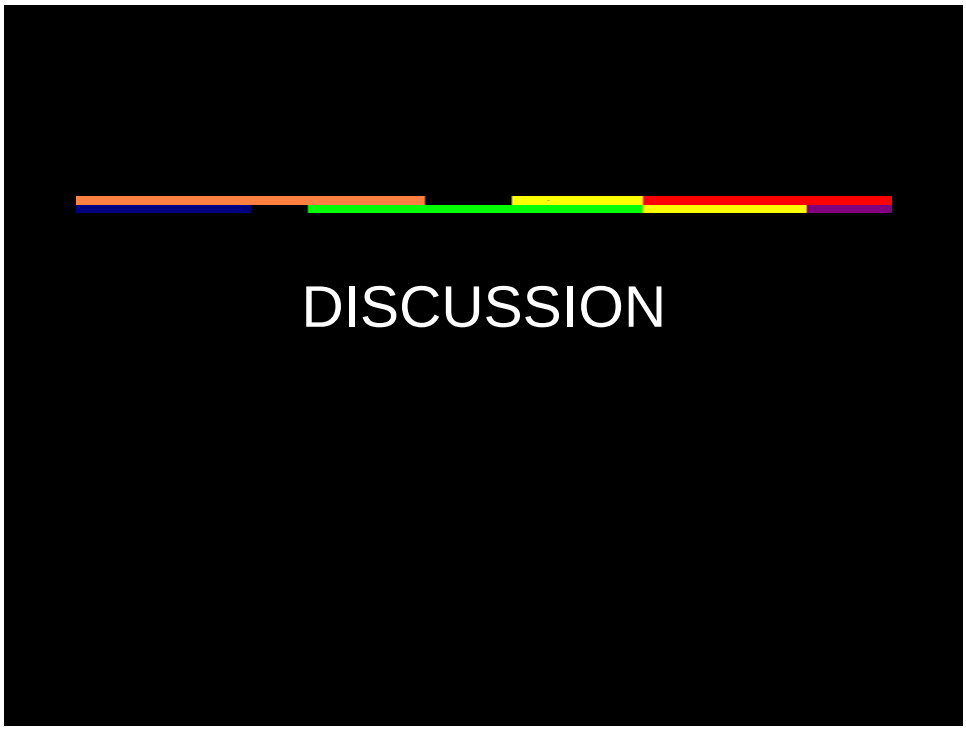
So, my argument is we don't need to make the character *perfect* but we do need to give it a lot of these other skills, and here are some of them. The character is not *always* helpful, but you can express approval, disapproval, liking, disliking, and the character should detect and respond to that in a way that we would expect an intelligent agent to do. And certainly, it should go away without doing a little dance and wink if you're annoyed if you tell him to go away.



Who does this? I don't know. I put the cartoon dog back up here for now. I put that to underscore that I don't think we need to solve the hard AI problem and build machines that are as intelligent as people.

We do, however, need to get a balance back in computing. Computers and their designers have been ignoring our affect. There *is* a time to ignore affect, there is a time to sense it and not respond to it, and there is also a time to respond to it. And it's that *balance* that has been missing. So, the challenge before us is to not build machines that appear over-reactive to every emotional nuance, but to find a way to put skills of Emotional Intelligence into the system in a way that doesn't call attention to them, but just leads to a much more productive and enjoyable interaction.

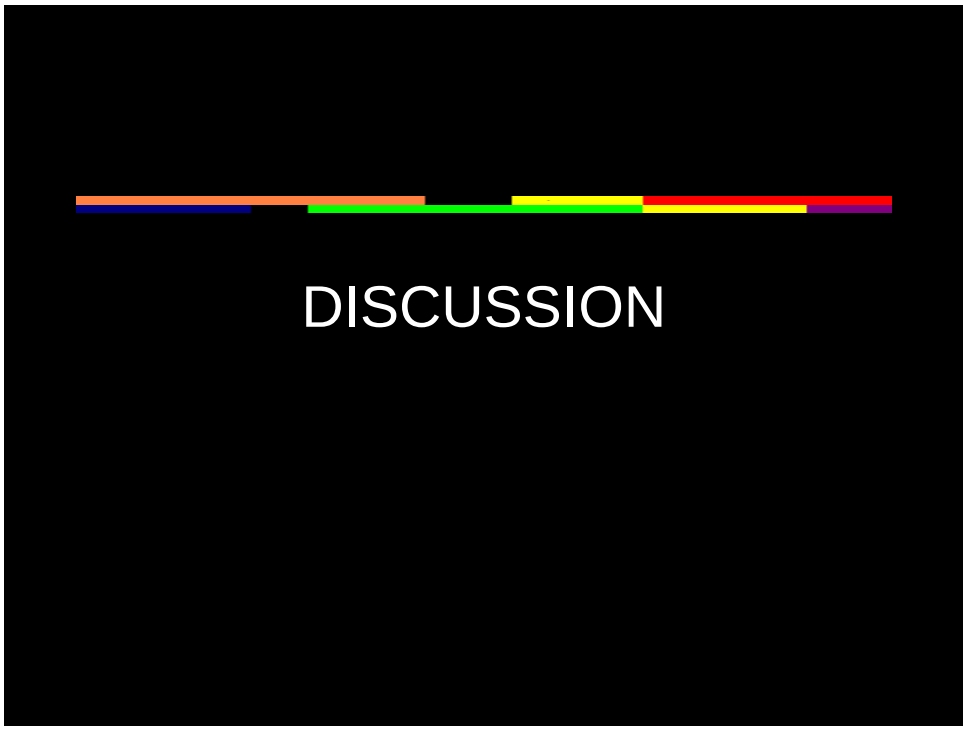
Thank you very much.



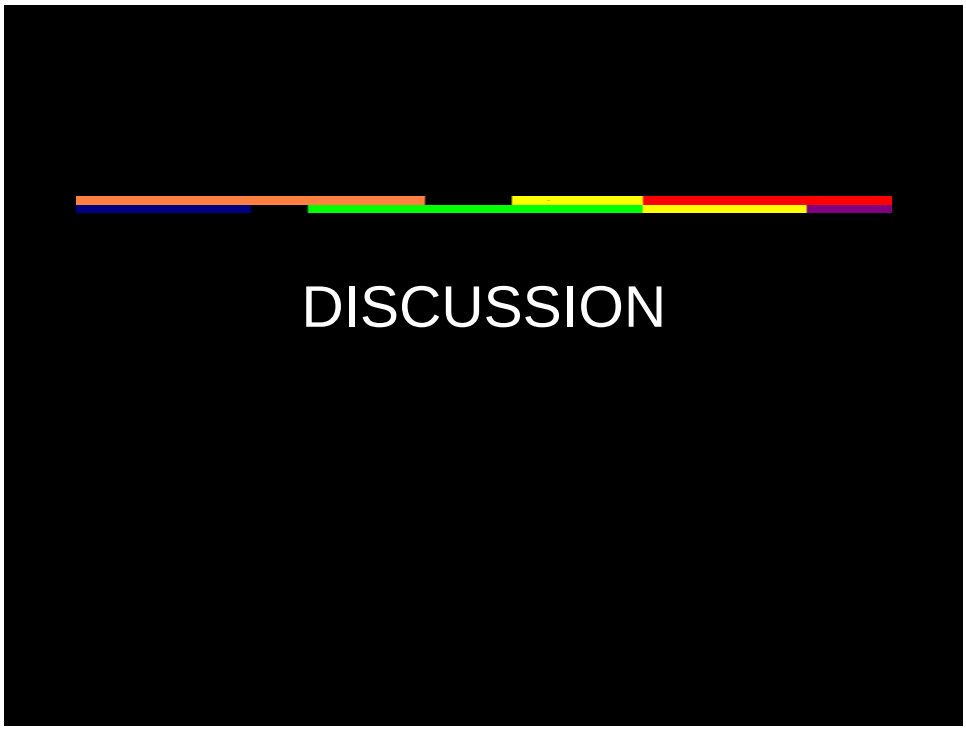
DISCUSSION

DR. ZEIDNER: Thank you very much for this very exciting talk, do we have any questions?

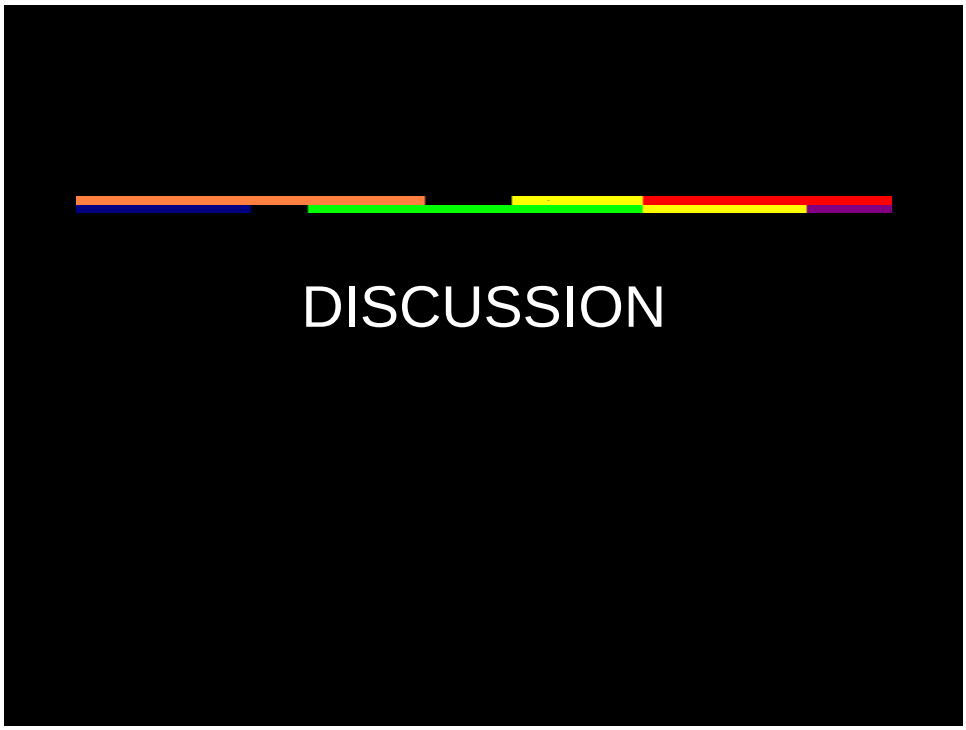
DR. JOHNSON: So some of the states that you are measuring are, generally considered to be cardinal and some of them are clearly correlated with emotions, but are not on your list of cardinal emotions, like frustration, for example, is not the same as joy, or anger or something like that. So I guess I'm curious as to where you see where the real bang for the buck is, in terms of recognition, is it these cardinal emotional states or are there some other things like attitudes that you're really getting after?



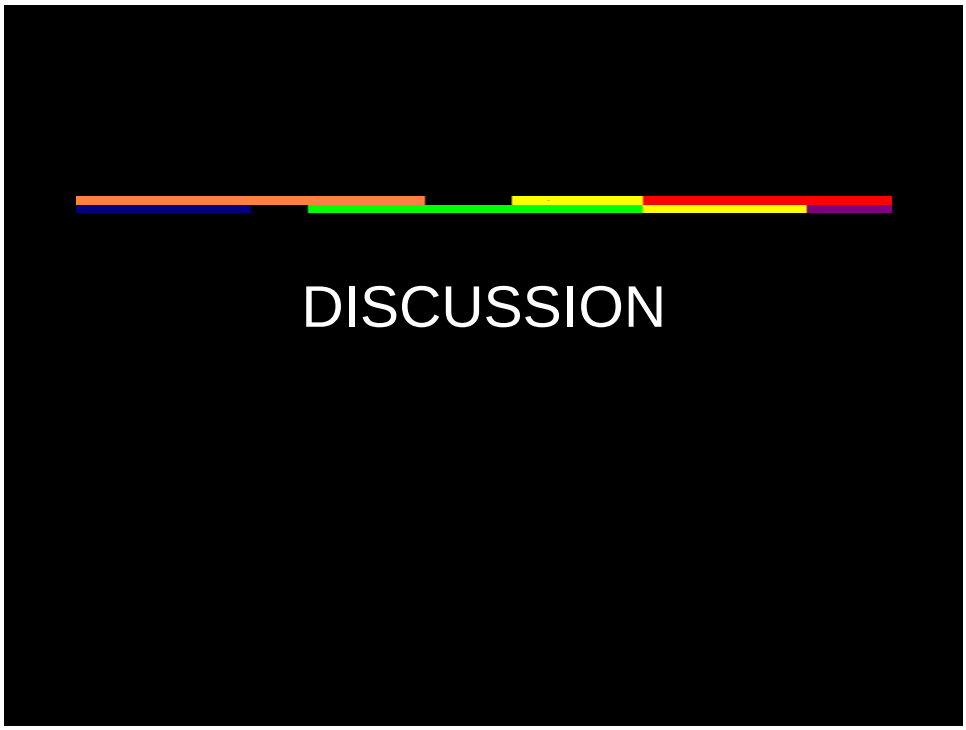
DR. PICARD: There are a lot of wonderful theories of emotion out there that propose various basic lists of emotion, basic according to various different criteria. I haven't found any list that seems to match what we see in real interactions, and I give a separate talk showing what we've observed in just learning interactions versus what's on all these lists. Although I want to be very mindful of these many different theories, our approach has been a little bit different: Instead of starting with a "basic emotion" list, we have been starting with interactive scenarios and seeing what happens in them that seems to be affect related. Now I recognize that that may fly in the face of some people's definitions of emotion as I use "affect" as slightly more of an umbrella word than emotion. Some people's definitions of emotion require everything in there to be valenced and some people argue about whether "interest" is valenced: I've heard people say dogmatically "it's positive" and other people dogmatically say "it's not valenced so it's not an emotion." And I'm not going to get involved in that argument, I'm just going to try to get the computer to recognize what the people are trying to communicate when they are in front of it. What's happening in the classroom when the students are losing interest, what's happening when you're sitting there with a colleague and they're cursing and banging on the thing – whether we all agree it's an emotion or only some of us agree it's an emotion – I want to teach the computer to detect it and respond appropriately to it.



DR. EKMAN: Just in terms of interest, the interest and the tension, when you're dealing with an interaction with a computer, I can be very interested in what someone is saying to me, and looking away. In fact, very often people do look away when they are engaged in an interaction with something really interesting and they are considering it very attentive. But you don't look away from your computer screen. So I think part of what you're looking at and I think is very intriguing, but it may radically change when you try to apply this to face-to-face interaction compared to machine interaction. Would you agree?

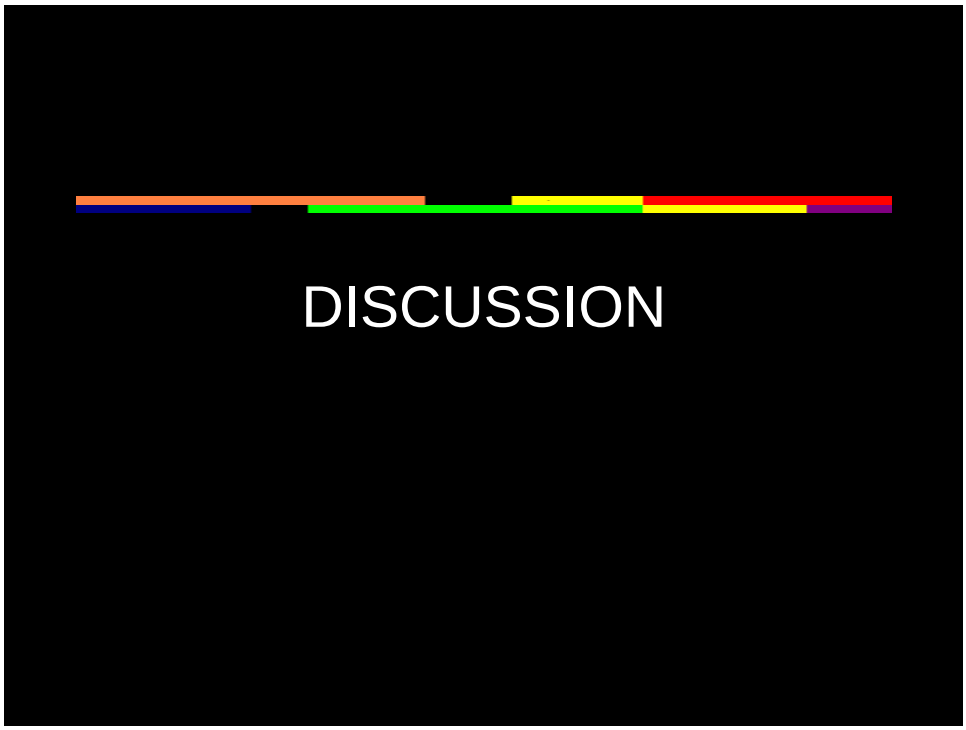


DR. PICARD: I would agree, in fact in describing that experiment, I used the word interest because that's what we actually used with the coders and so forth. Later I was thinking, really what we were measuring is attention to the screen and engagement in what is going on there as opposed to some sort of pure Platonic notion of interest. In fact, this problem plagues I think pretty much every study of emotion out there, all of which are situated in something and which have some context. I can often take the results they get, and say if I flipped the context like this, the results will be different. And one of the things that computers are especially stupid about is sensing that context. We have a whole effort in trying to build those context aware systems so that it shouldn't say the person is uninterested in anything right now, it should simply say the signs of interest, attention, engagement towards the object on the screen sort of ceased to be observable at that moment. We had the same problem with frustration. A person might be getting frustrated while reading their email. Is it because of something in the content of the email, is it because of the interaction with the system, is it because they would rather be doing something else? Attributing causality is a whole other difficulty in this work, and the causality, of course, feeds into the recognition of what kind of label you want to put on that state. Because if it's caused by something different you might want to call it something different too; these things all complicate the issues.



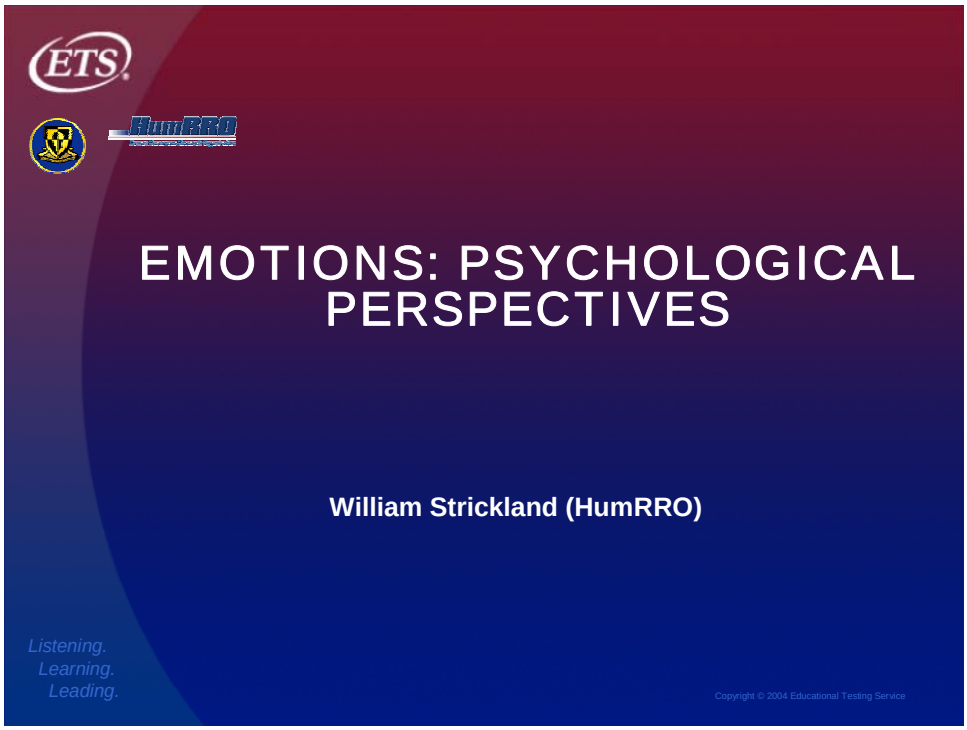
DR. GADE: Do you find in your work is it generally better to have an avatar associated with this kind of empathetic feedback, or does it really matter?

DR. PICARD: We've gotten strong effects with the avatar in the relational study with the Laura agent, but we did not run all the separate controls with each particular aspect of the relational behaviors ablated, so I couldn't tease out exactly what the effect of the empathic behavior was. In the Jonathan Klein study with the frustration and response we looked specifically at empathy. There was no avatar there, but we got a huge effect. I think avatars complicate things for a number of reasons; they change your expectations significantly. When you see a dog or a human face or a little Einstein thing or a paper clip, your expectations are very different. As we know, expectation has a huge effect on behavior and the affect that will arise subsequent to the exact same situation. You expect things to go well and you are much more disappointed when they don't than if you expect then to go badly. You expect more intelligence from an intelligent looking character versus a dog – so the type of avatar completely changes your response. So the presence of a visible character really complicates things, and we can get the effect without the visible character.



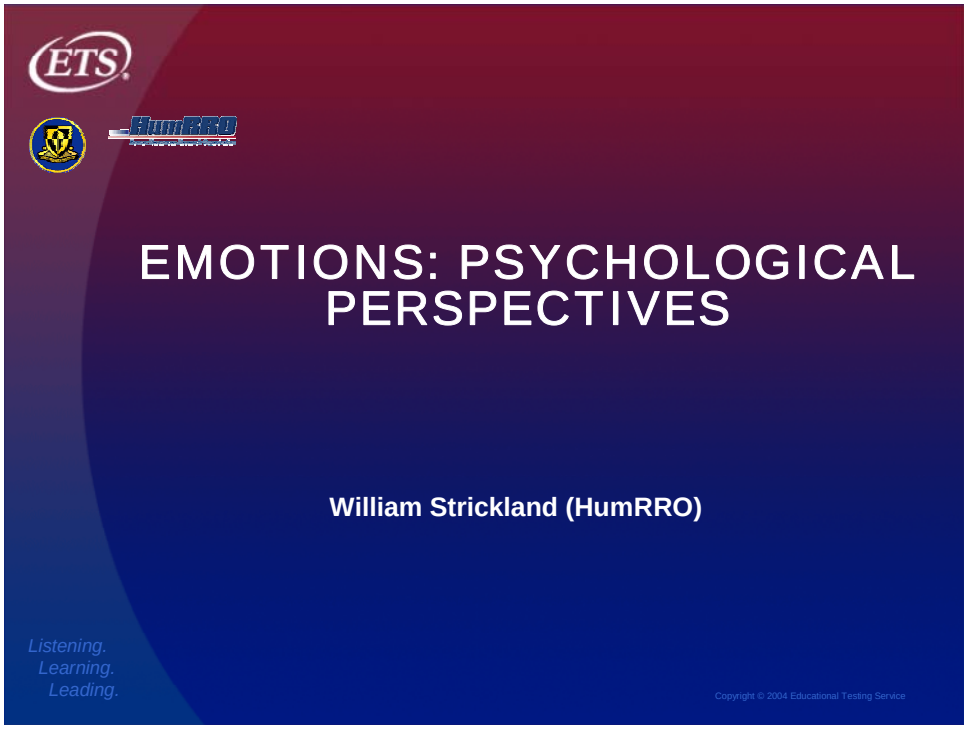
DR. ZEIDNER: Thank you so much. Before concluding, I wanted to mention that I was in a synagogue and in the attic there is supposed to be the first intelligent robotic agent, the Golum of Prague, you may know the story. In fact he was so emotional that he ran amuck and started killing off some of the villagers and had eventually to be put out of use. I do hope that this tradition of research will fare better than this original first computer. I think my take on AI is not so much to make computers more emotional or more intelligent, but to make people more intelligent and more emotionally intelligent to the better adaptive use of computers. Good luck with this research.

SESSION II: EMOTIONS: PSYCHOLOGICAL PERSPECTIVES



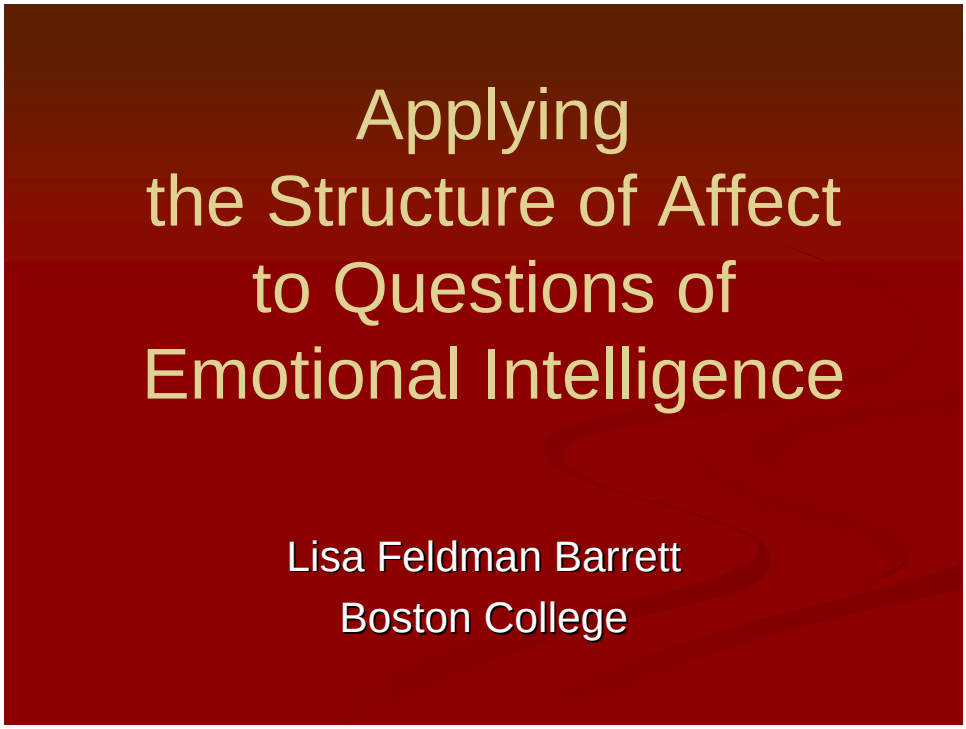
OPENING REMARKS

DR. STRICKLAND: Welcome to Session II, which is Emotions: Psychological Perspectives. I am Bill Strickland from the Human Resources Research Organization, or HumRRO, as you've heard us called a couple of times this morning. And on behalf of HumRRO, I want to thank ETS and the Army Research Institute for giving us the opportunity to be involved in this process. Paul mentioned a workshop we had last February. Putting together that workshop, working with Paul and Mike Rumsey, was a ton of fun; we had a good time, and we had an all star line up of presenters. A lot of hard work went into that workshop, and a lot of creativity went into selecting people for that workshop. As Paul said, it was then the notion that someone, meaning me and HumRRO, was going to have to be creative and come up with a second workshop--and I was worried. But events conspired and I was in the great position of having ARI on the one hand saying do something creative and make it interesting, something the Army can use, and on the other hand I had Richard Roberts telling me he had a great idea. To be stuck in the middle of that kind of situation, where Paul's paying for it and Richard's going to do all the work, was a no lose bargain for me. So I appreciate the work Richard has done, and I appreciate his letting me say a few words and making believe that I did anything for this conference except stand between him and Paul, because that's really all I did. Well, welcome back.



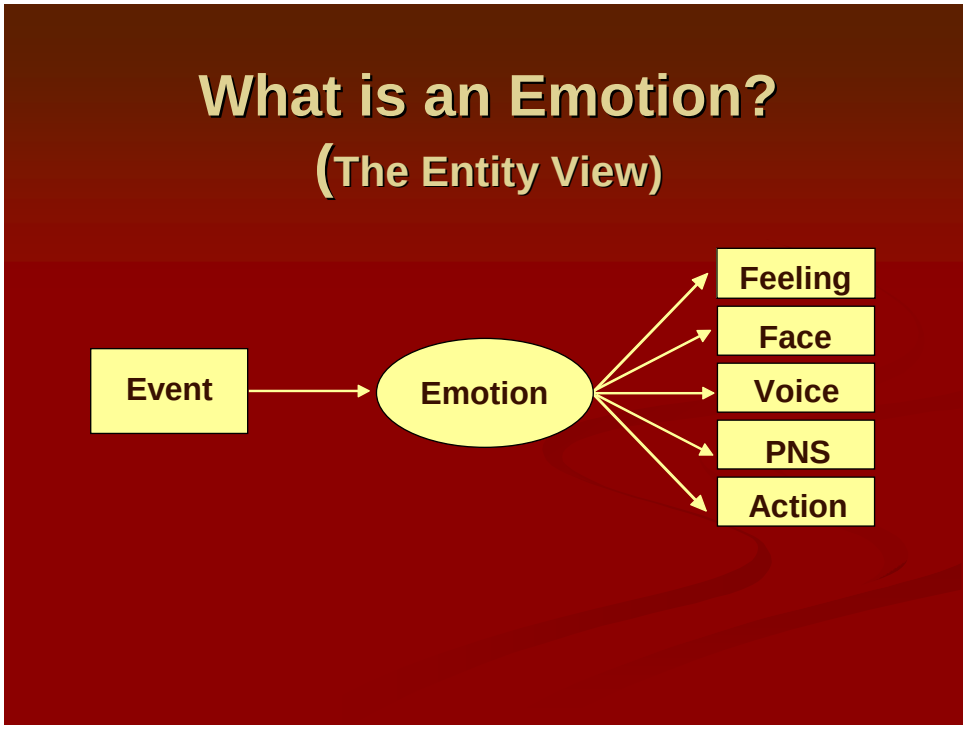
This morning we had four presenters in a multi-disciplinary perspective. We had a philosopher, sociologist, anthropologist and a computer scientist. I'm guessing most of us here are psychologists; I am. So, I don't know what Richard was thinking by putting the multi-disciplinary people first and the psychologists second, but then he schedules us after lunch, and I really didn't to know what to make of that. Then I sat through the morning, and I heard four great presenters, and I'm thinking, "crud, contrast effects, we're dead." But, having actually read the abstracts and met the presenters, I know that this afternoon will be at least up to the standards of this morning. And I'm confident we actually will enlighten and maybe entertain, although that isn't one of the real goals. I believe you will come away with something from this afternoon.

What I don't want to do is take time away from the presenters. So we have four presentations this afternoon. We are going to start with Lisa Barrett who is a professor of psychology at Boston College on Applying the Structure of Affect to Questions of Emotional Intelligence.

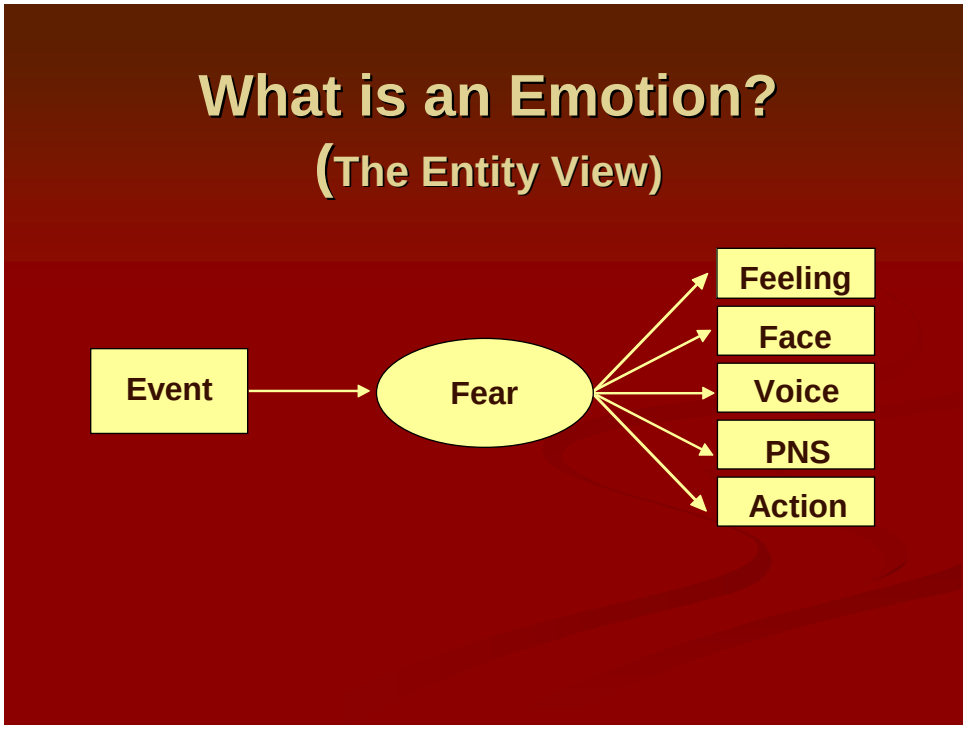


APPLYING THE STRUCTURE OF AFFECT TO QUESTIONS OF EMOTIONAL INTELLIGENCE

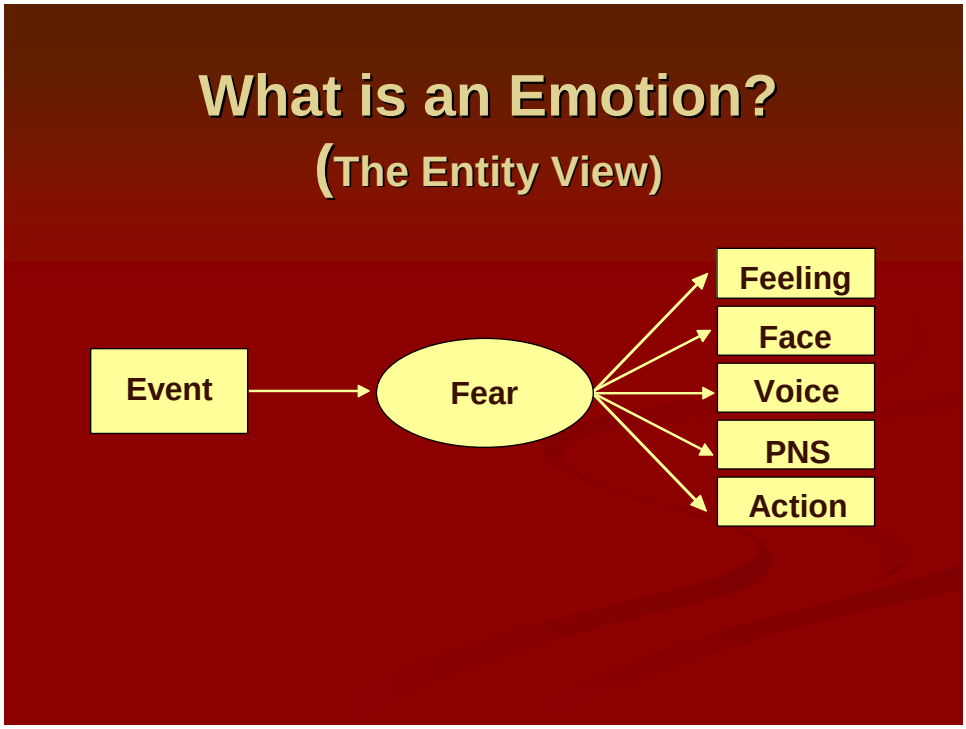
DR. FELDMAN BARRETT: First, I want to thank you all for your attention especially after lunch, and I want to thank the organizers for inviting me to speak today. In part, I think I've been put first as the talk after lunch to try to shock you out of your post lunch stupor. Because I think some of the things I'm going to say today are going to be surprising and provocative to you. Essentially, I'm going to try to answer the questions, what is the structure of affect and how is it related to emotional intelligence? And to do that, first we need to address what the structure of affect is and what it tells us about emotion. And to do that, I need to begin by giving you an overview of what I think of as the reigning paradigmatic view of emotion research. Some of which we've heard referenced to this morning. Basically the idea is we yell because we're angry, we frown because we're sad and that this is common sense, emotions cause us to act. Our common sense understanding of emotion influences the way we talk. We say things like, "you made me angry", as you triggered my anger reflex. Anger explains why we yelled and perhaps it even justifies it. This folk theory underlies, often implicitly, our construals of emotions in ourselves and in others and our ideas about emotional intelligence.



This reigning scientific paradigm which I'm going to call the Entity View underlies scientific thinking about emotion. Each category of basic emotion such as anger, sadness, and fear is a natural kind, an inherited reflex that is hard wired at birth that causes our bodies and brains to react in a particular way. This is a very simple overview, a schematic of this idea. So some event triggers the emotion which in turn reflexively produces a set of coordinated outcomes that constitute the components of an emotional response, including: feelings, some facial movement, some vocal signal, some peripheral nervous system activity and some kind of voluntary or instrumental behavior. These outcomes are automatically expressed, coordinated in time, and correlated in intensity due to their common cause.

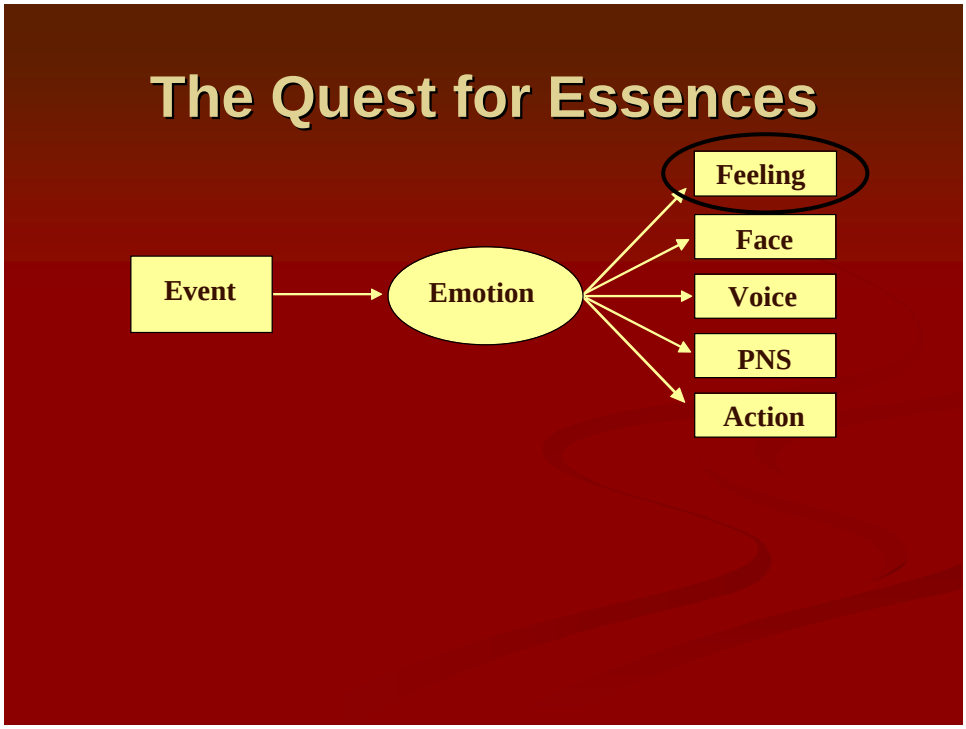


Into this schematic you can substitute for emotion, any specific emotion like fear, or jealously or anger and you have a theory of that emotion. Each emotion is presumed to have an essence that makes it a natural kind: A distinct mental state in Darwin's theory, an affect program in Tomkin's or Paul Ekman's theory, a set of appraisals in Nico Frijda's or Klaus Scherer's theory, or a neural circuit as in LeDoux's or Panksepp's view. Much of scientific and popular writing on emotional intelligence presupposes this view. So, when researchers refer to perceiving emotion, using emotion to facilitate judgment, having a rich understanding of emotion concepts and managing emotion in self and others, they are often but not always, referring to this theory, or implying this theory of emotion. Psychology has a long history of treating important ideas as essences. Memory, personality, concepts, each of these used to be considered entities with an essence that could be potentially be located in a particular part of the brain. So we used to search for the engram for particular memories and so on. In each case though, entity theories have been struck down in favor of a more generative theory. Such that each is now thought of as being emergent properties or by-products of interacting systems, each of which is instantiated in networks in the brain. So what about emotion? How sure are we that emotions are natural kinds with essences.

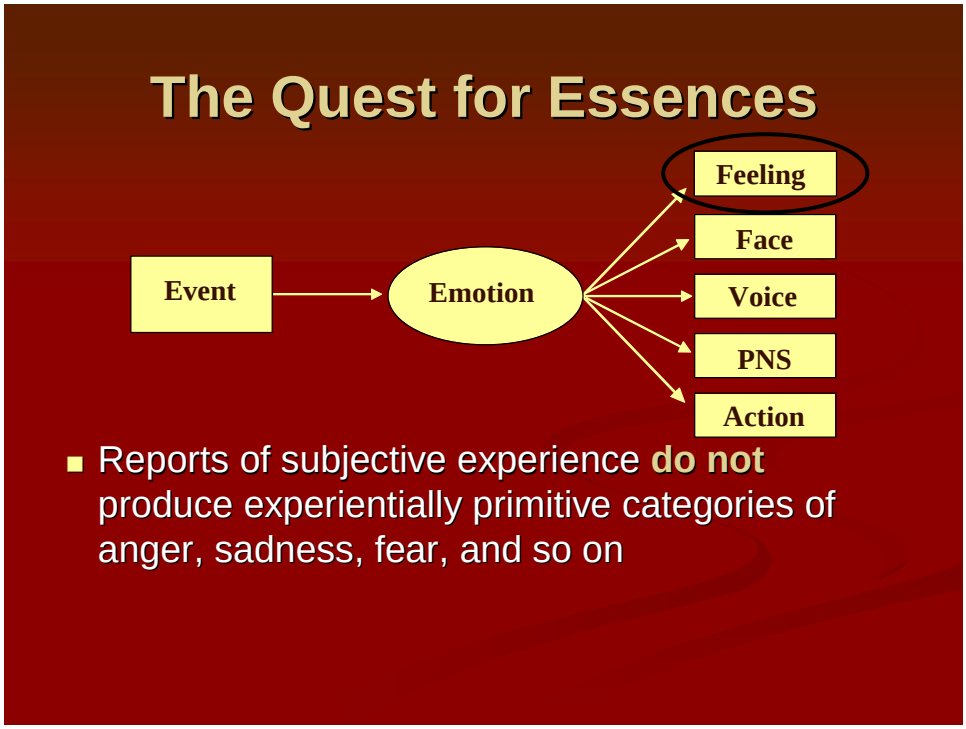


For much of the last century, this paradigm has organized emotion research in a quest for essences. For practical reasons the scientific search for essences has mainly been restricted to examining the output side of the figure. So if each emotion like anger or sadness or fear has a distinctive essence then the outputs will give evidence to this, in terms of correlated response patterns. So the assumption is that the structure of the data will reveal something about the underlying mechanisms. In philosophy this has a number of names but one that comes to mind is the principal of structural coherence that David Chalmers talks about or homeostatic property clusters that Boyd talks about. So what I want to do is to ask the question, well what does the evidence really have to say about this?

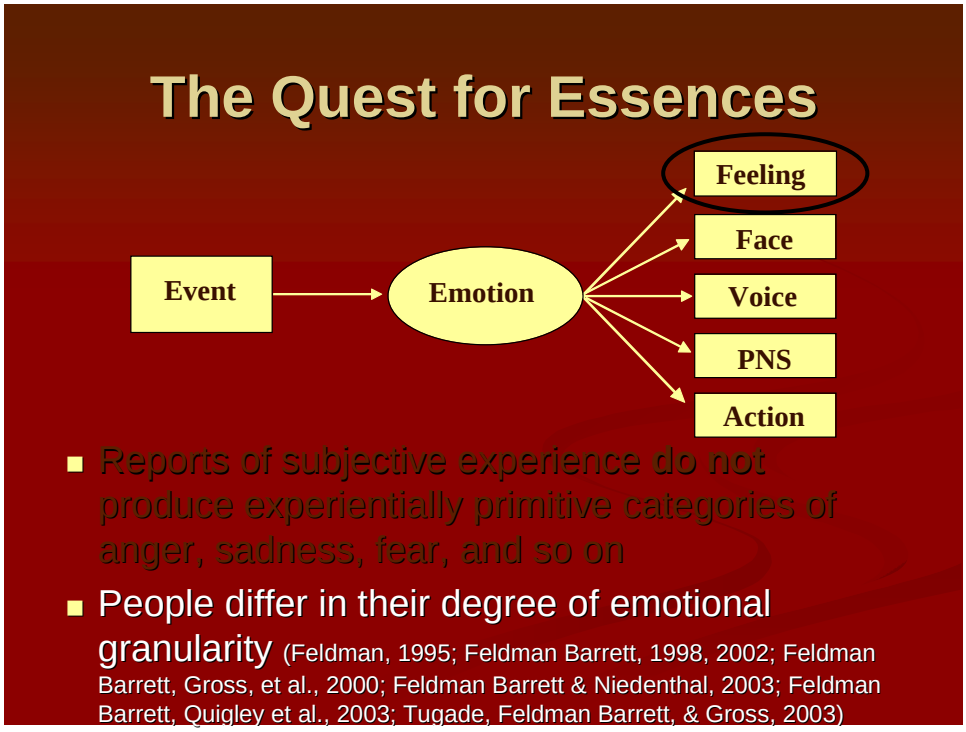
So for the rest of the talk the road map is basically to review the evidence for traditional entity views of emotion. And what I'm going to suggest to you is that the evidence is more equivocal than you might think. Second, I'm going to suggest that there is robust evidence for something called the structure of affect. And I'm going to walk you through a brief overview of what that structure is and what it has to stay specifically about emotion. And then third, I'm going to consider implications for research on emotional intelligence.



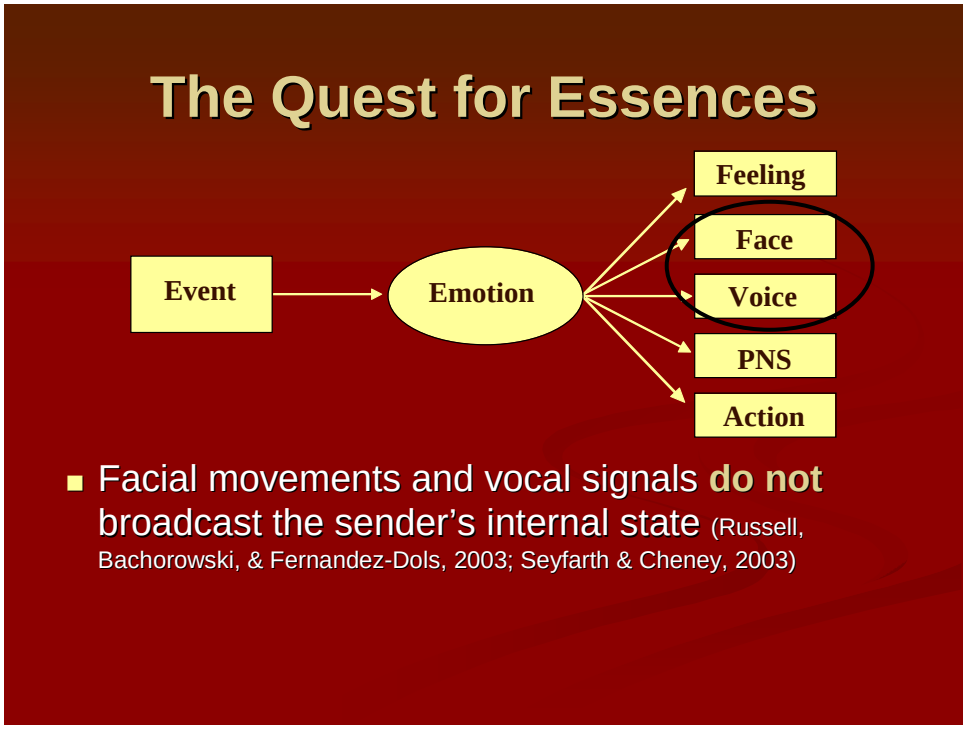
In this theory, the feeling box represents the simple veridical detection of the causal entity of the emotion. The emotion is an object of consciousness like a table or chair; it causes you to experience it. And because it is the sensation of a discrete causal entity, the experience of emotion should be experientially primitive. Meaning it can't be broken down into parts or reduced to anything psychological. So this essentially is the idea that reports should be homogeneous and that if you assess feelings with a self report scale, and examine the structure of the data what you should get is a Thurstonian kind of simple structure with one factor for each category of emotions, so one factor for anger, one factor for sadness, one factor for fear and so on. And this is actually not what you see.



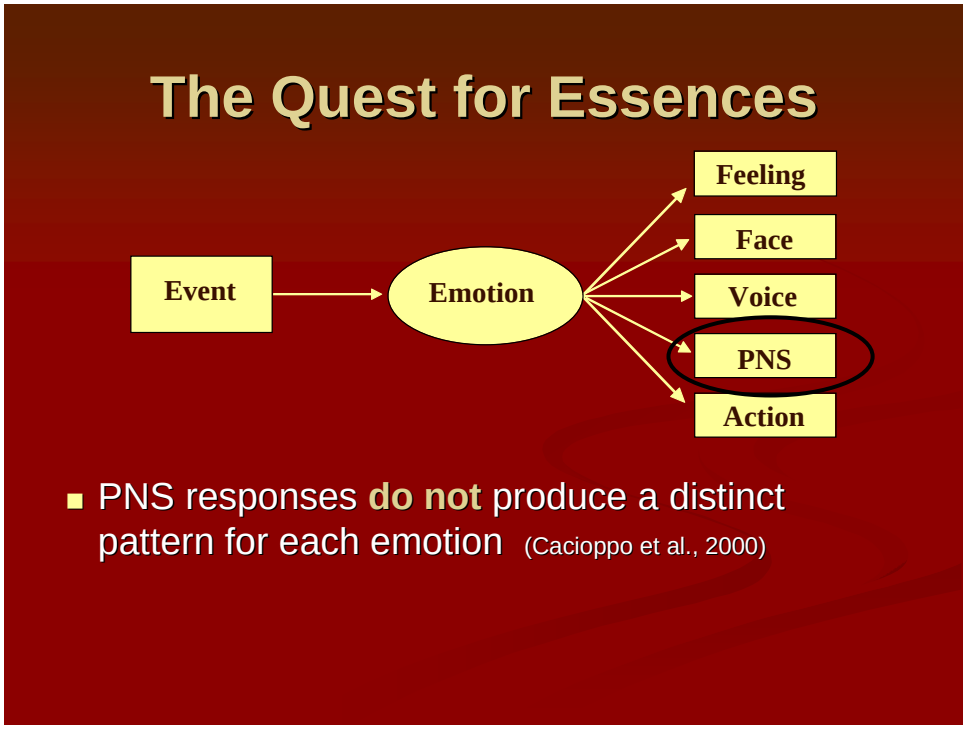
Reports of subjective experience tend not to produce experientially primitive categories of anger, sadness and fear.



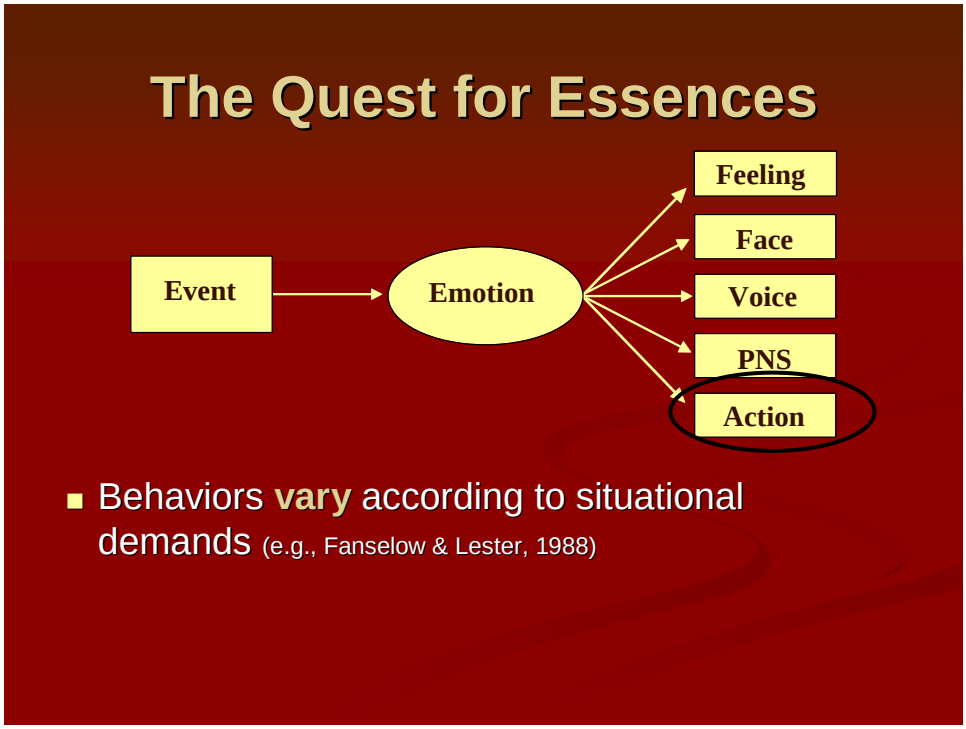
And furthermore, people differ in something I call degree of emotional granularity. That is they differ in the extent that they make differentiations in their verbal reports of anger, sadness and fear and so on. And I'm going to talk a little bit more about these data later. So the evidence in terms of structure of data for feelings doesn't really produce a categorical structure. Some people have used this to argue, well we know that the emotions themselves are categorically organized, if reports of feelings are not then that's a problem with self reports. But is it really the case that emotions themselves are categorically organized?



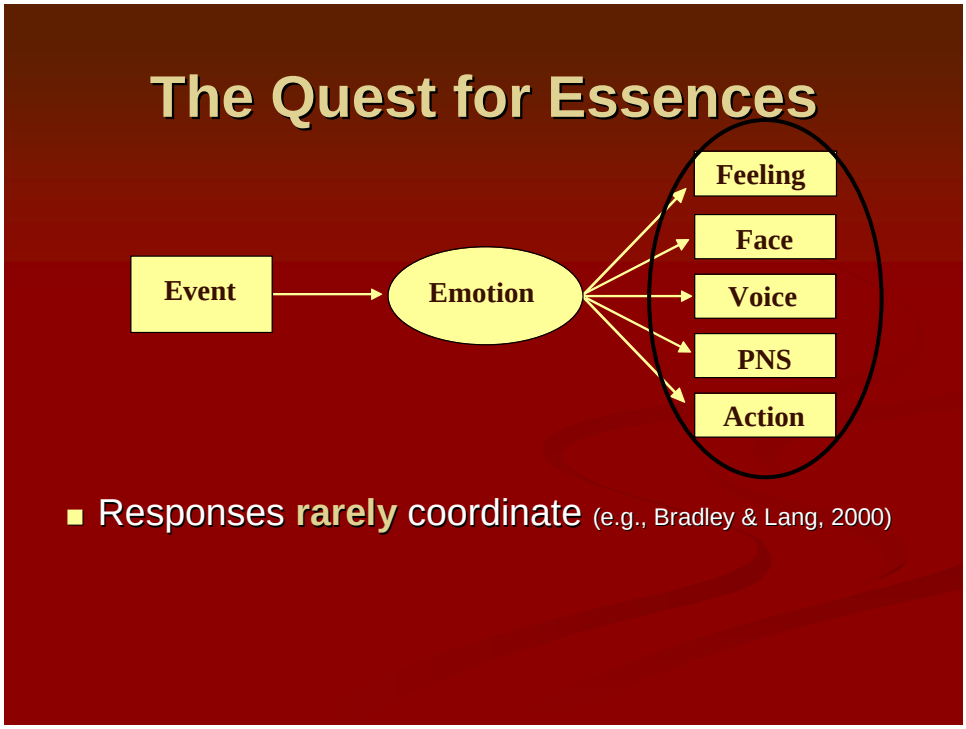
Facial movements and vocal signals also do not necessarily broadcast the sender's internal state. Even people who study animal communication basically agree that expressive behaviors in mammals rarely broadcast fixed encoded about the internal state of sender, suggesting that it is very unlikely that facial movements and vocal signals necessarily display information about the emotional state of an emotor. Even though admittedly, we perceive them as coordinated expressions. What about peripheral nervous system activation?



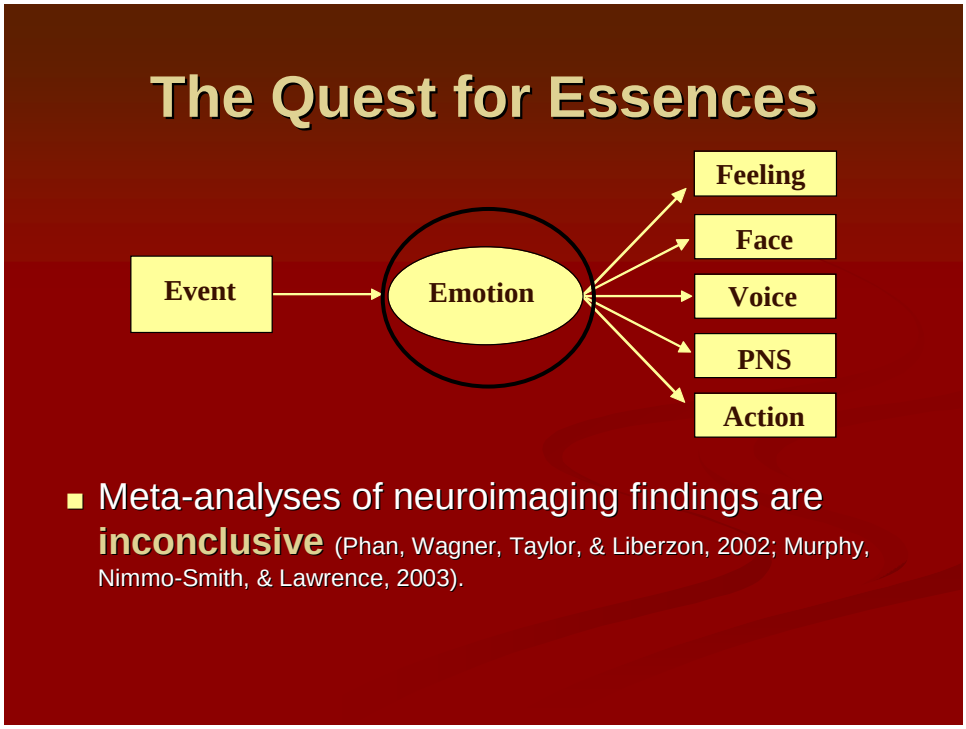
This has in some ways been the gold standard for the quest for essences. While it is the case that particular studies often will show autonomic activation patterns for particular emotions, the question isn't whether you see it in particular studies, the question is that when you look across studies, are these patterns stable? And the answer is no, they are not. So there is a meta-analysis that John Caccioppo published where they examined 30 years worth of this research. It was very clear that autonomic nervous system reactivity doesn't organize itself into discrete patterns one for each emotion.



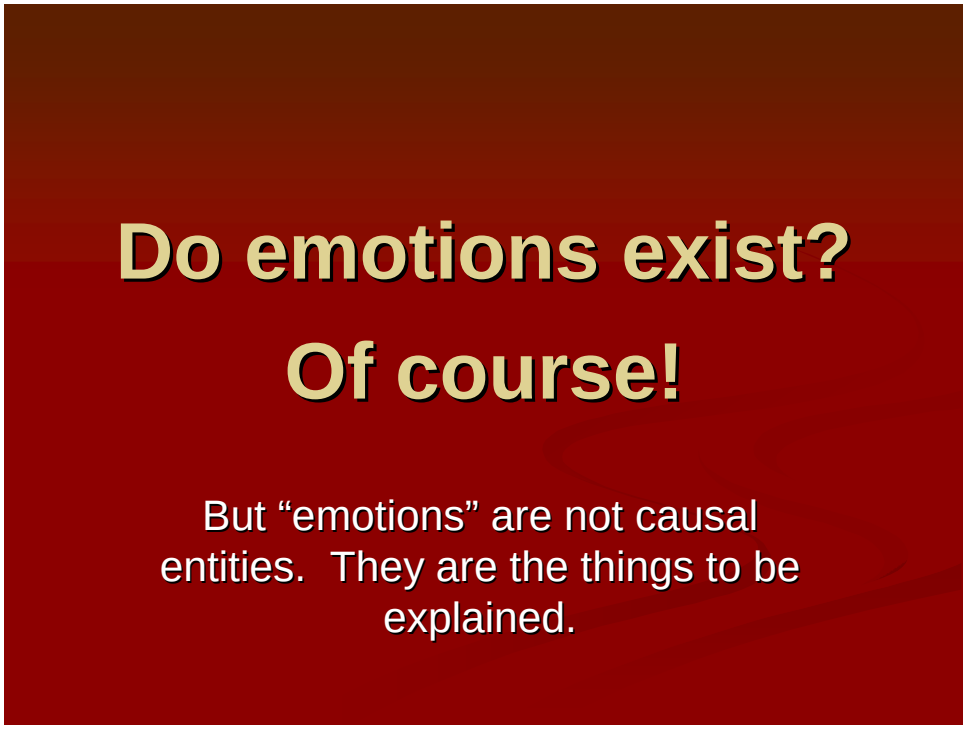
Similarly behaviors, meaning instrumental behaviors, correspond to situational demand that vary within discrete emotion categories like anger and fear. So that's there's no one-to-one correspondence between a particular behavior and specific emotions. And a really nice example of this in rats is the Fanselow and Lester article, where they show that when you put rats in a classic fear situation, what they do really depends on the situational determinants, how close the threat is to them. So sometimes rats will aggress, sometimes they'll freeze, sometimes they'll withdraw. There really isn't a one-to-one correspondence between a behavior and an emotional category.



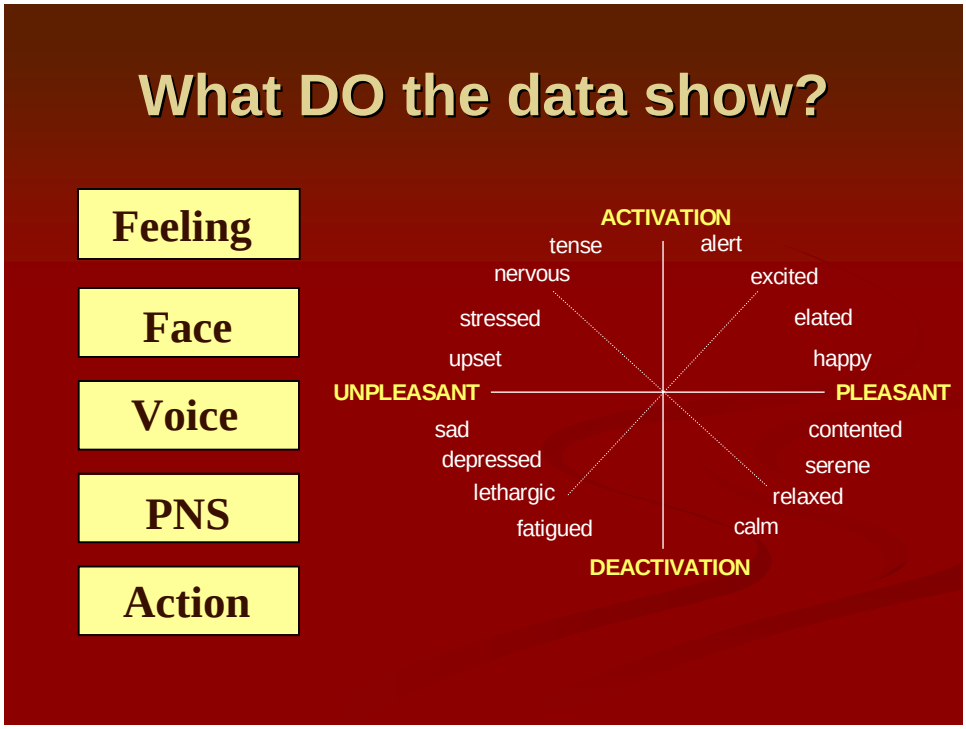
Furthermore, responses are rarely coordinated in time or correlated in intensity. This is one of the basic principals of classical measurement theory. If you see things a set of outcomes that are correlated, you can be pretty sure they all derive from a common cause. If they are not correlated, then that calls into question whether or not they derive from a single common cause. And it turns out that coherence between outcomes is empirically the exception to the rule. You do sometime see it, but you don't see it often. Neuroimaging techniques provide a way to directly search for an emotion's essence. And within any given study again, kind of like the peripheral nervous system findings, different emotions are associated with different patterns of increased brain activity. But the key question is whether these associations remain constant across different studies.



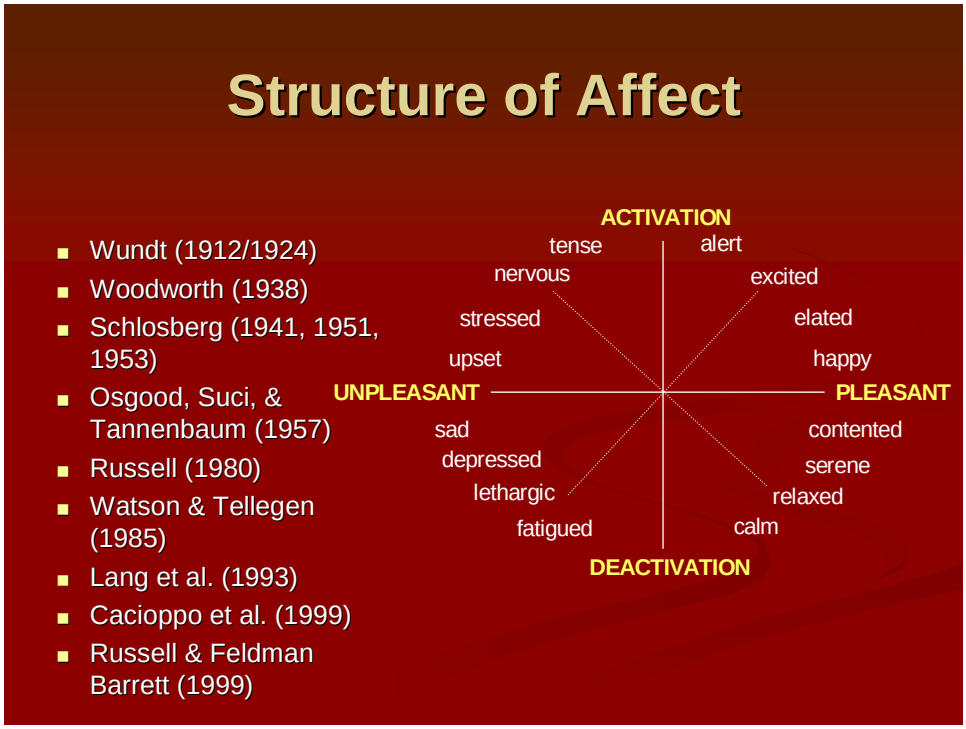
Two recent meta-analyses of neuroimaging findings over the last 10 years have been published. And what is interesting about these studies is that they tried to summarize emotion location correspondences and what is interesting is that there was inconsistency across these two meta-analyses, not only in which emotion, categories showed specific location correspondences, but in the locations that were identified across these two meta-analyses. The two meta-analyses don't agree with each other. This brief overview indicates that the data don't necessarily organize themselves into categories. So it doesn't mean you never see evidence for categories, but you rarely see it consistently across studies and across different experimental paradigms. And if there are emotion essences then almost 100 years of research had not produced consistent evidence for them.



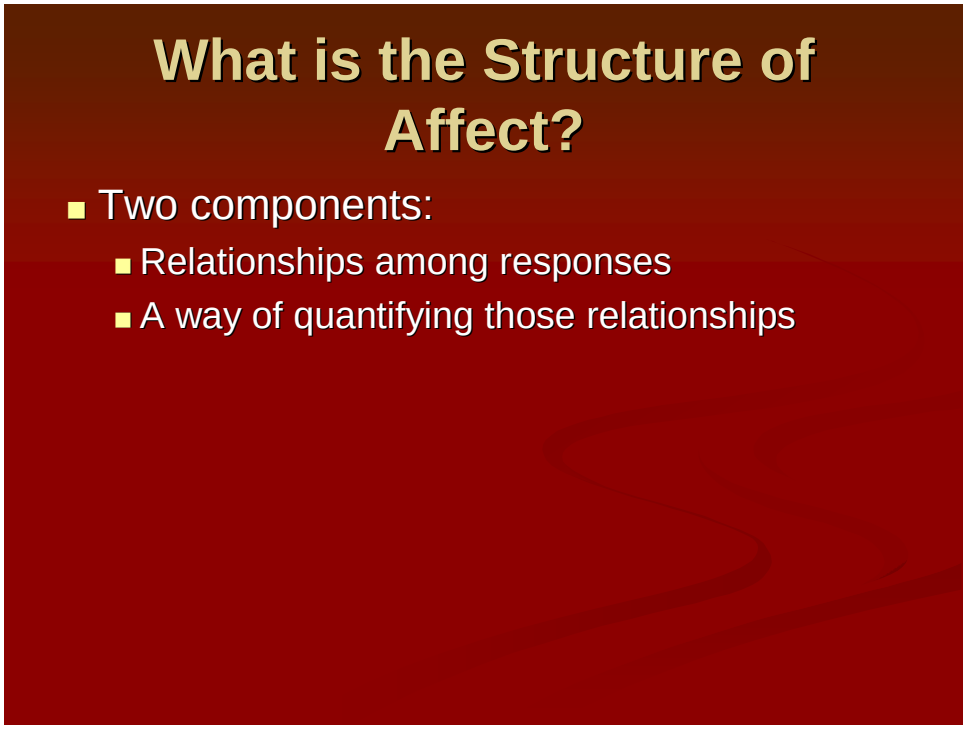
So this leaves of with the question, do emotions exist? And I would say of course they exist. We can’t deny that people have experiences that they call at least in western cultures, anger and sadness and fear, or that we see evidence of these emotions in others. But does that necessarily mean that emotions are entities with essences? I would suggest maybe not. Perhaps emotions are not causal entities, that things that explain feelings and physiology and behavior, perhaps they are not the answer to why people do things, rather, they are the questions. That is, we need to understand why it is that we see categories of emotional responses in other people and experience our own feelings in this categorical way when we do.



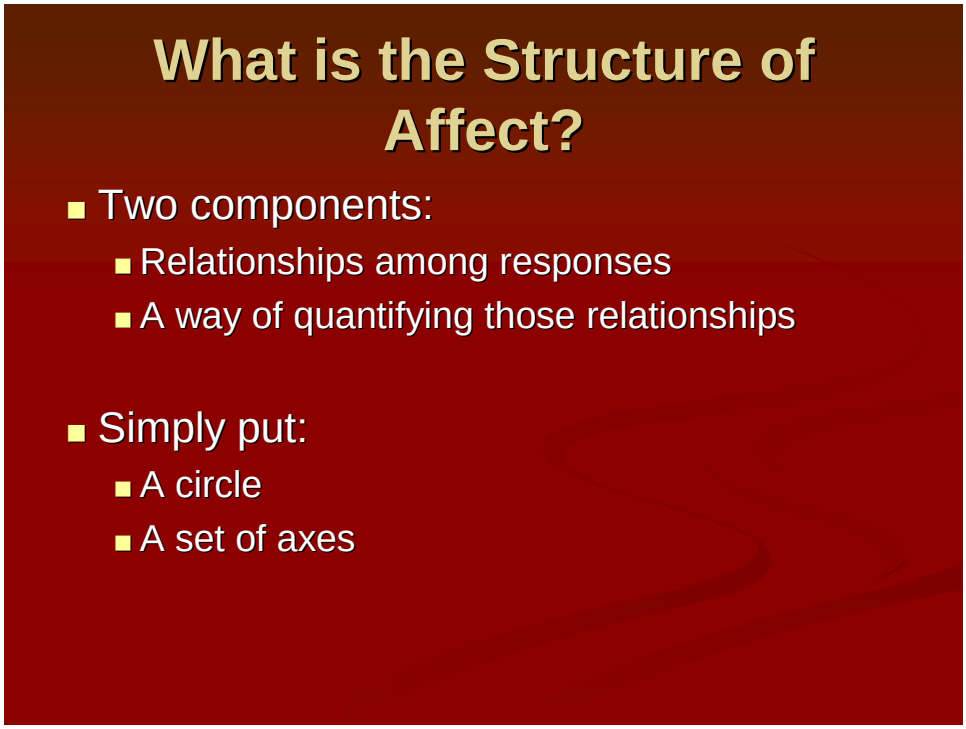
Now, what do the data show? Well, if we stop and think about the logic behind all the evidence that we just discussed, it was that the organization of the data reveals something about the psychological mechanisms that produced the data. And if we apply that reasoning to the empirical evidence that we actually see, then the data do reveal an organization of responses, but it's not categorical in nature. That is, analysis of feelings and judgments of other people's faces and judgments of their voice and peripheral nervous system activation and observational data about physical action, and even neuroimaging data, all produce something like this structure that comes under the rubric of the structure of affect.



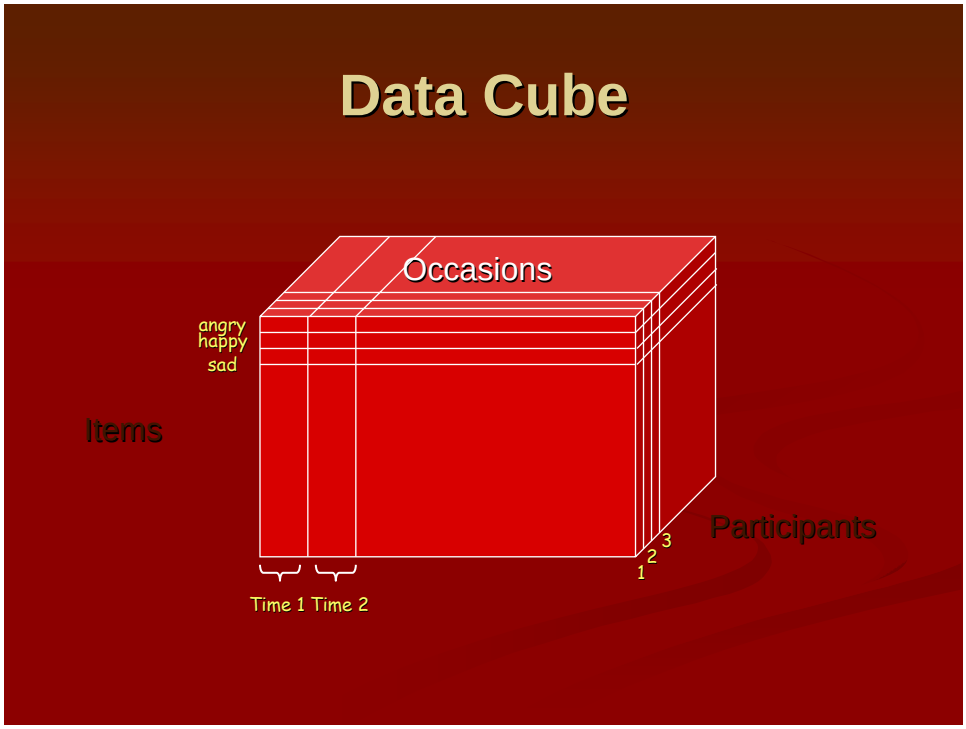
Now this structure has a long history in psychology, beginning with Wundt, but the question is what is it? I'm actually going to go over this a little bit of detail because I think that there is some misunderstanding at least in how this structure is reported in articles and what it's understood to mean. So, really the structure of affect from my perspective has two components.



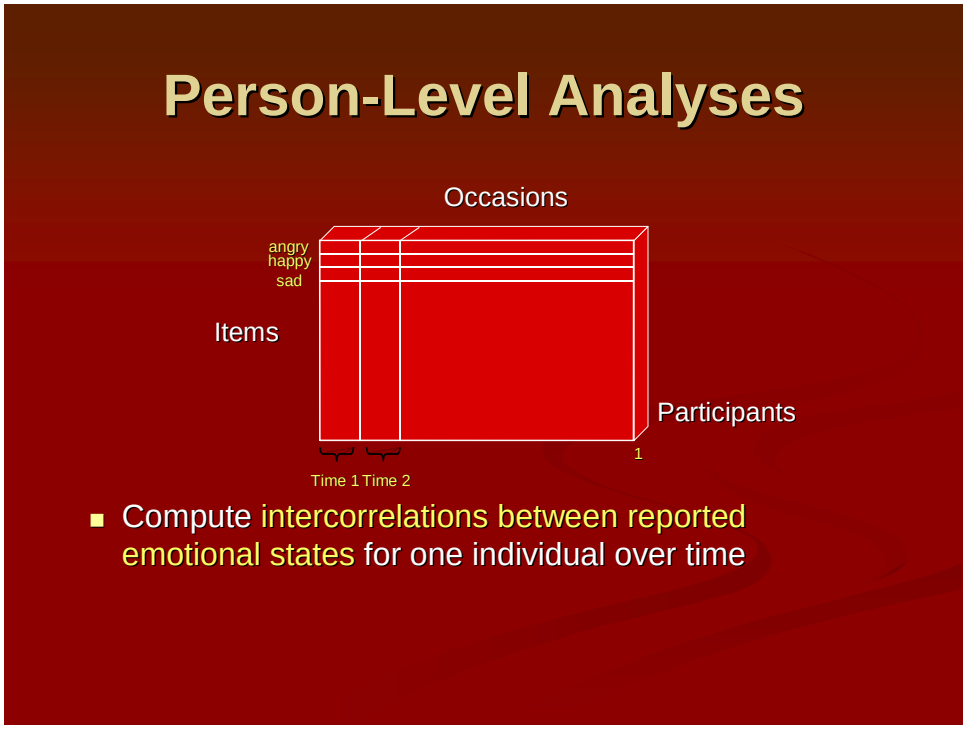
First, it summarizes the relationships among responses. So, for example, if we are having participants make judgments of other peoples facial expressions then we can do two things. We can either force them to make judgments into categories or we can allow them to respond on a Likert scale and look at the structure of their responses. That is, we can test whether or not they fall into categories or organize themselves into categories and so we want to be able to summarize the relationship between the set of responses.



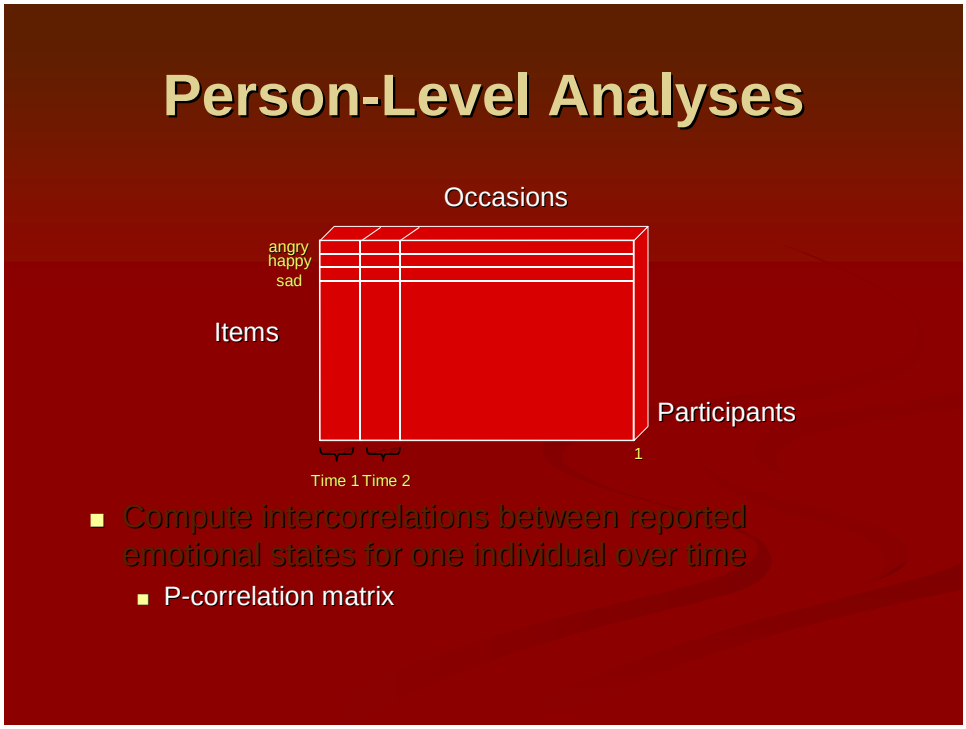
And then we want to way of quantifying those relationships. So simply put, the structure of affect has two parts: it has a circle and it has a set of axes. Now, I'm going to give you a demonstration of how this works from my own data where we study the structure of emotional experience and what we have subjects do is carry around palm pilots for between four to six weeks they are randomly beeped 10 times a day and at each measurement moment they are asked to report how they feel using adjectives on a Likert scale.



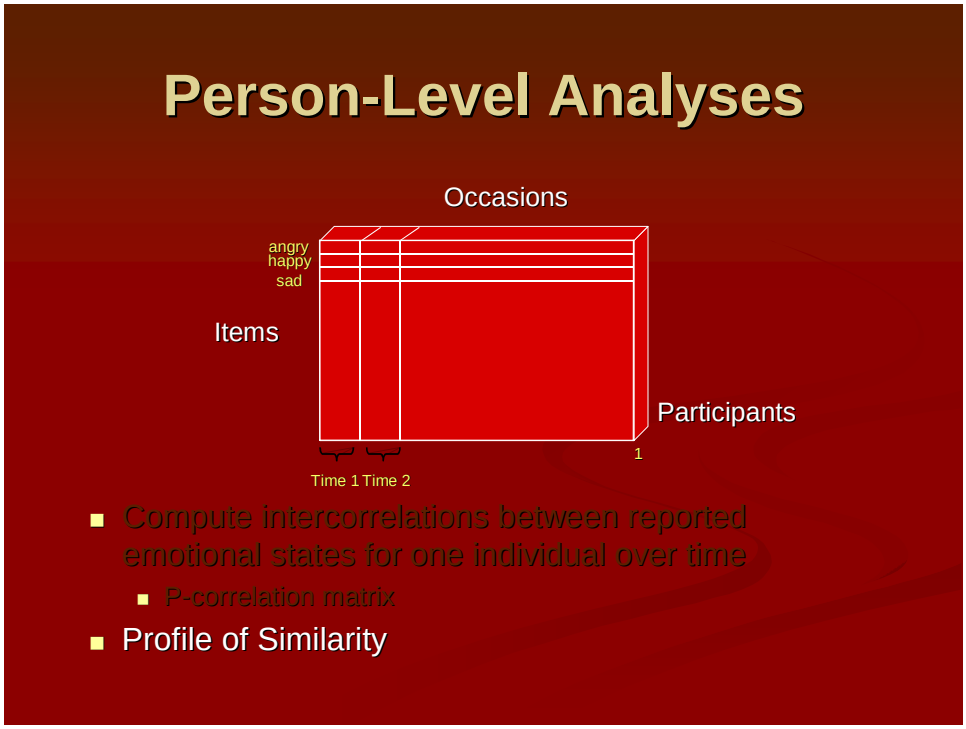
We also bring them into the lab and they do experimental tests, but the experience sampling data produces essentially a Cattell data cube, where we have a number of participants who describe their momentary feelings using a number of adjectives across a number of measurement moments.



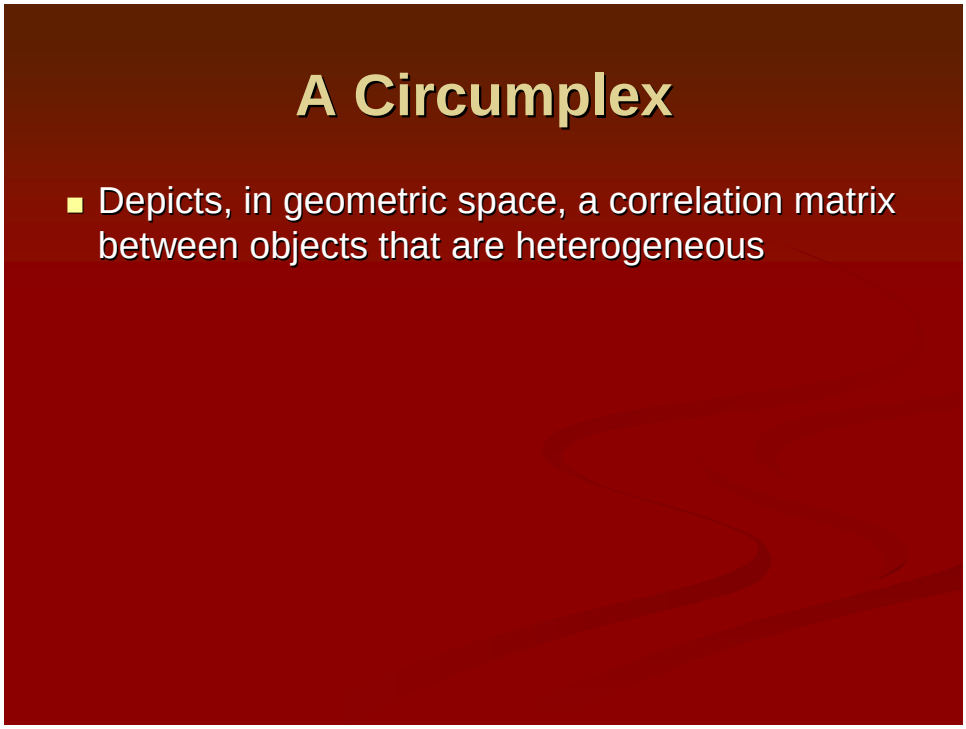
And what we do is compute the intercorrelations between reported emotional states for one person over time. So really we are not so concerned with whether a subject at a given point and time is feeling angry or how much fear they report experiencing on a Likert scale. Rather, we treat these responses like behaviors and we examine the structure of their verbal behaviors.



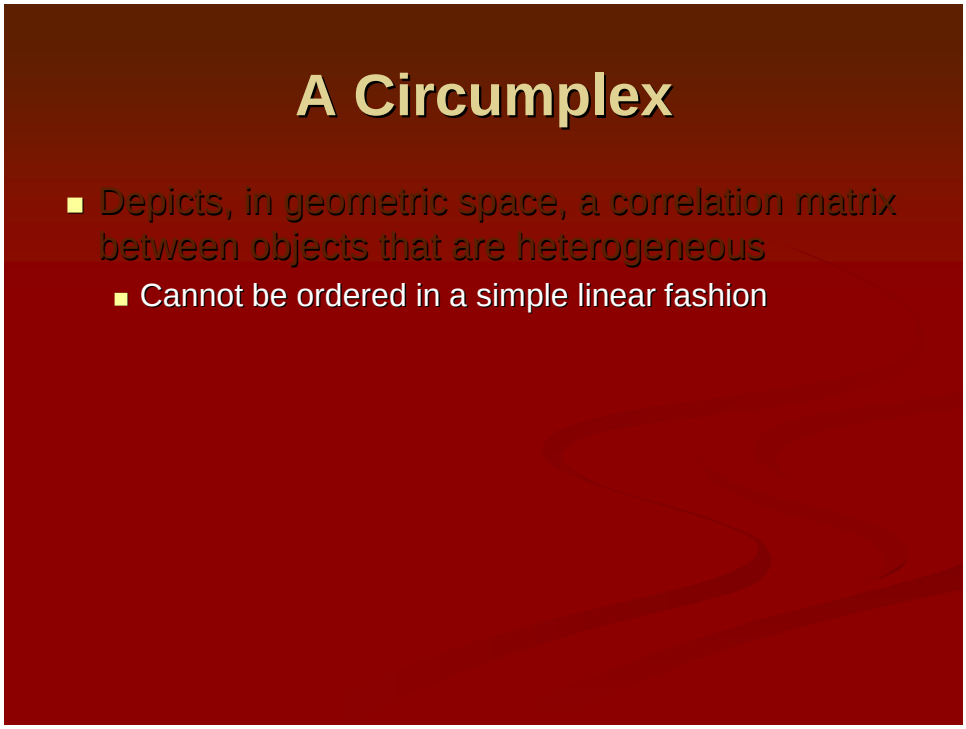
And what we do is essentially compute something we call a p-correlation matrix. A correlation matrix is a statistical description of the relatedness between the set of objects, and in this case the objects are reports of experience.



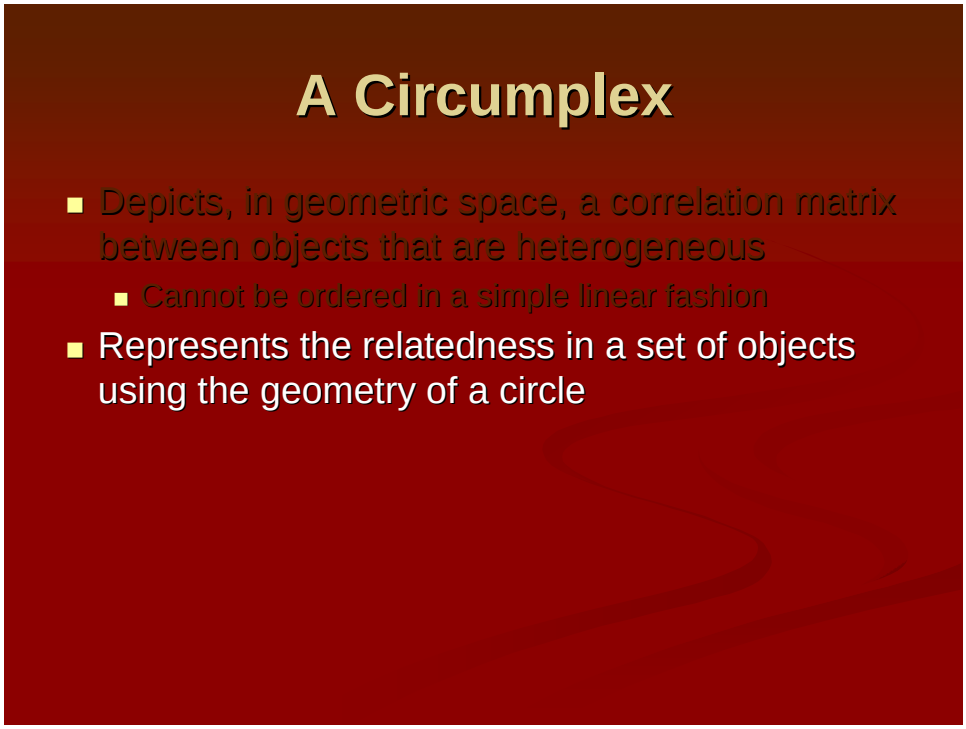
This is a profile of similarity. That is, a similarity in reported experiences. So we would use a profile like this, a profile of similarity, a P-correlation matrix to reveal to the extent to which people are reporting distinct emotional experiences. So how do we test this? Well, what we do is depict the correlation matrix in geometric space. And one of two things can happen when you do this, actually it's a continuum, but it's anchored by two possible solutions. One, is that get this Thurstonian type of simple structure with one factor for each emotion. Or at the end of the continuum you get a circumplex.



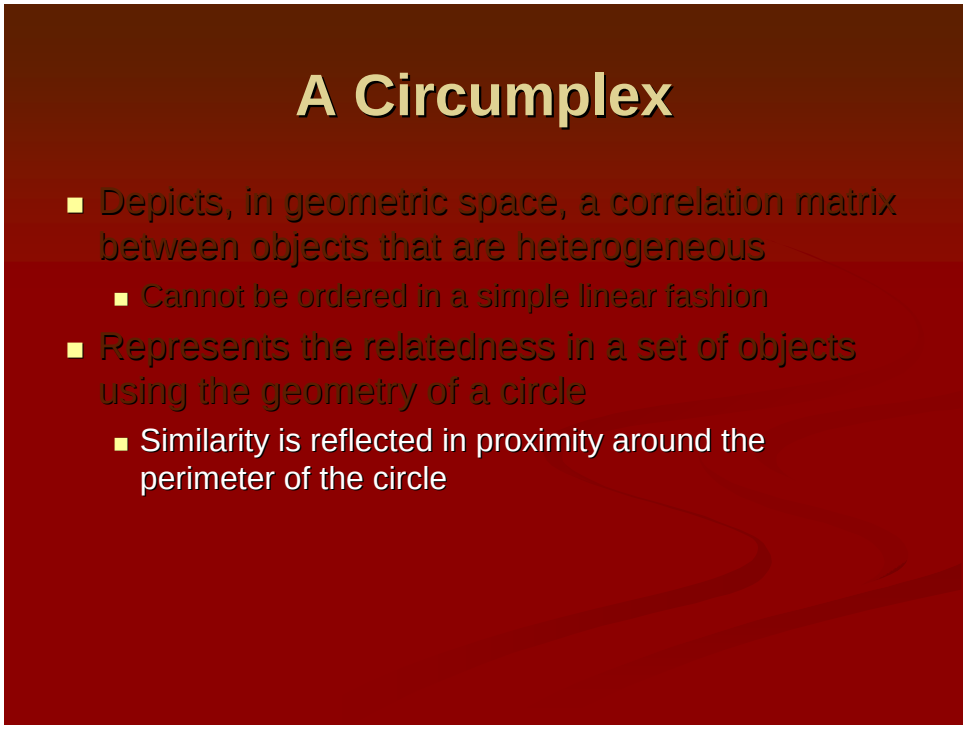
A circumplex, very simply, is a depiction in geometric space of a correlation matrix between objects that are heterogeneous which in classical measurement terms just means they have multiple properties.



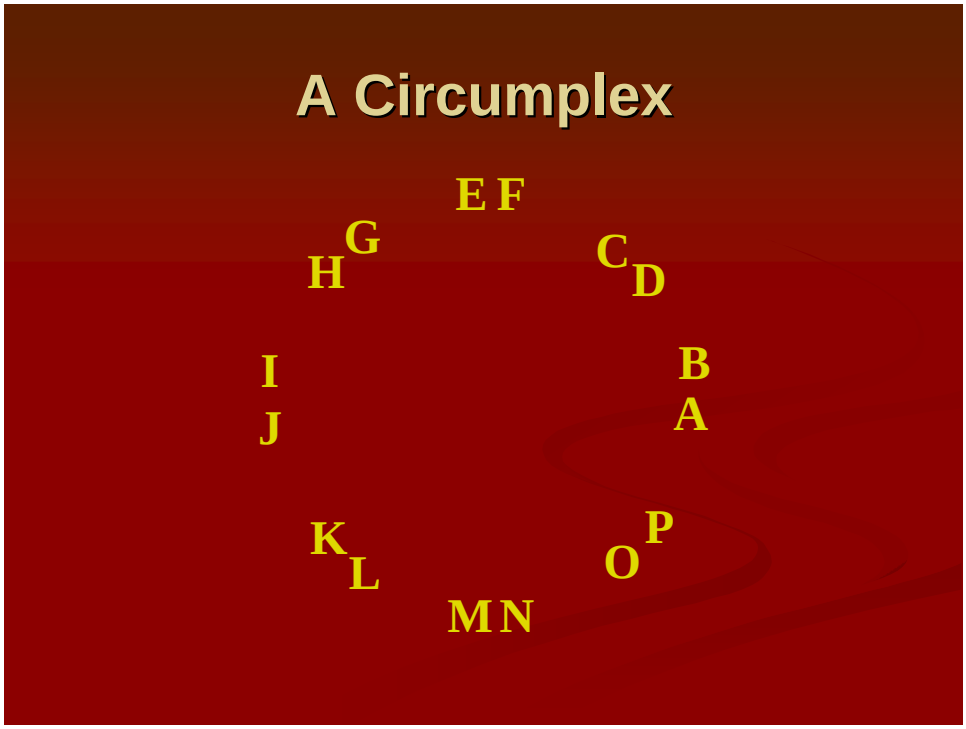
And because objects have multiple properties, they cannot be ordered in a simple linear fashion. To do so would be to miss important information. For example, interpersonal behavior, according to Jerry Wiggins and some others, have two properties, nurture and dominance. Any interpersonal behavior can be categorized or captured or described as having both of those properties. So if you order behaviors, along one dimension, let's say nurturance, you lose information about the other. This idea that items or objects or responses are heterogeneous was Guttman's essential point when he introduced the idea of the circumplex. So measurement theory is founded on the Thurstonian idea that objects or items or responses should be homogeneous meaning each response measures only one thing. And Guttman's observation was that it's rarely the case that anything we measure is only made up of one property, usually things have multiple properties, and so a simple linear ordering won't do.



And relatedness is represented by the geometry of the circle.

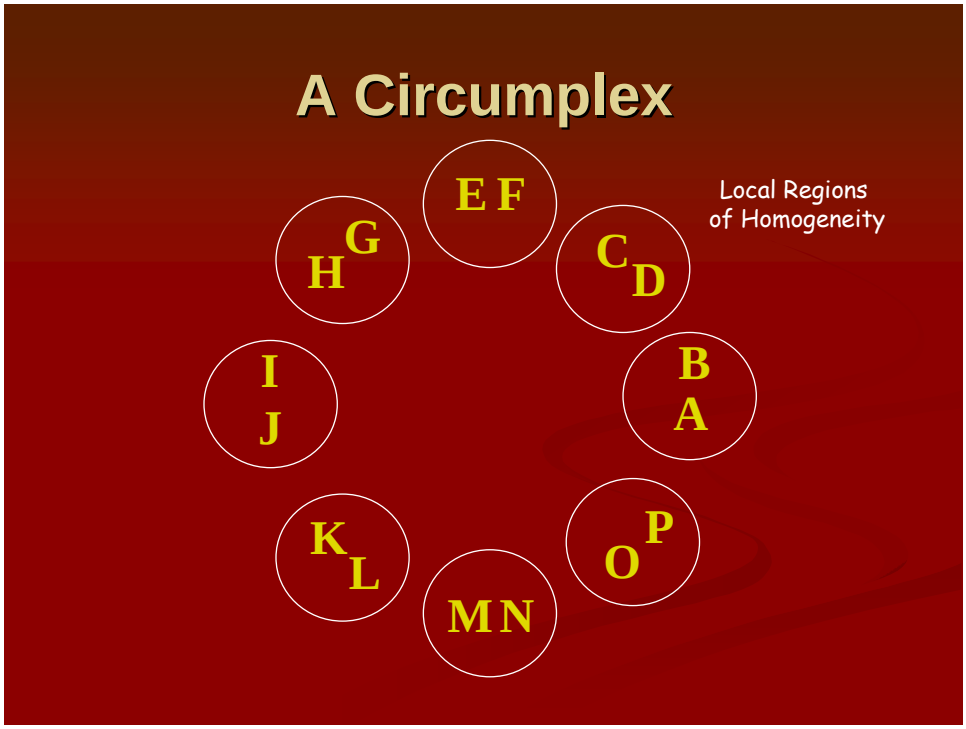


So similarity is reflected in the proximity around the circle.

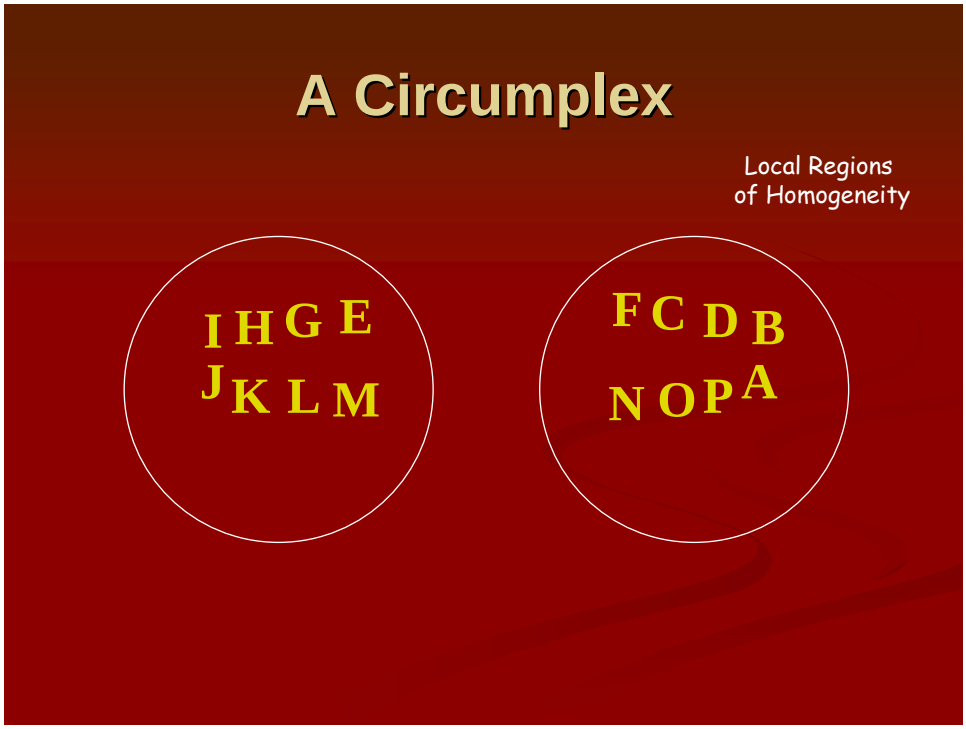


Progress around the circle, and here I'm just giving you a schematic of a circumplex, progress around the circle reflects the qualitative similarity between objects.

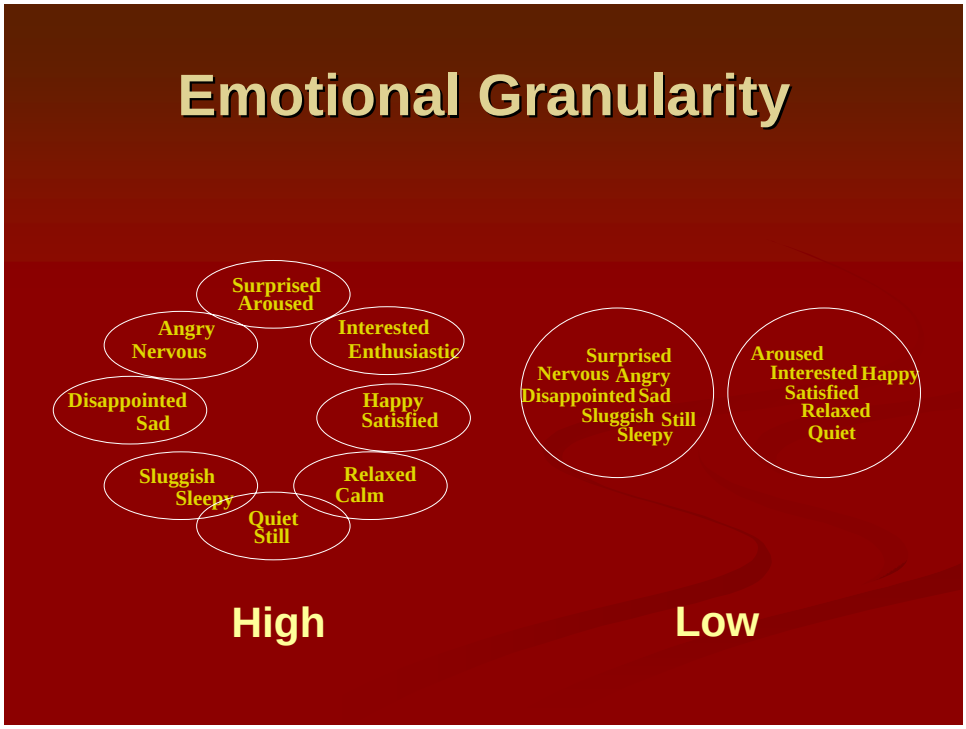
So, as the minimal arc distance increases, similarity decreases, meaning the correlation between the two objects decreases, indicating that the objects are becoming qualitatively different and the neighborhood surrounding each object approximates a local region of homogeneity. So the idea here is that A & B are very similar to each other. And they can be similar because of 2 properties, or 3 properties, or 12 properties, but the idea is that we don't need to think about those properties at least the circumplex is not going to tell us about those properties.



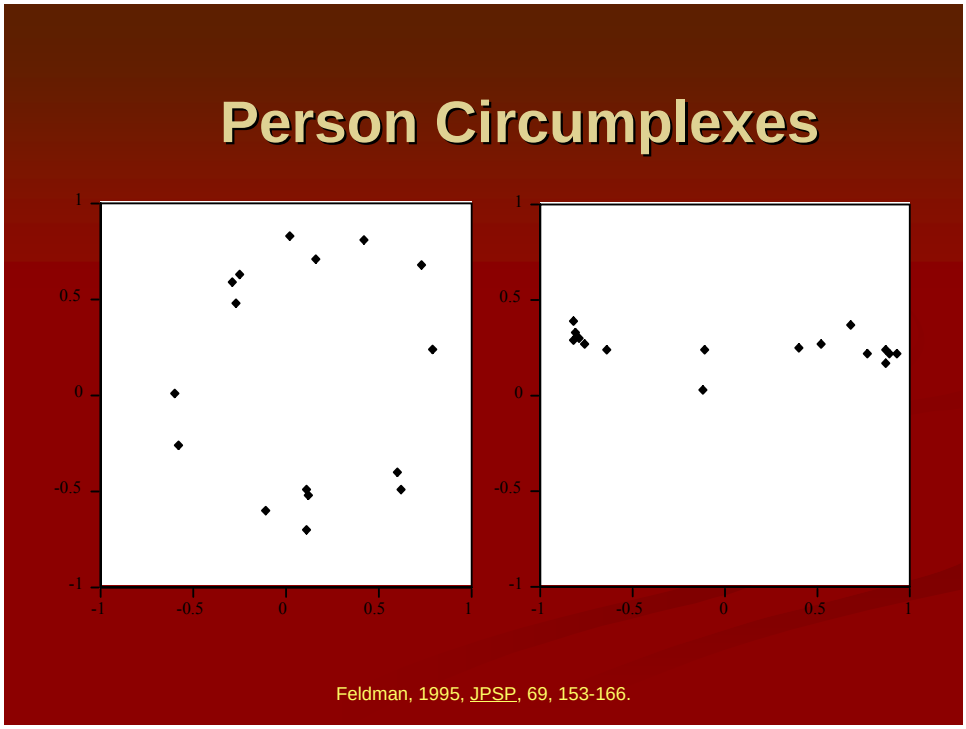
It just tells us how similar things are and not why. Now, a circumplex is defined by formal mathematical criteria that are related to the properties of a correlation function. But the structure, and this was shown in work by Michael Brown at Ohio State University, the structure need not be perfectly circular, and it need not have equally spaced elements around its perimeter.



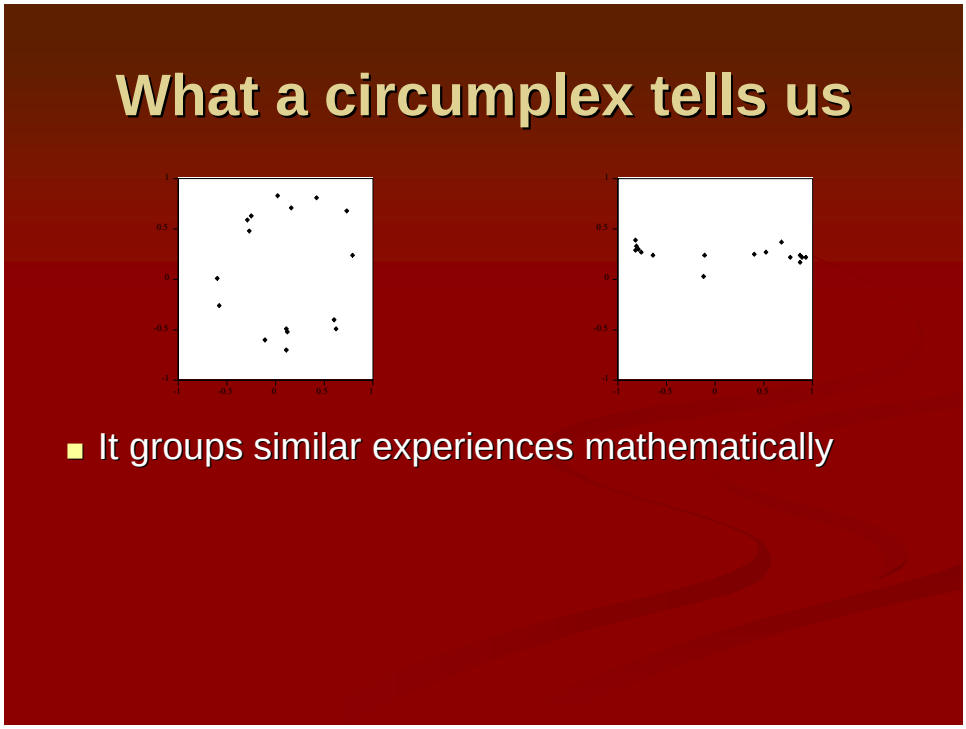
So in fact this schematic also corresponds mathematically to the correlation function that produces the circumplex. But notice that here we have two big regions of homogeneity, whereas in the previous example there were eight. In which I pulled those out of a hat. If emotional experiences are multi-dimensional then the same logic should hold, so if we take a P-correlation matrix for an individual and we render it in geometric space the resulting structure might look something like this.



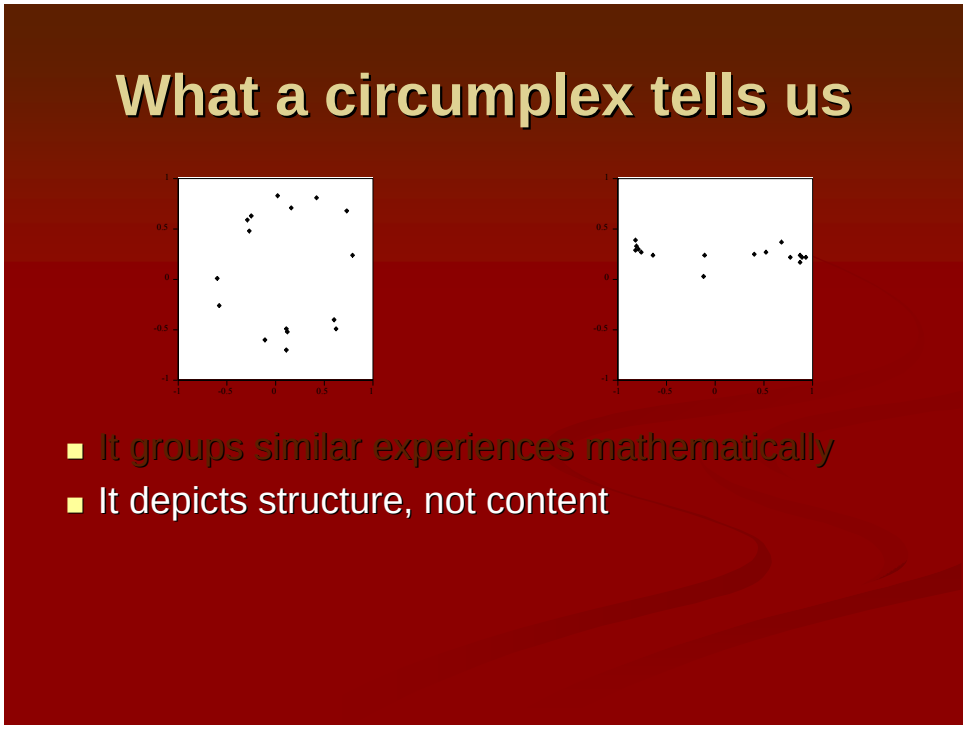
We call this high emotional granularity because as the person is using adjectives to describe their feelings over time, they are reporting many little regions of homogeneity. Similarity, it might be possible that we would see a structure like this person on the right, who is using the same adjectives but using them in a really different way. So, they are actually reporting two regions of homogeneity. So these are data from one of my earlier studies, this is what we see.



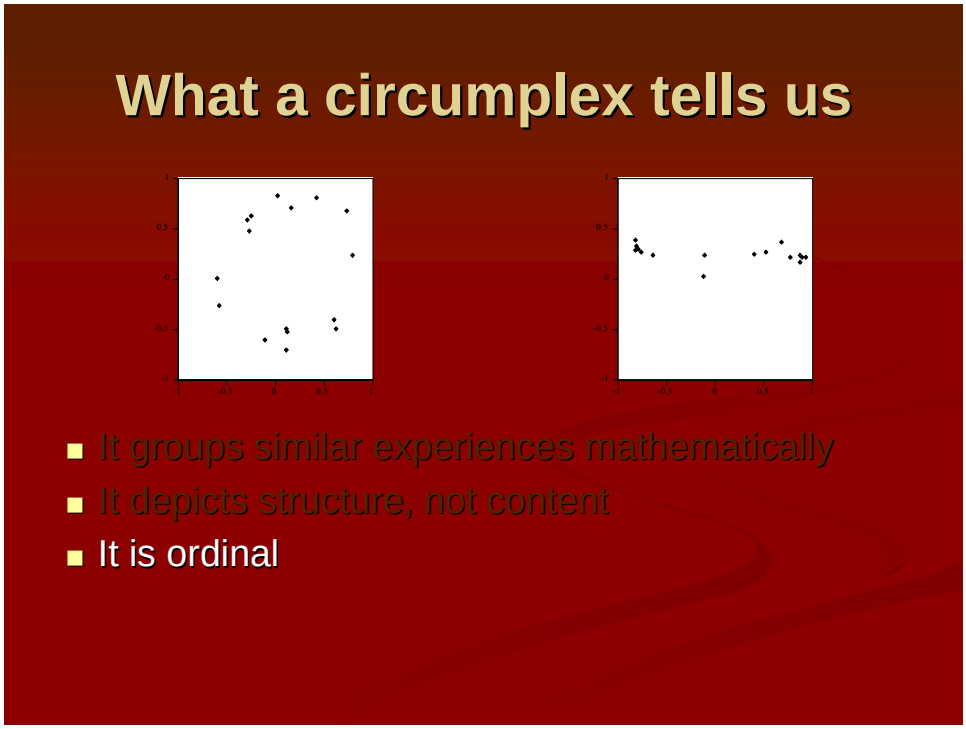
These are real data; these people essentially anchor two ends of the dimension of granularity. So these people differ a lot in their relatedness or distinctiveness in their reports of emotional experience. So the person on the left is making very differentiated reports of emotional experience and using labels like happy, and sad and angry, in a way that captures their distinctiveness. Person two on the right, however, is using the same terms but in a more global way. Now lest you think that this is just the property of words, I think Carlie said words were epiphenomenal markers. What I can tell you is that the structure predicts external correlates that are important, for example, related to emotional intelligence. So, which person would you think was more emotionally intelligent the one on the left or the one on the right? Yeah, the one on the left. And it turns out, I will give you just one example, when we look at not just self reports, that is global self reports, or retrospective reports of coping, but if we actually do experienced sampling and examine the emotion regulation strategies people report using over a two week period, people like the person on the left have a broader array of regulation and coping strategies available to them and use them more flexibly than people like the person on the right.



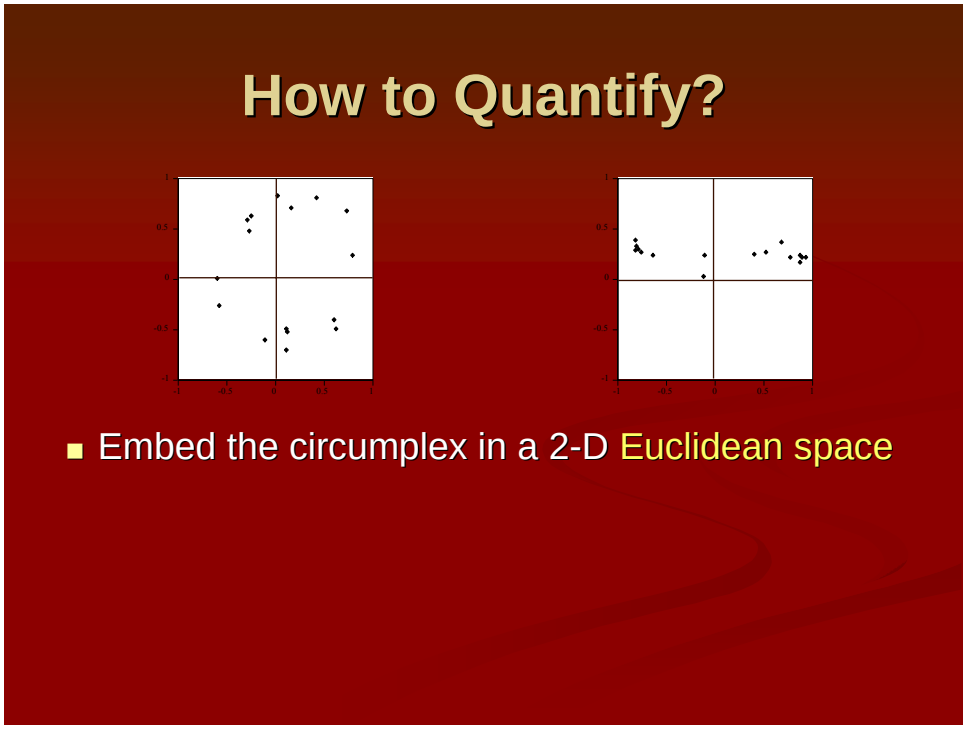
Now the circumplex is a mathematical formulism for grouping together sets of similar experiences because they share multiple properties. And that is all it is.



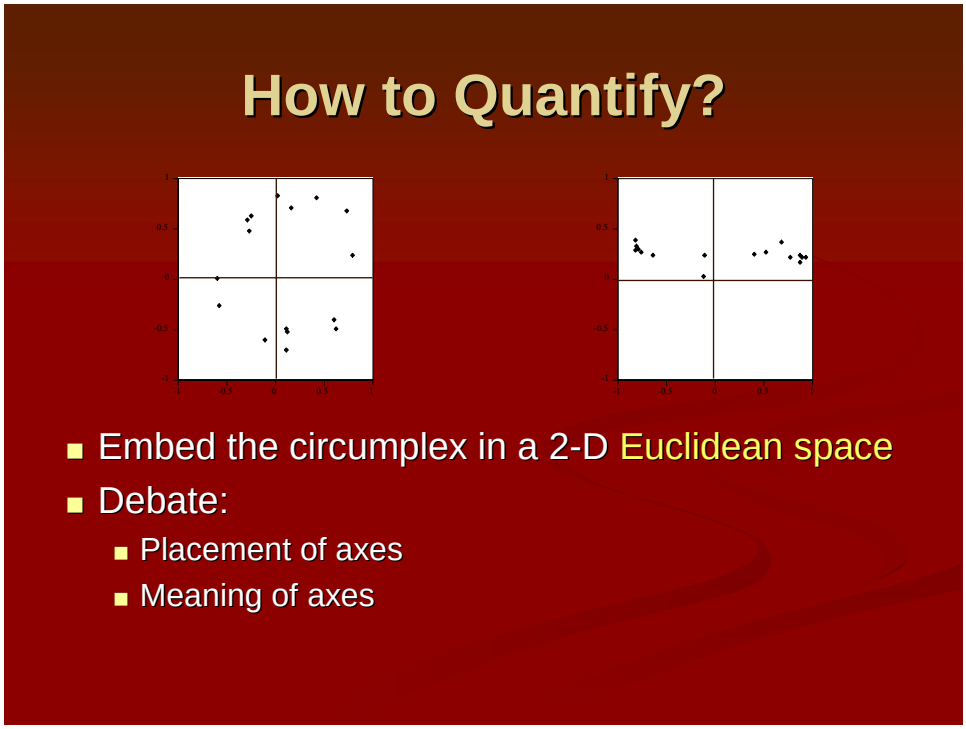
It doesn't tell us anything about what those properties are, it doesn't tell us anything about the groupings that the subject has, it just tells are the reports homogeneous or heterogeneous? Do they share only one property or multiple properties?



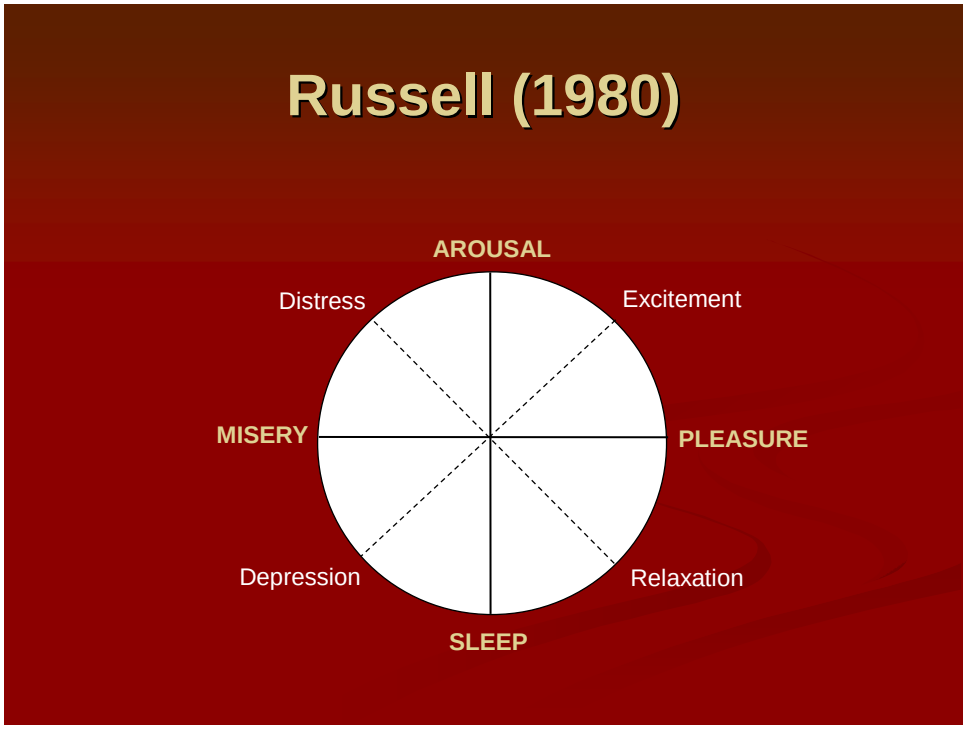
As Guttman conceived it the circumplex is as ordinal structuring of similarity, meaning that from an ordinal standpoint these two structures are actually identical. But from a quantitative standpoint, they're not. Because we know that the person on the left is really doing something different in reporting experience than the person on the right. So how is it that we characterize these differences?



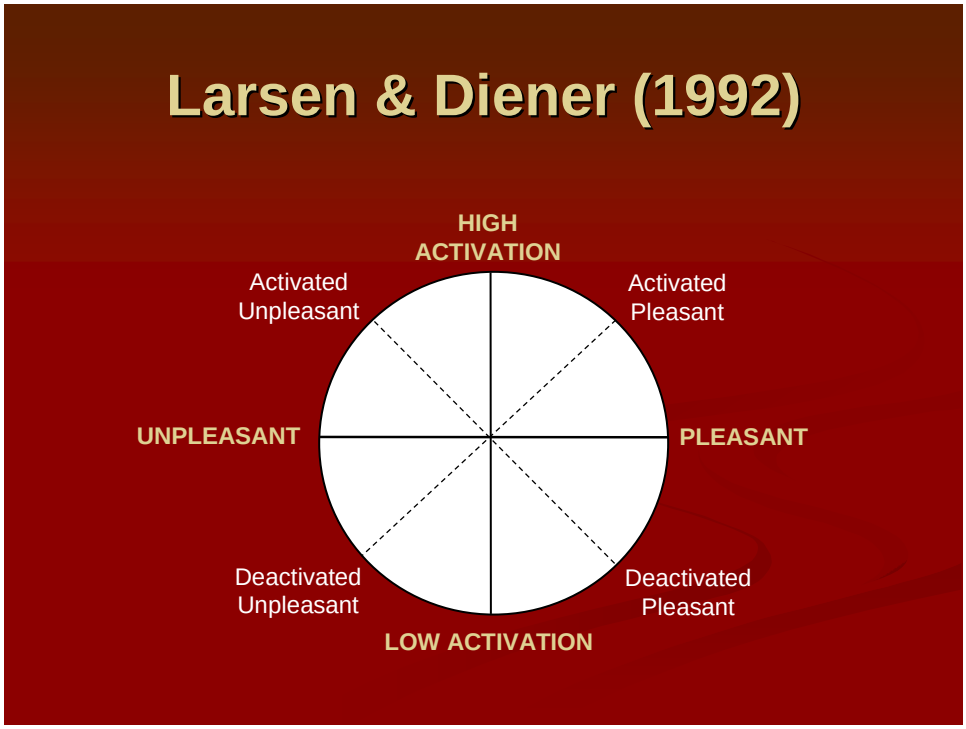
And it was Shepard's idea to embed the circumplex in a Euclidian space of two dimensions. Now this is the point of debate for most structural research on affect.



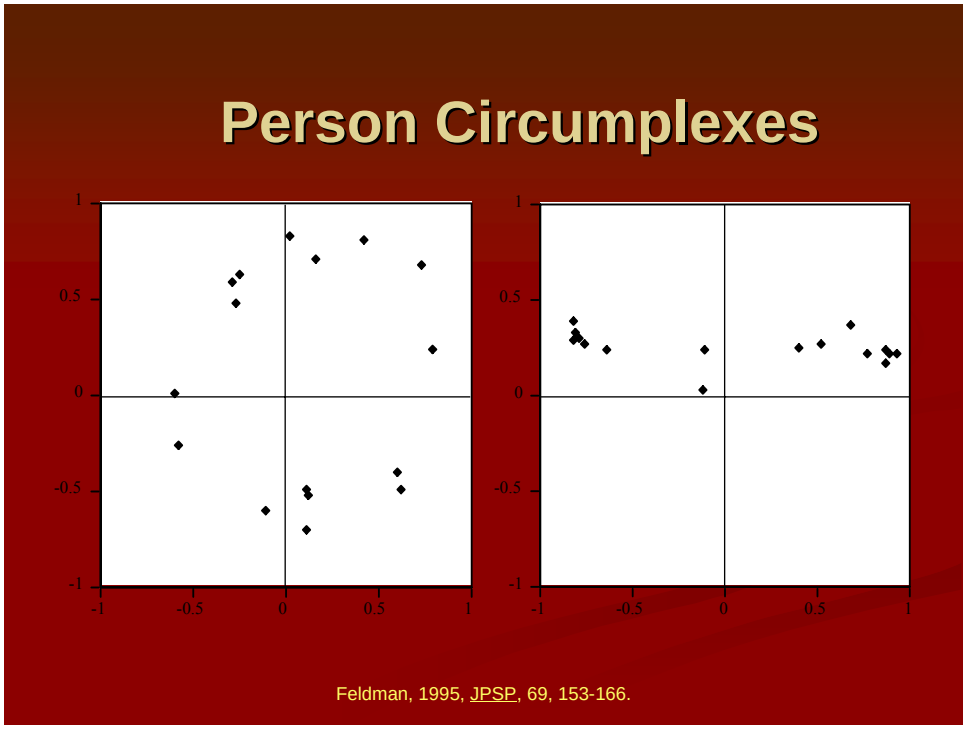
Pretty much everyone agrees that the heterogeneous structure is there but there's considerable disagreement about where to place the axes and what they mean. Here is a brief overview.



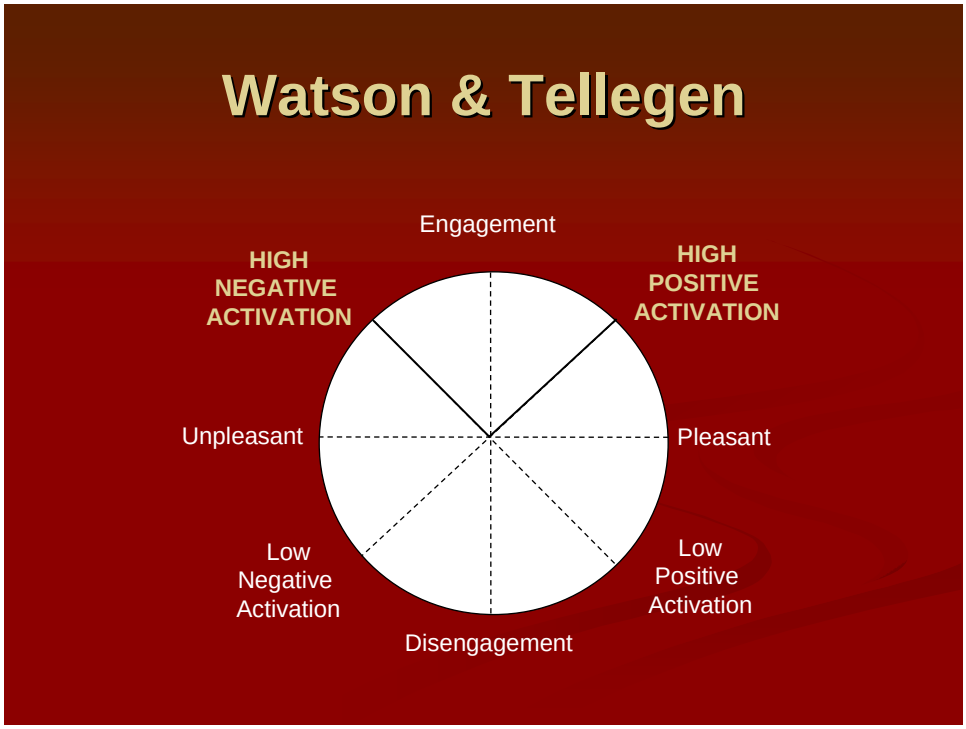
So in 1980 Jim Russell essentially combined a circumplex analysis with the dimensional analysis that was around since the time of Wundt. And he focused on two dimensions, the horizontal axis is pleasure, displeasure or valence and the vertical axis arousal, what he meant by arousal was not actual physiological arousal, but feelings of activation or deactivation.



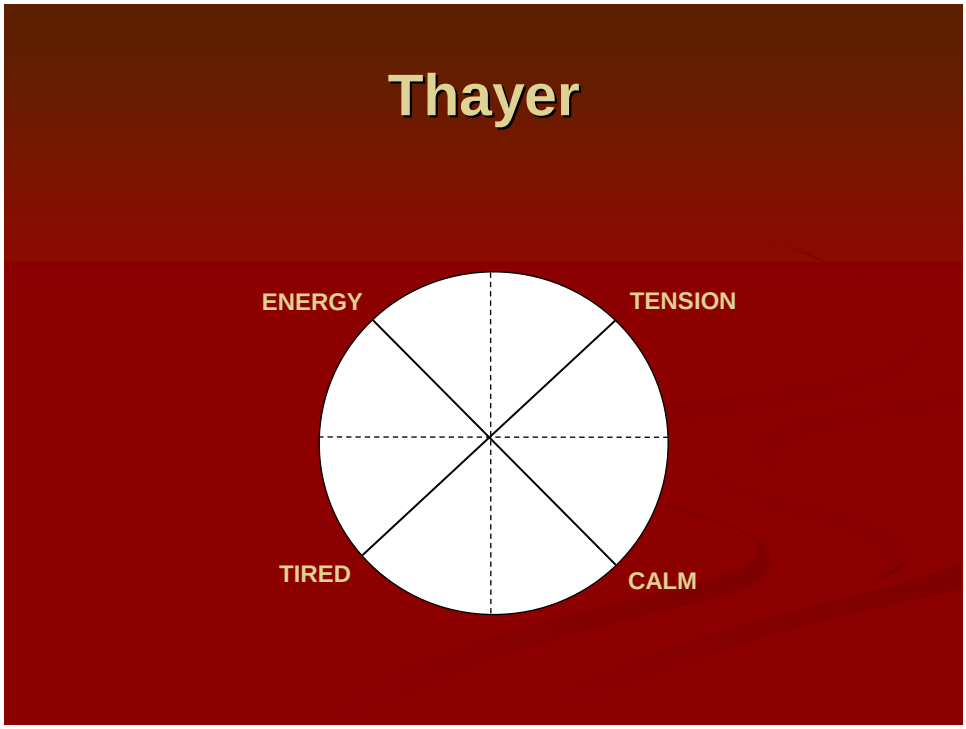
And in fact, Larsen and Diener used these same dimensions in 1992 but just renamed them and actually if you look at circumplexes that are acquired in this experience sampling fashion, it turns out that valence and arousal dimensions quantify nicely the differences in relatedness that we observed earlier and these are not just a property of language.



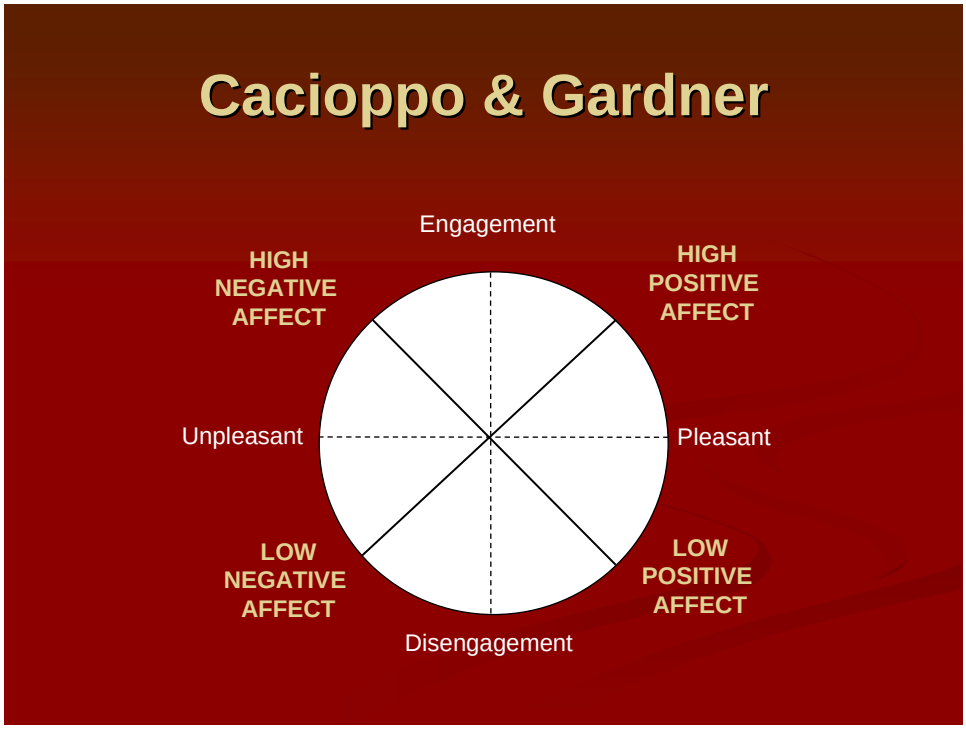
So it turns out that people who emphasize like on the right the person on the right is emphasizing valenced properties of their experience more than the person on the left. The person on the left is emphasizing felt activation in their experience more than the person on the right. And it turns out that the extent to which people emphasize these properties also have predictable external correlates. So the more someone emphasizes the hedonics of their experience the bigger their valence dimension the more sensitive they are to valenced information in their environment. Similarly, someone who emphasizes activation or deactivation more in their reports are actually more inter-receptively sensitive to their heartbeats. We replicated that finding across several studies.



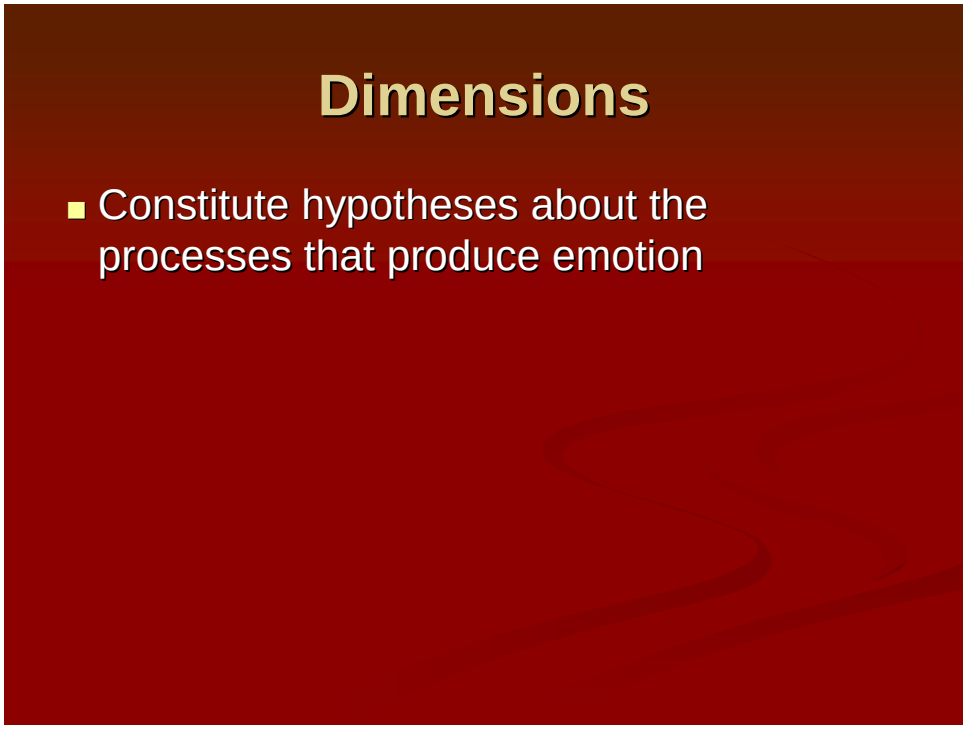
Now this is not the only rendering of the circumplex space quantitatively, so in 1985 Watson and Tellegen rotated the axes and actually they only used the upper half of the space. Originally they called their constructs positive affect and negative affect, but this led to great confusion in the literature so in 1999 they revised those labels.



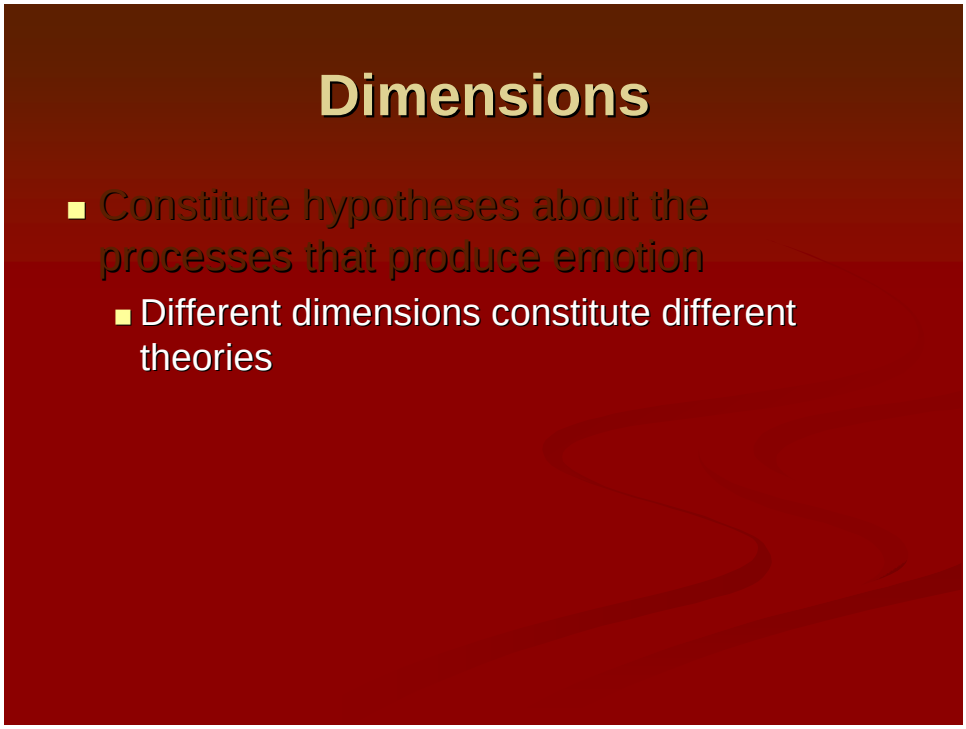
Bob Thayer has used the same axes, although he uses the whole axes; he gave them different names.



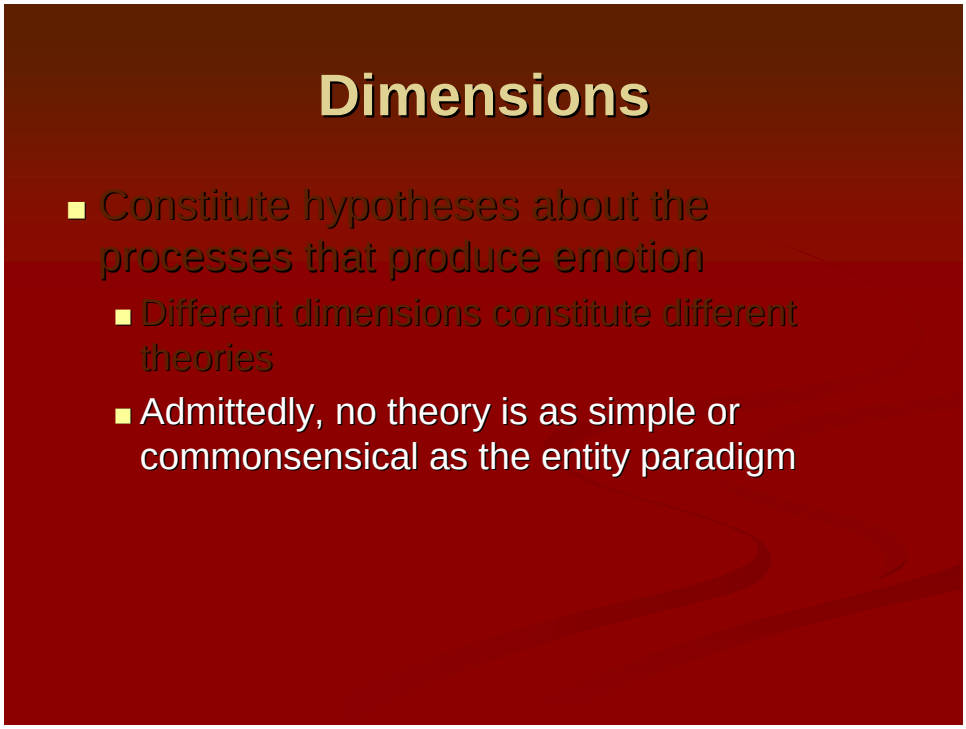
Most recently Cacioppo and Gardner anchored the circumplex in much the same way but gave them different labels. Now, I don't really have enough time to go over all the nitty gritty about what the labels are and what they mean but essentially the labels define the axes as psychological dimensions.



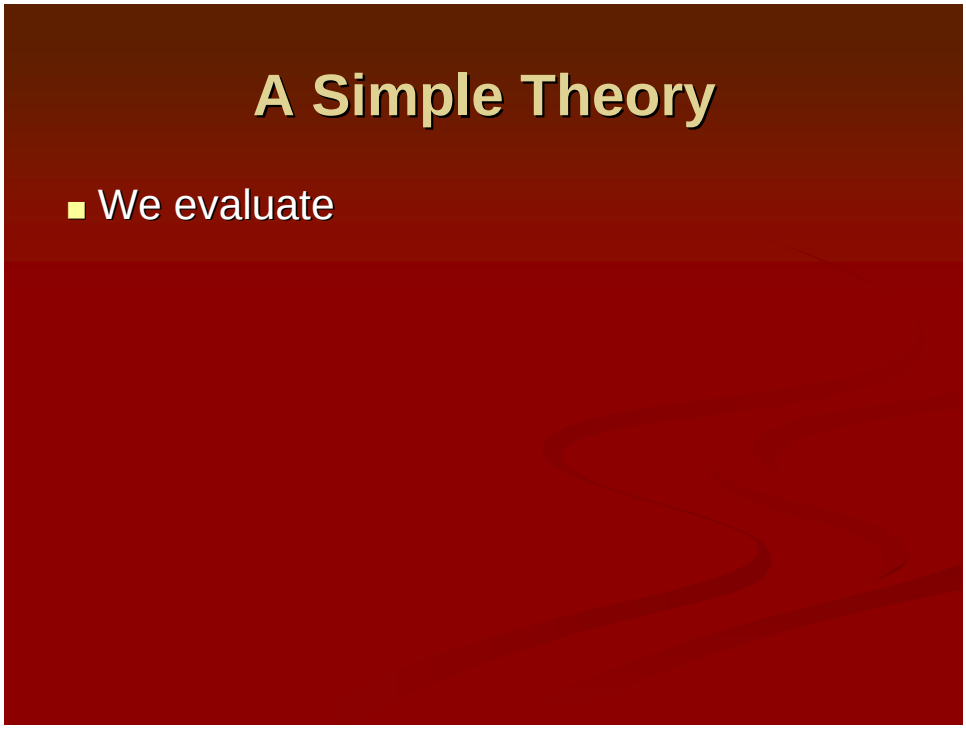
And so each rendering or each set of dimensions constitutes hypotheses about the processes that produce emotion.



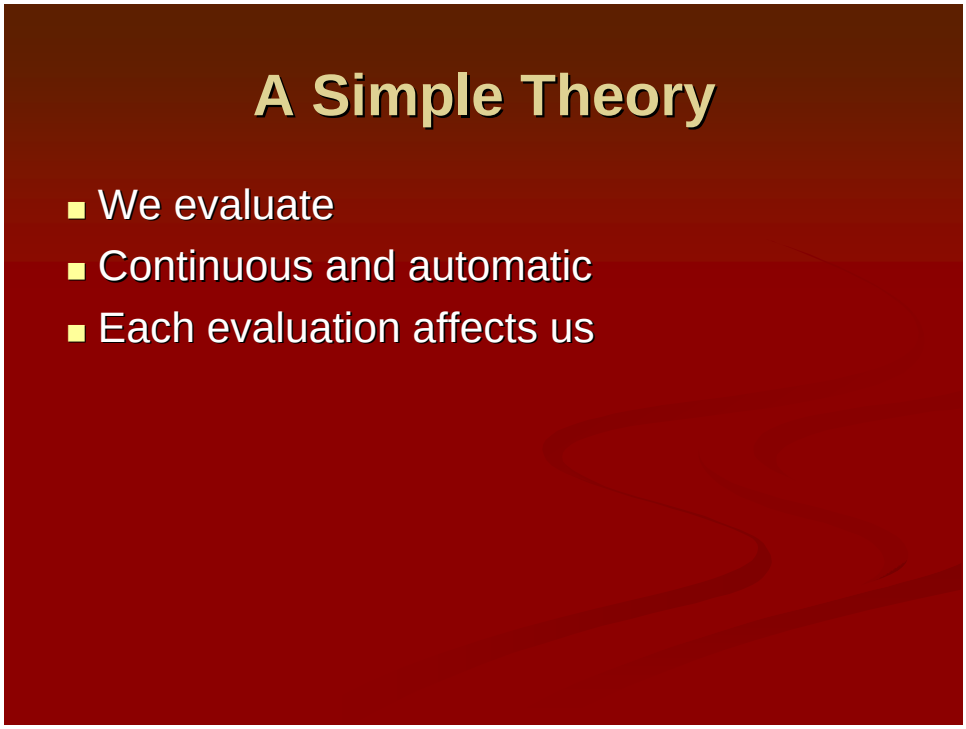
Different dimensions constitute different theories.



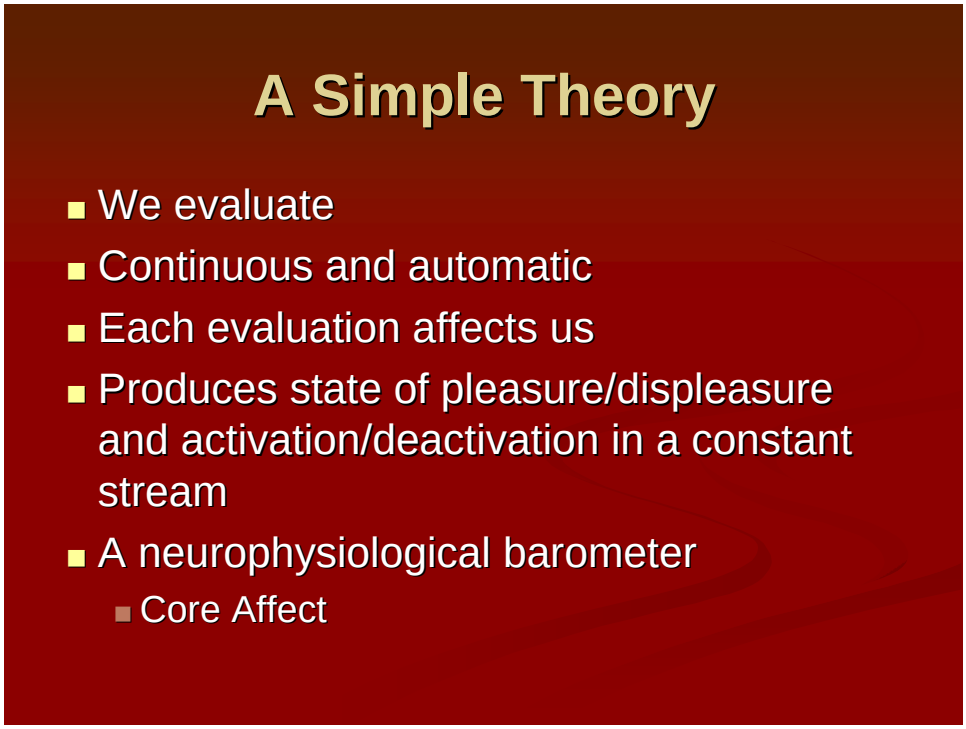
Now admittedly, no theory is as simple or commonsensical as the entity paradigm. But it should be possible for these dimensional models, the structure of affect, to help us understand why it is the case that we see categories of emotion in ourselves and in other people. And so for the rest of the time, I'm going to present to you admittedly speculative but somewhat simple theory of how I think we can derive categories of emotion in ourselves and others from these two parts of the structure of the affect meaning the circle and the axes.



The first idea is just really simple, we evaluate. We know this from appraisal theories of emotion, we know this from the animal literature and animal learning, we know this from social psychology, studies of automatic evaluation. As we walk through the world we are constantly exposed to countless stimuli that we evaluate. We know that organism's judge, represent, and respond to the value of objects in their world where value is simply defined by whether a stimulus will help you or hurt you.

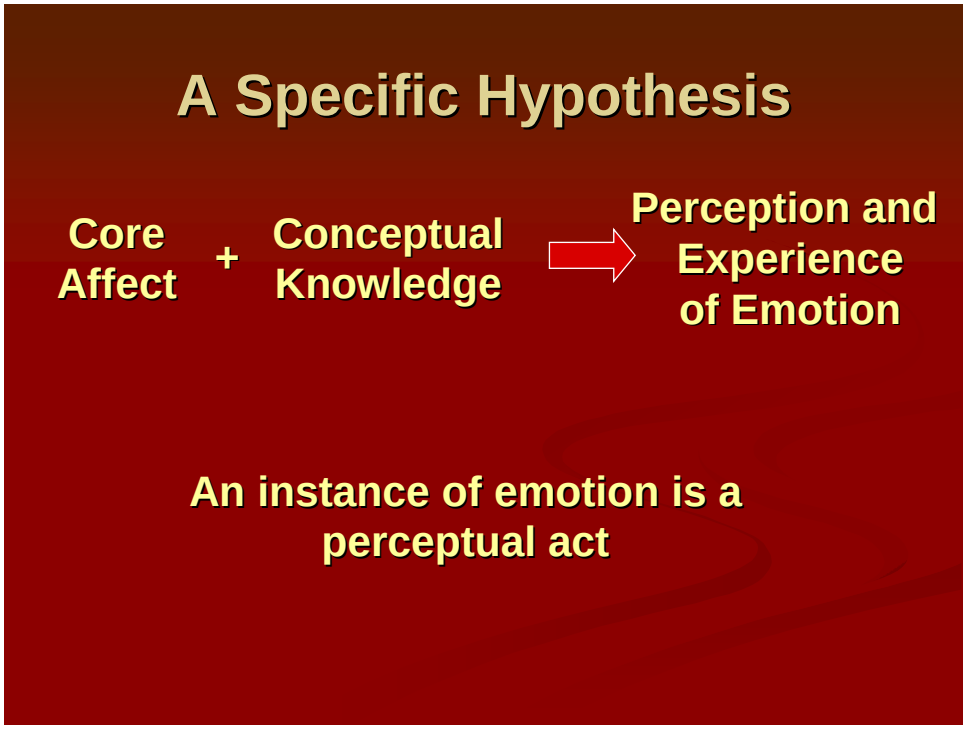


We know from the work of John Bargh and others that evaluation is continuous and automatic. We are doing it all the time, it is not something we can help. And each evaluation affects us. Each evaluation has autonomic hormonal and attentional effects and produces behaviors for others to see. So some responses may be innate like freezing, and others may be acquired but become routinized like making particular configurations of facial muscle movements so that they're perceived as expression. We also know something about the neurobiology of this evaluation, so it is related to the link between the basolateral complex and the central nucleus of the amygdala and may also involve orbitofrontal cortex.

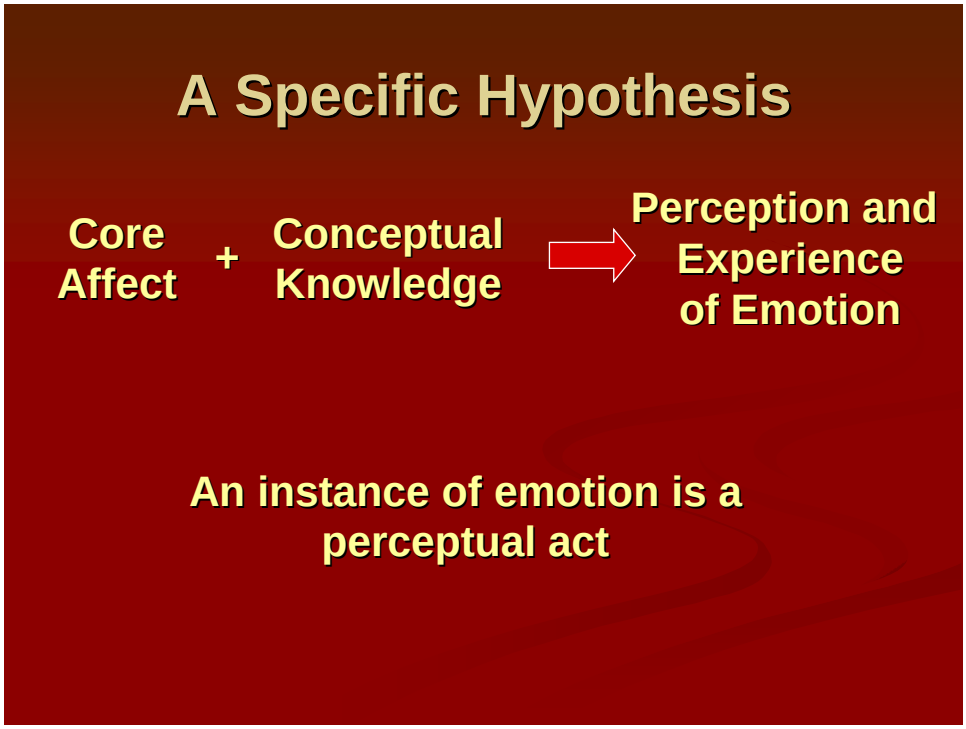


Each evaluation produces an affective state that is simultaneously characterized by two properties, pleasure/displeasure or valence and activation/deactivation or arousal. These properties are primitive meaning they are irreducible on mental plan and that they're universal. The extent to which a state is characterized by one or the other properties varies within a person over time or across people as I showed you earlier, and also across cultures. There's really interesting new work by Batja Mesquita on that point. Each evaluation produces some level of reaction because there are multiple stimuli around that you are evaluating the sum of those will have an affect on your current neurophysiological state. So the sum of these evaluations is like a barometer of the individual's relationship with his or her environment on a particular point in time and we call this barometer core affect. Core affect is like an accounting of how events and objects influence the state of an organism at a given moment in time. And self reports or physiological responses or measurements of people's instrumental behavior are like barometer readings and if you analyze these barometer readings they render evidence of the barometer that is the axes that I showed you earlier.

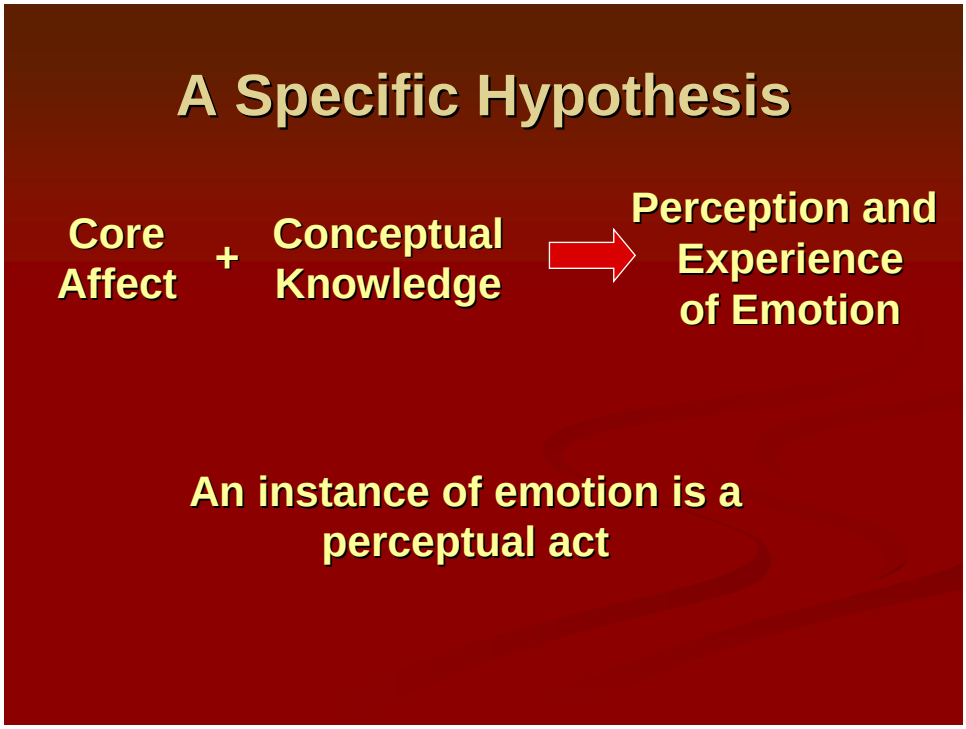
Now how does core affect translate into individual emotions that we perceive and that we feel? And my suggestion to you today is that through the categorical knowledge about emotion.



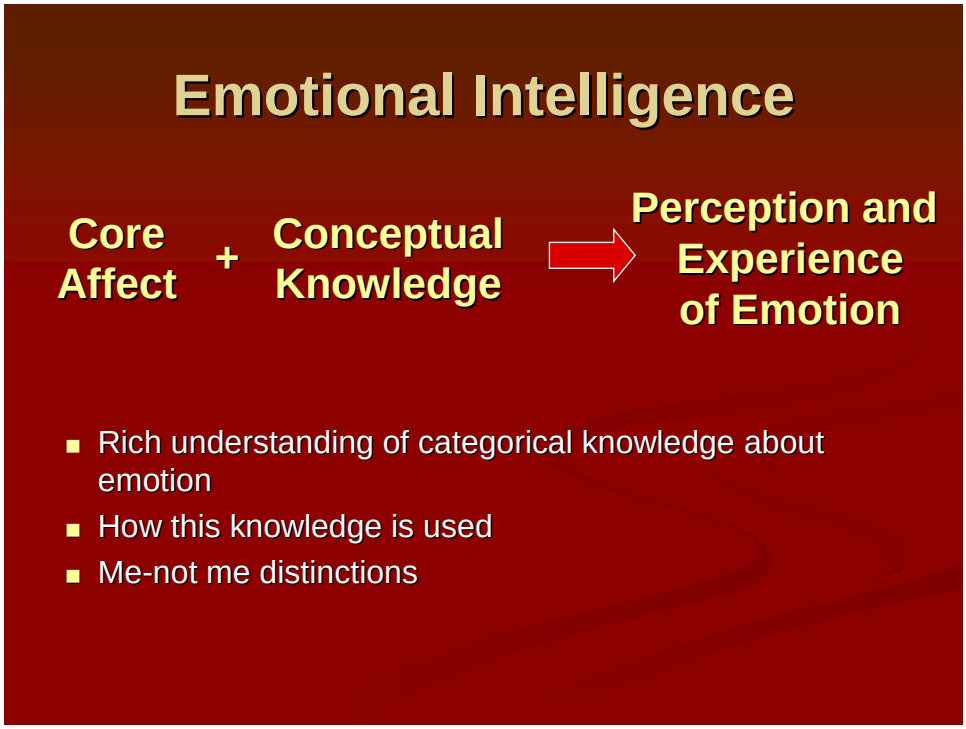
So, the basic premise here is that things that we recognize as a discrete emotion begin with a perception of core affect in ourselves or in the behaviors of other people. And that core affect is perceived through the lens of emotion knowledge to produce the perception or experience of emotion, so that an instance of emotion is a perceptual act. Now to some people I think this will sound like a pretty off the wall thing to say, but actually this idea is not new and it's not so far out. We know that conceptual knowledge in categorical knowledge influence perception all the time. It influences our perception of physical objects, of phenomenal contents like color, and even of people. So the idea here is that what's basic about basic emotions is not that they have some kind of biological essence but rather that they are basic at a conceptual level. They help us organize what we see and our own experience. And there is really good evidence from the person perception literature and social psychology that we observe other peoples behavior and understand that behavior in terms of categorical knowledge about persons.



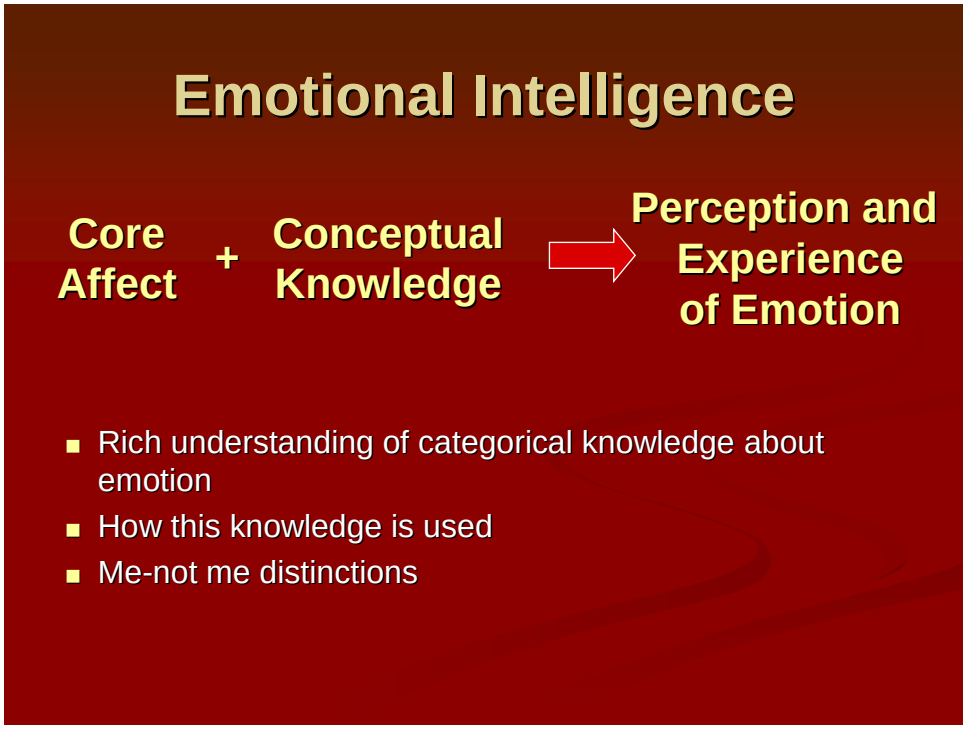
So the basic idea behind the person perception literature is that people are constantly moving and doing things. They are constantly engaged in a stream of action. And we partition this constant movement into discrete meaningful acts. Smiling, stealing, stomping - this is called behavioral identification -- where a stream of behavior that we observe is chunked into a behavioral act. And we isolate and organize even evidence of emotional behaviors or affective what I would call affective behaviors in this way. So Bob is moving his feet heavily as he walks, we recognize this as the behavioral act of stomping, Bob moves his facial muscles in a particular configuration, we recognize that as an emotional expression. There is a lot of evidence to show that categorical knowledge about persons, whether you are a man or a woman, whether you belong to this racial category or that racial category, influences not only the attributions we make about why people do what they do, but actually what we see them do. The actual behavioral identification is influenced by categories of knowledge that we have about people and it influences our perceptions in this way in an automatic fashion. Meaning they come on-line to shape our perceptions of others before we even know it is happening.



So what I'm suggesting today that is a plausible possibility, is that just as behavioral identification is shaped by categorical knowledge about persons, emotion identification may be shaped by categorical knowledge about emotion, both in ourselves and in perceptions in ourselves also in other people. So knowledge about emotion categories may act like emotion stereotypes to shape the perception of emotion. Just like stereotypes about people shape our perceptions about what they do and what it means. And so what would this mean for a theory of emotional intelligence? Well, first of all and I'm just going to give you some very brief examples of what this might mean. Not necessarily asserting in any strong way that these are the only things it might mean but rather, how should we think about emotional intelligence if emotions are emergent properties or outcomes that we perceive and really that the biological given is affect. First of all, branch 3 of emotional intelligence has more importance than we ever thought before which is that more emotionally intelligent people have a rich understanding of categorical knowledge about emotion. So they understand not just the scripts that all we learn as kids, but actually they have a very ideographically infused detailed understanding of emotion and how it's supposed to work situated by context.



And that emotional intelligence would also be associated with how people use this knowledge. So rather than saying that a marker of emotional intelligence is a perception of ourselves and others we can talk about how people manage emotion knowledge in the perceptual process. That's pretty much what social psychologists talk about when they talk about behavioral identification. They talk about how people manage categorical knowledge about persons in the perceptual process so I would suggest something very similar. For example, we know that there are great individual differences in working memory capacity. Some people can suppress the activation of automatically activated stereotypes and other types of conceptual knowledge; they have the capacity to do that more so than other people do. It's not just the ability to perceive emotions in others, it's also how you go about doing it and the extent of control that you have over doing it and also the ability to make me-not me distinctions. In social psychology it's fairly well known that we have a sense of naïve realism about the world. We believe that what we perceive is actually the way things are. So we believe that because we see categories of emotion in other people and because we experience them ourselves that that must be true, that there must be biologically instantiated in our brains.



But it's also possible that we can make a distinction between what we see and what's really there. For example, just because a baby cries and it gives me a negative feeling, I have core affect that moves towards the negative end of the space doesn't necessarily mean that baby is bad or that baby is deliberately trying to manipulate me or so on and so forth. And there is really nice evidence from the work from Daphne Bugental who shows that parents who are at risk of abusing their kids are not able to make this me-not me distinction. They use the properties of their experience to tell them or they infer something about the stimulus, which is the child, based on their affect response to that child and they are not able to make that distinction. And finally, I would suggest that we should think a little bit more about what it means to regulate core affect and not necessarily regulating emotions. Because emotions in my way of thinking are the outcome of a set of psychological processes, one of which is core affect. So that would really be the thing to be regulated. Thank you.

DISCUSSION

DR. STRICKLAND: Questions?

PARTICIPANT: You talk about stereotypes and evidence suggesting that there may be tired or dizzy types, and so forth. Can you map that on to your model?

DR. FELDMAN BARRETT: What I presented to you are my ideas for the next 5 or 10 years. The analogy that you are making is exactly right. The idea would be, we categorize, that's what we do, that's how we see the world. And we do it automatically and it's pretty efficient. So the question would be, when it's not so efficient can you correct for it, can you suppress the activation of one category and actually deliberately or with controlled processing call up another one that maybe matches the situation better and will that change how you make perceptions of other peoples emotions, or even your own, will that change under cognitive load, when you're absorbing the ability to engage processing. That's exactly the kind of question that we are going to be looking at over the next five years or so, but that's exactly right.

DR. EKMAN: As you might expect, as a basic emotions researcher, the first part of your talk I would disagree with, let me just give you one example. I don't know anyone who works in study of emotion, in terms of category, who would ever call it an inherited reflex, that's your term; I think it's sort of a parody. I published an article in 1980 on the 'startle' as an example of what an emotion is not, because it is a reflex. So, I don't think anybody, at least no one I know, or anyone I read, thinks of them as inherited reflexes. I do think these valence and activity clearly are attributes of emotional experience, there's no disagreement. It's just whether any category of emotion has a fixed location. Anger can be very unpleasant, but it can be very pleasant too, there are many people who enjoy anger. I think these attributions are a good way of differentiating particular instances in which an emotional experience occurs. So, there is a big difference between enjoyable anger and very toxic, unpleasant anger. In terms of the last part of your talk, I really thought that was quite interesting, at least in your first PowerPoint's on that, I would agree with every point on there, that evaluation is automatic and it affects us and it produces experiences that we value that have valence in activity. So, no argument, I think the final resolution, if there ever really is one, is going to be one of one form or another as you're trying to do, where we use both consideration of dimensions and categories. It's not an either-or matter, so I'm glad to see that you're not treating it as either-or.

DR. FELDMAN BARRETT: No, I'm really not. I will just respond to a couple of things he said. As I said, what I presented was a schematic. We could debate over whether or not categorical researchers, as you might want to call them, might say that. You may not say that but Panksepp says that I can quote you where he says it. And he's not the only one, so fair enough, so let's just take that off the table, so I stand corrected. I would say a couple of other things. First of all, it's true sometimes anger can feel great and other times it can feel terrible. But the dimension of valence isn't a dimension of connotation, it's a dimension of denotation and actually they are empirically separable things. I'm always kind of hesitant to cite Osgood in this case. Everyone cites Osgood as an example of a dimensional theorist. But you know Osgood actually meant connotation, he didn't mean definitions of concepts, he meant actually the connotation, in an evaluative way. Evaluation can mean two things, did it feel good or bad, does it look good or bad and evaluatively, in some kind of social desirability way, is it good or bad? And I don't think that the dimensions at least the way I use it are really talking about denotation they're talking about the definition of something, is feeling good or bad or making an imputation about whether somebody else is feeling good or bad, it's not whether this is a good feeling to have right now in this kind of secondary evaluative way. And third what I would say, is that I'm not trying to say either this or that.

DR. FELDMAN BARRETT (CONT'D): Look, when I talk to my mother about how I'm feeling, on those very few occasions when I talk to my mother about how I'm feeling, I use words like I'm angry or I'm elated, I use words like that and when I talk about my husband or my child I use words like that too. I don't think those words are epiphenomenal I think there is something basic about them. The question is whether it's biologically basic or basic in a conceptual sense. I'm not trying to say there is no evidence, I'm just saying there's not as much evidence as you might think or that many people just assume that there is biological evidence. And at least for my way of thinking it's equivocal and it's equivocal after a hundred years of looking. So I think that it might do us well to take the data seriously and think about other ways we might approach this problem, and let's take our lead from other literatures like memory or the study of persons and see what we can learn from them, but we just might disagree on that.

DR. LANE: I enjoyed the talk very much. I was wondering if you could say a little more about core affect. In particular, to what extent is it conscious or not conscious and how does it relate to other concepts like background feelings or mood?

DR. FELDMAN BARRETT: When Jim Russell and I wrote the original paper on core affect in 1999 and he published a more elaborated analysis of it, the idea is that it is very clear that evaluations have an affect on our bodies and our actions. So core affect is defined as that kind of a state, the same way that temperature is a state. Let me give you an example of temperature and see if that helps. So, I'm feeling some kind of body temperature all the time, but I'm not necessarily aware of it. And my feeling of my temperature will actually cause me to do things without my awareness, I could take my sweater off, if I'm feeling warm, I could open a window and I may be completely unaware of having done so. There is some kind of experiential state which I may or not be attending to, so it certainly causing me to act. Now, if there's a dramatic change, lets' say in the ambient temperature around me, or if somebody says to me, gee you're looking flushed, that might cue me to pay attention to my temperature and represent it in some kind of way that I'm aware of. And then I might act on it. So the answer to your question is, core affect causes feelings, but you're not necessarily walking around being conscious of those feelings all the time, it's not a requirement. Does that answer your question?

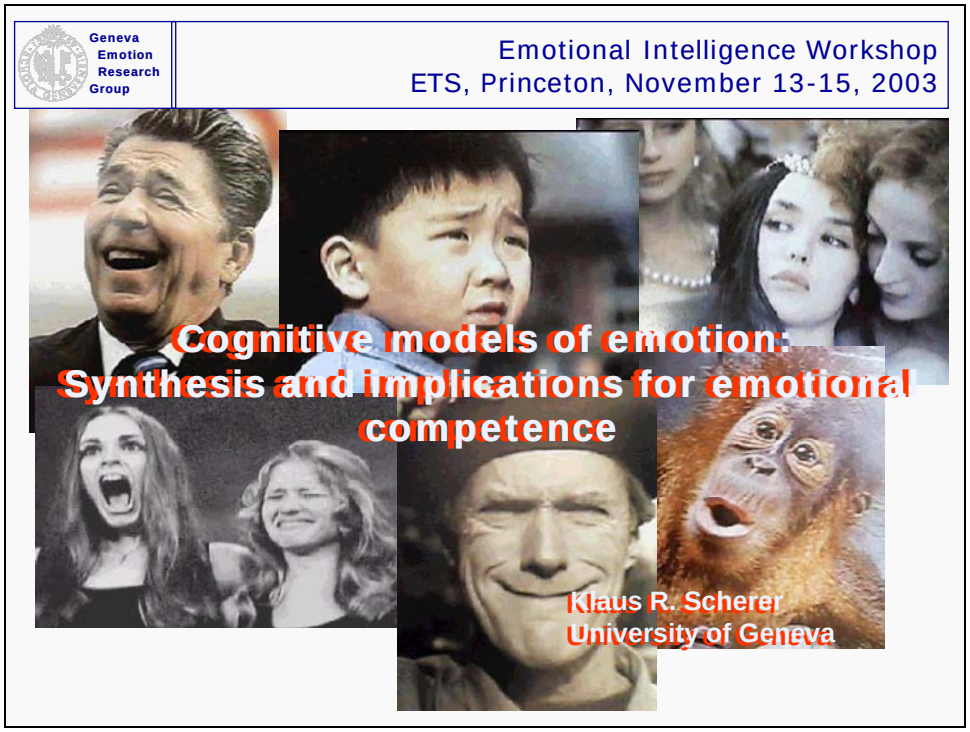
DR. LANE: I think so!?

DR. FELDMAN BARRETT: I would just add this; that one of the things that concepts do is that they help us make figure-ground distinctions. We have this kind of physiological activation going on all the time and some of it has to do with our evaluations and some of it doesn't; is this, the kind of thing that you mean?

DR. LANE: What I'm getting at is to what extent is it a conscious feeling that people are attending to or not attending to?

DR. FELDMAN BARRETT: I'm trying to avoid the word conscious, but it's a feeling that can be attended to, it's a state that can be attended to or not. That's what I would say. Sometimes you are aware of it, other times you're not. But it still causes behavior. You would say conscious, but unattended, I think.

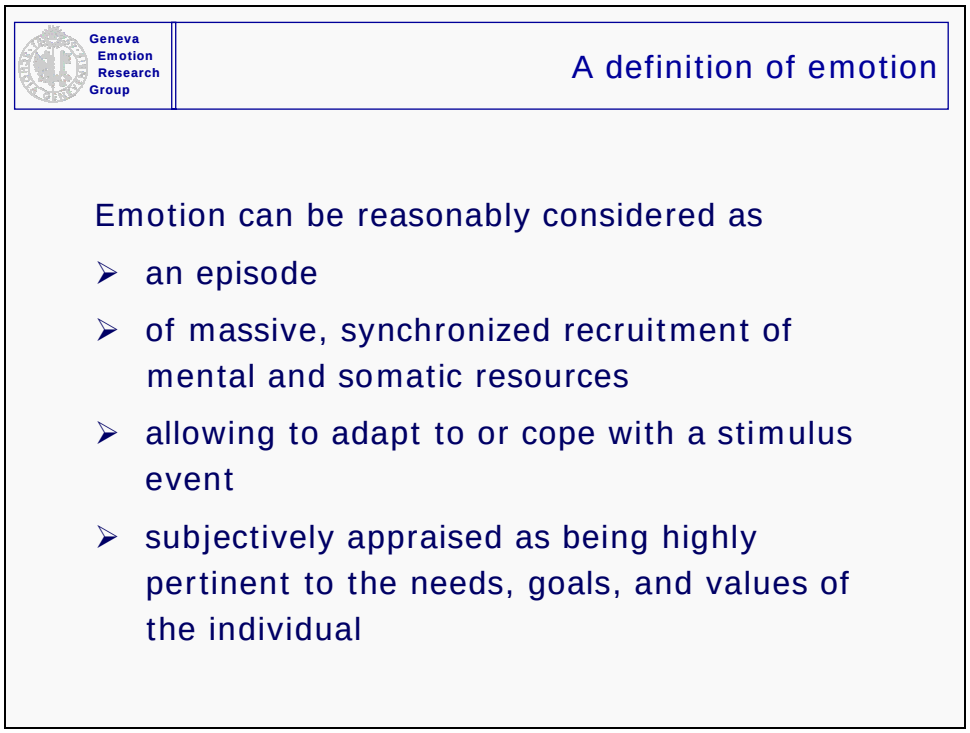
DR. STRICKLAND: Thank you.



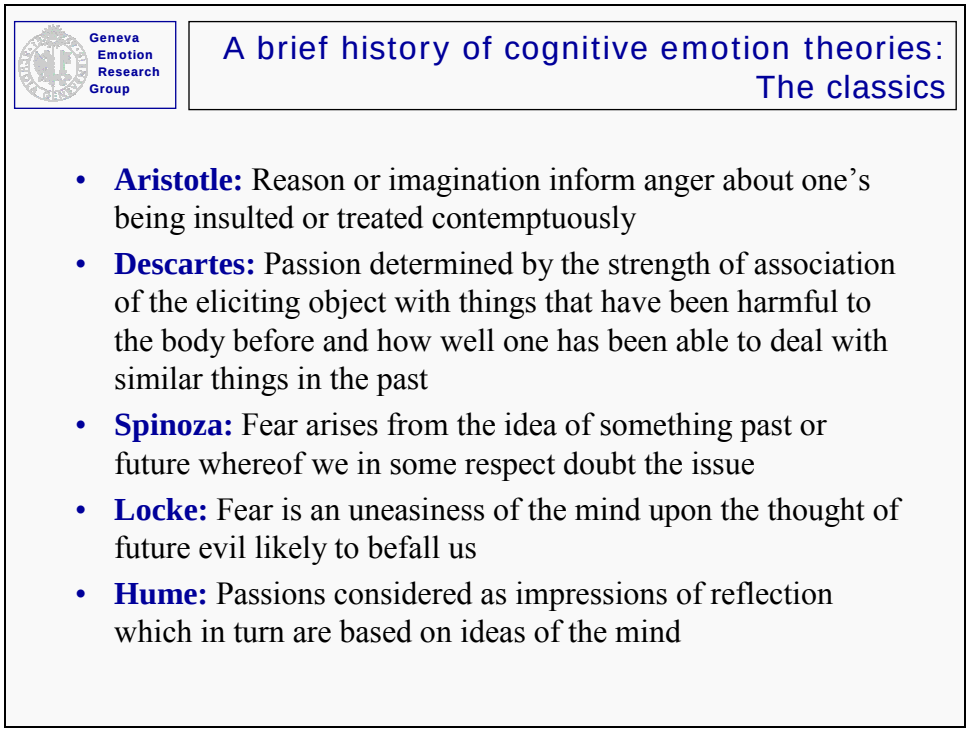
COGNITIVE MODELS OF EMOTION: SYNTHESIS AND IMPLICATIONS FOR EMOTIONAL COMPETENCE

DR. STRICKLAND: Next up we have Klaus Scherer, Professor of Psychology, from the University of Geneva and he will be talking on Cognitive Models of Emotion: Synthesis and Implications for Emotional Competence.

DR. SCHERER: I have a lot of slides, I'm afraid. So I will show a lot of them very quickly, so you won't be able to read all of them in depth. What I'm supposed to do is talk about cognitive models of emotion, which is the brief that Rich gave me. And I'll do that and do it very quickly and then try to describe a model that goes into some depth and that may help us to link it to emotional intelligence. In fact, this is the program: cognitive theories, history and synthesis and then the component process model and I will identify several major processes that are involved and we will try to see to what extent we can look at these processes in terms of individual differences and the role that would play for emotional competence. And at the end we'll get into a little more detail with the recognition of emotional expression.



Let me briefly give you my definition of emotion so I will talk about that and not other kinds of affect states. Some of the things that I think Lisa talked about may not fall under this definition, so I will only talk about things that can be reasonably considered as episodes in time. Episodes characterized by massive synchronized recruitment of mental and semantic resources allowing the individual to adapt to, or cope with, the stimulus event and that are subjectively appraised as being highly pertinent to the needs, goals, and values of the individual. So there are several conditions that I would call things like mood, interpersonal stances, attitudes, and so forth, but not emotions.



There are a lot of cognitive models of emotion and they start very early. Aristotle, Plato, and I would include but he's not on the list, one could argue could be considered a cognitive theorist, Descartes certainly Spinoza, Locke, Hume, as I said I won't go through all these statements but if you read these authors carefully they are clearly cognitive theorists of emotion. They are all wondering about what it is that brings about certain emotional states, in fact it is very pertinent to some of the things that Lisa said and we'll come back to that. But the question is: what produces the emotion, what produces what is supposedly then a core affect? And there are lots of theorists, philosophers mostly, who have given remarkable lucid responses to that question. And I think we are not really well advised to not heed some of the things that have already been discovered.

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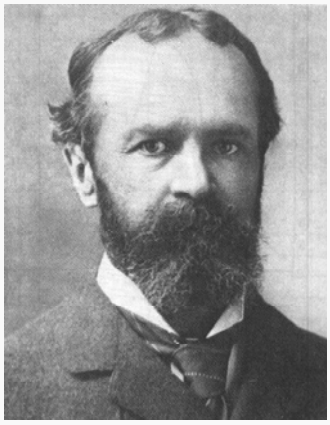
A brief history of cognitive emotion theories: A revolutionary theory



William James (1884):
"...the bodily changes follow directly from the *perception* of the exciting fact, and that our feeling of the same changes as they occur *is* the emotion"

i.e., emotion = feeling

(1894): "the nature of these bodily changes is determined by the overwhelming 'idea' of the significance of the elements of a situation for the well-being of the organism "

Over a hundred years ago, William James proposed a cognitive theory (contrary to what many people think). He did say that the bodily change is followed directly from the perception of the exciting fact and there are feeling of the same changes as they occur, is the emotion so it is a perceptual theory. But of course he said it 10 years later when he had been attacked. Emotion he equated with feeling and I think that was one of the problems and a lot of the debate is due to that equation. Indeed, he said in 1894 the nature of these bodily changes is determined by the overwhelming idea of the significance of the elements of the situation for the well being of the organism. That's straight appraisal, so James was really one appraisal theorist before his time, certainly a cognitive model of emotion.

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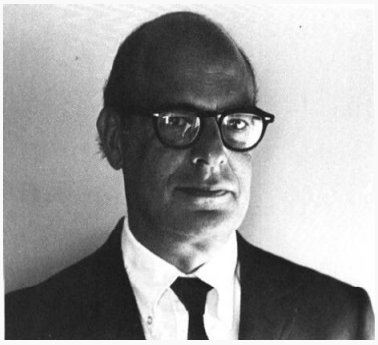
A brief history of cognitive emotion theories: Non-trivial social psychology

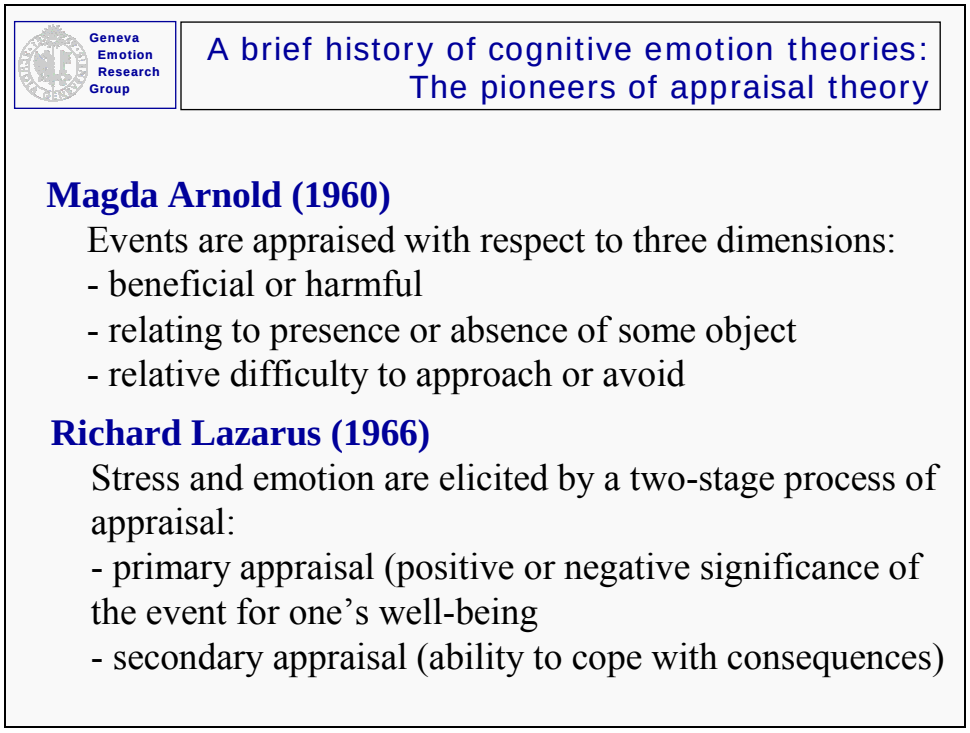


Stanley Schachter (1962)

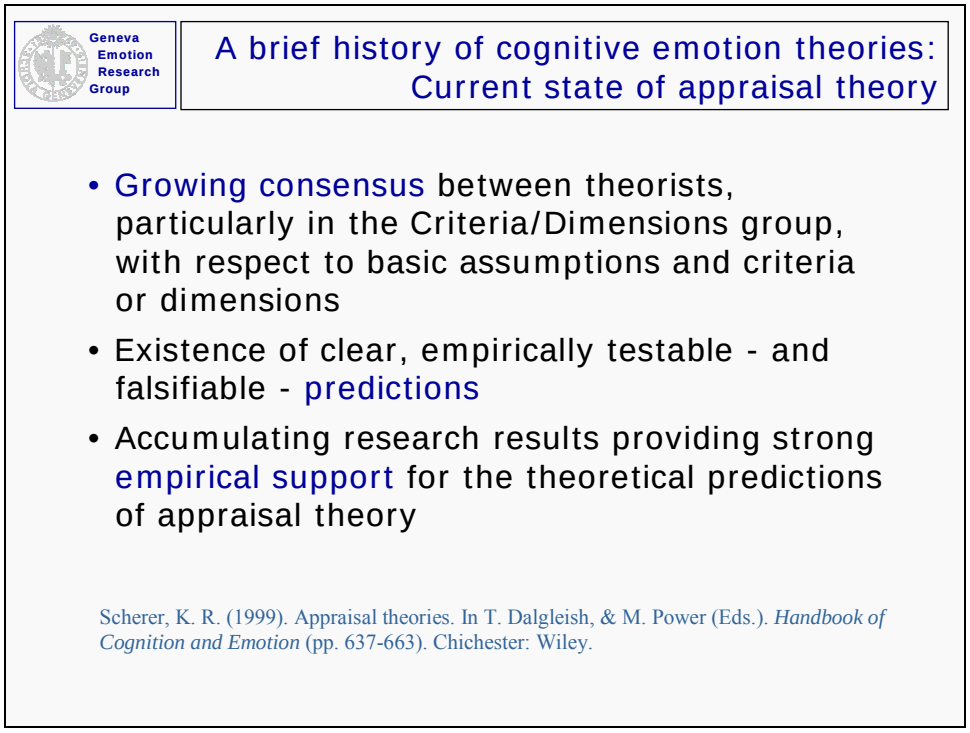
Emotion is determined by 1) the perception of heightened nonspecific, sympathetic arousal, and 2) cognitions concerning the interpretation of the situation in the light of one's past experiences

Normal case: "The perception-cognition 'figure-with-a-gun' in some fashion initiates a state of physio-logical arousal; this state of arousal is interpreted in terms of knowledge about dark alleys and guns and the arousal is labeled 'fear'" (1962, p. 380)

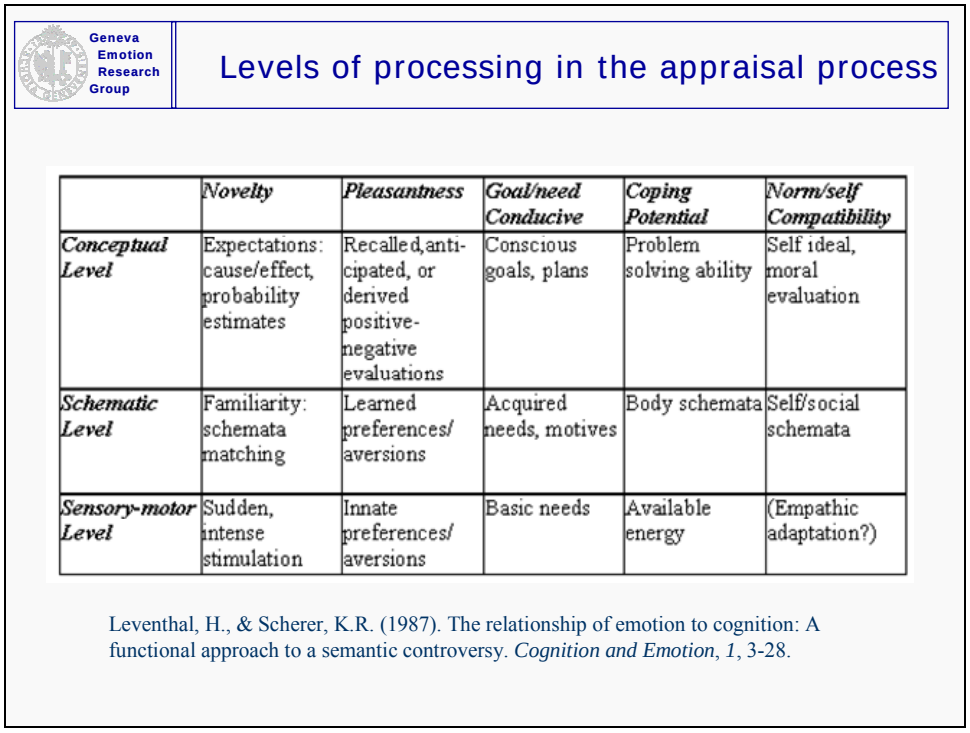
In this slide we have Stanley Schachter, who is often considered to be the first cognitive modeler of emotion; well as we've seen he's not. Unfortunately what he did was to put an extraordinarily interestingly constructed case, the one he had in his experiment with Singer, before us as an example of a theory of emotion. Now in reality what he thought, and this is again a quote, "the perception cognition figure with a gun in some fashion initiates a state of physiological arousal. This state of arousal is interpreted in terms of knowledge of dark alleys and guns, and the arousal is labeled fear. Now that is appraisal. " That is a normal case, he then goes on to do experiments and advise a theory about an abnormal case, and unfortunately the theory has dominated emotion psychology for about 20 years or more. But he clearly was aware of the fact that emotions are triggered by the evaluation of events and that is what has been usually considered to be the case ever since Plato or before.



So Magda Arnold really was the first to explicitly argue for appraisal, she used the term explicitly for the first time and she started to identify dimensions, dimensions that could be used to understand how people do evaluate situations or events that happen to them. Richard Lazarus of course went much further in terms of the specificity of what he suggested, also in terms of the process, identifying not only the fact that there are different kinds of dimensions that need to be evaluated but also the fact that there can be reappraisal, so in some sense he can be considered the father of appraisal theory. But then there has been a lot of other kind of models, models that put forth criteria dimensions, models that put forth goals or themes, models that consider meaning, models that focus on attribution. All of these, even though some of the people there would not consider themselves appraisal theorists, can be considered appraisal theorists, and they are certainly all cognitive modelers of emotion.



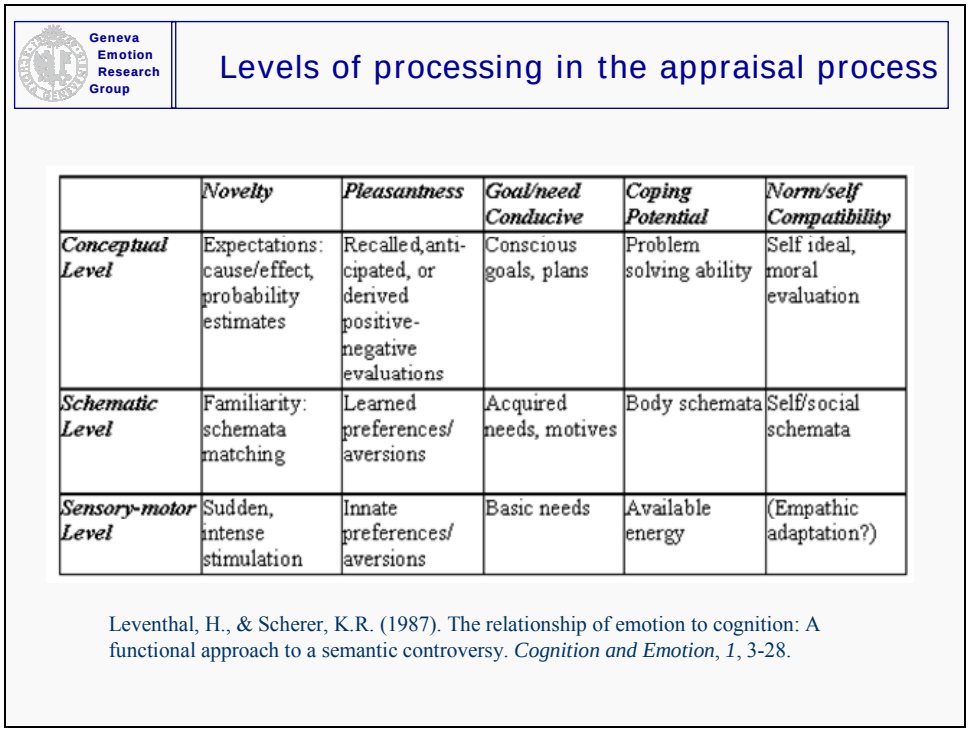
Let's look at the current state of this area. There really is quite a lot of growing consensus between different theories, particularly in the criteria dimensions group. The basic assumptions are the same and to a large extent the criteria dimensions are similar although the labels may differ. There are also, and I think that is very important, clear and empirically testable and falsifiable predictions for the first time, we can be held account for the theories we put forth. And in fact in my case, a lot of what I predicted didn't work and I had to change the theory which means some people think I don't have a theory, because I changed it. There is a quite a lot of empirical support now, and it is marred by the fact that a lot of it is based on self report, but there are a number of studies that use other indicators for appraisal processes so we will be able to get beyond that methodological problem of the admittedly problematical search for probably often unconscious processes by verbal report.



	Novelty	*Pleasantness*	*Goal/need Conducive*	*Coping Potential*	*Norm/self Compatibility*
Conceptual Level	Expectations: cause/effect, probability estimates	Recalled,anti-cipated, or derived positive-negative evaluations	Conscious goals, plans	Problem solving ability	Self ideal, moral evaluation
Schematic Level	Familiarity: schemata matching	Learned preferences/ aversions	Acquired needs, motives	Body schemata	Self/social schemata
Sensory-motor Level	Sudden, intense stimulation	Innate preferences/ aversions	Basic needs	Available energy	(Empathic adaptation?)

Leventhal, H., & Scherer, K.R. (1987). The relationship of emotion to cognition: A functional approach to a semantic controversy. *Cognition and Emotion*, *1*, 3-28.

Here is now the model that I defend and in an empiricist fashion I will use my own model to try to convince you of the merits of this approach, trying to understand the structure of emotion in a somewhat different way from what Lisa has tried to demonstrate to you. The idea is that there are modal emotions, I don't call them basic emotions; they are certainly not like Paul Ekman said, considered to be reflexes nor are they considered to be biologically based. But there is, I think, that it is part of the universality that Karl Heider was talking about this morning, there is evidence that these major states that have words in almost every language that we know of, that there is something about them and what it is about them. And this is the issue of conceptual knowledge and where does conceptual knowledge come from; it must come from the existence of some sort of regularity in life. Our language describes things we regularly deal with and we regularly deal with certain types of situations that produce states that we then label with a similar word. So we have words for joy, happiness, anger, rage, fear, panic, sadness, etc., and these are the kinds of states that you could argue are modal in sense that they don't occur very often because people very often get frustrated; anger is very frequent as we shall see.



	Novelty	*Pleasantness*	*Goal/need Conducive*	*Coping Potential*	*Norm/self Compatibility*
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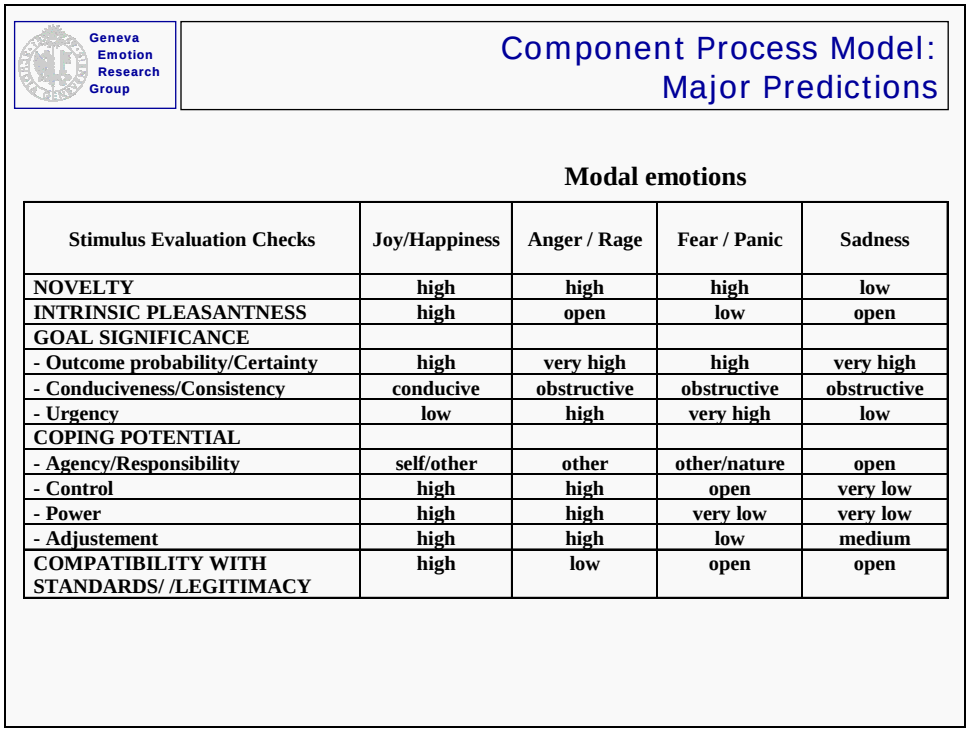
Leventhal, H., & Scherer, K.R. (1987). The relationship of emotion to cognition: A functional approach to a semantic controversy. *Cognition and Emotion*, *1*, 3-28.

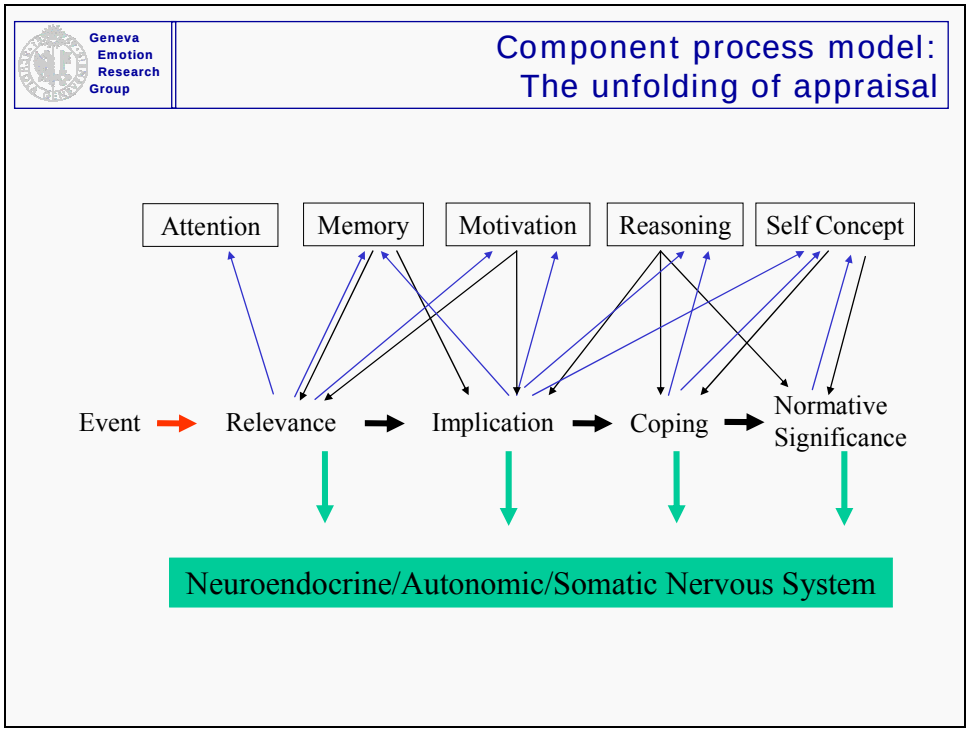
So to some extent, the fact that we have also, just in terms of the frequency of use, certain modalities, I think, indicates something about the human condition. And it also indicates, and that is of course the basic message that Darwin wanted to convey and that's why his work has been so important on all the work that follows, that emotions are adaptive. Indeed, they are there for a cause, they are there to help us deal with the situations that occur in life, everyday and they are optimally suited for that, much more than reflexes, in fact that's why they are there. They are much more flexible than reflexes or instincts, that's they're hallmark, so that's why they do not have a particular profile or signature that is invariable because situations differ. The situations that differ will call forth emotions that differ, but they still, I think, will fall under this notion of mortality. They'll share things even though they may have somewhat different physiological signatures, different expressions, etc.



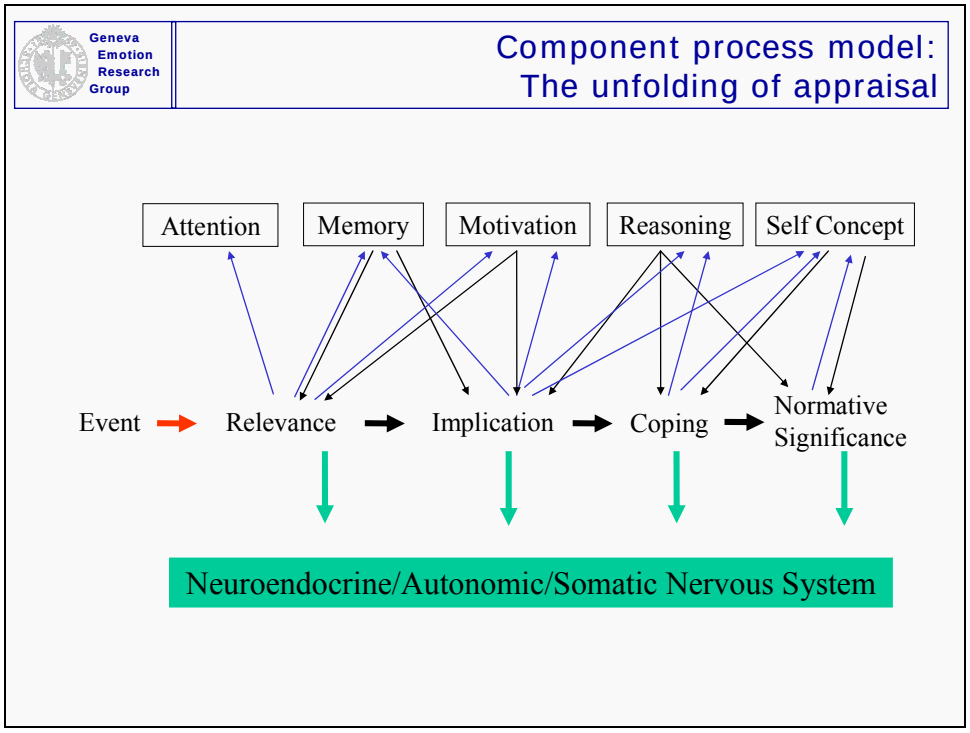
Modal emotions

Stimulus Evaluation Checks	Joy/Happiness	Anger / Rage	Fear / Panic	Sadness
NOVELTY	high	high	high	low
INTRINSIC PLEASANTNESS	high	open	low	open
GOAL SIGNIFICANCE				
- Outcome probability/Certainty	high	very high	high	very high
- Conduciveness/Consistency	conducive	obstructive	obstructive	obstructive
- Urgency	low	high	very high	low
COPING POTENTIAL				
- Agency/Responsibility	self/other	other	other/nature	open
- Control	high	high	open	very low
- Power	high	high	very low	very low
- Adjustement	high	high	low	medium
COMPATIBILITY WITH STANDARDS/ /LEGITIMACY	high	low	open	open

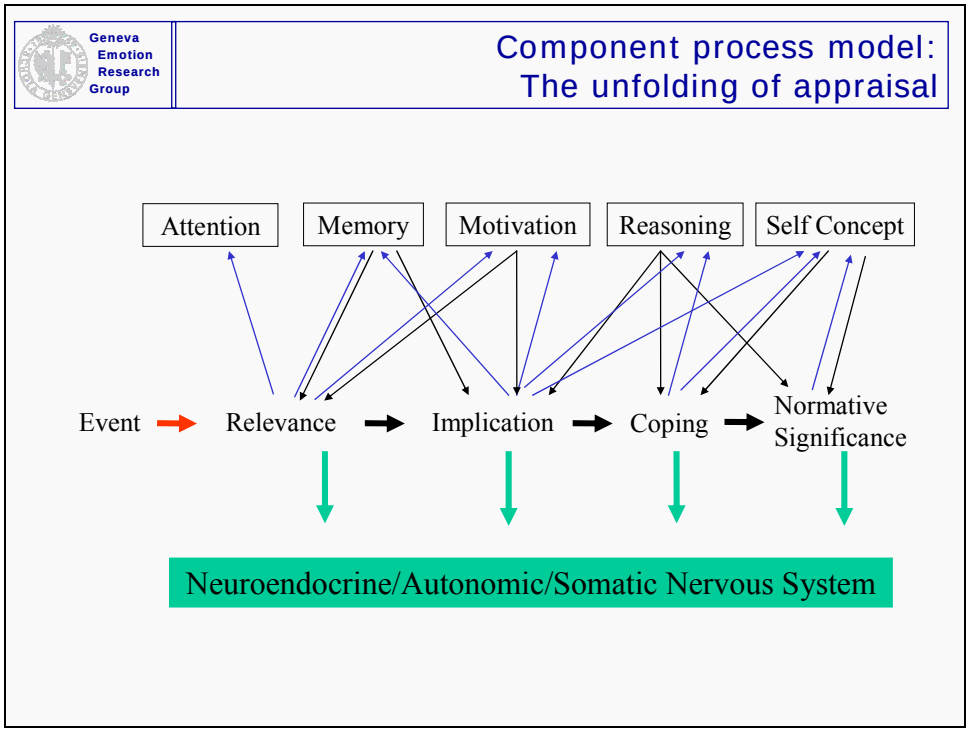
What you see here is the attempt to theoretically propose, what kinds of appraisals will lead to certain kinds of modal emotions? For example, joy would be high novelty, high intrinsic pleasantness, high outcome probability, certainty conducive to our goals, plans and needs, low urgency of response, usually the agency doesn't matter too much we're happy if something positive happens to us, no matter what. We have control, we have power, we can adjust to the situation, and generally joy is linked to high normative kind of standards, it's legitimate.



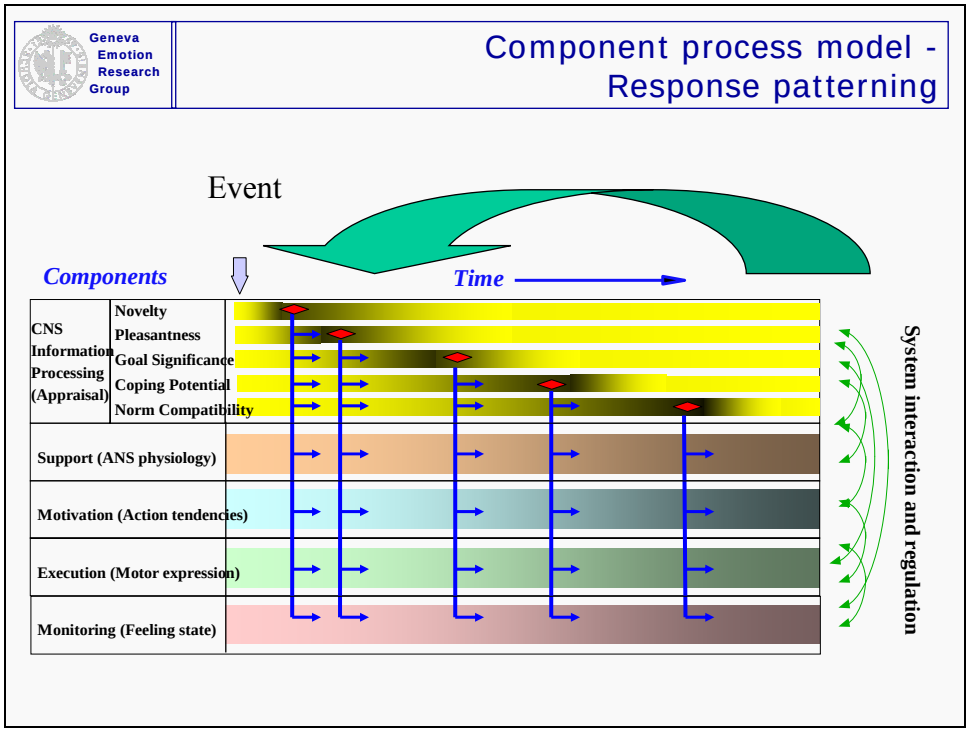
I don't want to complicate this, as many of you may have seen this, so the fundamental notion, and this is really shared by all appraisal theorists, is that we can predict what emotion should follow in evaluation of an event on the basis of a set of criteria like these. In fact, the idea is that much of this occurs in a very unconscious fashion, this is an early suggestion produced with Howard Leventhal where we combine Howard's theory of three levels of emotion with the kinds of criteria, similar to evaluation checks that I've proposed. So the idea that the very low sensory modal level processes, highly unconscious, schematic level could be partly conscious is a generalization of sorts. So the idea is that appraisal can really occur on all of these levels. Obviously, the lower levels are very basic, so basically they are often innate preferred preferences or aversions, they are basic needs; as you move up it becomes much more conscious but it also becomes small, subtle, and complex in terms of what goals or plans are being evaluated, the problem solving ability etc. And all of this seamlessly works together. I think we have parallel processing obviously, evaluation moves back and forth between the unconscious and the conscious, lots of things are going on at the same time and again it's very important to consider that Lazarus' re-appraisal idea is extremely important, appraisal changes all the time, it's a constant process, it's not a one shot deal.



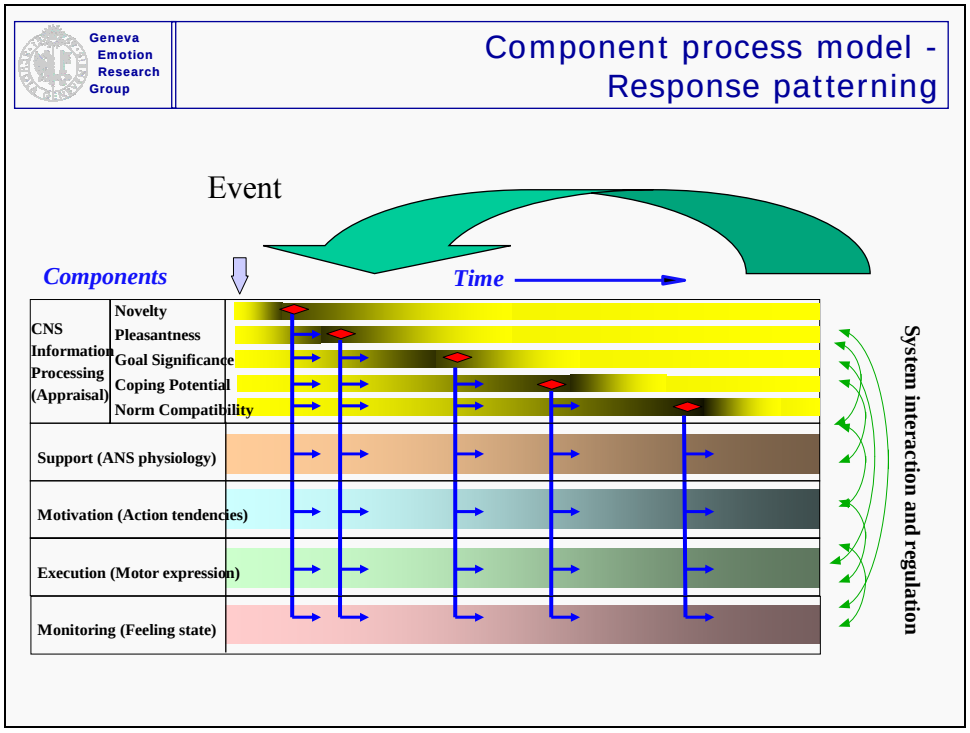
Here is a little map of how to conceive of this, so an event happens and it immediately will be attended to, if it's considered relevant. It will also draw on memory and motivation to examine relevance and also provide implications as to what does it mean to me and what will be its consequences. It draws on reasoning, self-concept, and motivation to do this. The issue then is how can we cope with this event, what do we have available as power, etc? And that again draws on several of these things; highly self assured people obviously have different kinds of evaluations of their coping abilities than people who are less assured. Finally, we have normative significance. Now the important thing is the arrows that go down. Again, the idea is, and that has been really the question being asked by philosophers and psychologists alike; is how can we understand the emotion manifestations, the response structure that we see, facial expression, the physiological expression, etc? And that I think is one of the most important issues. The answer that some appraisal theorists, including myself, give is that maybe each step in the appraisal process will have an effect. We know that when we consider something as relevant and attention is directed to it, there will be physiological responses that have been studied intensively by psychologists working on attention. We know that the danger of being eaten up by the bear (William James has come out of the woods) that there is increased peripheral blood flow to the legs because of running.



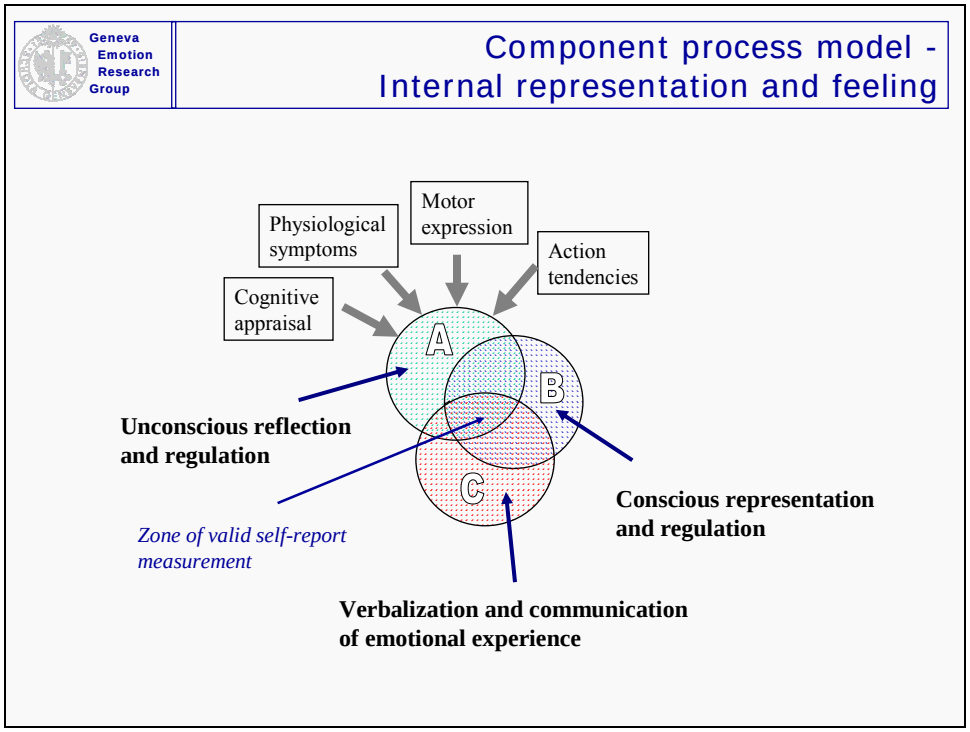
Again, the issue is; what is the appropriate preparation? It's not the action that counts, it's the preparation, because emotion until the very last moment leaves us the choice of behaving one way or another. And the true beauty of emotion is that in a very short period of time it prepares us to react in an adaptive fashion. So the idea is that these intermediate outcomes, if you will, will continuously affect the neuroendocrine system, the autonomic, the somatic, the nervous systems, and thereby continually prepare the organism. And of course this is not a one shot process that ends here, it is recursive, it continues all of the time.



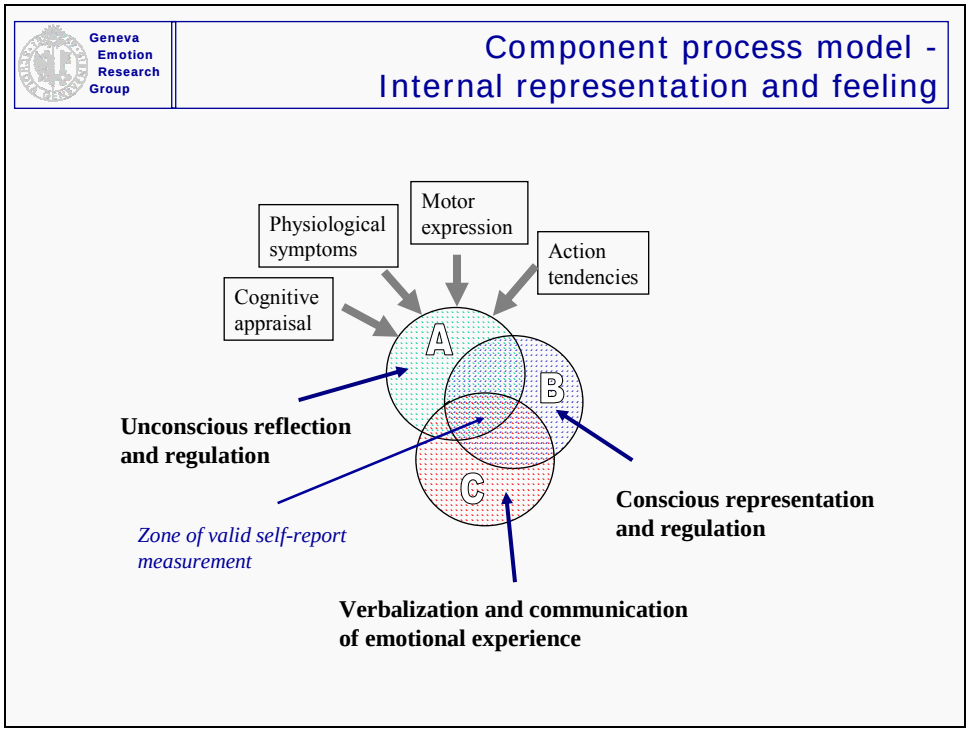
Let's look at another way of visiting the effects on the periphery. So first of all, we should note that there are, of course, interconnections between all these systems, they are synchronized. And Lisa said we have no indication that this synchronization exists; I don't think anybody has looked at it. I don't know of any single study that has tried for a strong emotional excitement to look at all of these channels (if you do know of one, I'd be very happy to know about it too). So I don't think we know. But the assumption is that there must be this interconnection because we find the interconnection for all sorts of other things. Like interconnection of the brain, interconnection of the periphery is well documented. Now we don't know exactly how it works, but it is certainly there. The assumption is, that's why I put the definition up, that the emotion episodes are characterized by an increased degree of interlinking, coordination, synchronization of the different systems, not only the periphery but also the central nervous system. The assumption is that as the event happens, what will happen is that immediately there will be preparation of synchronized responses in all of these components. As it unfolds, the cumulative change yields a state that will more and more be fine tuned. Of course, what this is very highly compatible with is notions like Ledoux's notion of very rudimentary appraisal (even though he doesn't like the word that is what it is). Appraisal through what he calls the low road, with amygdala projections followed by the high road. This is the kind of completely cumulative, recursive phenomenon where you get first very rough rudimentary response preparations, followed by increasingly fine grained response variations.



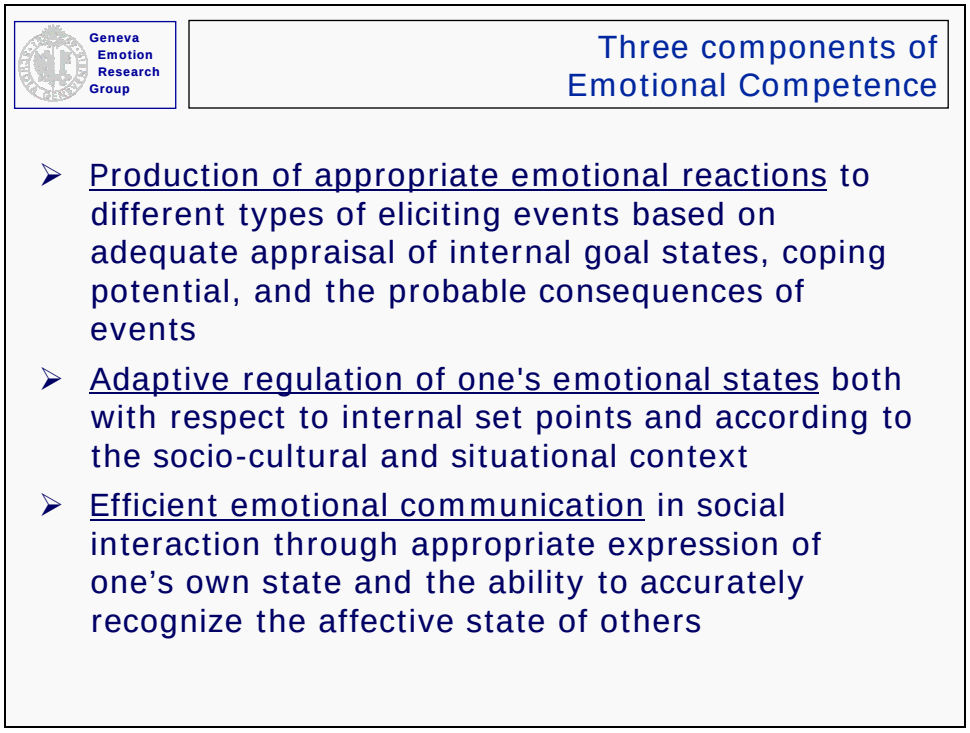
There is some predictions, the beauty of the kind of concept that I'm proposing to you is that you can use the literature in trying to understand what should happen to ANS, what should happen to the phase of the voice, and so forth. We can test these predictions and we have done so for some of these, and it's not too bad, in fact, it works pretty well for some of the channels. We looked at some of the physiological work with Johnston, Richman, some of the voice work, and Tanya Bensinger. How does that map onto feeling? I insist on separating feeling from emotion, it is really different. Feeling is a component of emotion. As I've said the problem with William James was that he really used the two in the same kind of fashion, he didn't make a distinction.



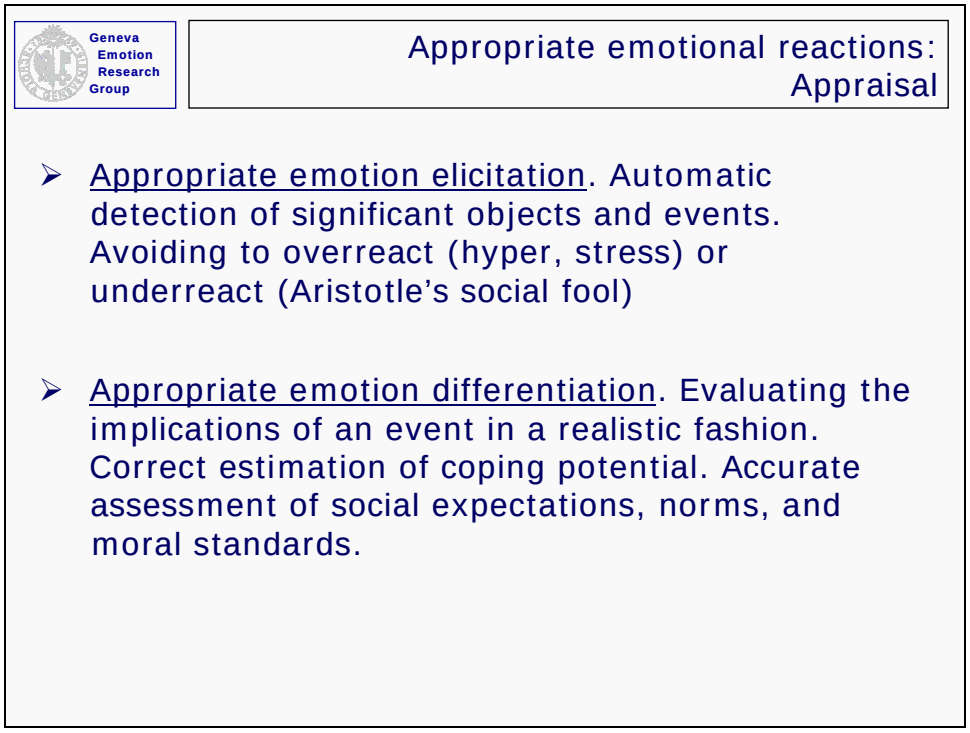
The assumption is that feeling is a reflection of all that goes on in the process of emotion. Thus, the cognitive appraisal of the event, the physiological symptoms through appropriate receptive feedback, motor expression and the action tendencies, because of the motivation being generated by the emotional reaction, will be reflected in an unconscious fashion. And even at that point there will be some kind of regulation; it will be highly unconscious in terms of ways in which it functions. Some of that will then become conscious and as you can see in this Venn diagram, there are areas which will overlap because consciousness is constructive. In fact, there will be a construal of things that did not happen just because the way that consciousness is structured. And there is evidence in that in work on the way in which we actually consciously represent this; for example, we can verbalize at some point what goes on. Unfortunately, what we can study is only that little bit here which is the verbalized conscious part of emotion and clearly it's the tip of the iceberg. A lot of it is covered underneath and that is probably the most important and most realistic in terms of representing what went on. Okay, so again the notion of the different but synchronized reactions that are being integrated. Now, I insist on the word integration; the integration of the separate representations into quality intensity in duration of feeling.



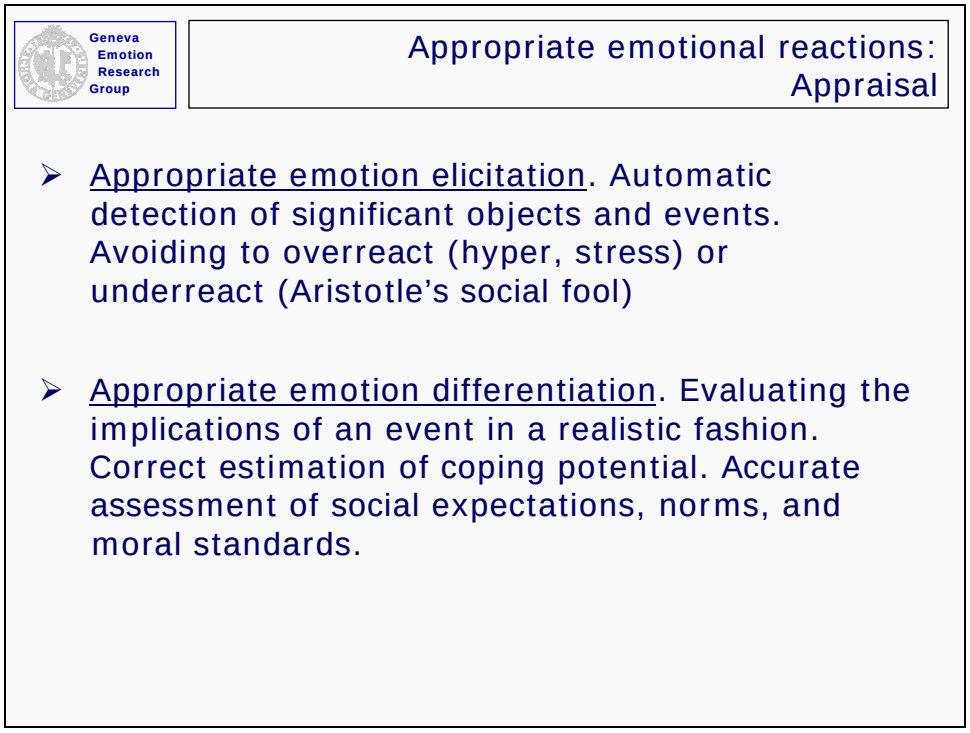
Now clearly Wundt has suggested that there are not two but three dimensions that underlie introspectively conscious representation of that state. I think all the data we have indicate that that is true. People can and do very readily respond to the requests to specify how positive or negative they feel, whether they feel aroused or not. But the idea is, and if you read Wundt, he distinguishes between the feeling and emotion. And the dimensions are for feeling. Dimensions he says, is how we subjectively evaluate how we feel, but emotion is different. He purposes a very different kind of structure for emotion in the sense that things are added and the things that are added, I think, is appraisal. Because what is very important from the very process is that there is conjoined representation of all of these things that I think are somewhat unable to be separated. But we have spent enough time discussing this and fighting with Lisa and other people. We don't want to do that, we want to talk about emotional intelligence.



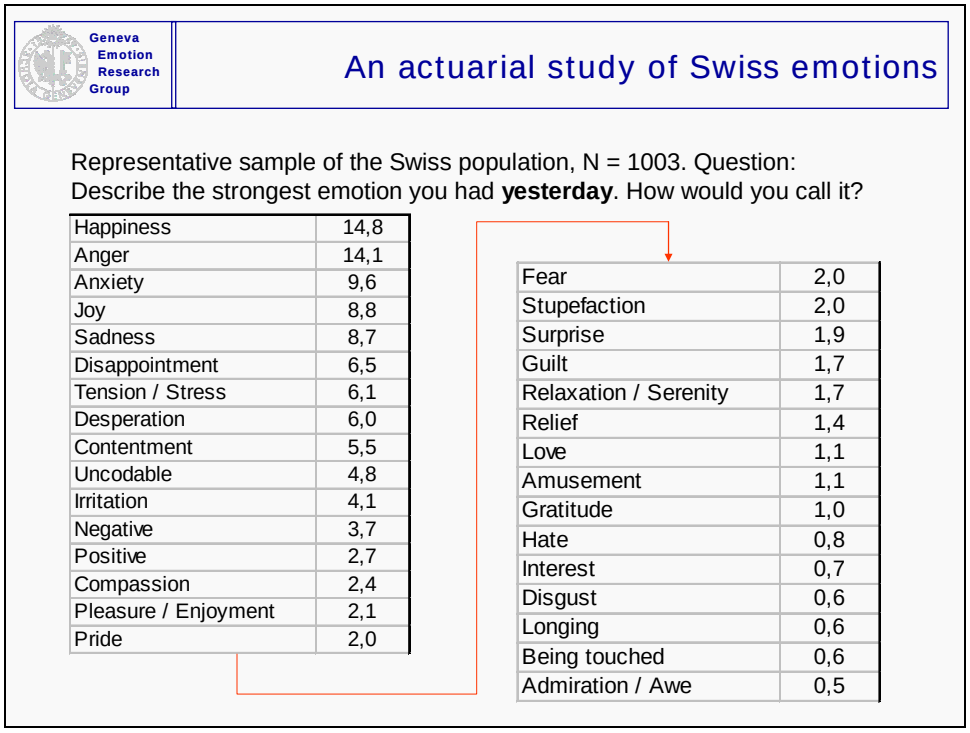
Similar events, significance detection, implication, evaluation, response, preparation, multiple integration, I think very important, episodic storage, very brief, but rule extraction long term memory. Now how can we link that to emotional intelligence? I suggest that there are three components. And I differ a bit from Jack Mayer and Peter Salovey in terms of the different components. I think the most important component, but nobody really talks much about, is to produce the appropriate emotional reactions to different types of events, based on adequate appraisal of internal goal states, coping potential, and the probable consequences of events. That is, I think, the most adaptive kind of emotional intelligence; if you react with the wrong emotion you are not using the potential that this incredible performance system gives you. Then there is, and that is obviously in everyone's model, adaptive regulation of one's emotional states both with respect to internal set points and according to the social cultural and situational contexts. And finally, again most people would have that in their model, efficient emotional communication and social interaction through appropriate expression of ones own state and the ability to accurately recognize the effective state of others, very important in socially living species.



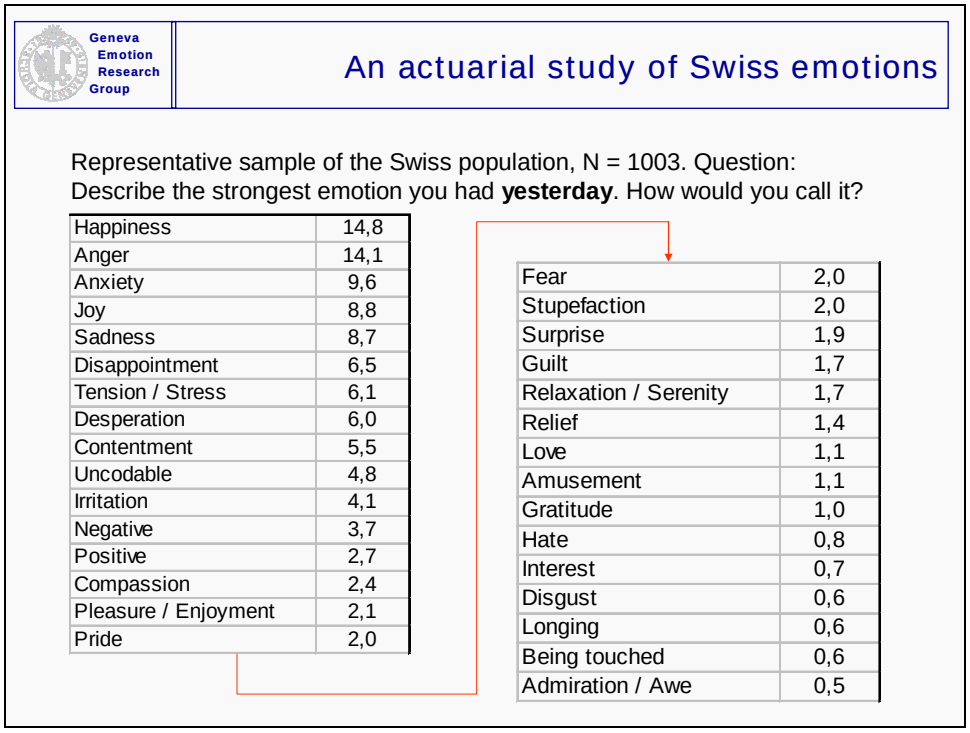
Okay, now what I will do is try to indicate some ways in which we might look at emotional intelligence here. The first thing is appropriate emotion triggering, in the sense of detection that something is very important. In the flow diagram that I showed you, this is the very first step. I think it is the most important one because we are bombarded by stimulation and we have to decide what we want to spend attention on, so it is very important not to overreact and not to under-react. If you overreact you are probably stressed a lot of the time, people will think you're "hyper". If you under-react, and Aristotle was actually the first theorist of emotional intelligence, the famous bit in the *Nicomachean Ethics* that probably many of you know, where he says you have to become angry at the right point in time, with the right person, with the right intensity, if not you will be considered a social fool. And that is not realizing the importance of certain events for you, so our importance, our relevance detection ability is paramount. Nico Fridja has once called emotions relevance detectors, that's what they are, very important. So, if you want to be emotionally intelligent you have to be quite attuned to, unconsciously very often, decide what's important for you and what is not, because you are going to spend some special attention on it. Appropriate emotion differentiation is, for example, evaluating the implications of an event in a realistic fashion. This includes knowing what consequences will come from the event, correctly estimating your coping potential, not overestimating your ability, (nor underestimating it); accurate assessment of social expectations, norms, and moral standards.



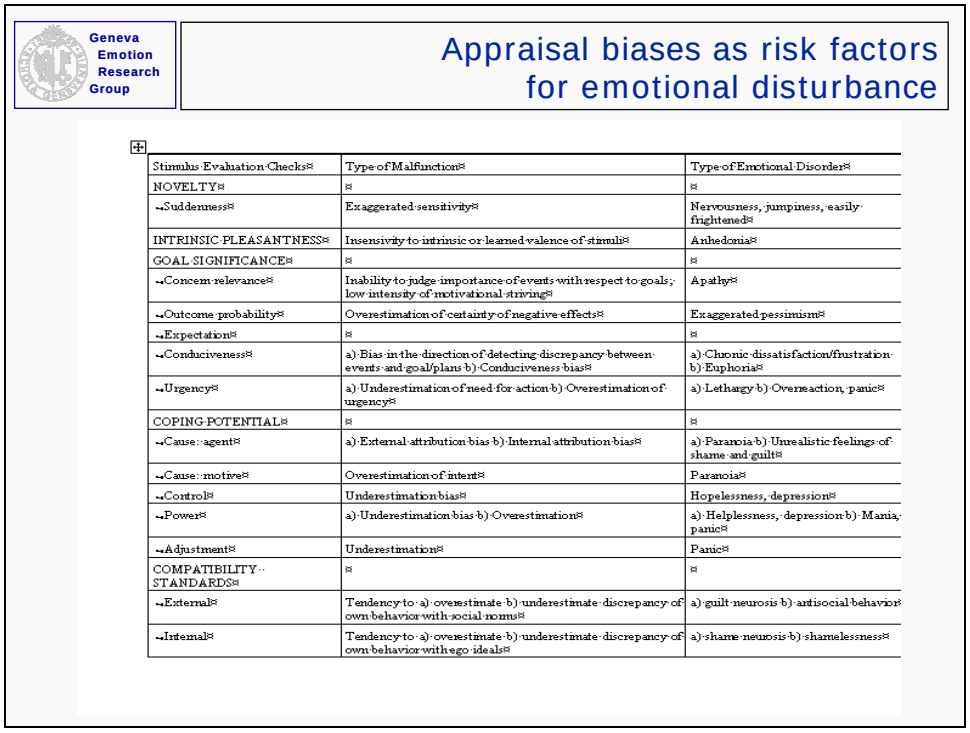
Here is a nice example. It attacked me, so there is a causal, external attribution, in a case where we would all say well that's quite unreasonable, not very emotionally intelligent.



Here is a study with switched emotions. What we did was this. We asked a representative sample of about one thousand people to describe the strongest emotion you had yesterday. And again, contrary to what Lisa said, people do use categories exclusively. We find very little, sort of general negative and positive, you have it here - 3.7% negative, 2.7% positive, this is people, in their own words. We said, describe an event that produced an emotion, and then tell us what it was. Thus, it was completely open and we got lots of categories; you can see the richness of it for yourself. This is already reduced to families or classes from what was a much larger set of labels used by people. One thing that I thought was very interesting, happiness is the most frequent one, anger is the next most frequent one, then there is anxiety, joy, sadness, etc. There is a lot that we could discuss about the data, very intriguing data. The reason that I'm showing it to you, we also asked people after they had done this, how often do you experience certain emotions, and we gave them 14 labels. One of the interesting things is that if you say that you frequently experience happiness, a likelihood of having experienced happiness yesterday is higher. So we computed odds ratios and here you have sort of the mean for experiencing happiness, anger etc.; the numbers you saw before. This is people who say they have a lot of happiness in their lives. This is people who have little happiness in their lives. It seems that if you have a tendency to experience certain emotions, the likelihood that you will experience one today is higher. Now you can say well that is a clear method artifact, method similarity and so on. Well, there are some safeguards and we can't rule it out, but it's unlikely and it makes sense.

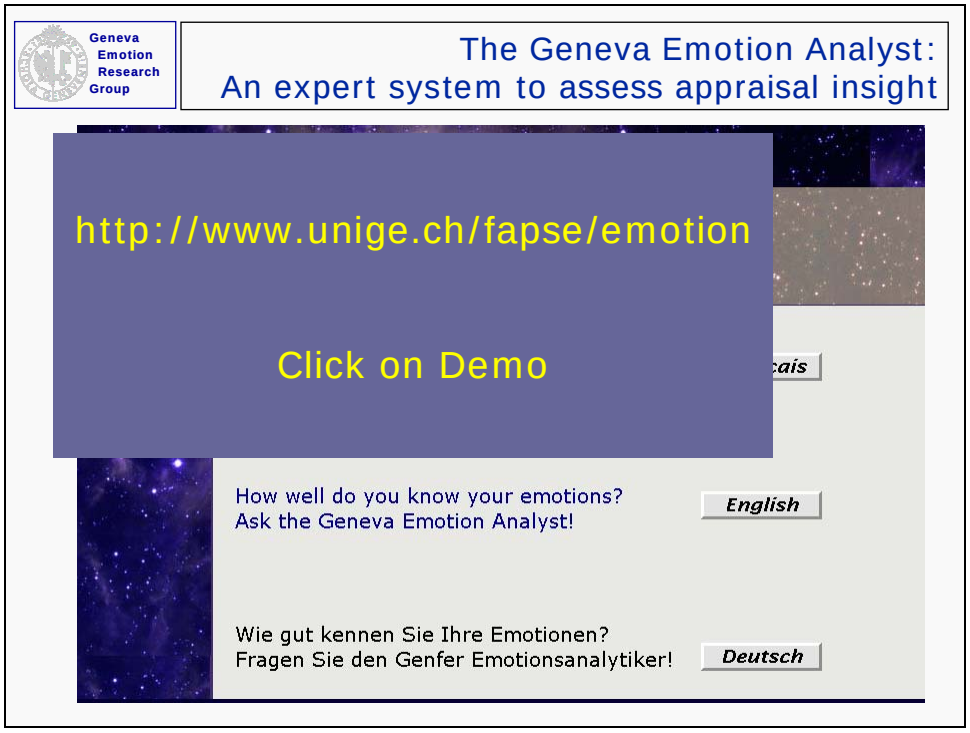


When people are depressed, they are probably likely to appraise things differently. So the explanation is that the appraisal may be responsible, you may have appraisal biases that will let you experience certain emotions more frequently. That's why I say that is one of the most important parts of emotional intelligence, to appraise things correctly. If you continuously underestimate your coping potential, the probability that you will experience something that is more like sadness or fear is of course much higher, because you underestimate your ability to cope.

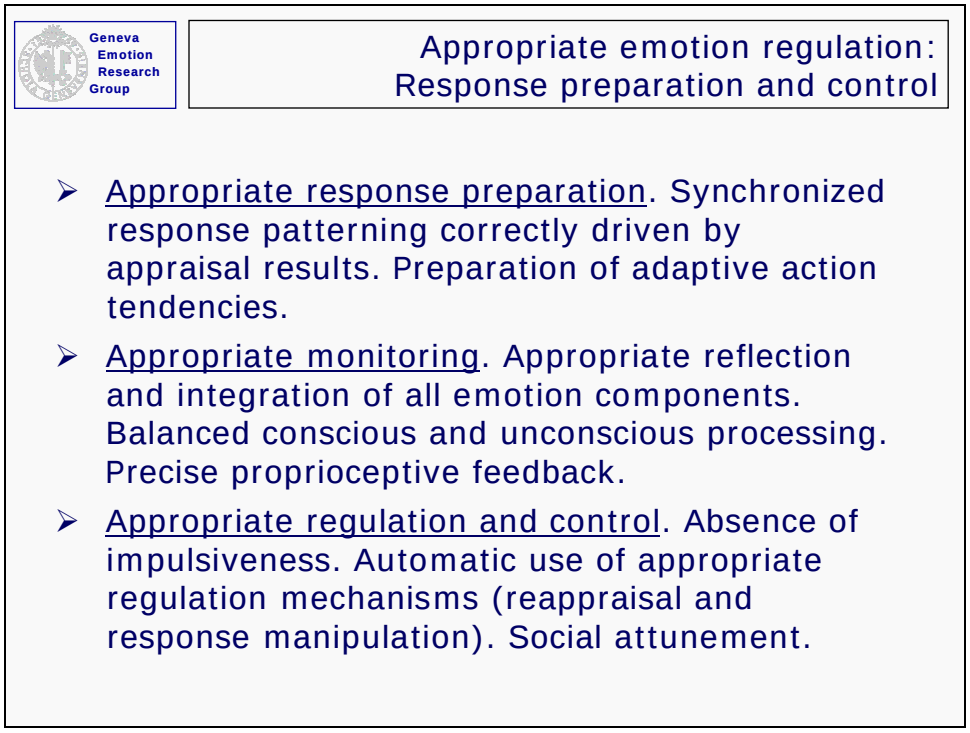


Stimulus Evaluation Checks	Type of Malfunction	Type of Emotional Disorder
NOVELTY		
↔Suddenness	Exaggerated sensitivity	Nervousness, jumpiness, easily frightened
INTRINSIC PLEASANTNESS	Insensivity to intrinsic or learned valence of stimuli	Anhedonia
GOAL SIGNIFICANCE		
↔Concern relevance	Inability to judge importance of events with respect to goals; low intensity of motivational striving	Apathy
↔Outcome probability	Overestimation of certainty of negative effects	Exaggerated pessimism
↔Expectation		
↔Conduciveness	a) Bias in the direction of detecting discrepancy between events and goal/plans b) Conduciveness bias	a) Chronic dissatisfaction/frustration b) Euphoria
↔Urgency	a) Underestimation of need for action b) Overestimation of urgency	a) Lethargy b) Overreaction, panic
COPING POTENTIAL		
↔Cause: agent	a) External attribution bias b) Internal attribution bias	a) Paranoia b) Unrealistic feelings of shame and guilt
↔Cause: motive	Overestimation of intent	Paranoia
↔Control	Underestimation bias	Hopelessness, depression
↔Power	a) Underestimation bias b) Overestimation	a) Helplessness, depression b) Mania, panic
↔Adjustment	Underestimation	Panic
COMPATIBILITY STANDARDS		
↔External	Tendency to a) overestimate b) underestimate discrepancy of own behavior with social norms	a) guilt neurosis b) antisocial behavior
↔Internal	Tendency to a) overestimate b) underestimate discrepancy of own behavior with ego ideals	a) shame neurosis b) shamelessness

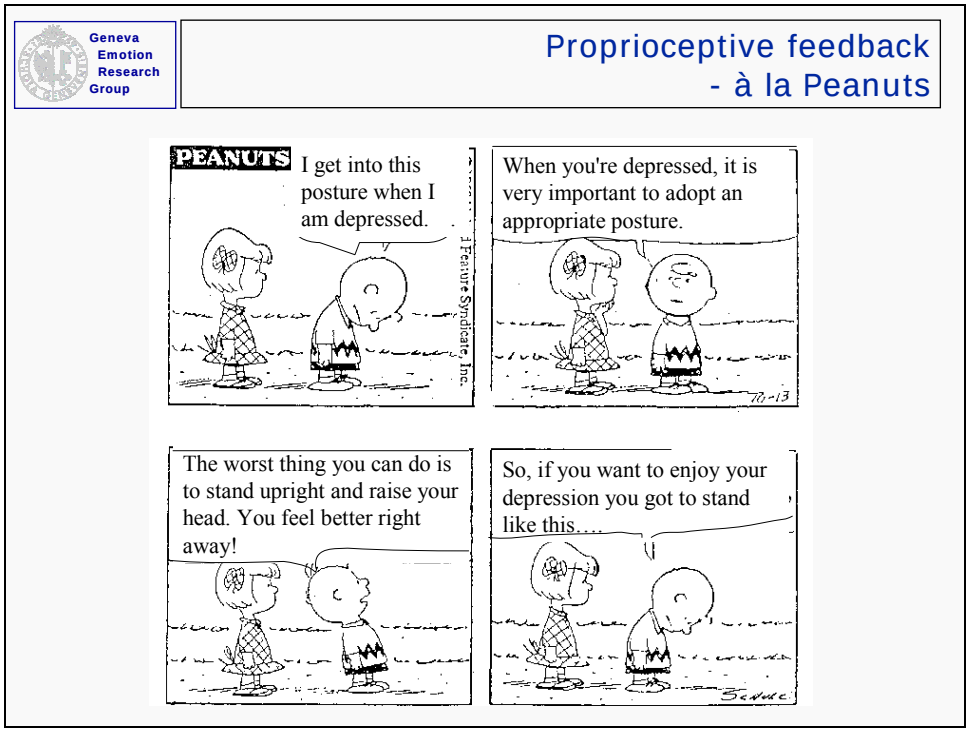
And in fact, this is a list of malfunctioning appraisal checks in the psychiatric categories that one can link them to. So if you continuously underestimate your coping ability, the likelihood of depression was much higher. I debate this often with psychiatrists and they claim that this is not an etiological factor; it is just an accompanying factor. We can't be certain, but I do think it is I certainly an aggravating factor, certainly a risk factor.



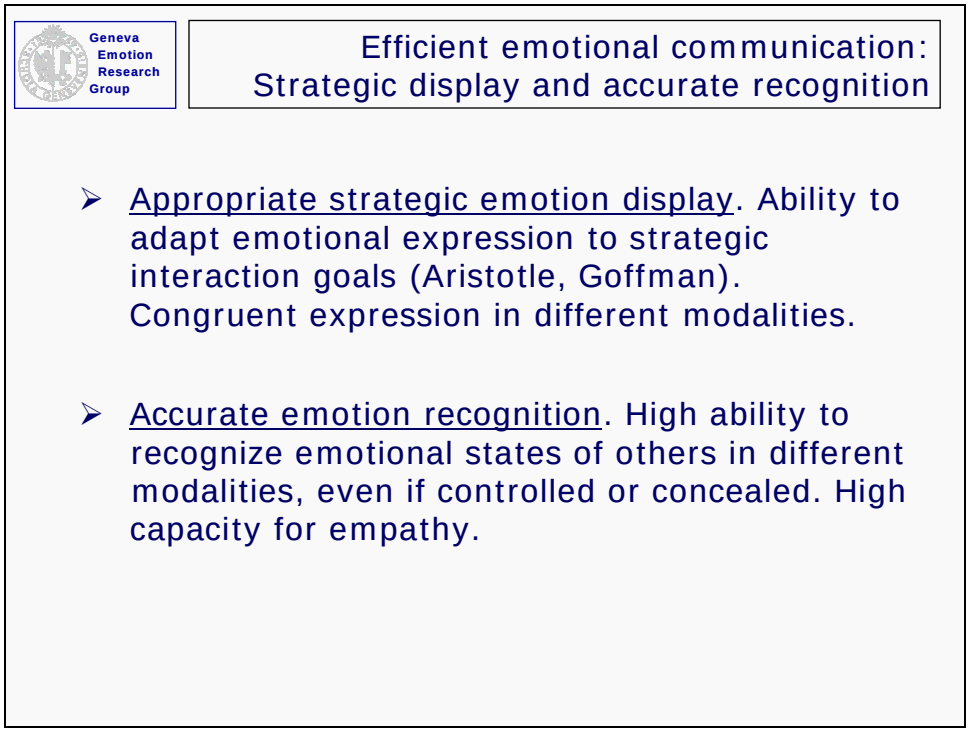
Here is something that you can do on your own, we have set up a little demonstration, but given the time we won't work and so if you would like to take a look and use this thing. It's an expert system to assess appraisal insight. If you go to this website and click on demos, you can actually try it out. What it is, is the computer asking you to remember a recent emotional experience and then it will pose you about 25 questions and on that basis it will try to predict your emotion. And it's intriguing to use it as a device for teaching, you can actually use it in your class, in fact one of you here said he had done it. I use it with a lot of success because it does help inside. Because one of the things that happen is that people do not realize what, in fact, has contributed to the production of their emotion, to the appraisal. And people differ greatly in times of how much insight they have into their goal structure. Many people will discuss the results with themselves – "well, I didn't have that goal" and I said "don't' you want to survive", "yes but, so..." It's quite intriguing in terms of emotion knowledge that we as psychologists tend to take for granted that people are motivated and that there are certain kinds of goals. People in general do not have that notion. So it's quite interesting to use this little tool to try to understand how people conceive of what determines their reactions in certain situations.



Response preparation and control are also obviously important. It should be synchronized, given the nature of emotion and it should prepare adaptive action tendencies, otherwise it's not doing its job. Appropriate monitoring should be an appropriate reflection and integration of all emotion components. Again, if as I would claim, feeling as a monitoring system, feeling is the system that allows us to regulate and it sets the standards for regulation. It should integrate the components correctly, it should be a balanced processing between conscious and unconscious parts, and it should be precise in proprioceptive feedback, for example. And, there should be appropriate regulation control – for example, absence of impulsiveness, automatic use of appropriate regulation mechanisms, reappraisal of response manipulation, social attunement, and so forth.

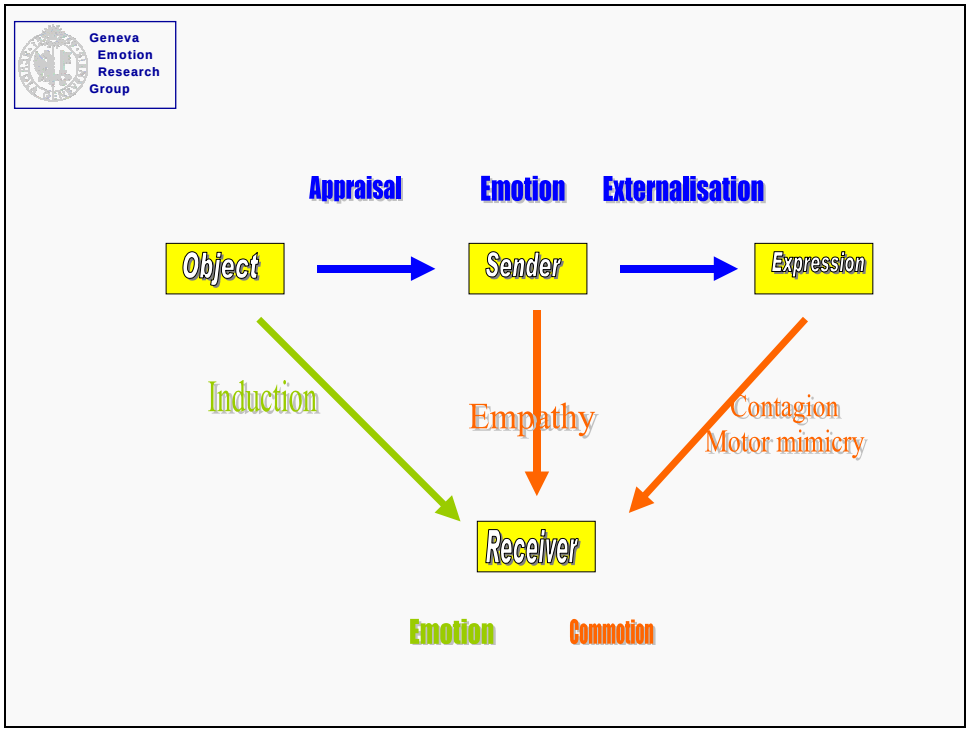


Here is another example, I like this very much. So Linus says, “I get into this posture when I am depressed. Knowing you are depressed it’s very important that you adapt an appropriate posture. The worst thing you can do is stand up right and raise your head, you’ll feel better right away. So if you want to enjoy your depression, you’ve got to stand like this.” Very good advice, that’s part of emotional intelligence in times of proprioceptive feedback regulation.

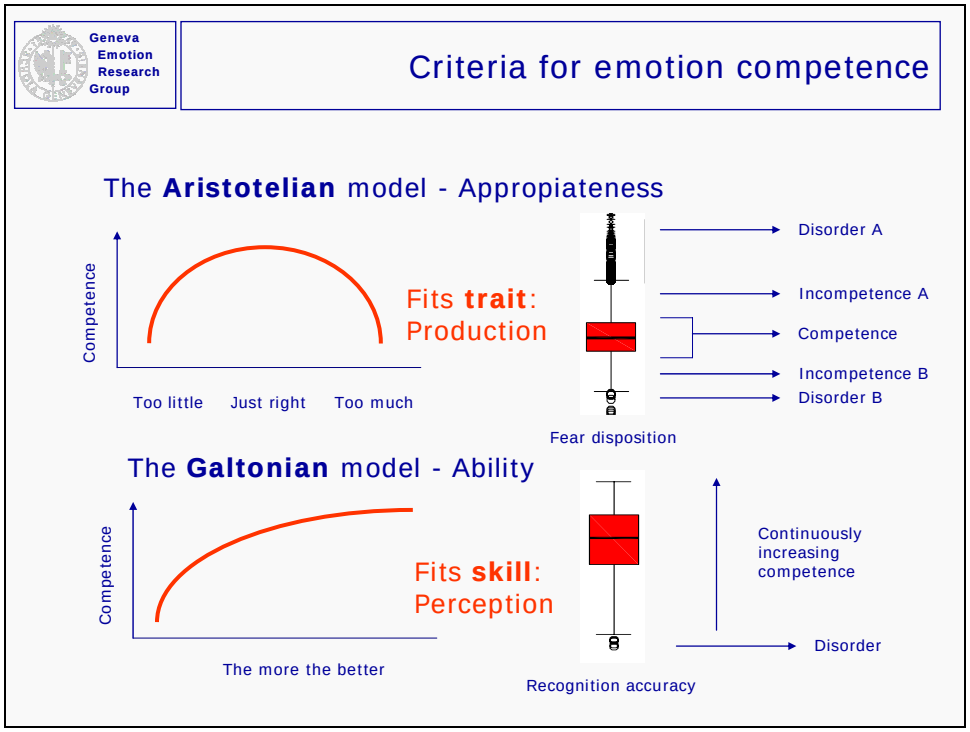


With respect to strategic display and accurate recognition, as I said, Aristotle has pointed out the importance of social use in emotion, and Erving Goffman too has written beautifully about this topic. There is also the issue of congruent expression and different modalities. Paul Ekman's work on deception, for example, is very nice in showing that when you're trying to deceive very often what happens is that the different modalities are no longer attuned and they are no longer congruent; in addition to all sorts of other indices that are becoming available for those who can see them.

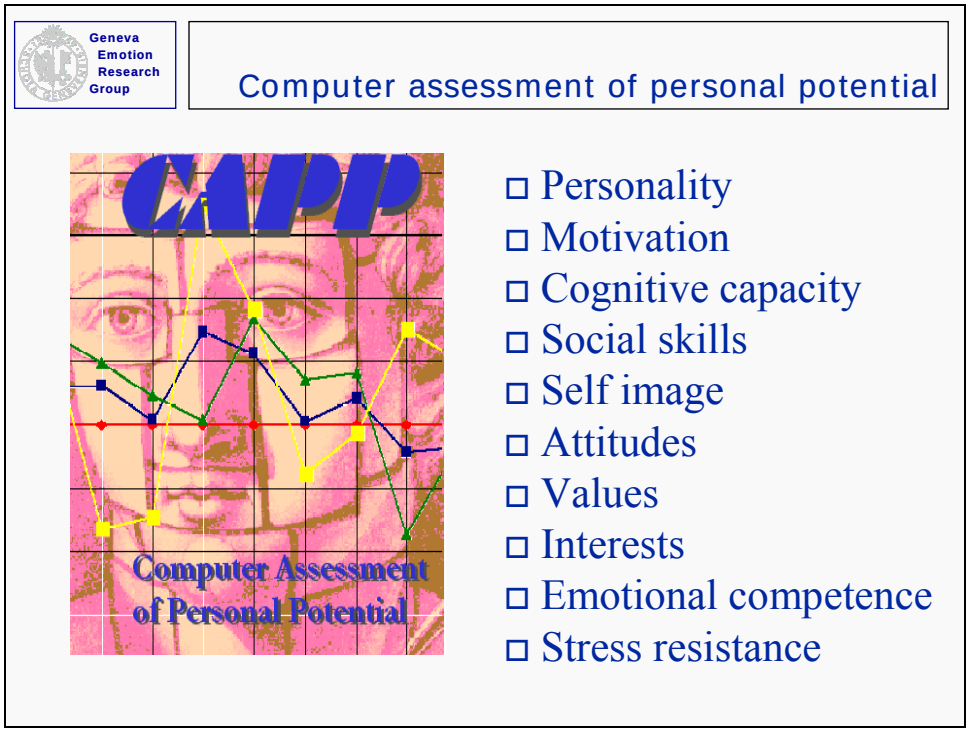
. I don't need to belabor this point, I think we all know that, accurate emotion recognition is important, for example in negotiations, to understand when someone gets edgy, when someone gets irritated to the point that the negotiation may break off, and some people are just much more savvy, much more attuned to these subtle cues than others. So, tests that will tell us the way in which we can test our ability and increase it would be of very high importance in many situations, negotiation situations in many fields, including business, of course.



I will not talk about this slide, in the interests of time, but its worth presenting. It represents an attempt to try to explain recognition on the basis of an empathy based model.



So let me know talk about the criteria for emotional competence. You may have noted that I have substituted emotional competence for emotional intelligence, even though I'm a very good friend of Peter Salovey and Jack Mayer, I don't think it's a good label, I think it's better to find another one. But I won't succeed, I know. Here is the Aristotelian model, a model that sort of really insists on the appropriateness of the response. And it's also of course a stoic model-not too little, not too much, just right. In many cases that's the advice. So you would expect a curvilinear fashion. And you have the Galtonian model, the ability model, the more the better. And that may be true for some other competences where you want as much as possible. And you could sort of look at it in terms of traits, it's more like a trait, you want to have a certain competence, if you don't have it your incompetent because you have too much of it or too little of it, and if it's more it becomes a disorder, like some of the cases where I showed the link between appraisal malfunctioning and depressive disorder or other affective disorders. In the case of the Galtonian model, it fits a skill in its conception. So it's continuously increasing competence and a state of disorder, when you are very low on this. So it would be interesting to try to have all our research guided by such models that predict what would be the ideal, the most competent level on a particular dimension, whether it follows the Aristotelian model or the Galtonian model.



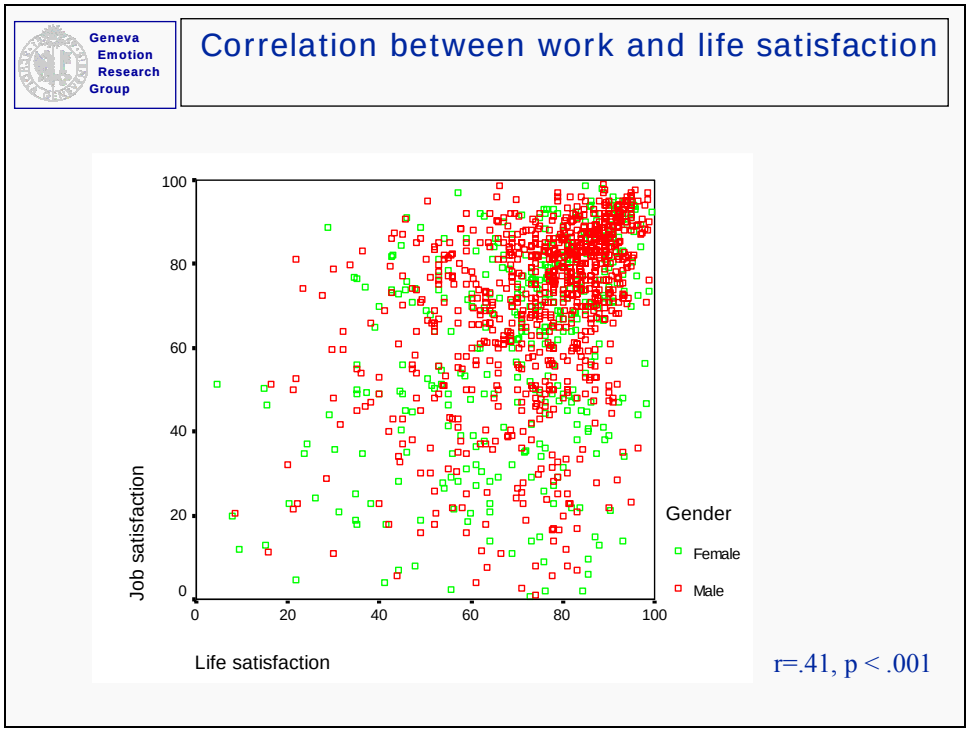
The five minutes that I have, I would like to show some data for some of the stuff that I've been talking about. We've developed a package for different tests about 25 of them, all computer-administered. The battery includes measures of personality, motivation, cognitive capacity, social skills, self-image, attitudes, values, interests, emotional competence, and stress resistance. For example, for emotional competence we have one test called the emotion index that gives you a number of scenarios, you're supposed to get into the scenario and then it gives you a number of emotions and you are supposed to say how much of each you would experience. You could have mixed emotions, etc. And the idea is we used scenarios that were based on a big intercultural study of about 3,000 people in 37 countries. We tried to find the most ambiguous situations where you could react with many different kinds of emotions. And so the assumption is that people will consistently, for the whole set of scenarios that vary quite a bit, tend to respond with let's say more anger in each of the scenario responses, might be people who have high trait anger it could be linked to the personality trait scales. But we go beyond anxiety and anger; like I said we have many more emotions including things like shame and guilt, sadness, because of the obvious relationship with depression and other kinds of things. And in fact it works out quite nicely, as I will show you.

Geneva Emotion Research Group

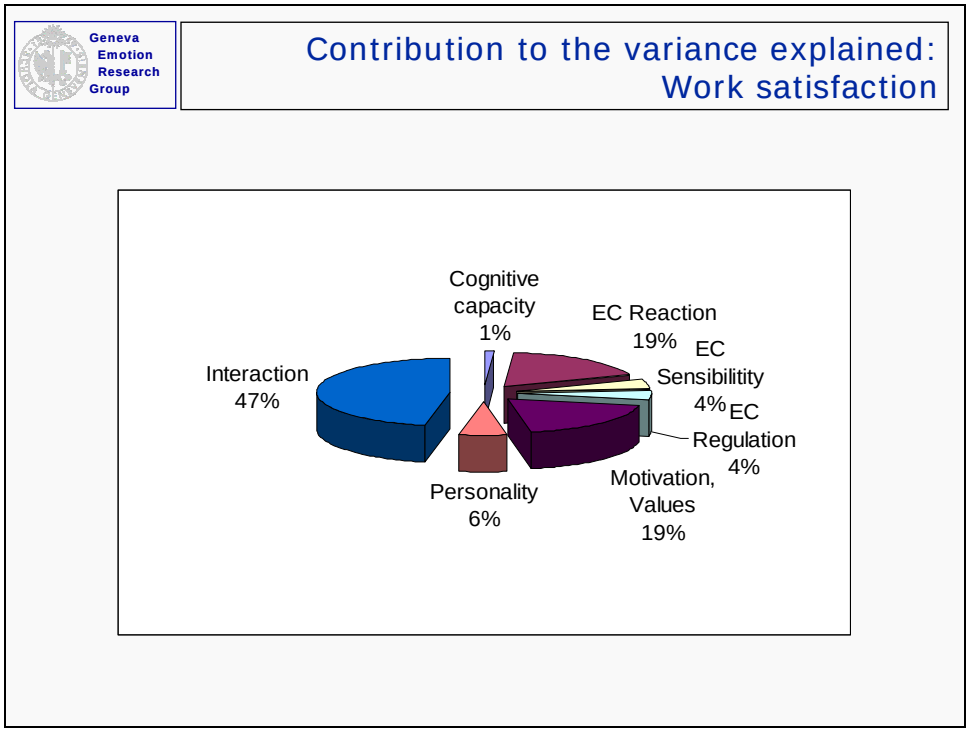
The validation sample: approx. 1400 persons, mostly managers

	Men	Women	
Upper Mgmt	371	56	427
Middle Mgmt	384	167	551
Personnel	212	183	395
	967	406	1373

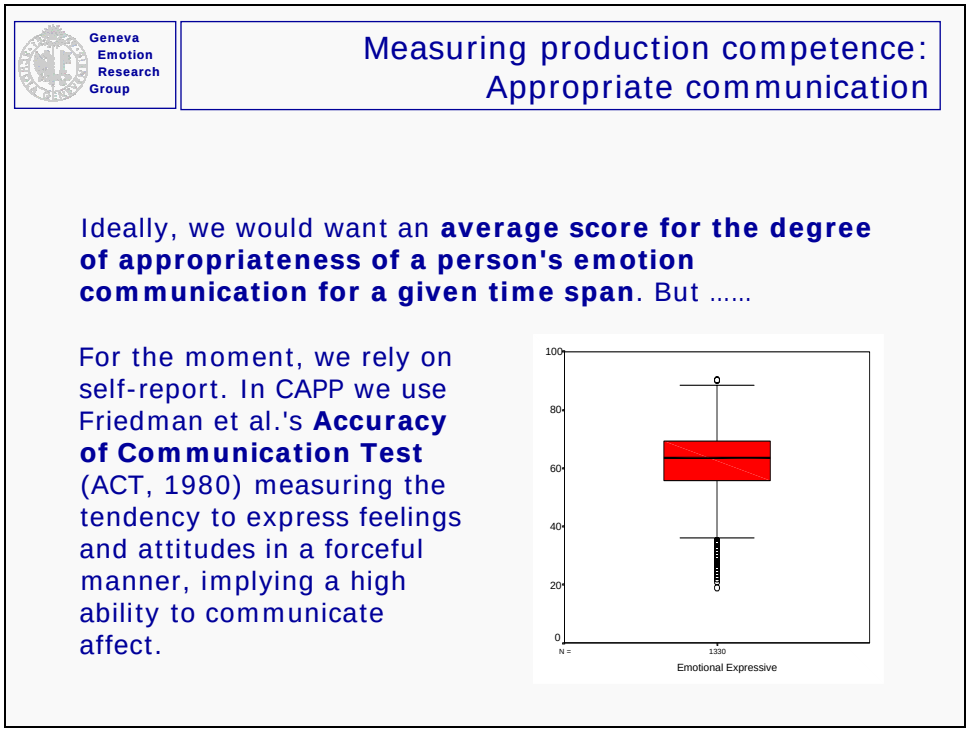
This is the validation sample, about 1,400 people, mostly managers, middle and high level. Obviously, one of the problems is how do you validate? Performance data are sometimes very hard to get and when you do get them, they are not always very clean, so it's a problem. And as I said, very often there is an inverse relationship between getting these data and getting what you want in terms of the psychological aspect of the data.



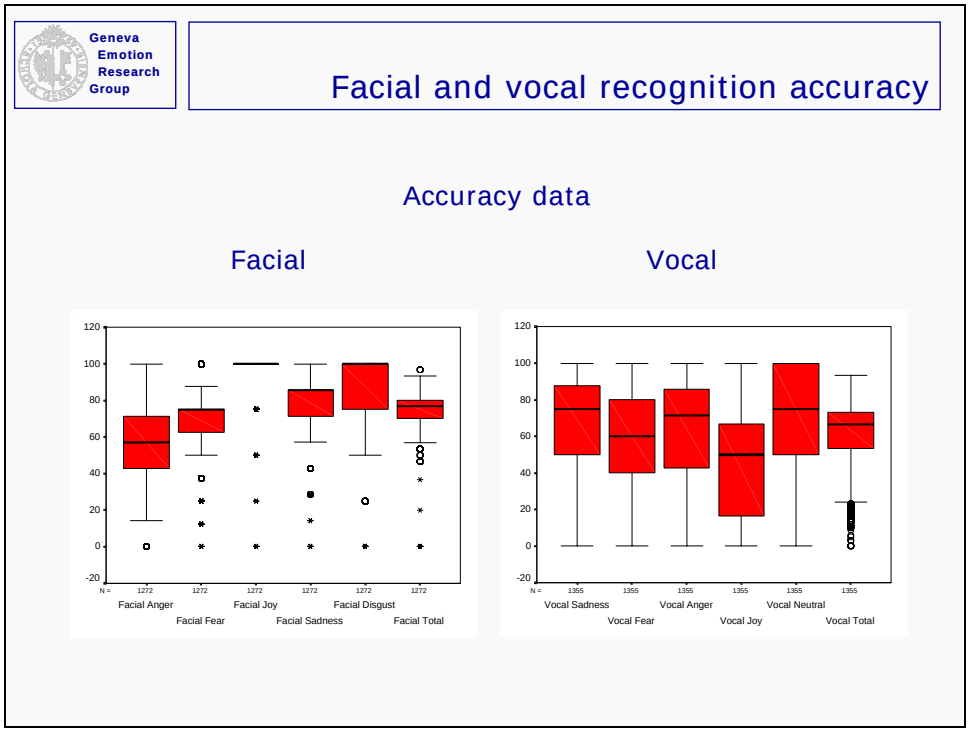
So here is work satisfaction and life satisfaction plotted against each other. This I am going to use as one example, just what can we predict in terms of work satisfaction, because you could argue that to be satisfied with your work and your life is a good outcome, so your emotionally intelligent if you are satisfied with your work and with your life. The question is how much can we explain?



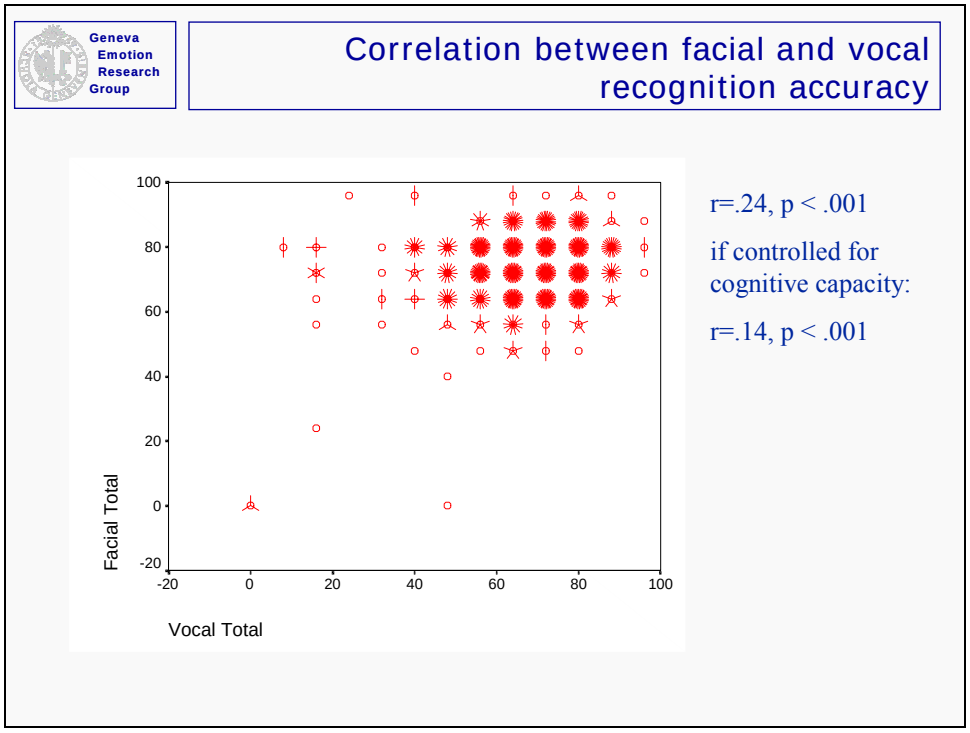
Here is a grouping of the variables that we get from those 25 tests, something like 200 variables into cognitive capacity, emotional competence, in terms of the reaction, emotional competence in terms of sensibility, emotional competence in terms of regulation, motivation, values, and personality. You can see that cognitive capacity is not a very good predictor, in fact that correlates with other findings in this area. The appropriate reaction is very important, almost 20%. Sensibility for this, is less important, but I predict it is very important for other things. Motivation and values are very important and most importantly of all of these factors is interaction. So the interaction between these different things, as one might predict, is very important.



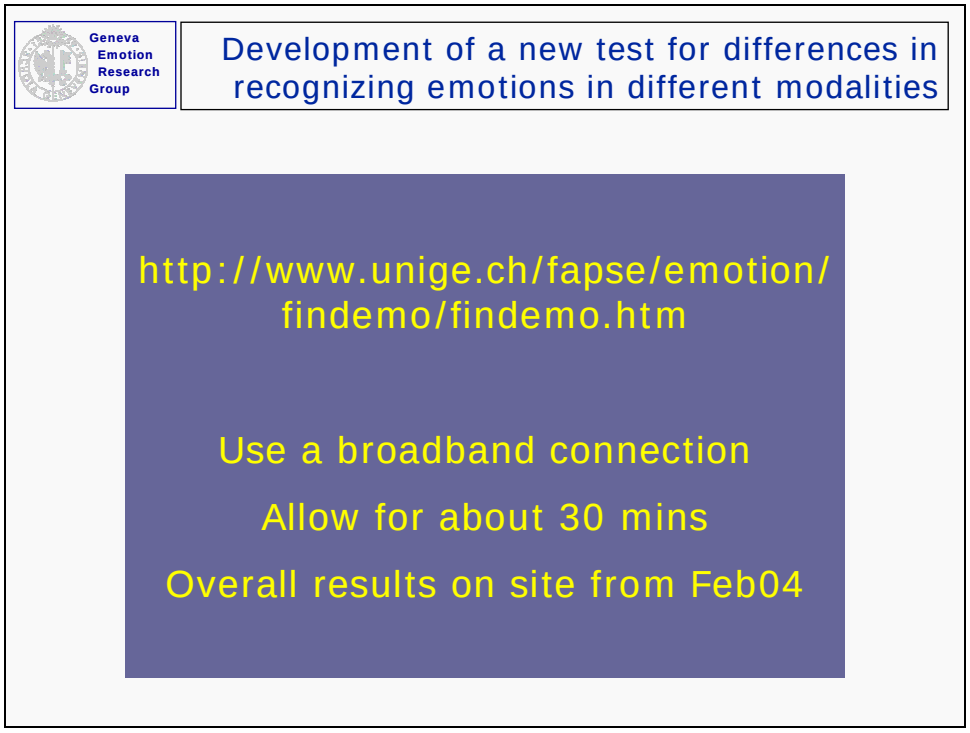
We wanted to test this Aristotelian notion; if you have communication of emotional expression you could say it should be Aristotelian, not too much, not too little. So it should be that, well it isn't, that's what we get. We thought that we would get a curvilinear relationship. No, the more you express the more satisfied you are with your life and your work, I don't know why; the instrument may not be a very good one, we are working on a better instrument for that one anyway. But again, I think it is interesting that making predictions and having models for what you expect, at least you have a handle on trying to understand what's going on.



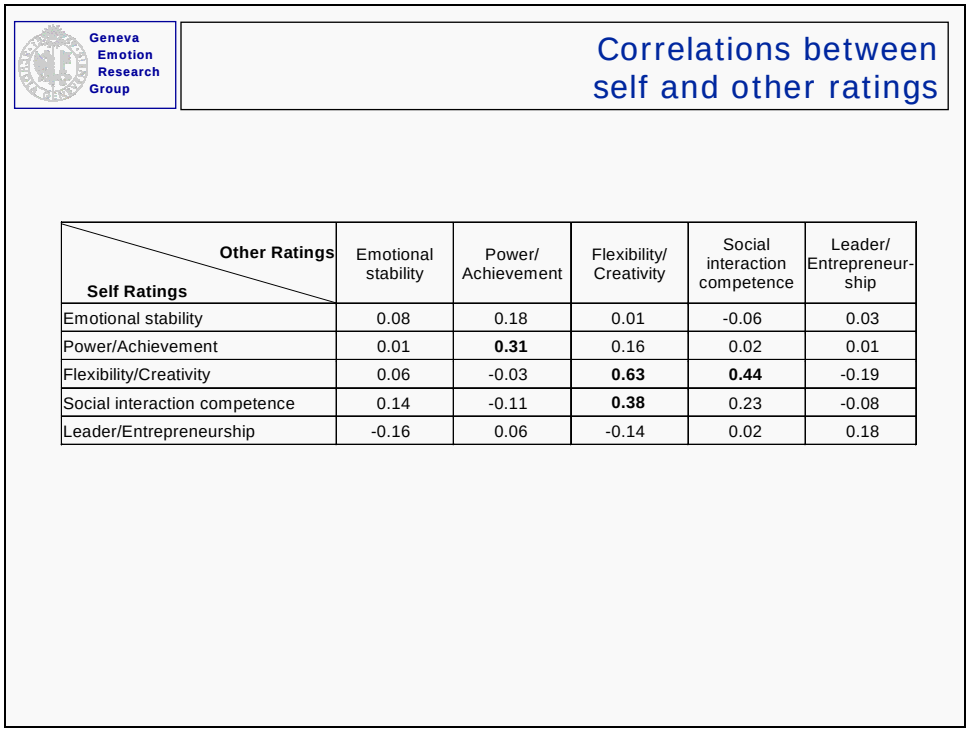
Here is facial expression using Paul Ekman's picture set, vocal expression using a test that we developed ourselves. Facial expression generally you get a much higher percentage, you get almost no variance for facial joy, because everybody recognizes it immediately. There is also a lot of interesting things to discuss in terms of the difficulty of different emotions that are not the same in the face and the voice.



Here is the correlation, .24 is the starting ground. If you control for cognitive capacity, one marker only, it drops to .14, so it's not such a high correlation. Some people claim that it's sensibility across the board if you test one, and do it only on a few pictures, that's fine; well maybe not. We have 30 items in each and we can say something about the recognition ability for individual emotions, big individual differences. And, as we can see the generality of the skill is not so obvious.



What I want to almost close with is a very experimental kind of instrument that we have developed just to try out, because we are in the process of producing a major new set of data with actors from whom we want to use their portrayal. This has both video, silent video, video audio, audio only, and photo. It has about 120 items, and you can try it out. Actually it's on the machines here but we don't have time to show it. So if you want to try it, you can go to this address and try it out. It's really for this conference only and we are using it with a student sample, it's not generally available, it's basically just for testing. It is the first attempt to try to get at modality specific ability like the PONS test that Bob Rosenthal did a long time ago, but using emotions basically it's the actors that we've used for the vocal stuff that we had videotaped at that time, so we're using for the first time the videos from that study.



Self Ratings \ Other Ratings	Emotional stability	Power/ Achievement	Flexibility/ Creativity	Social interaction competence	Leader/ Entrepreneur-ship
Emotional stability	0.08	0.18	0.01	-0.06	0.03
Power/Achievement	0.01	**0.31**	0.16	0.02	0.01
Flexibility/Creativity	0.06	-0.03	**0.63**	**0.44**	-0.19
Social interaction competence	0.14	-0.11	**0.38**	0.23	-0.08
Leader/Entrepreneurship	-0.16	0.06	-0.14	0.02	0.18

Let me finish, I have one minute maybe. And this is again on the criteria issue. A lot of you who test emotional intelligence use what is so often called 360 degree, which is, I think, an euphemism, to some extent. I use the old standard, peer-rating/other-rating notion. We did this study with 45 managers, who we had perform the test package. We then asked all their colleagues to do the usual kind of other ratings. Now the interesting thing is that you do get some correlations of significant power and achievement, not bad, flexibility, creativity, and so forth. Particularly for emotional stability, however, you do not get any relationship and it's clear why. Why should you have your emotions hang out for your colleagues to see? You don't show your emotionality, so if you want to get an emotion, asking other people may be the worst thing you could possibly do. So when we went and looked at how other ratings correlate with some of the other instruments we have, we can see that the emotion index that I talked about, people who are habitually sad people, habitually serene people, habitually shameful and guilty people; well there are correlations with what other people perceive. So there are links, but they are not on the emotional stability axis. So what I want to leave you with is two arguments. One is, let's base the notion of emotional intelligence on the process model of emotion, because that's where it belongs. We need to know how emotion functions, in order to know when it functions better. And secondly, let's develop instruments that get at that, that get at the kinds of things that we need to measure if we want to know, who is going to function better than others. Thank you very much.

DISCUSSION

DR. STRICKLAND: We have time for a couple of questions.

DR. EKMAN: I have three questions. First, I hope you will tell us why you prefer competence to intelligence. The second is concerned with the finding you described a few minutes ago; simply knowing how someone feels doesn't necessarily get you very far. Indeed, it may get you into trouble. The question is: how do you use the information? And the third is this: your last set of results, might this be a Swiss phenomenon, I wonder whether you get the same thing in Naples?

DR. SCHERER: I will start with the last, this was really an international sample, the data are from multi-national companies in Geneva, I don't think there were too many Swiss among them. So, it was many different nationalities. But certainly I think it is an important issue, the cultural differences, we have seen them in other data. We have some Asian participants in these studies, they react very differently, we now have people in Egypt doing the tests and again, incredible differences on some things, some personality aspects, some emotional aspects that have to do with customs, with religion and so on. On using the information rather than just getting it, I completely agree. But so far we have no handle on it. I think it's both, first you need to have it and then you need to act on it. Why I prefer competence to intelligence? Well, intelligence is supposed to have a small *g*, I don't think emotional competence has a small *g*.

DR. ZEIDNER: I think the Galtonian versus the Aristotelian models apply to different models of emotional intelligence. There are ability models, such as Salovey and Mayer, and there are mixed-models that sort of combine and blend personality and attitudinal variables and temperament and motivational variables and so forth. So, if you would adapt Bob Thorndike's distinction between monotonically increasing functions of ability, such as the Galtonian model versus the curvilinear Aristotelian model, actually they apply to distinct conceptions for models of emotional intelligence.

DR. SCHERER: I'm not sure. I think there are two different dimensions that are cross-cutting. I agree with the distinction between the trait model that sort of looks at fairly diffuse emotionality and personality traits and the ability approach, but I think even if you take an ability, to let's say read minds of other people, let's suppose we have that. It could be possible that an Aristotelian model could be better because we wouldn't want to read everything including stuff about us, we want maybe to only go so far.

DR. JOHNSON: Two questions. One, could you explain in the context of your study what you mean by too much emotional display, and secondly, I would like to ask you to comment on that last slide where you showed strong negative correlation between morality and power and achievement.

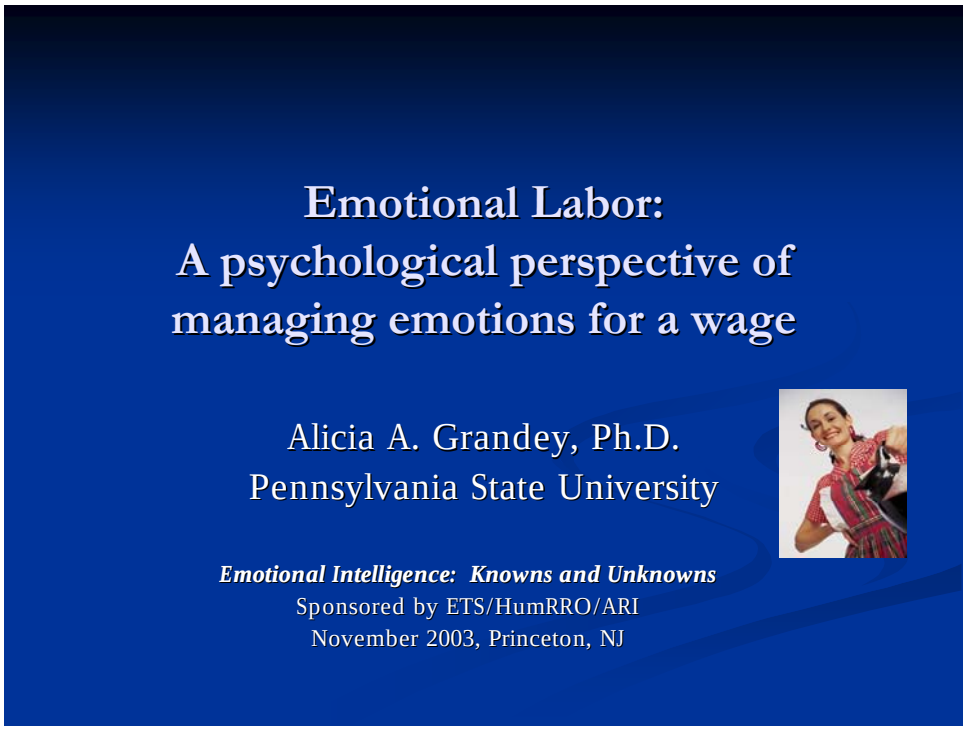
DR. SCHERER: That's always a good one to discuss with managers. I think it's something that we find generally, that you have a strong negative correlation between, for example, entrepreneurial orientation and also power orientation and we have value scales, work value scales and human value scales, and those kinds of values. It seems to recruit different kinds of people. It is a very stable finding. Remind me of the first question.

DR. JOHNSON: What do you mean by too much?

DR. SCHERER: In this case it was just a theoretical notion that in such an Aristotelian or stoic model, you would assume if you are very high on something that that is already too much. So in terms of the empirical data, it's just a plotting of the values on that scale, on the ACT scale; and the "too much" means normatively in terms of the underlying model, which doesn't seem to pan out.

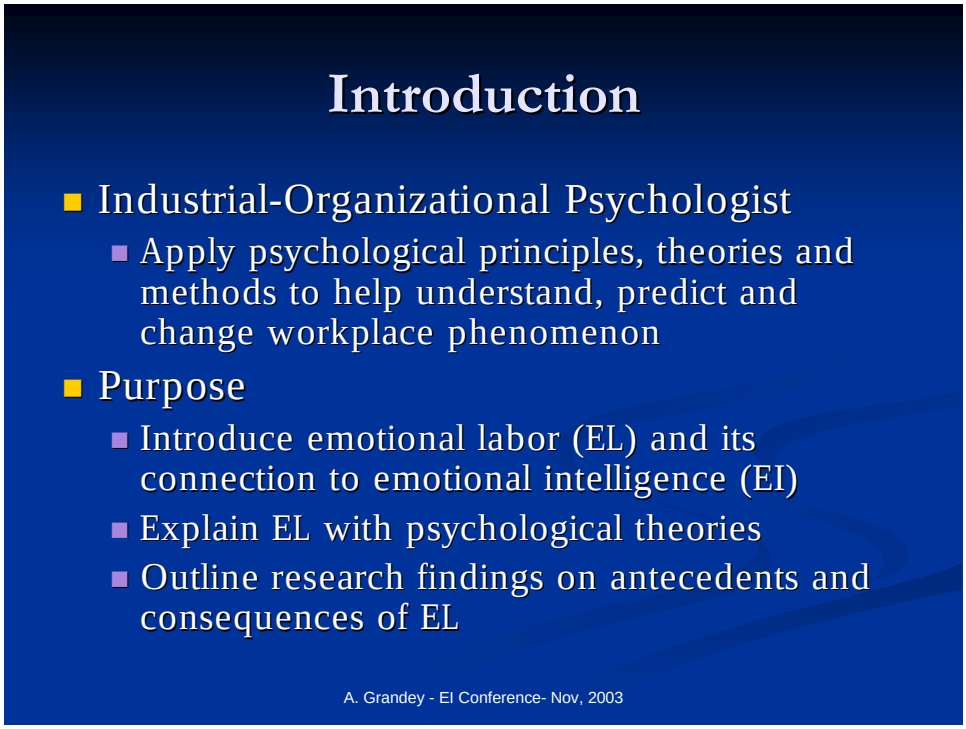
DR. IRVINE: I'm wondering if you've gotten into the business of interventions, and if so, how do you teach appropriateness? Do you have general rules for teaching that?

DR. SCHERER: No, the test is used mostly for management development, so it is being used to talk about mostly shortcomings. For example, results where there is a clear problem with manager sensitivity to local cues, there you ways of training them or Paul Ekman will probably talk about the tools for increasing skills for facial recognition. So for the ability scales and the Galtonian model, we have good intervention models. For the appropriateness no, and you're right it's a very problematic issue, especially since appropriateness may not be global, it may be local in terms of specific combinations. So it probably can't be dealt with general rule systems of any sort. Thank you.



EMOTIONAL LABOR: A PSYCHOLOGICAL PERSPECTIVE OF MANAGING EMOTIONS FOR A WAGE

DR. GRANDEY: What I'm talking about today is something called Emotional Labor, if you haven't heard of that concept that's wonderful, because what I'm going to do today is give a fairly basic level conversation about what is this concept and then what does it have to do with emotional intelligence. It also needs to be stated that I'm coming from a psychological perspective, as this section is all about. And what is beautiful about this is that my predecessors today have already talked about what are emotions and today I'm going to talk about how we regulate those emotions, so this is building nicely on the previous work.

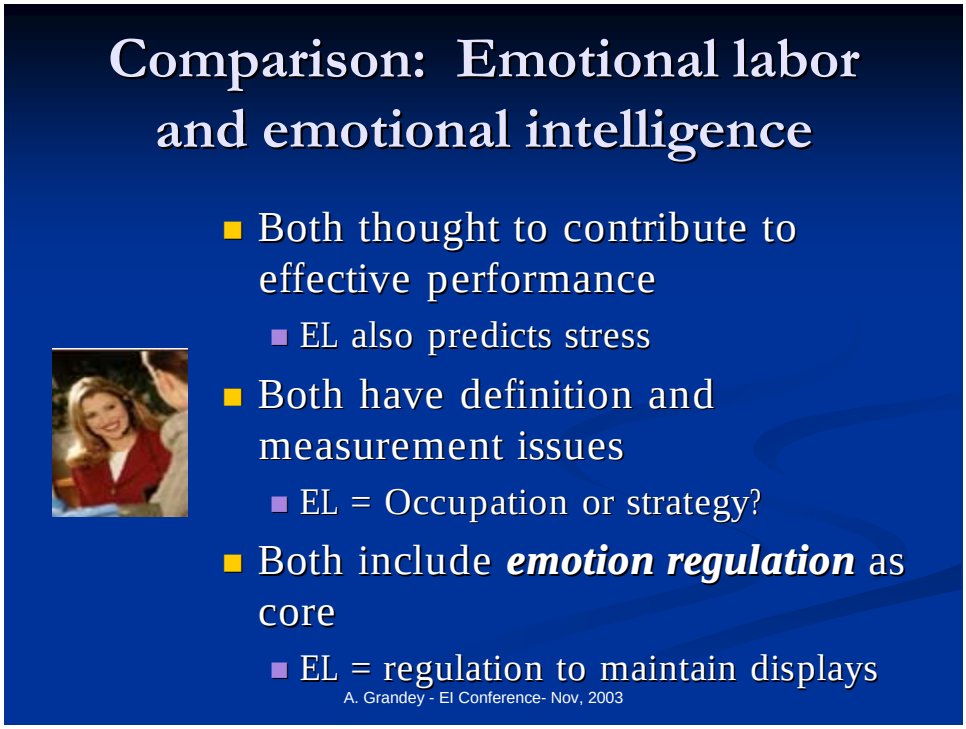


A little bit of background about me. I'm an industrial organizational psychologist, which means that I'm someone that applies psychological principles and theories to the workplace in order to understand or predict the workplace phenomenon. And I have to be totally honest here and say when most people ask me if I do research on emotional intelligence I say I stay away from it with a ten foot pole. And the reason for that is because there is so much ambiguity, so much difficulty, and in our field so much vitriol about the concept. When I sought to do this presentation and I'm very thankful for Richard for asking me to do it, I realized that there is actually a lot of overlap between the emotional labor field, which is one of the main core areas of emotions in the workplace, and emotional intelligence. So one of my purposes today is to introduce emotional labor to folks that might not be familiar with it and to show the connection to emotional intelligence, which I appreciate having to do as well. I'm going to explain emotional labor using some psychological theories to demonstrate how the theories helps us to understand these phenomena and I will also be outlining some research findings done by myself and other psychologists using a variety of methods on looking at the antecedents and consequences of emotional labor together, which again, I think should inform most emotional intelligence researchers.

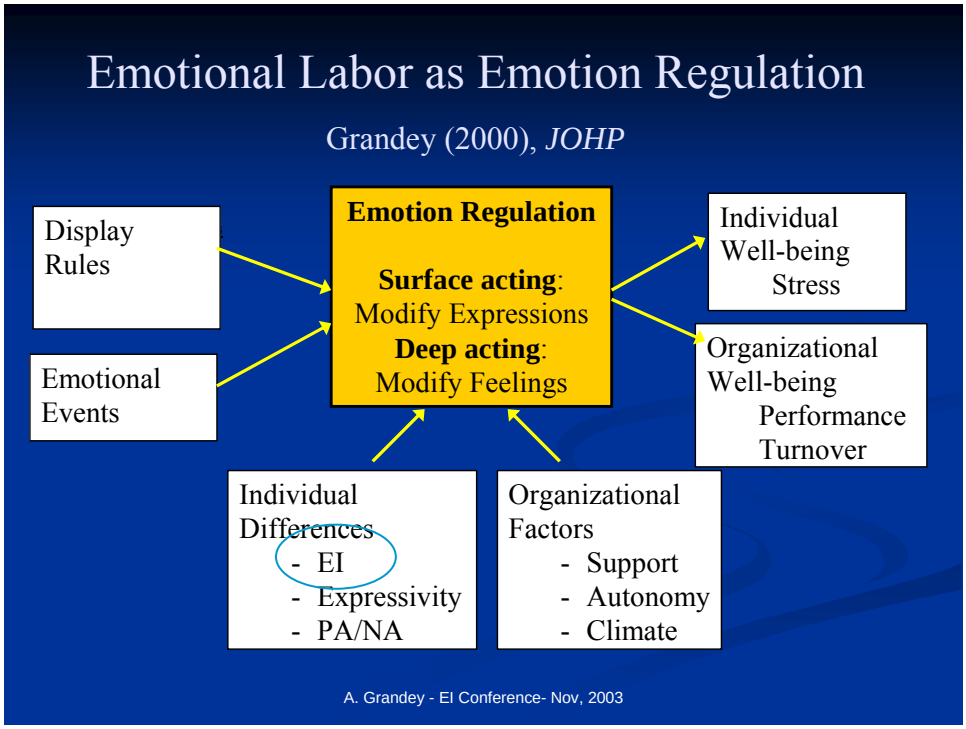
So what is emotional labor? Emotional labor was defined by Hochschild as, "the management of feeling to create publicly observable facial and bodily display." And in her book, "The Managed Heart: Commercialization of Human Feeling" in 1983, she talked about how emotional labor is something that is done for a wage. Meaning that regulation of emotion is done by individuals for money or for tips. So, she is distinguishing it from emotional work or emotion regulation which is done more generally; we all regulate our emotions in different social settings. But in this case, we are talking about emotions as a commodity, that it's part of an economic transaction. When you go to Starbucks you don't just come in for the coffee, you come in for the friendly service. She is talking about how this is a very different and unique phenomena.

And one of the things I felt like I needed to justify before I continued was to demonstrate why this would be important. One of my reasons for thinking this is a lot of times, at least from what I've read, emotional intelligence is focused on management, maybe because that's where the money is for training and so forth. But it tends to be focused on the upper level echelon in businesses. Actually, emotional labor is focused on the lower levels, the entry level jobs so it's focusing on the service industry. And I argue that there is actually good reason to study this population in particular and here are some of the reasons why. One, as we probably all heard, there is a high growth in the service industries, it's one of the most increasing sectors of our economy in terms of new jobs. So that is a reason right there, it's where most people will end up working on average. There are unique expectations as I've already alluded to in the service industry. A job in the service industry is defined by the fact that you interact with the public. You are what is called a "boundary-spanner", you span the boundary between the organization and the public.

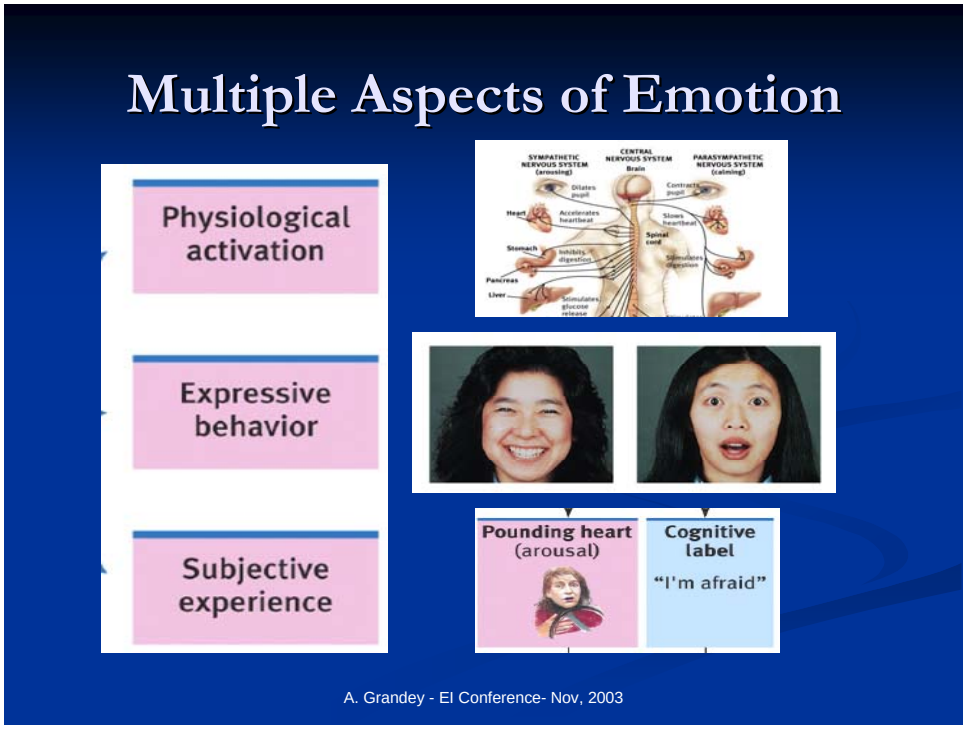
So you are the connection for those two entities. When people come in, you represent the company to that individual and therefore, the company has a vested interest in you demonstrating and representing them in a positive way. And therefore, they subscribe to certain display rules. And we've already talked a little bit about display rules, in the other talks as basically just what occurs in social interactions, but here they are much more explicit and I'll talk more about that later. But you've probably heard about the ideal of "service with a smile." Some other characteristics that make these jobs particularly interesting is the extremely low autonomy, which is partially demonstrated by the presence of display rules; they don't even have the autonomy to show the emotions that they actually feel or want to feel. They might have a script in front of them, if you go into Taco Bell there will be a script saying, "push this button, then make sure to smile and ask how are they doing, have a nice day"; it's all scripted out and there is very little autonomy in what they do or what they say, and how they say it. Also, low pay according to labor statistics. In addition to being one of the most increasing jobs that are available, it's also one of the most lowest paid jobs. So while this might be done for economic exchange, employees are not necessarily being compensated for that emotional labor. And of course, there's also very high turnover in these fairly low wage and low skill jobs.



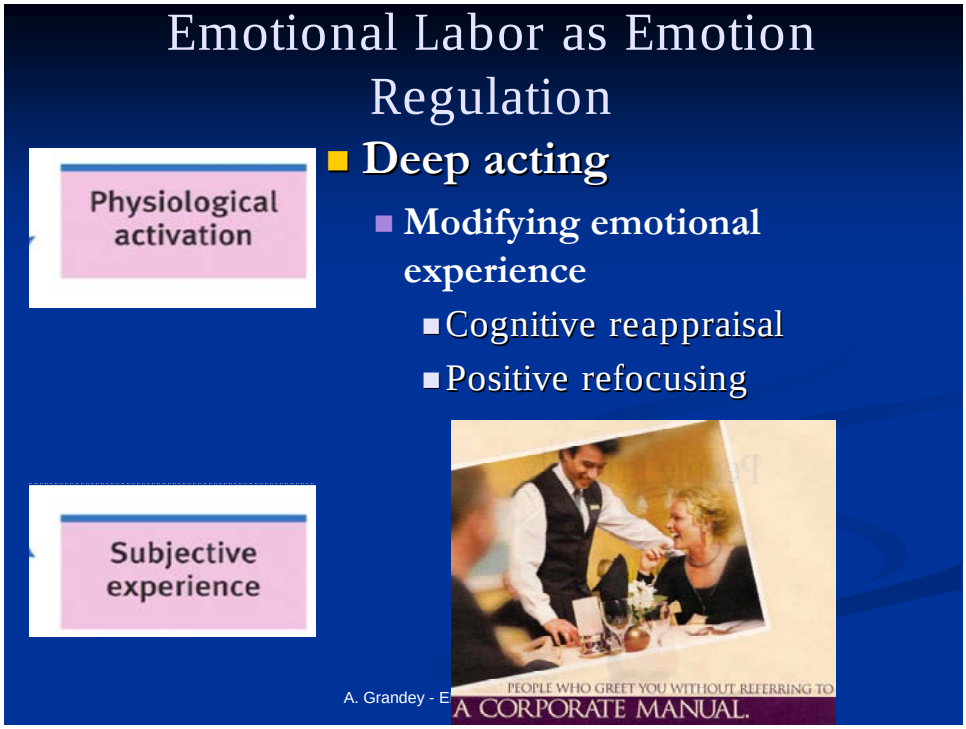
So let's talk about this connection between emotion labor and emotional intelligence. As I've already said, one of the differences is the population that is studied, but here are some of the things that are similar between these two. Both of the topics are thought to contribute to effective performance. So, you do emotional labor in order to get a good reaction from a customer and with emotional intelligence we try to see if it's related to performance in organizational settings particularly, or in developmental areas in children, and so forth. But when we study emotional labor, we also are often using it to predict stress and I haven't really heard a whole lot about people in emotional intelligence literature using that to predict stress. I could be wrong; I might be a little bit out of the loop on that. Both have definitional and measurement issues, which makes some sense given the newness of at least those labels. In the emotional labor field, one of the difficulties is whether emotional labor is an occupation, like physical labor, emotional labor, cognitive labor is a type of job one has or whether its strategy, you're laboring emotionally. I subscribe to the second of those two. You kind of look at this along the lines of emotional intelligence, and the argument is, is this an innate ability or a skill? We have similar debates in emotional labor. So I need to point out that I'm representing emotional labor, but these are my views on emotional labor and I'm not the only view of course on emotional labor.



And the thing that I think it really all comes down to, and I'll spend the rest of the time today talking about, is the idea of emotion regulation. In my view, emotional labor represents one's regulation in the workplace for pay; that one is regulating for certain goals in an interaction that are defined by the organization. And of course that is one of the core dimensions of emotional intelligence. I think there is some cross-fertilization that can occur between those two areas. As Klaus Scherer mentioned, I will also be drawing on one of my own models of emotional labor, but mainly just to introduce a kind of framework of variables and how they might be related to each other. And I'll go through each of these sections, so this is kind of just an organizational framework. You can see there that in this original theory piece which I published in 2000, emotional intelligence is included as one of these predictor in terms of personality variables, I will spent most of the time today talking about situational antecedents and the consequences, and briefly will cover the bottom parts towards the end.



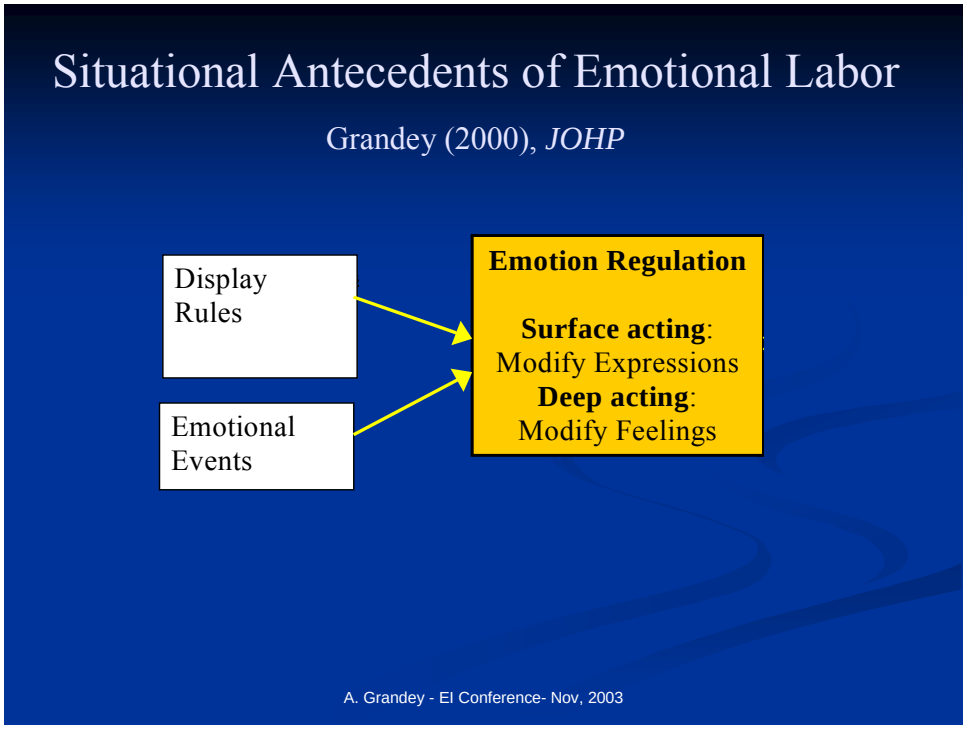
But first I want to talk about more explicitly what I mean by emotional labor as emotion regulation. As has already been discussed, there are multiple aspects to emotion and I particularly appreciate Lisa Feldman Barrett's conversation, that they don't necessarily work in tandem and as other people have alluded to this, they don't necessary are all working in the same way. One can work on different aspects of emotions or one may feel one part and not the other part. But in general, breaking it down into three categories, we can talk about physiological activation, expressive behavior and subjective experience, or appraisal of one's feelings.



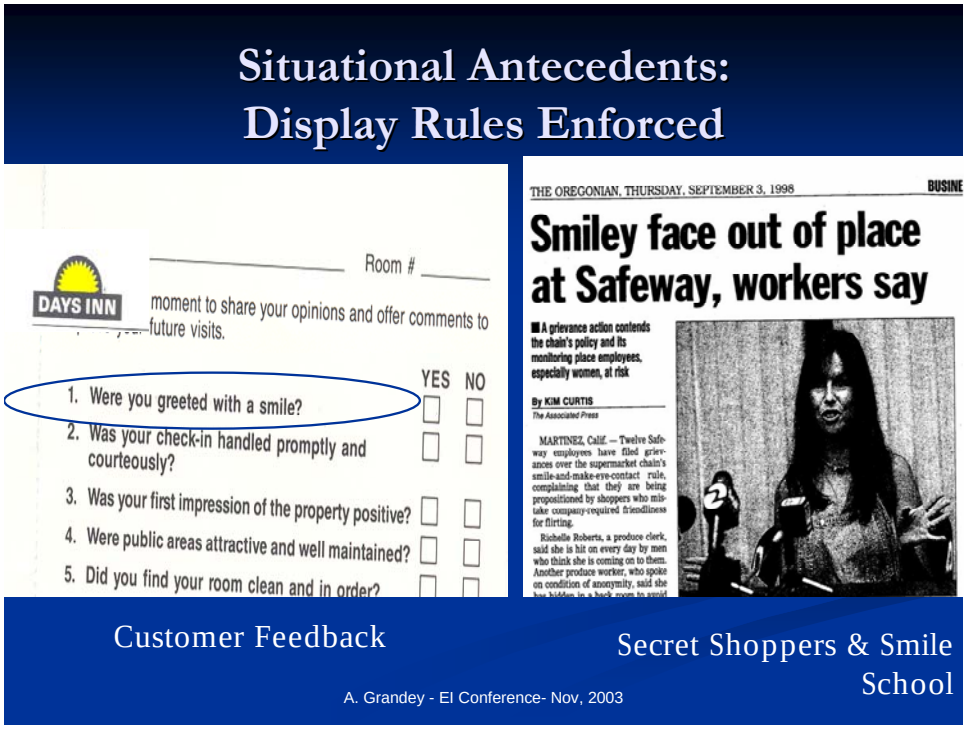
So, what we can do then is talk about how one might regulate those different facets. So we can actually regulate different parts of those emotional components. One of the components that Hochschild described was called “deep acting” and in my paper I discuss how this is similar to James Gross’ sense of antecedent-focused emotional regulation. The idea of deep acting regulation is that one is modifying an emotional experience, before emotion becomes full-fledged, one takes the situation that might become emotional and reappraises it, or focuses on something different about the situation, in order to feel differently. So, they’re actually adjusting the subjective experience to that situation and perhaps also modifying their internal states, calming down their bodily arousal to that otherwise perhaps anxiety producing or angering situation. On this slide is an example of how this is discussed in the service literature. The image shows this very nice looking man laughing and joking in a realistic way with a customer and says “people who greet you without referring to a corporate manual.” Meaning, that we have authentic people here who deeply feel what they are actually showing, they’re not just doing because that we told them they have to provide service with a smile. So, one of the ideas of deep acting is that the employees are actually trying to modify their feelings and therefore become more authentic. And in the process, therefore, in changing their internal states it may then change their expressive behavior and become more authentic.

We can contrast this with the other side of the coin that Hochschild talks about which was surface acting, and again this could be a correspondent to James Gross' response-focused regulation. So after the emotion has been felt, the situation occurs, one feels upset, now one might choose "okay, I can't show this emotion." And as we discussed, feelings and expression are not always congruent. So the person simply may modify the expression, they may not do anything with their internal state, they may be aware that they are feeling upset, being aware of the eternal turmoil and yet put on a smile as shown in this image below.

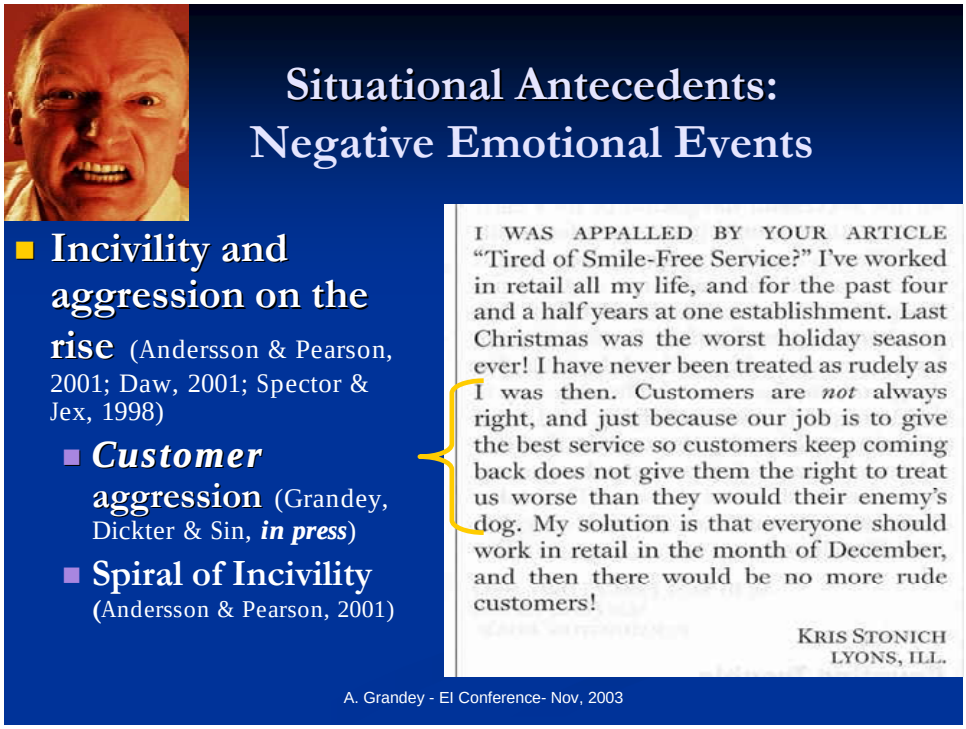
Putting on the mask and this can be done in two main ways, as I talked about in my article. Suppression, simply just pushing down the feeling or masking it, or faking or enhancing, to try to pump oneself up and feel something a little bit more than they, maybe, previously felt. But either way, it's all about the expressive surface level.



So what are things that lead to needing to regulate? I'm going to focus here on situational aspects that might lead to the need to regulate emotions and again, this is particularly focused on the service setting. I already said most social settings have display rules. I want to show you how it's different in the service setting. Display rules are explicitly stated and enforced, you might have seen signs on your basic fast food restaurant saying, "hiring smiling faces", it doesn't say friendly people, it just says "hiring smiling faces." There is a separation from the face from the person, a depersonalization almost. What they're doing is they're saying we hire people who show friendliness, and then they proceed to train them in how to act friendly to customers and then they enforce it through a variety of means.

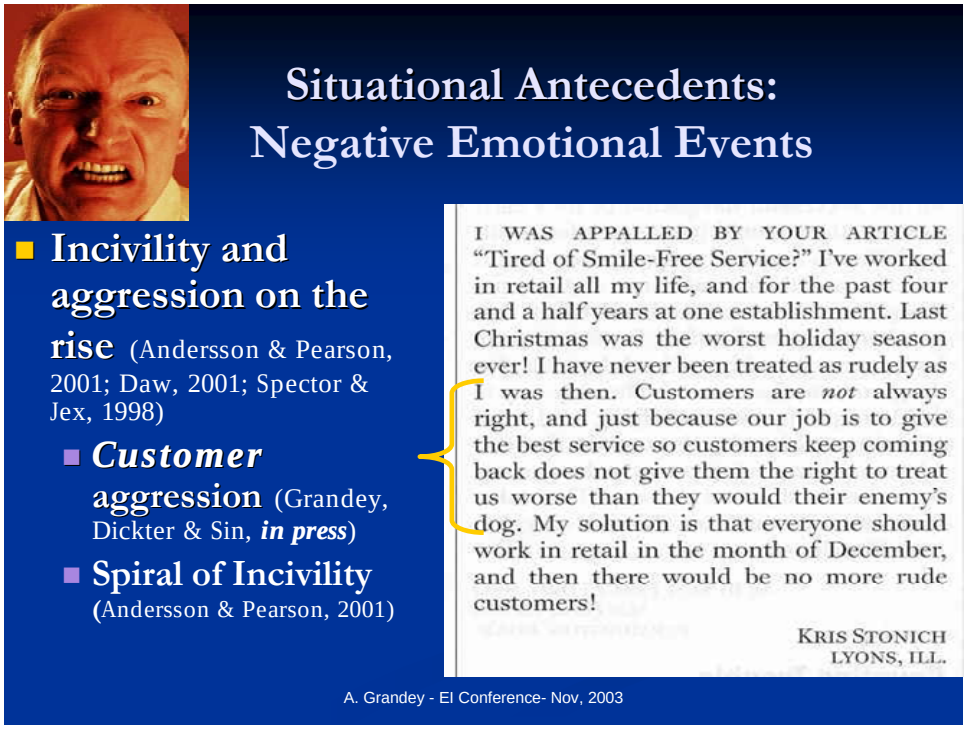


This is showing an example from an actual Days Inn comment card that they give out to all of their customers, the very first question is, “were you greeted with a smile?” And that’s the feedback that can be given to that service worker at the front desk, “this shows you were not providing service with a smile to our customers.” Another way that we can see this in action is use of secret shoppers. A lot of service industries use secret shoppers to go in and pretend to be customers and then identify if a person is actually carrying out the display rules as they are explicitly stated in training. On the right side of the slide is one of my favorite cases to discuss, Safeway in California, the clerks were trained and told that not only are they to be friendly to customers, they had to smile and hold eye contact for 3 seconds or more. Try to turn to the person next to you and stare at them for 3 seconds. That’s a long time, and it would generally seem to imply some kind of feeling that is not actually felt. Because what we tend to do is stare longingly in people’s eyes that we care about. And in fact, what was happening in the situation and the reason they brought a lawsuit, was that they felt they were being sexually harassed by customers who were taking it the wrong way. And what some people find amusing is that if they didn’t enact this behavior, they would be sent to smile school. And that’s literally what they called it in this organization, the smile school, to relearn how to be friendly to all customers. So basically, we’re moving the autonomy from the service workers to act in a way that feels appropriate, as was talked about in previous talks, and saying, “no, this is the way you have to act, regardless of circumstances.”

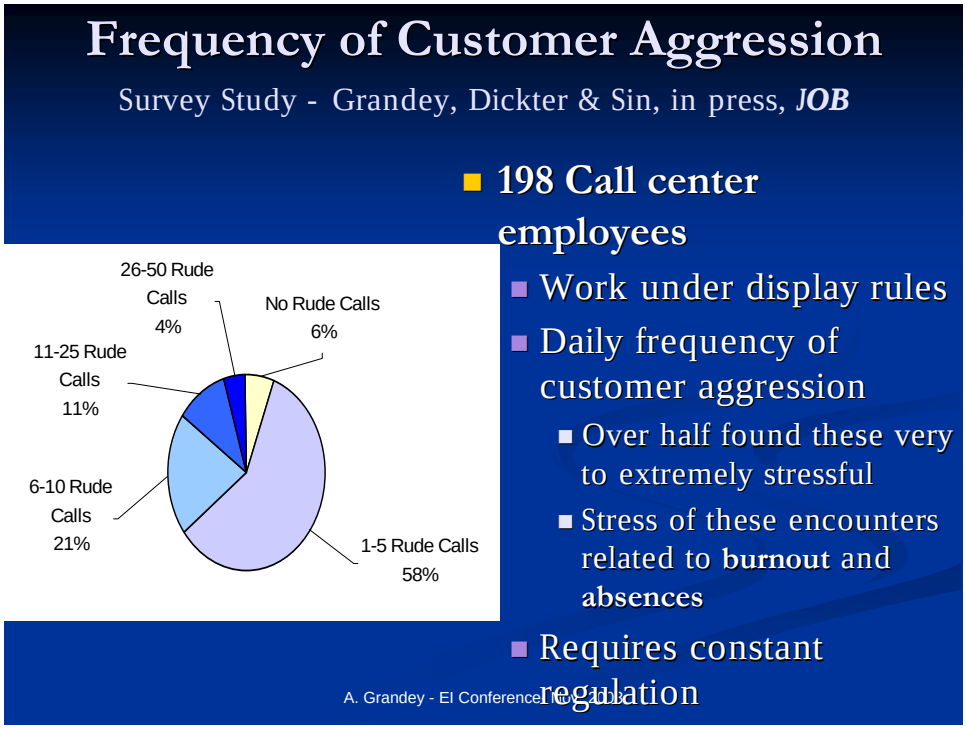


Talking about the other aspect of predispositions or antecedents towards emotion regulation, are negative emotional events. You have the display rules of "be positive", and generally that is the case, although there are some services where they are required to be negative, they tend to be the exception rather than the rule. And then you also have the possibility that this might be an industry where there are even more negative interpersonal events than normal. So we have literature that in general suggests that there is more instability and personal aggression than there used to be. And we can attribute that to the 24-7 economy, we can attribute that to the basic lack of courtesy, some people say it's lack of good upbringing, all the divorced families, whatever is the reason. One of the things that I've been particularly interested in is the occurrence of customer aggression towards the employee.

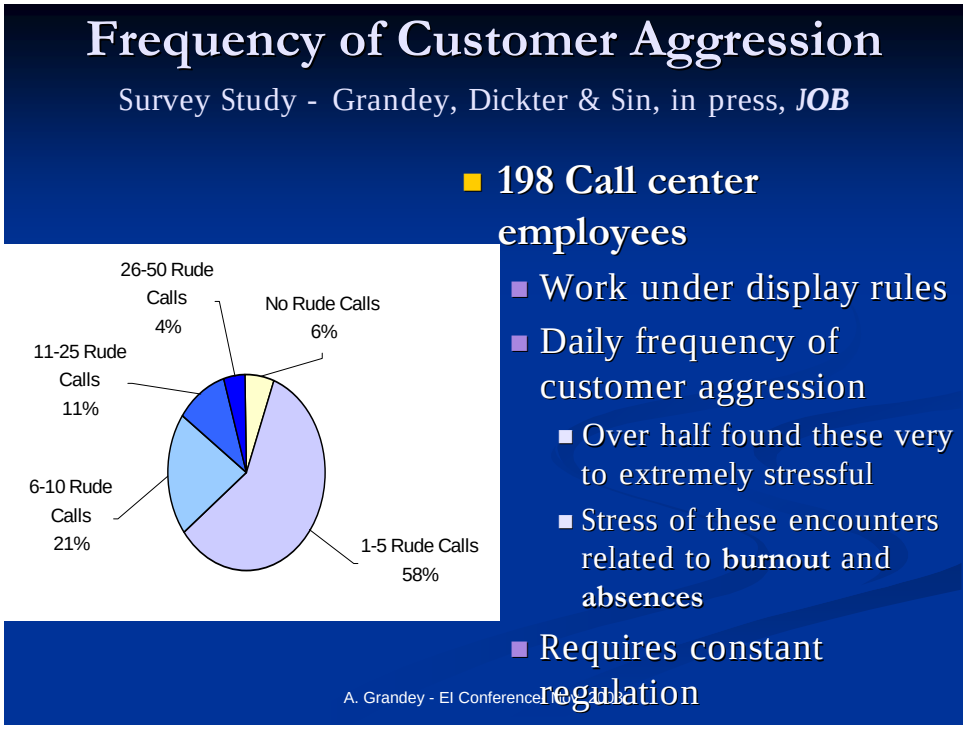
Think about this situation: The customer is coming in for assistance from this employee who is required to smile at them. And the customer knows that the customer is always right, we talked previously about how the negative feelings flow down the hierarchy, well here is the perfect case of that. You basically have a person, who maybe even is a service worker somewhere else, but they have come into another service environment and now they're in charge, and they get to take it out however they are feeling on this poor person at the counter that has to be nice no matter what.



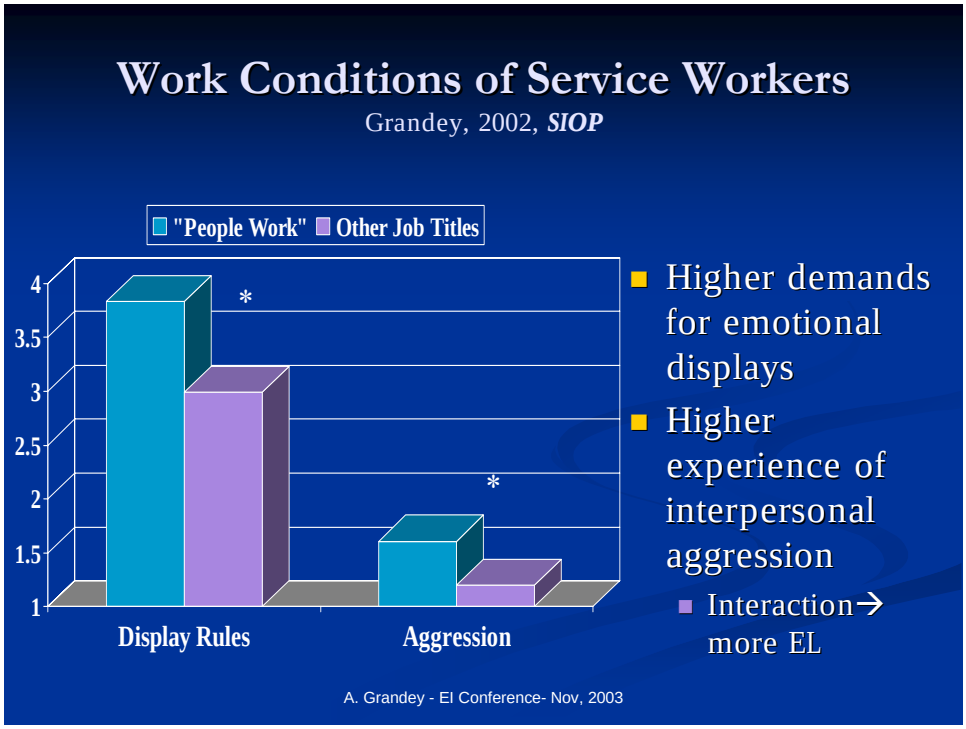
While I do acknowledge that some people maybe haven't had that experience and when our economy was particularly good, we did not see as much friendly service, because management couldn't fire their service employees because they needed more bodies. But now we might see again, them having to keep up this encounter. I have here an example; Newsweek ran a story about this smile free service, what's going on with all of these rude employees, talking about the economy. And in response to that, this woman wrote in a letter to the editor. She said, "This last Christmas was the worst holiday season ever. I have never been treated as rudely as I was then. Customers are not always right, and just because our job is to give the best service so customers keep coming back," and that's the idea of why there should be display rules, "does not give them the right to treat us worse than they would their enemy's dog." If you read Stud Terkel's Book, "Working", which is a classic in looking at people's jobs, he talks about a hotel clerk who uses that exact terminology, and I think his book was written in 1975, where he says, "I could be treated worse than somebody's dog." So we have here a real sense that there can be customer aggression and this can lead to a spiral of incivility. Where the customer is being rude to the employee, who then feels bad then lets it out on the next customer, which then diminishes the positive effects that the organization is hoping for in terms of managing impressions with customers.



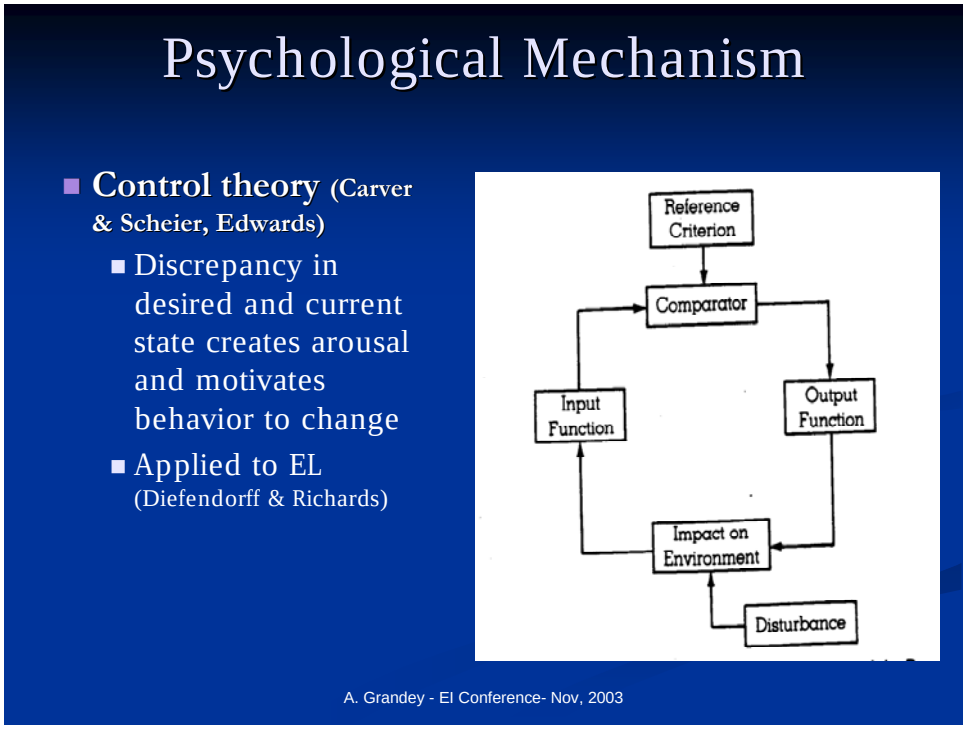
Is this actually a common problem? This is something that I've been researching for the last couple of years about the frequency of customer aggression. Is this a rare thing or this happen fairly regularly? And of course it depends on the setting. But in this one study I have just gotten published, this was with call center employees. So here you have voice-to -voice interactions, which you can argue might be less stressful or can actually create more stress because the customer may not feel the normal shame or embarrassment about letting out their negative feelings at this faceless person at the end of the other line. In this call center study, they all agreed that they worked under positive display rules. And what you see in this pie chart is the reporting of how often they experience daily customer aggression. Based on interviews I did with these employees, the response I was getting was that this basically occurred on a daily basis and that in our survey I should ask how many times a day this has occurred rather than a month or week. So what you can see here is that in the survey 58% said it happens about a handful times a day. So if you figure they get about 50-60 calls a day, and this is an incoming call center service, so they are calling in with a problem or a dilemma. 58% were saying yes, it happened regularly more than 5 times a day. Four percent said it was happening on almost all their calls. And in asking them how stressful did they find this, over half said it's very stressful.



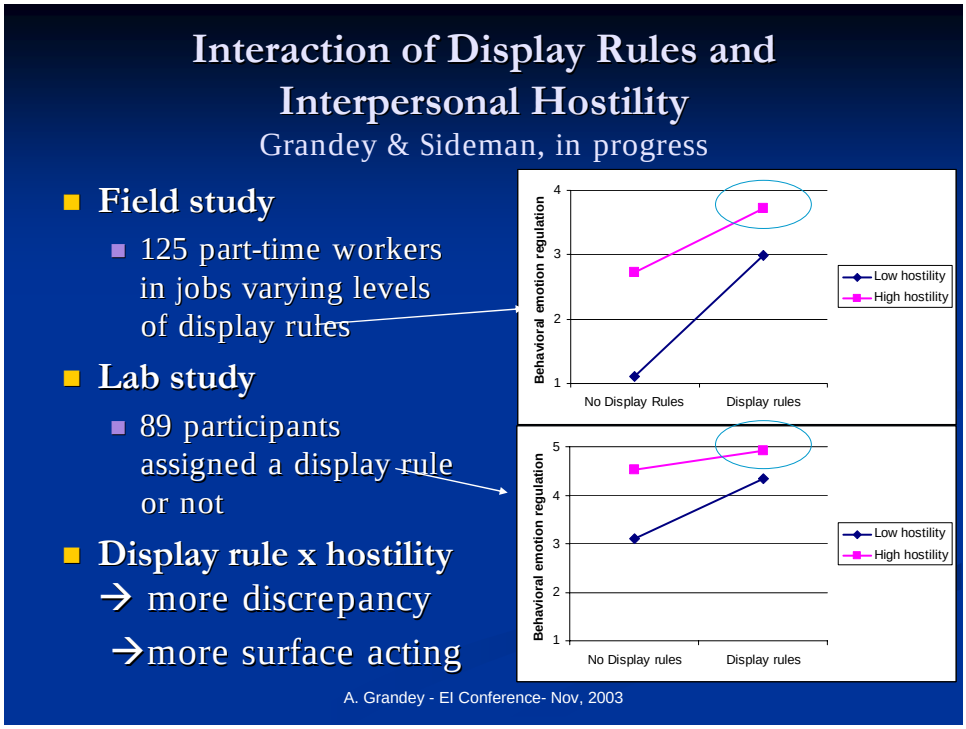
So it's not like it's happening regularly so they're habituating to it and then it's no big deal, they're still finding it to be a stressful thing. And in fact, their appraisal of this event was related to their burnout and subsequent absences from the workplace. And so one of the things we can think about here is the situation of working under these display rules, and then having these negative customers might then require some constant emotion regulation from the employer.



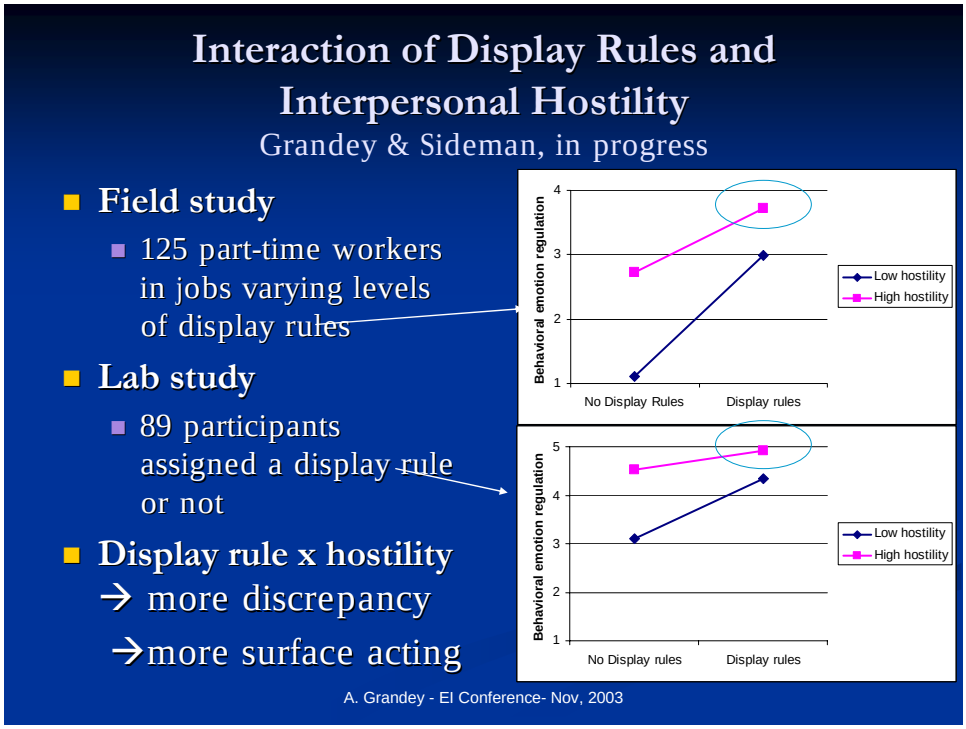
This is another study that I did where you can see clearly here the difference between people who do “people work” and people in other job titles, so people let’s say in the physical labor or clerical work where it’s not quite as much of a part of their job to interact with people. On the left you see the perception of, do you work in a job where it’s required to be nice to people that you have suppress your negative emotions, and on the right the frequency of interpersonal hostility or aggression from others. In both cases, “people work” reported significantly higher levels of both display rules and aggression. So we are setting up here a potential discrepancy that might create more regulation for this job type. Again, this is with people within a range of jobs not just call centers.



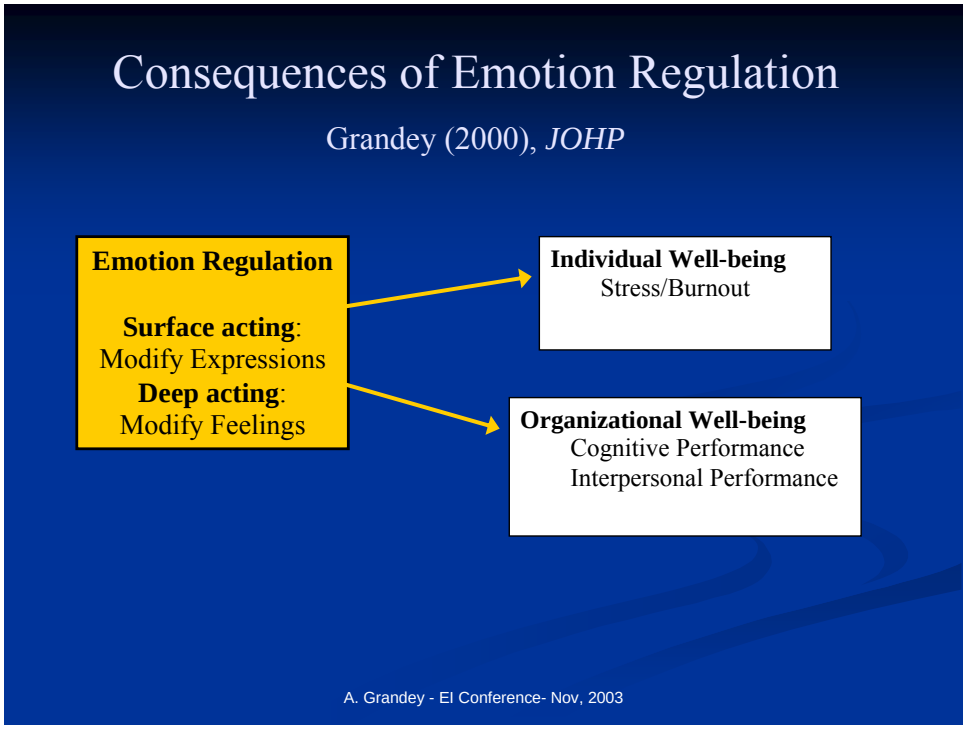
One of the ways we might understand why this might lead to regulation is a very established theory that is used in a variety of fields including engineering, is control theory. Control theory has been used to explain self-regulated behavior; we're probably going to hear about that later from Ruth Kanfer perhaps. It's also used to explain stress. Recently, it's been applied to the idea of emotion labor, and it makes a lot of sense. The idea of this is that we have a referenced criterion and goal. In these settings, the goal could be the display rule; you have to provide service with a smile. We then might have a disturbance, and in this case, we can think about that as rude customers, that they impact the environment and impact our input. We're now not feeling the way that we need to express. Okay, so this comparison occurs here in this control theory model and thus results in the need to regulate or to change one's output in order to then impact the environment in the way one is supposed to. This is a negative feedback loop that keeps informing one whether they're matching the referenced criterion, in this case the display rules, or not and the need to regulate until one does. As you can see this could be a constant process throughout the day, particularly if there's high frequency of customer aggression.



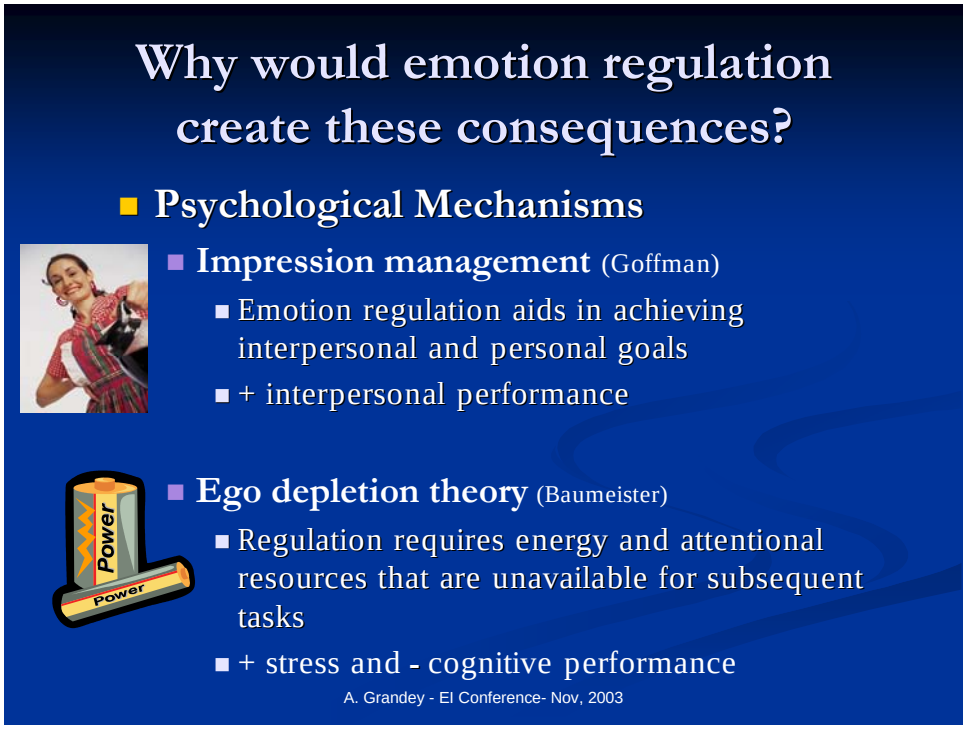
Looking at this interaction between display rules and interpersonal hostility, I've been doing work with Lori Sideman, a graduate student of mine, within both a field setting and a laboratory setting, both have, of course, limitations. In the field study, this is a survey study with part-time workers, we just ask them what perception you have of having to control your emotions at work and also the frequency of interpersonal aggression. In the lab study, I'll talk about this more later, we do a simulation of service encounter, where we actually assign them to a display rule, so we don't have to worry about them perceiving it or not, it's an objective display rule that they're given, of either show positive or just be yourself. And then we actually either give them a very negative encounter, or not. In both cases you can see that the interaction is not too different. Basically in the situation where there is the most discrepancy, where there is high hostility and a display rule, you have the highest reported level of surface acting, and that's this behavioral emotion-regulation on the left. We're still doing the study looking at deep acting, so that is not finished yet. And in the situation where there should be the lowest discrepancy, so low hostility with no display rules, there is almost no surface acting in the field study and much lower levels in the lab study.



Of course in the lab study they are less experienced at the tasks, so that makes sense that there would still be some regulation there. I also want to note an interesting part of the interaction is, when there are display rules in both cases, the people are regulating quite a bit regardless of what's happening in the situation. So one of the things in this literature has been that these explicit display rules create stress in employees. And one of the most intriguing things about the lab study particularly, is that even when people were not given display rules, there were no significant differences between how positively the customer rated them in their demeanor. So people might be using their own kind of ideal sense of self as their reference criterion rather than necessarily always use this explicit criteria. But if an explicit criteria is given, it might create this higher level of regulation and higher levels of stress; more on that in a moment.

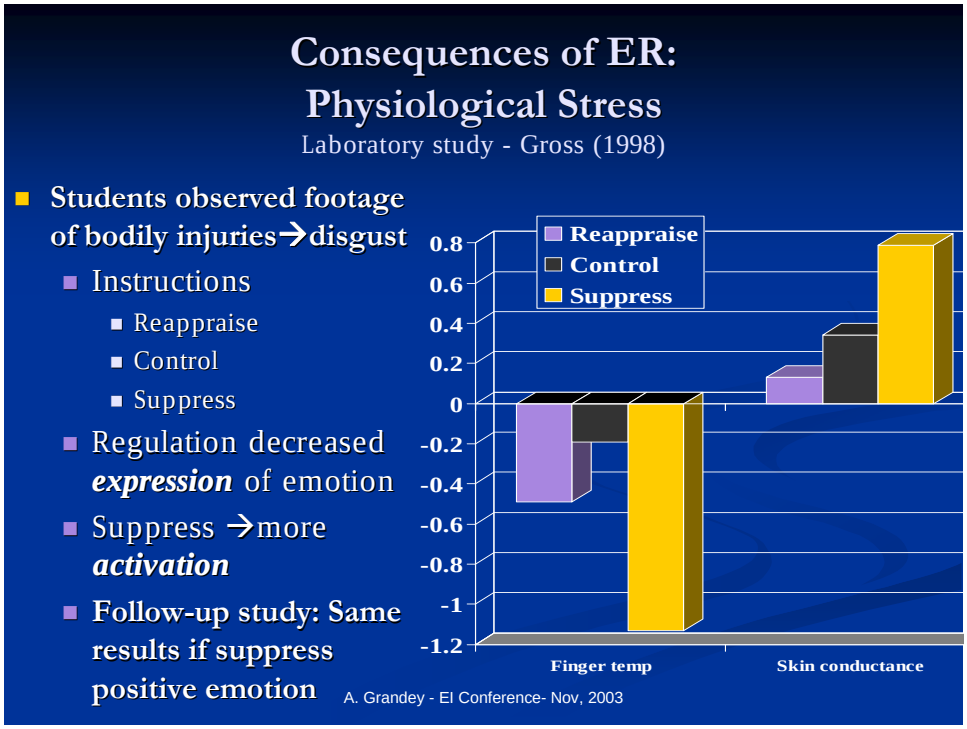


Let's talk about the consequences then of emotion regulation. The biggest key here is that perhaps there might be different types of consequences for these two different types of outcomes and certainly that has been discussed by others. I want to acknowledge here as well that the deep acting idea is consistent with a long range of coping literature that has looked at reappraisal, Lazurus looked at reappraisal in terms of coping literature, so this is not new in terms of that concept of putting them together and talking about them as regulating one's emotions is what is new.

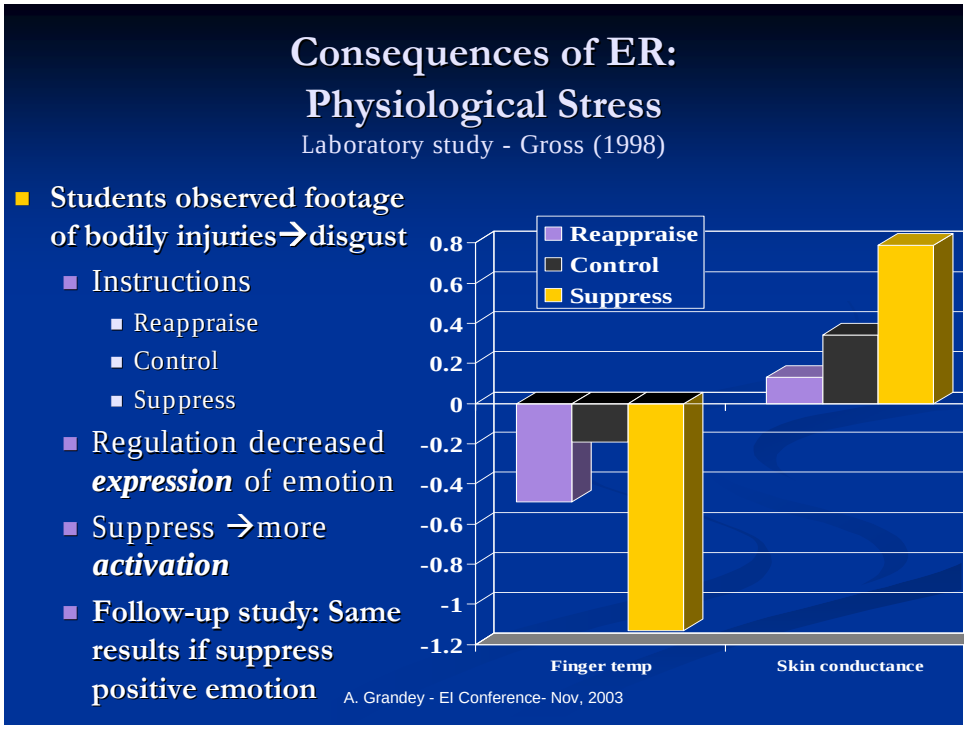


So why would emotion regulation create these consequences of stress in personal performance, cognitive performance? Two psychological mechanisms are ones that I have used in my literature, they're not the only ones by any stretch of the imagination. One is impression management, also the dramaturgical perspective, which is one that I subscribe to, discussed by Goffman also by Ashforth and Humphrey. And the idea here is the same idea as in emotional intelligence, that one needs to regulate in order to interact successfully or effectively with others. So you regulate, you control your anger, you don't show certain inappropriate emotions and that is positively related to well performed interpersonal interactions. However, on the other side we have this idea that it might be all well and good for the organizational setting that's saying, "Hey you've got to be nice" okay and they get the benefits. There is literature that shows smiling is related to higher tips, it's related to better intentions to come back, it related to satisfaction with the organization. But, there's the theory out by Baumiester and it's also discussed by James Gross, that having to regulate constantly requires energy and resources. It requires attention; it requires self-resources that become depleted if they're continuing to be used. Thus, they are unavailable for tasks that are subsequent to that regulation experience. So in order to test that we would look to see if regulation is positively related stress indicators and negatively related to cognitive performance which you might expect if one is involved elsewhere in their cognitions.

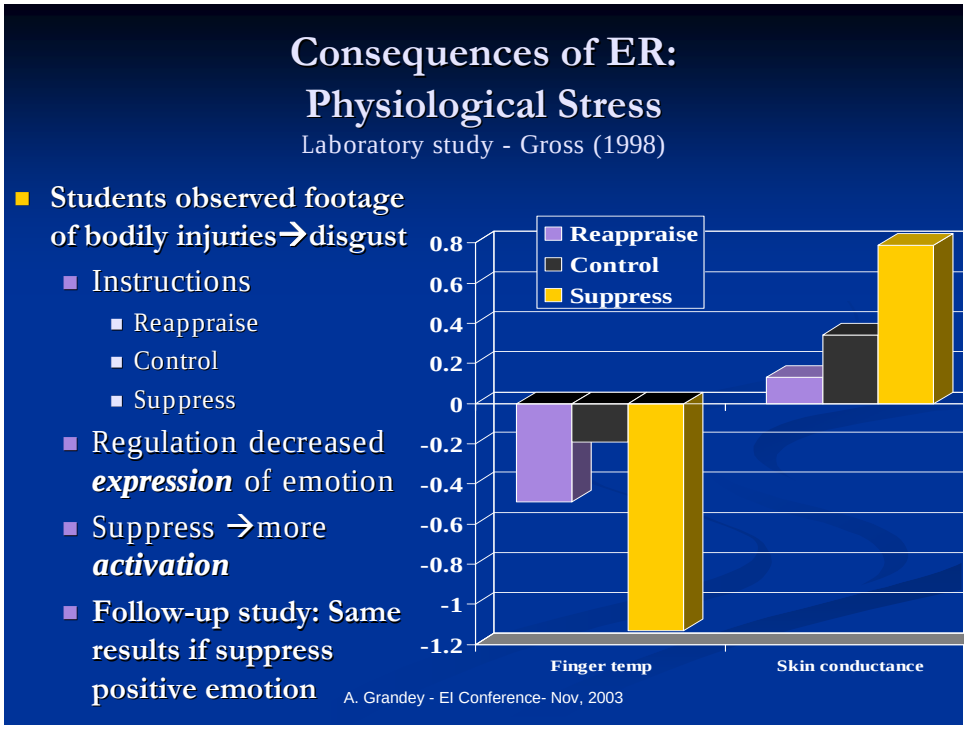
So we can look for evidence for these consequences in a couple of different ways and one is to compare types of regulating with each other, so we can compare when one surface acts or deep acts, or we can compare these regulations with simply not having to regulate at all. And there are two pools of research we can use. One is psychological laboratory research and there has been a wide variety of studies done by James Gross with a variety of colleagues, looking at all sorts of indicators. Someone had mentioned, is there anyone who has looked at all of these different indicators at once to see if they all meld together, and in fact James Gross does have a study where he looked at physiological measures, self-reported measures, cognitive performance, and other reported performance, and the results were very different. But we can also look at service-context research. So perhaps things might be different if this regulation is occurring in a service-context, and so it's important to be context specific when we are doing this research.



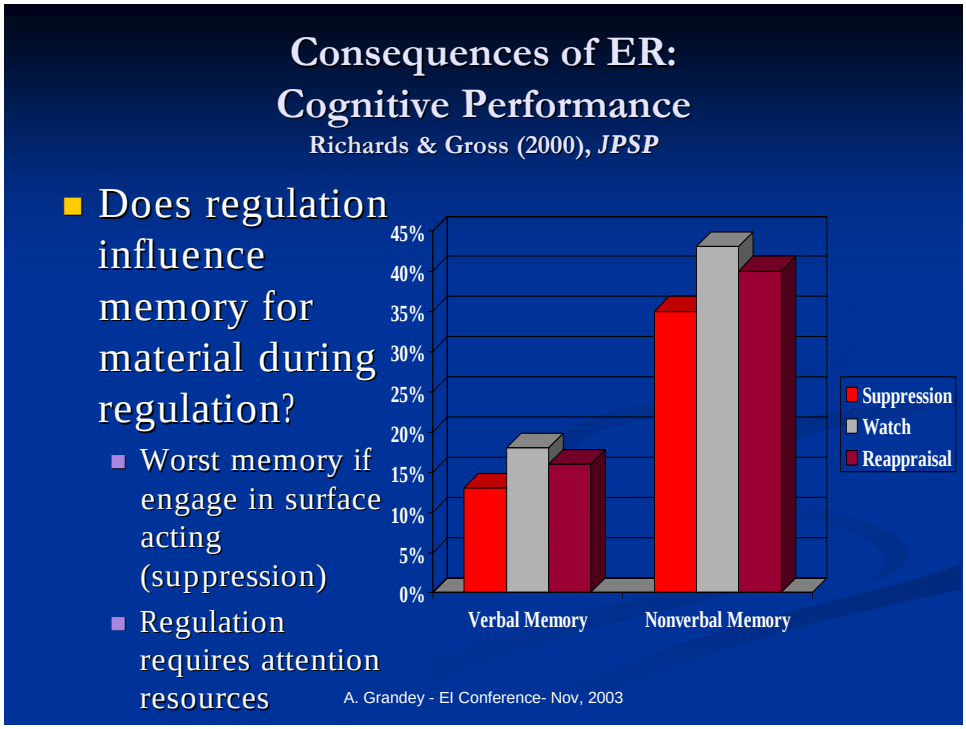
Okay, I'm going to first mention a couple of James Gross' studies because it is important to be informed about the general psychological research and then we can turn to the more context specific. So James Gross has done a variety of research looking at the physiological indicators and as was mentioned, that's often seen as the gold standard because at least that's not marred by self-report, but it also is potentially difficult to interpret as to what it exactly means. I'm going to show you findings that were significant but there were other indicators that were not. In his study that he has published and looked at in a couple of different ways, students observed footage of basically medical students working with a cadaver and they were then supposed to feel disgust. This is footage that has been well documented to make one feel a certain emotion within. And they were in one in three conditions, they were either told to reappraise the situation as a medical student just looking at it in a medical way, don't get to worried about what is going on, but try to separate and distance yourself from the occurrence. The control condition was not given any special instructions, just go ahead and feel and express whatever is going on within you. And suppress was just told, don't let anyone that might be observing know how you're feeling, and they were being videotaped.



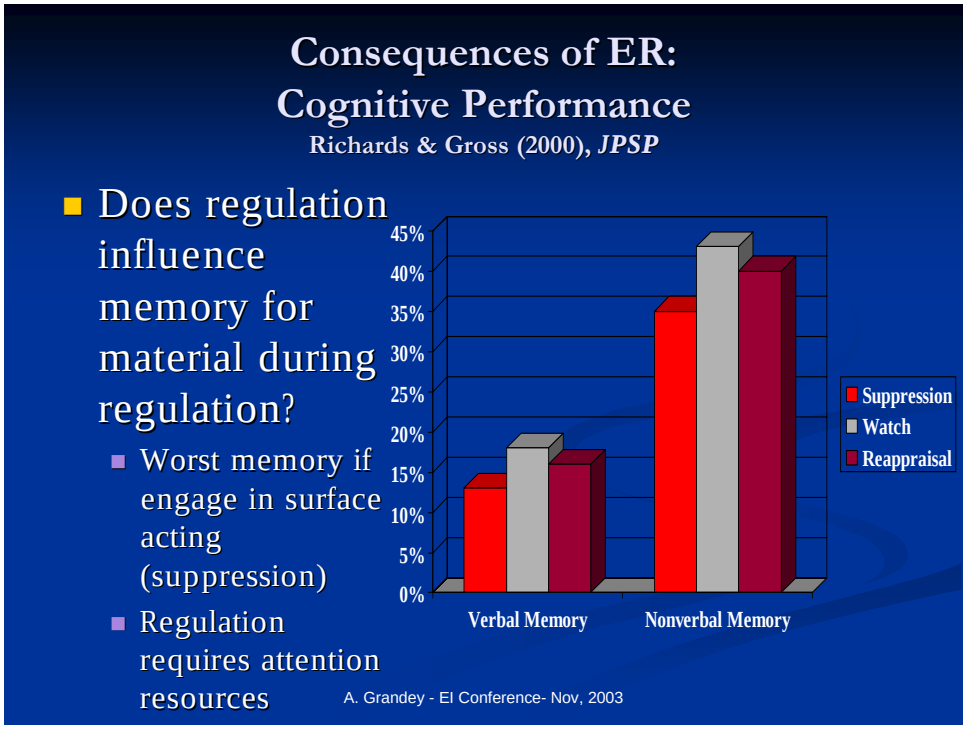
So before I show you the physiological measures, its important to note that regulation did in fact decrease the expression of emotion; both reappraisal and suppression were effective at hiding signs of emotional expression. So it does seem like they had followed the instructions. What was interesting was the comparison between suppression and the control group and reappraisal. So, this first one here is finger temperature. As you know when you get stressed, your fingers get cold because your blood is all going somewhere else, not going to the peripheral nervous system. So what you see here is how cold was it, so more cold is a longer bar, and the suppression condition is much colder; significantly more stressed in that indicator than the other two conditions. The other indication is skin conductance. So the first signs of potential stress is sweat in your palms, and here again, we see a higher indication of stress in the suppressed condition. It should be pointed out that this is not because of they're feeling negatively, it's not because, "I'm feeling badly therefore I'm having activation", and that's what we've already talked about. It's about the regulation of that emotion that seems to be creating physiological arousal. And one of the intriguing things about this is the idea that you would think that showing emotion should create activation. You're doing something more with your body and your face; you're making expression. But in fact, actually suppressing it and not showing that emotion, found these physiological effects.



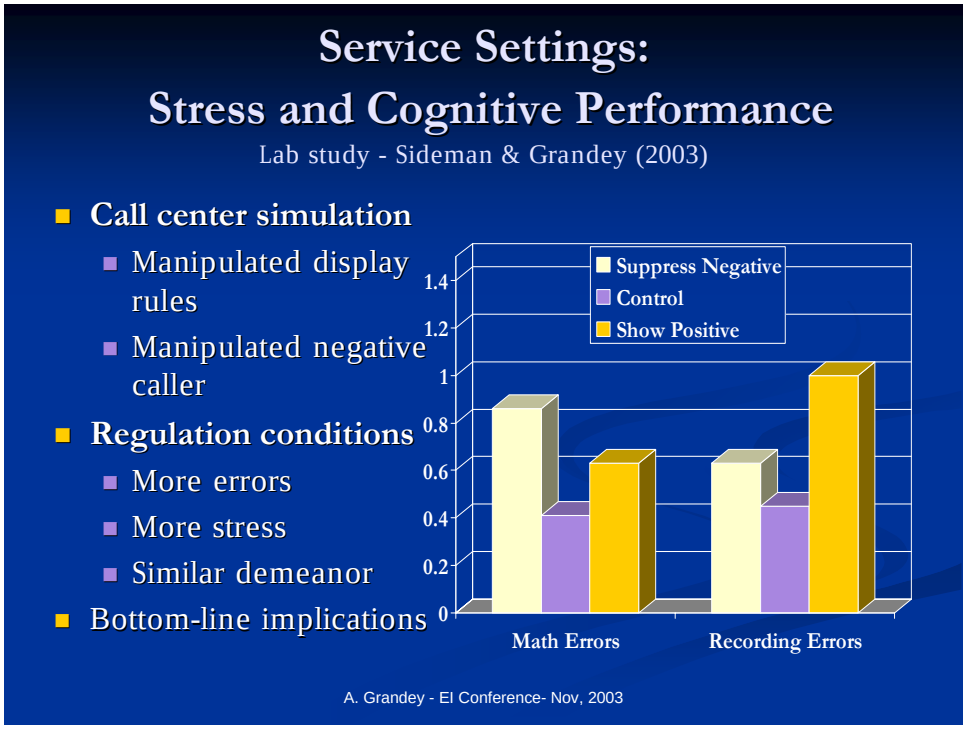
So that idea of bottling up emotion actually seemed to have some credence here in this research. I also want to mention a follow-up study that was done, one question that you might be thinking does this also occur if you're suppressing positive emotion? Is it just dealing with negative or is about suppression in general? And he did in fact find similar results if they were suppressing amusement to an amusing video. So suppression itself requires a lot of energy.



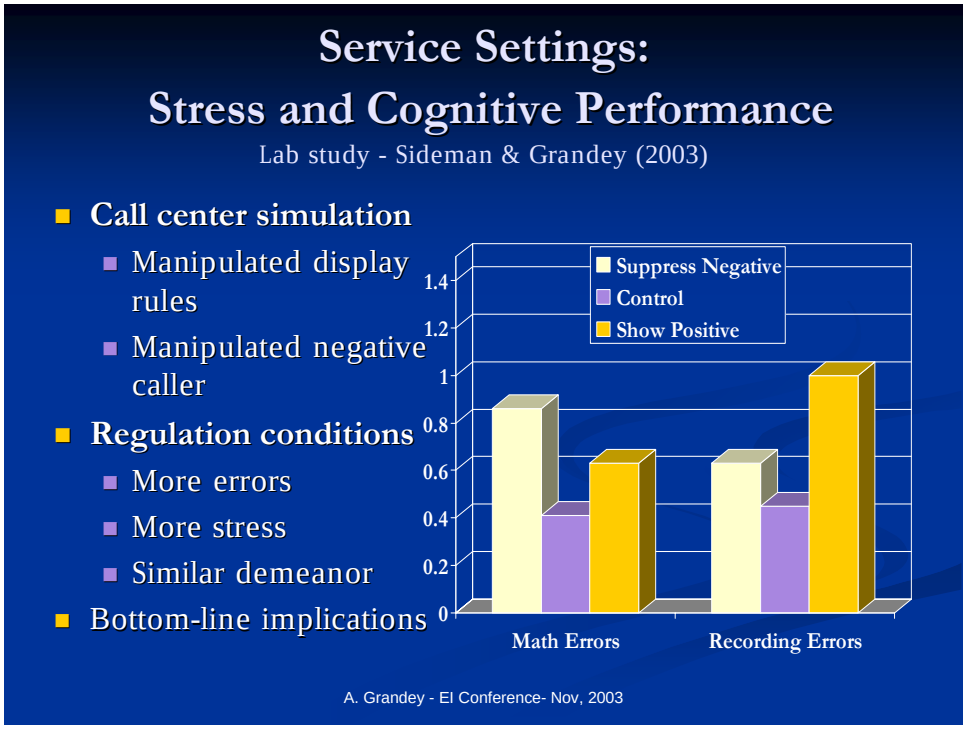
So we might also ask about what are the other consequences of regulation? Cognitive performance: Does regulating and which kind of regulation removes a tension or awareness of other tasks that you might need to be doing. So in this case, Richards and Gross were looking to see if regulation influenced memory and they looked at both recall and recognition memory. So they were presented with a series of slides where they were shown these bodily injuries that were fairly neutral or very, very negative induction of mood. And then they were asked afterwards to see if they could recall or recognize the information that was flashed in between each slide. So they were given some basic demographics about the injury, how it occurred and this was incidental memory, they weren't told that they had to try to remember these terms, this was just if they picked up on any of these details.



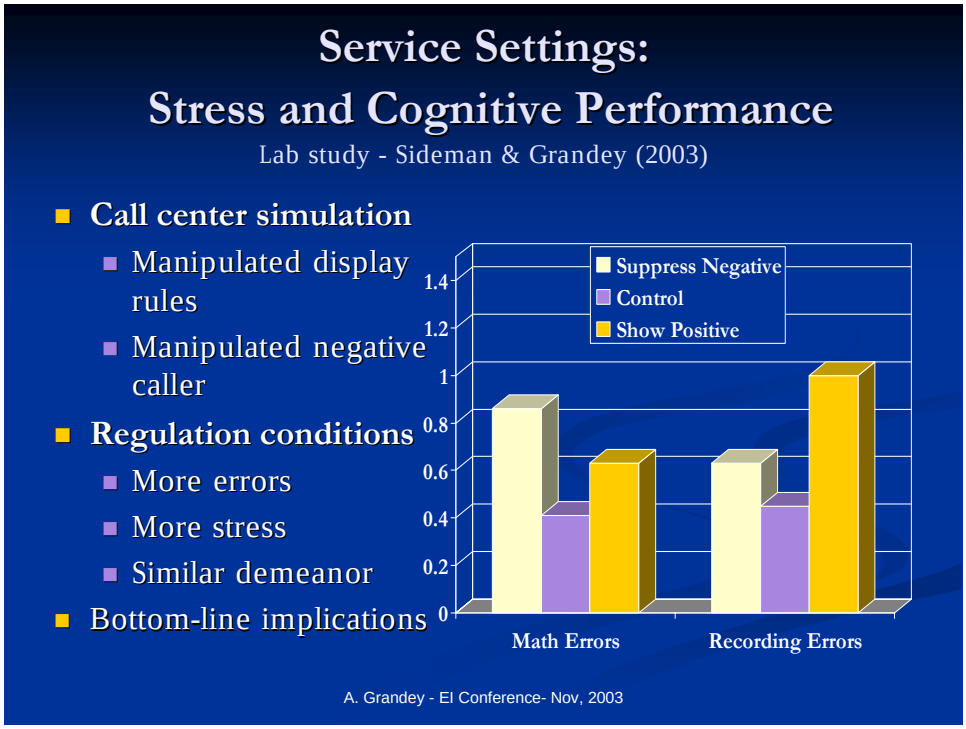
So again, we see here this is the suppression conditions, we see verbal memory and this was non-verbal memory. So the pieces of information that were read to them versus pieces of information that they simply saw. Suppression resulted in a lower percentage of accuracy than the other two conditions. Reappraisal was slightly less accurate than controls but it was still suppression that seemed to have the worst memory effect. So this would lead us to think that perhaps regulation requires some attentional resources that drains one's attention to other things. You can think about this also in an another framework, Wegner's ironic control processing, where if you're told don't think about a white elephant, and of course the white elephant pops into your head. You're told to not think about these emotions or to not show them and then you feel all the more desire to do something about it and therefore maybe it creates a distraction.



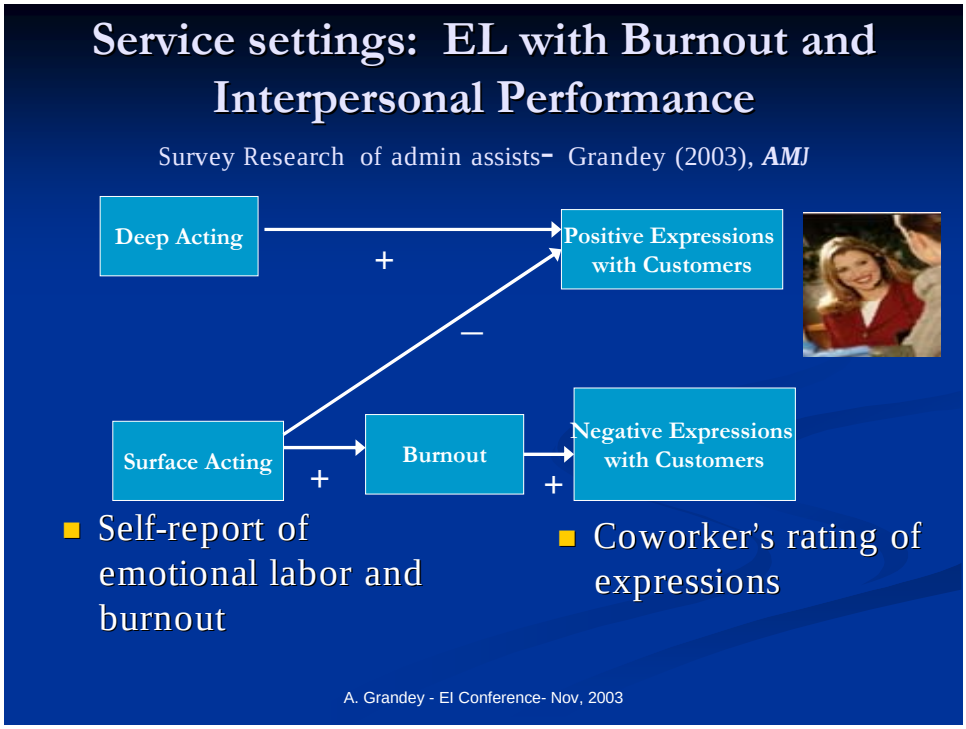
So let's move into the service settings, do we see some similar results here in the service center? This lab study that I mentioned before, it's a call center simulation. So what we did was we manipulated display rules, and in this case we thought it would be interesting to not just say suppressed or reappraised, but to look at suppression of negative, so in other words -be professional, be very controlled, you don't want to have the person think you're an emotional person, we want professional employees here. Of they were told to show positive- be very enthusiastic, be very friendly, we want friendly people in this organization.



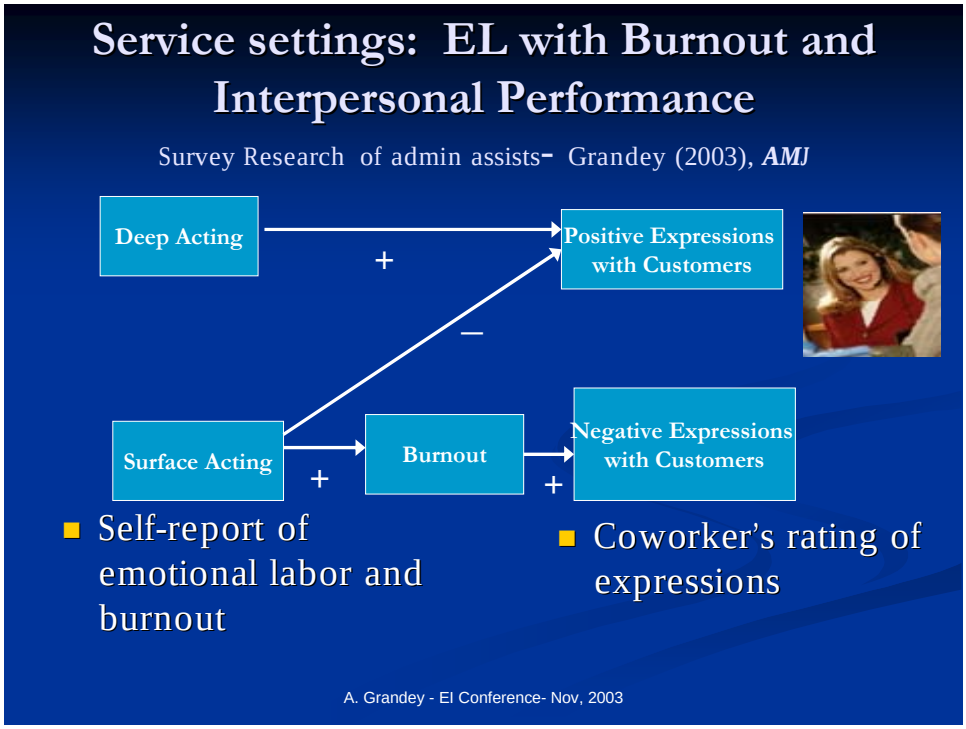
So those are both about display rules but they're different requirements, they're asking for different things. They are very consistent with the types of display rules that the companies would give their service workers. And in the control group they were told we just want you to be you. We also manipulated whether they had a very negative caller or not. So the second caller was always negative, so the first caller gave them a little time to practice their role and then the second caller called in and was very irritated at having to wait for time before they could get on-line, they were upset that things weren't on sale, they were annoyed that the person took so long can't believe how much things cost. They weren't directing their anger towards the person per se, but it was still self-relevant because we were evaluating their performance and they were aware of that. There was also the similar script used but someone had a positive tone of voice. So we manipulated how effectively negative the tone was, with the script and the difficult caller. So the person was difficult in both encounters, but in one condition he was very negative, and the other one he was more neutral and polite. What you see here, we're looking at when the person is adding up the bill and recording the information would they make more mistakes in a regulation condition than in non-regulation condition and does it depend on what kind of regulation condition they are in.



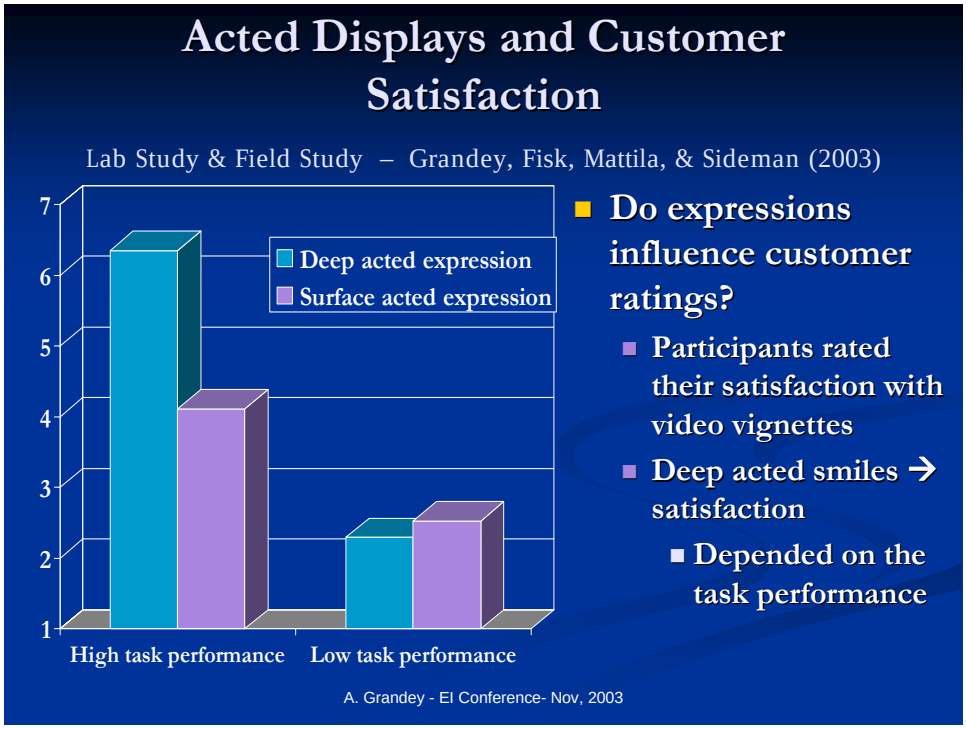
So we see here the suppressed negative condition- be professional, be polite. Here is the number of errors in control condition, and there is a significant difference there in terms of the number of math errors. And here's the "show positive" condition. So, in both cases, doing regulation of any sort whether it's suppress negative or put on that fake smile, there was more mistakes made. In fact, quite a bit more if we're looking at recording errors. It doesn't necessarily just seem to be just suppression of feeling; as far I know, this is the first study that has tried to examine the idea of fake positive in comparison to suppress negative. If I'm mistaken please let me know. And again, the interesting thing is that they were rated as having similar demeanor across these conditions so the confederate callers were rating them, they were blind to the display rule condition and they were rated in all three conditions in being fairly positive across all the raters. So bottom-line indications are that clearly if a person makes even one small error that could make a difference in how things are shipped, that could make a difference in the satisfaction of the customer when the item is received; you're one number off of an ID code, it makes a big difference. Even though there weren't very many errors, it's still enough perhaps to have a bottom-line implication.



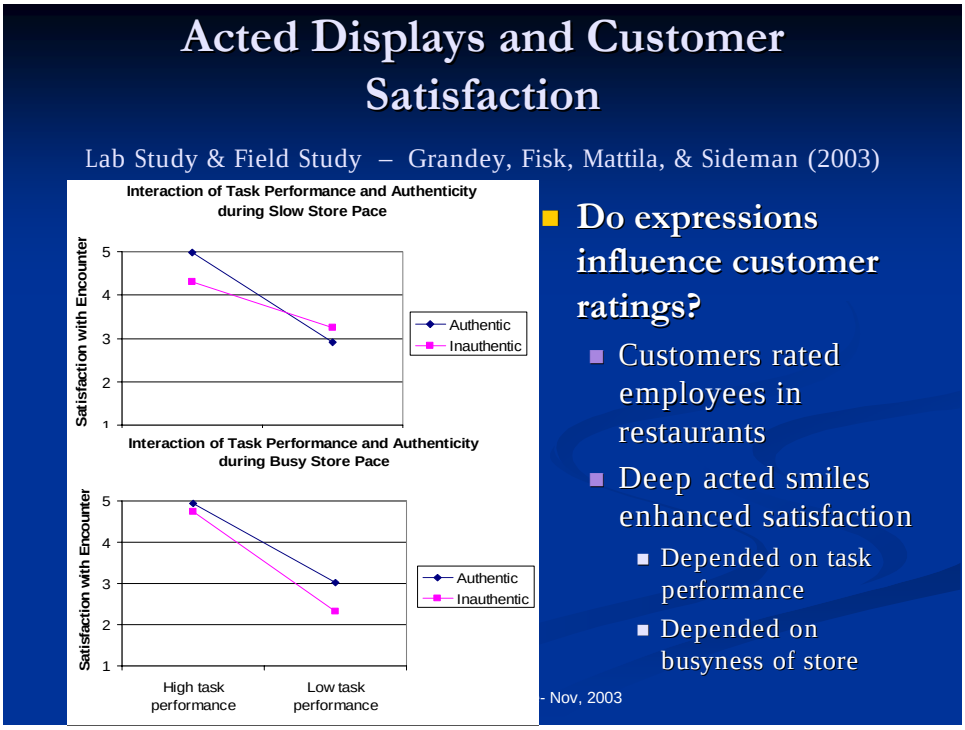
This is a field study, so we're moving out of the lab and let's go into a service setting of real people. This is survey research with administrative assistants, there has been a variety of research showing that they also are required and expected to be super friendly and nice even when they have professors yelling at them for no good reason. And what you see here, the model that I was testing was a dramaturgical perspective, the employees reported whether they did surface acting and deep acting. So, the extent that they say that they managed their feelings, that they tried to make their feelings in line with their expressions, that they work with their feelings, as well as to what extent do they fake an expression; put on a mask and pretend how they're feeling. Then we ask them also to report their level of burnout in this job. Finally, we asked them to hand a survey to a coworker, who would see them observing. As you know, most administrative assistants are working in an open room where they could see each other interacting with customers.



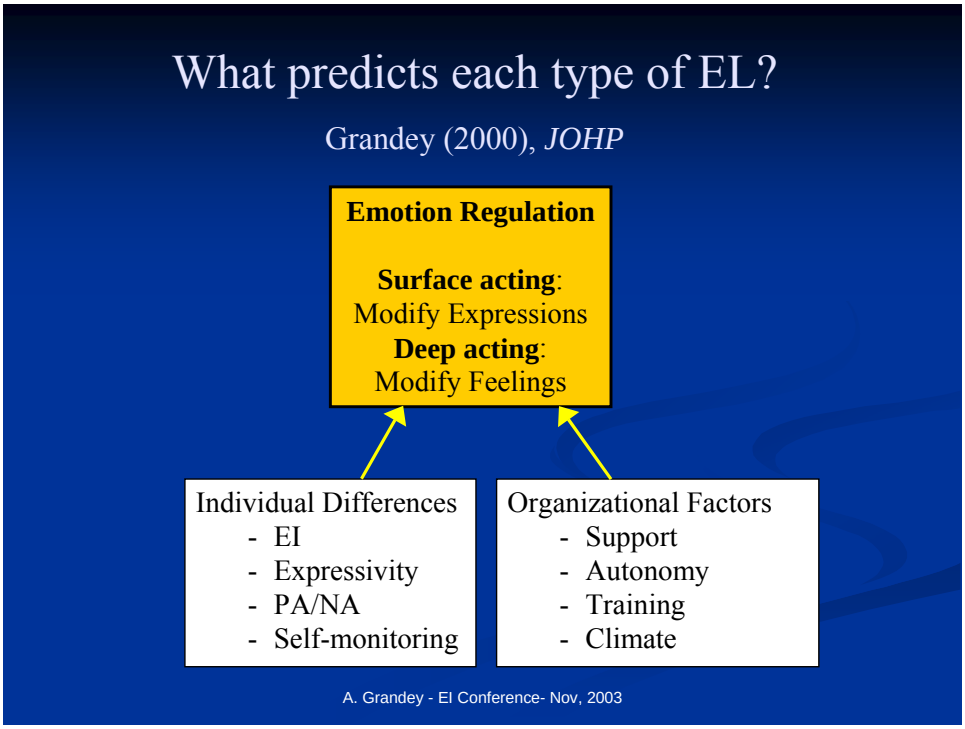
So the positive expressions to customers and the extent of the negative expressions to customers were completed by a coworker and sent in separately to me. You can see here basic results. People who reported doing more deep acting were being rated as having more positive, authentic, and friendly expressions to customers. People who were reported more surface active, were negatively related, they had a negative correlation with the rating of positive expressions to customers. In addition, doing surface acting - faking their expressions, was related to more burnout, deep acting was not, and this burnout was what then led to being more willing to express negative. Has this person ever blown up on a customer; the more likely they were to do that, the more likely they were to have been burned out and that seemed to be because of surface acting. This is all cross-sectional data, but that's why we are doing the laboratory studies.



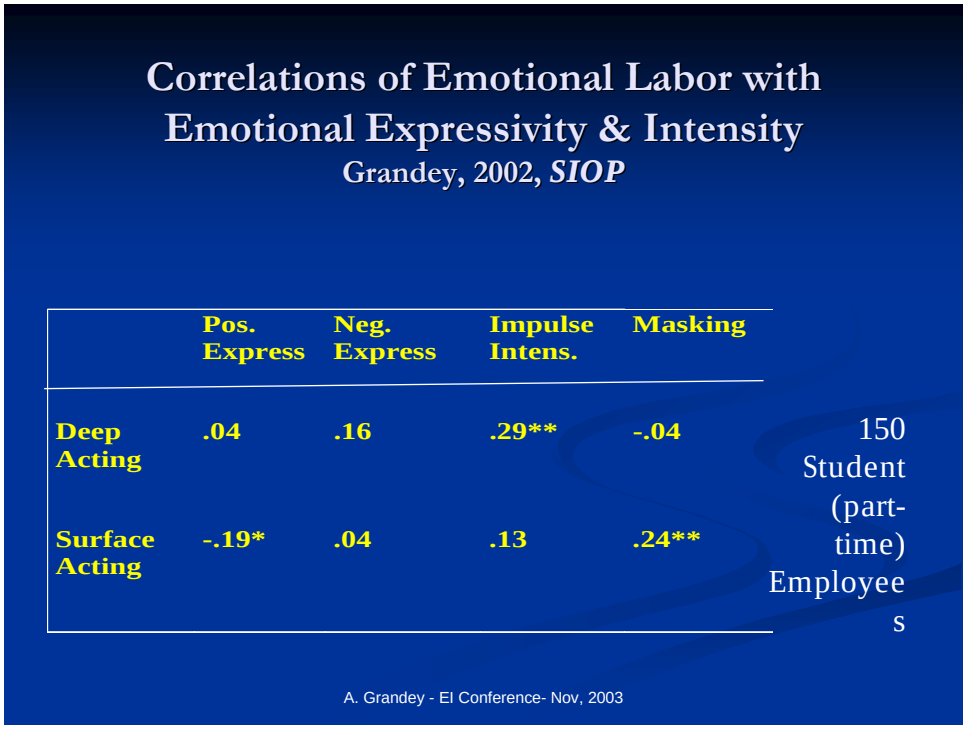
I also have some research that's been looking at another part of the service encounter, which is, do your customers respond differently to the way that people regulate emotions? So we talked about cognitive performance and stress, that study was a survey study, this one is blending research and field research to see, do people really notice? If you're in a customer setting, do you care if someone is being fake to you or not? So again, with the idea that a deep acting person will seem more authentic, a surface acting one will seem more inauthentic, do they notice the difference? And in this laboratory study, we showed students vignettes with an actress, who either used deep acting, method acting, to display enjoyment, or to display a faked expression. And then we manipulated whether she had high task performance or low task performance. So, how important is this display thing to customers? Because if it's not important to them, should we really be studying it? If it's all about their efficiency and accuracy then that's what we should worry about in customer service. What you can see here is that when the person had high task performance, being authentic mattered. In fact, it made quite a bit of difference in terms of the customer satisfaction that was reported by the individuals watching the video. However, when there was low task performance it didn't make any difference, there was no compensation effect, that person wasn't giving them the display that they should have; it really didn't matter.



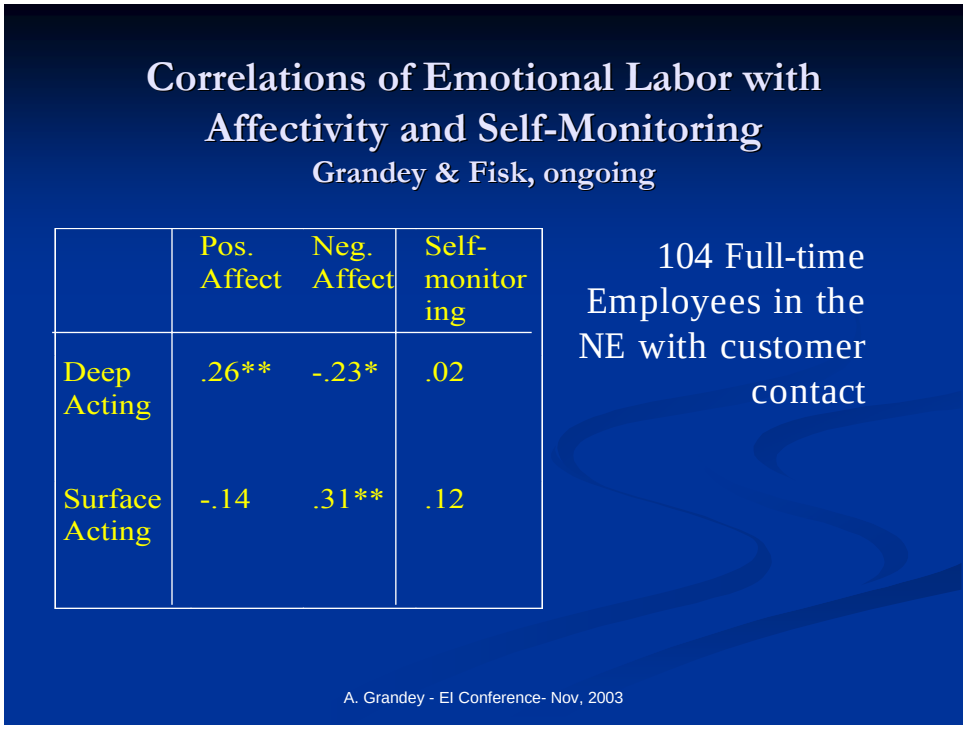
We replicated this in a field setting. So this is actually in a slow store where customers actually rated the authenticity, the task performance, and their customer satisfaction with a waitress encounter. And you see here the same basic image as I showed you for the lab study, but if we vary the busyness of the store, so we look at only at the surveys from people in a store that was busy, we see the opposite effect. So that when the store is busy and there is low task performance, now authenticity matters. I argue that this is the case of expectations; if a store is busy you assume there might be some less efficiency, less accuracy, but that is when you look to other cues to see whether you're satisfied with this encounter. Whereas if the store is slow, that person better be smiling at me because they don't have any excuse for not doing so and they better be real about it. So this goes back to the other folks that have talked about the importance of context in a situation of how we interpret emotional cues, but it also argues for the importance of deep acting in certain situations.



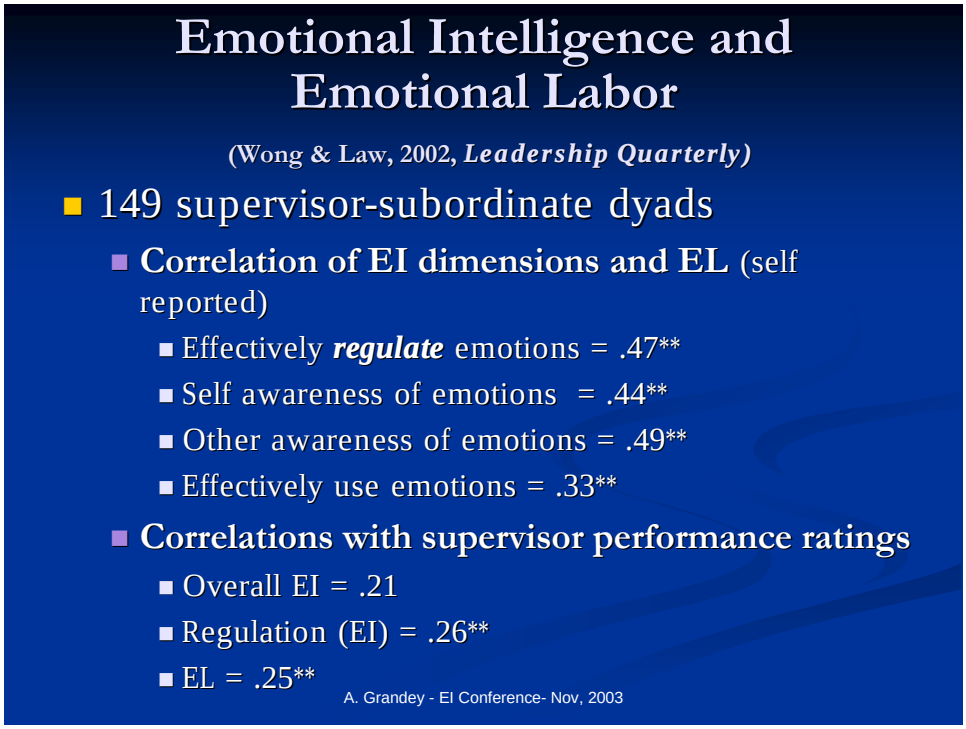
I'm going to have to briefly go over these ideas here about personality. I've alluded to a variety of individual differences that should be related to whether people are doing surface and deep acting and how effectively.



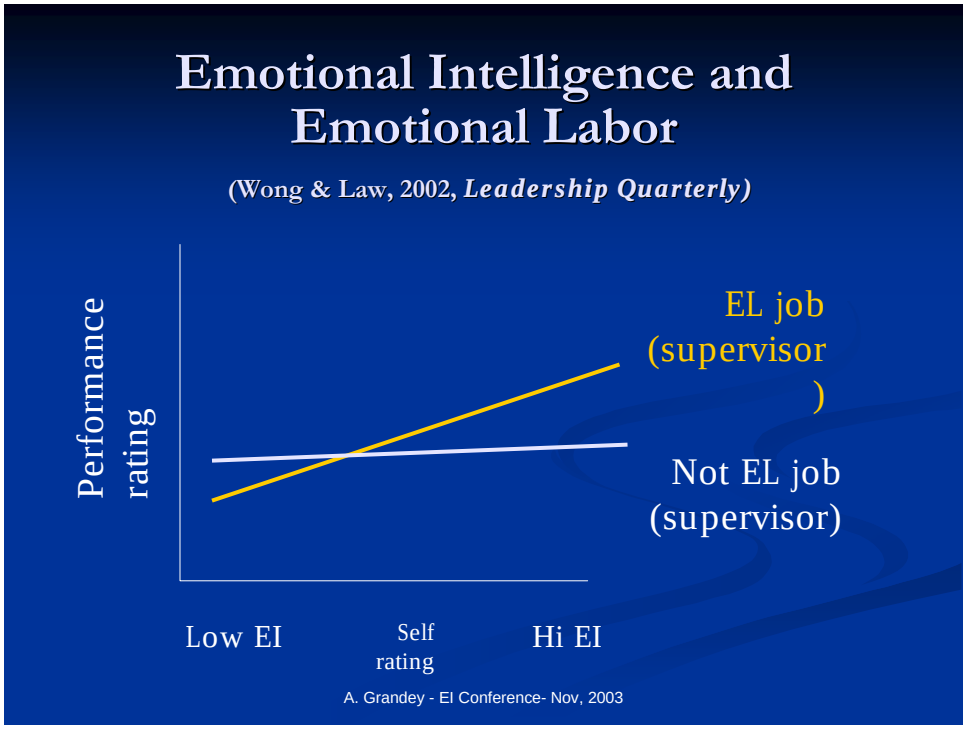
I've got a number of studies that looked at expressivity, Gross has published some scales of expressivity, and there is some overlap with the deep acting/surface acting constructs as might be expected.



Also looking at affectivity, self-monitoring was not related to deep acting and surface acting, we're following that up now with a different survey.

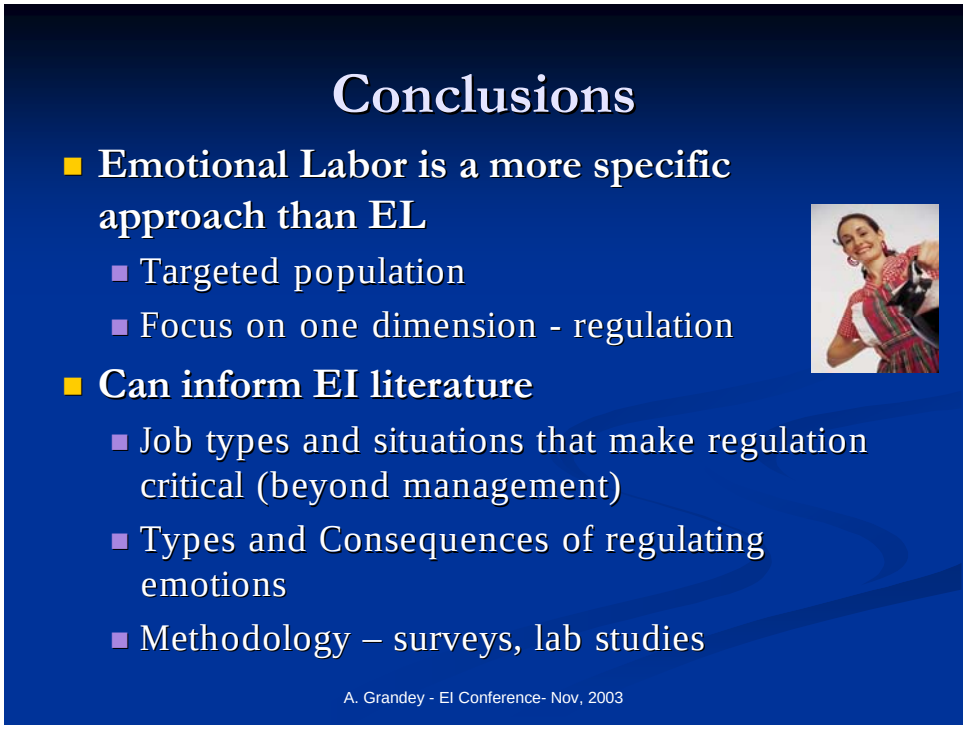


And I want to spend a moment talking about this recent study that was published, in case you haven't seen this, that actually looks at both emotional intelligence and emotional labor. They are looking at whether there is a correlation between emotional intelligence dimensions, so focusing on the four dimensions as listed there, and self-reported emotional labor by the employee. And you can see that the correlations are quite high and especially, effectively regulate emotions was very highly, (.47) correlated with self-reported emotional labor as I had expected, and also with awareness of others' emotions. In order to appropriately regulate, you have to know what to regulate to. The slide also shows correlations with supervisor performance ratings. Overall emotional intelligence was related .21, which was not significant. But, if you only look at the regulation component of EI, it was related .26 and similarly, emotional labor was related .25. So I think there is some overlap here that we need to start paying attention to and we need to meld our research.



They also found an interesting moderator where they asked supervisors, "Is this an emotional labor job or not?" Again, I've often said that it's looked at as an occupation rather than a strategy. If you are in an emotion related job, as rated by your supervisor, then emotional intelligence becomes more important as one might expect. And this is the direction I think our literature needs to go.

So currently, I'm working on a number of studies that are looking at group differences, I found very interesting findings in terms of race and very little in terms of gender, which is interesting in itself. The racial differences in terms of willingness to do emotional labor in a service job and related to the next concept of fairness, of how fair is it to have regulate emotions for an organization? Should I have to suppress my anger if an employee is yelling at me? And there are racial differences there as well. We are also doing a study right now with a sample in France, which is notorious for having bad, rude service. We're actually looking to see if the model maps onto the French coworkers and we're actually finding different factor structures for the items, so I don't even know how to analyze it at this point. And lastly, looking at organizational interventions, right now we're running a study where we are trying to train these students in how to do deep acting to see if, in a very quick simulation, we can train them in how to reappraise the situation that makes a difference in their stress level.



So I would argue that emotional labor is simply a more specific approach than emotional intelligence, it's a more targeted population, certainly, and it does focus on one dimension of what is seen as emotional intelligence but in some ways I think that's the way to go. Emotional intelligence is seen as such a broad concept, that maybe the way to really get at it is to start out looking at individual facets. And that is certainly what has been done in a variety of literature up to this point; we just haven't called it EI. So I think this can inform emotional intelligence literature, certainly the variety of methodologies that are used by psychologists might be of use to the EI literature.

And finally, I just want to say thanks to a number of people. Thank you.

DISCUSSION

DR. ZEIDNER: For the benefit of the audience, one of the things to come out of the emotional labor literature, is that work doesn't always mean service with a smile, right?

DR. GRANDEY: I very quickly glossed over that point but I did allude to that. Yes, bill collectors have been studied, they need to express negative emotion, bouncers, and also police interrogators, and other groups have been studied. So, you're absolutely right, they tend to be very specific groups though that have negative display requirements, whereas we can talk about service in general, as generally having positive display. Yes, I agree with you.

DR. ZEIDNER: Looking at the interface you see in emotional labor and emotional intelligence, I think when you're looking at the congruency between the type of labor being done in a situation and the ability to do it, corresponds with the situation and really that would be emotional intelligence, as would be the extent you realize that what the context demands should regulate emotions accordingly. Another way to look at it conceptually, perhaps, is by looking at the distinction between fluid and crystallized components. Emotional intelligence, being more of a fluid ability, and emotional labor more of a crystallized component, as it is based on experience, training, you could use role perception and so forth to actually regulate emotions; just an idea.

DR. GRANDEY: I'm actually very intrigued by the first thing you said. It's true that emotional intelligence is being aware of the situation responding in accordance to what is needed in that situation that maybe high EI people would not be good service workers, because they are constrained in how they can respond. They are not allowed to use their whole repertoire of potential cues and skills, unless they have a job that has some amount of autonomy in terms of display rules.

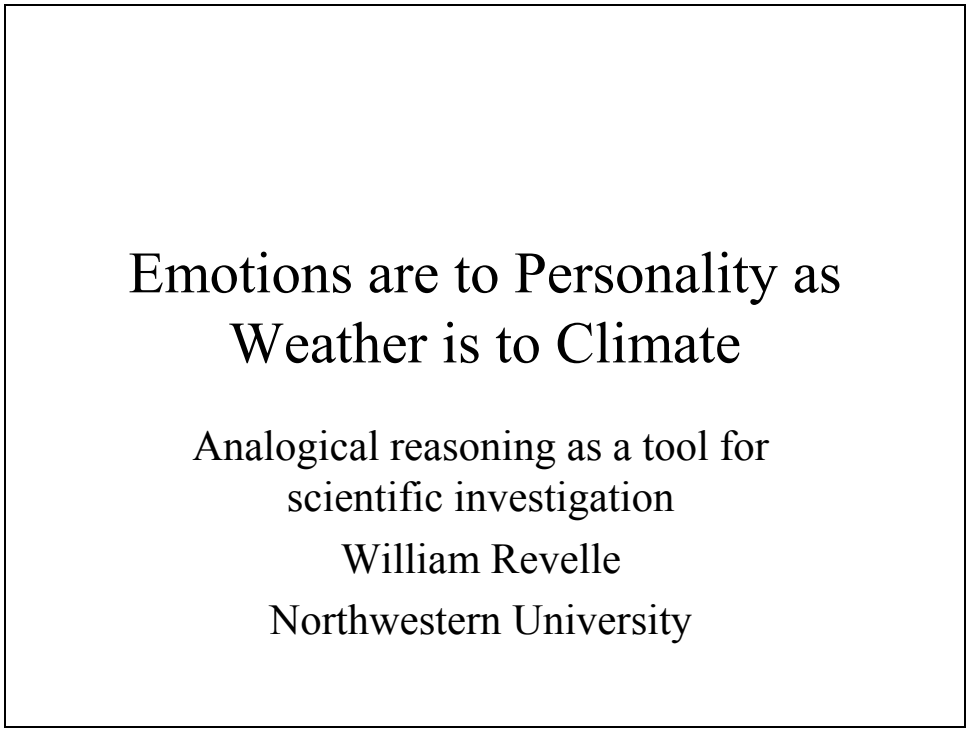
DR. ZEIDNER: I think being adaptive is to actually use emotional intelligence.

DR. GRANDEY: Actually, I would argue that that's what customers want. They want personalized service, they want adaptability and in fact if you look at literature in bars, they want the person to give them free drinks, which the organization doesn't want, but it's the same kind of idea. They might want authenticity which might even mean, go ahead and tell me you're in a bad mood and why. Although I have some other evidence that that's just not the case.

DR. JOHNSON: So, cognitive skills in general, we expect over time after practice, there will be less demands on working memory, improvement in dual-task performance, things like that. I'm curious about the role of training, in what you just described here. You looked at college students, who may not be expert emotion workers, and secondly, the way you defined it as being as introspecting on emotional state, it might be that the experts have it done so automatically they just want to slip into the role and just don't think about it. So would you comment on that please?

DR. GRANDEY: Sure, a variety of thoughts are going through my head. One is just how we train them, we try to have it be a simple enough job that it wouldn't require very large cognitive demands, so that we would could expect college students to do it. And generally, we haven't had a lot of problem, although we just moved from pen-and-paper to a computer system that is creating frustration, because it takes so long to fill it out. They certainly don't have the same skill in terms of emotional intelligence; I've had some students tell me that it was their worst experience of their lives, that they now know they never want to have that kind of job. And certainly it is very different if you are in a call center study where people have actually been screened to have that type of work, so that is definitely a downside.

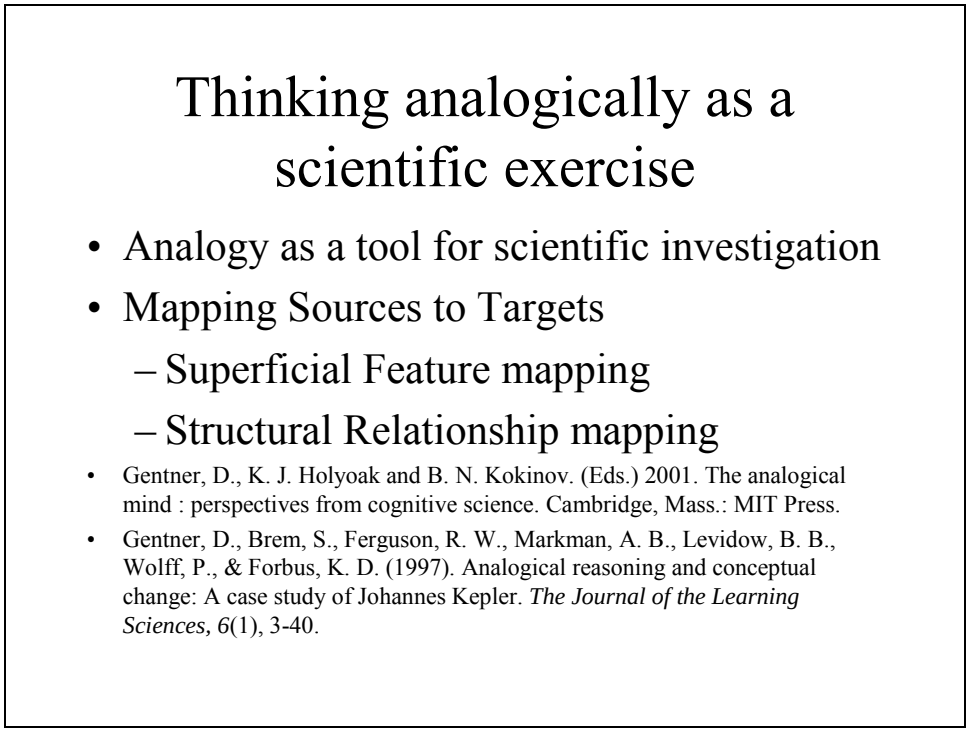
DR. GRANDEY (CONT'D): On the upside, if we can look at ways of training them to where even if they don't come in with those skills they can still perform better. We aren't just using self-report, we are also using the confederate caller's ratings of how well they handled it, we're also looking at their task performance ratings as well as some objective measures of their cognitive performance. And now we've included a measure of emotional intelligence, which we can argue about whether that's a good measure later, to see if that helps predict their performance. Whether they're coming in with certain skills that then help them on this task, regardless of what training we give them. The idea of training is in every article I write on deep acting because I keep finding positive benefits of deep acting; we need to train employees in deep acting. But how do you do that and still say you can have autonomy in terms of your feelings, without saying we're legislating your feelings? Doing it in a way that we care, we want you to be able to manage your emotions healthfully, and there has been very few studies done on that. One done by Parkinson et al. on teachers helping them learn how to keep a diary and try to regulate their emotions with reappraisal. But, we're just in the infancy stages of that.



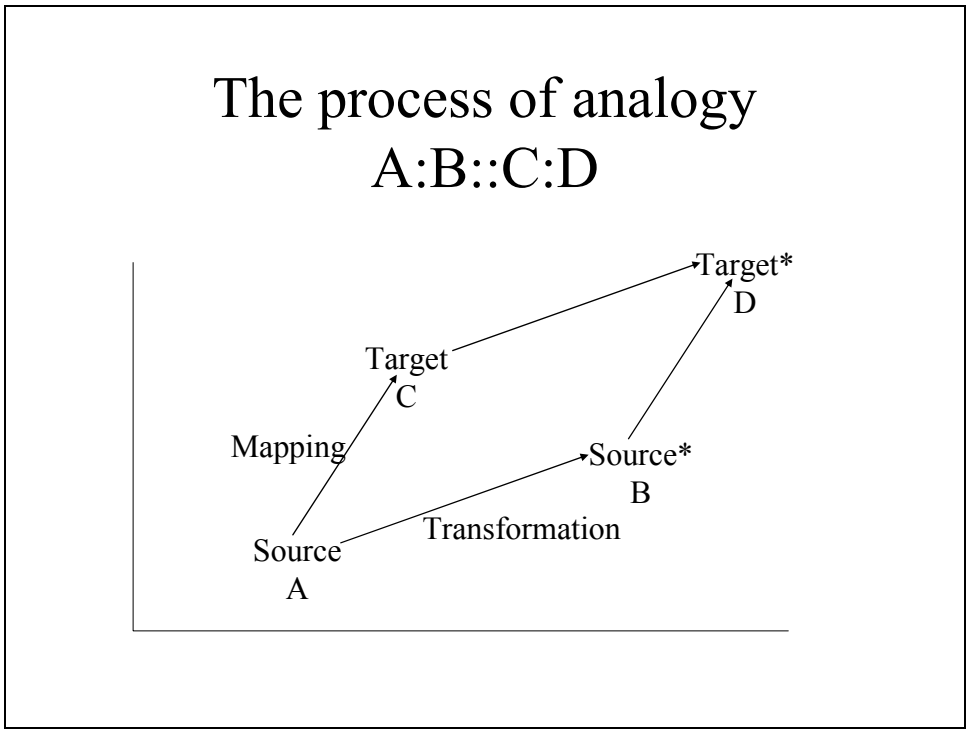
EMOTIONS ARE TO PERSONALITY AS WEATHER IS TO CLIMATE

DR. STRICKLAND: I am now going to hand over to Dr. William Revelle, whose presentation today is entitled, “Emotions are to Personality as Weather is to Climate”.

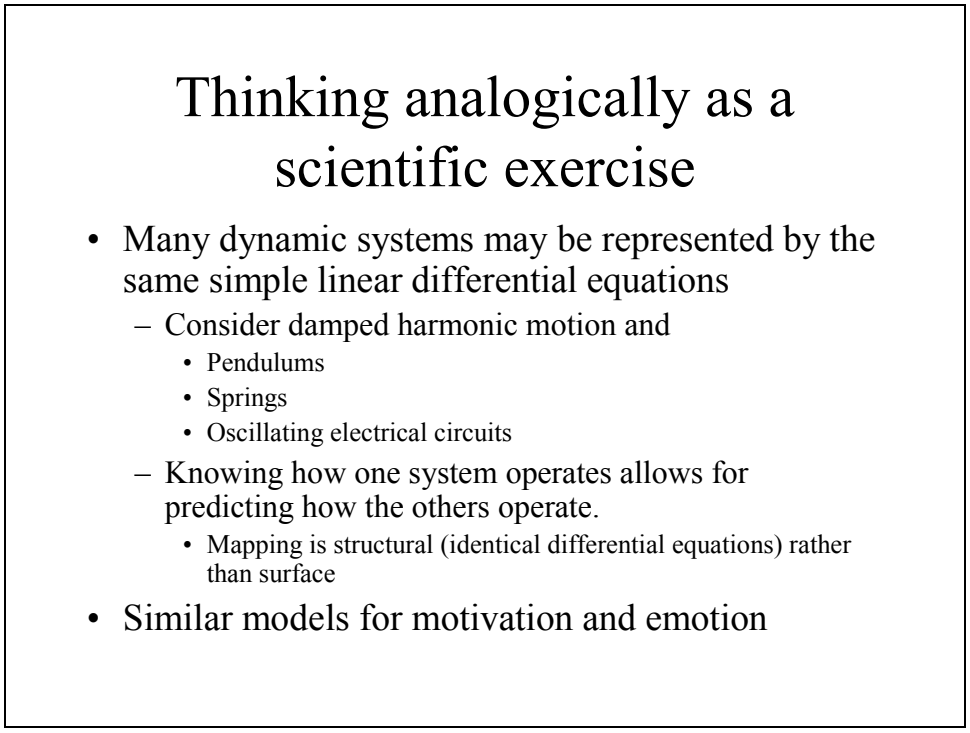
DR. REVELLE: I am going to talk about emotions and how they are to personality as weather is to climate. I think this is very appropriate to do at ETS, since this is the home of analogical reasoning after all, or at least the analogical tests and the SATs.



A colleague of mine, Debra Gentner, pointed out that analogical reasoning is really fundamental in the study of science. She has several papers about this that are well worth reading.



Basically, we can think about the process of the analogy as either a superficial mapping or a structural relation mapping. So, it involves a transformation of characters in the source to another part of the source, and you can then map the source to the target and consider the transformation from the target to the transformed target.

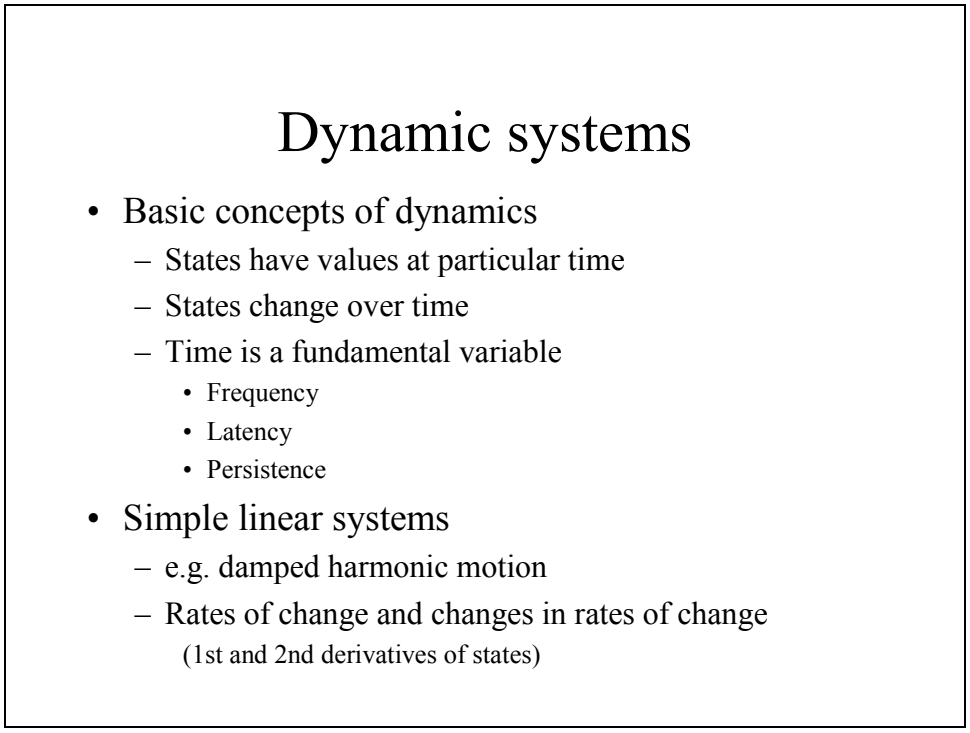


What I want to talk about in particular is trying to think about personality and emotion as they relate in terms of various dynamic systems. I have been spending a lot of time over the years thinking about dynamic systems, and we know that dynamic systems have been used a lot in terms of the physical sciences; in high school and college physics we were all taught about pendulums and springs and oscillating electric circuits. They're analogous to each other because they have the exact same differential equations. You can study a pendulum and you actually learn a great deal about studying how electric circuits work. It has been suggested for many years that similar models can be applied to motivation and emotion.

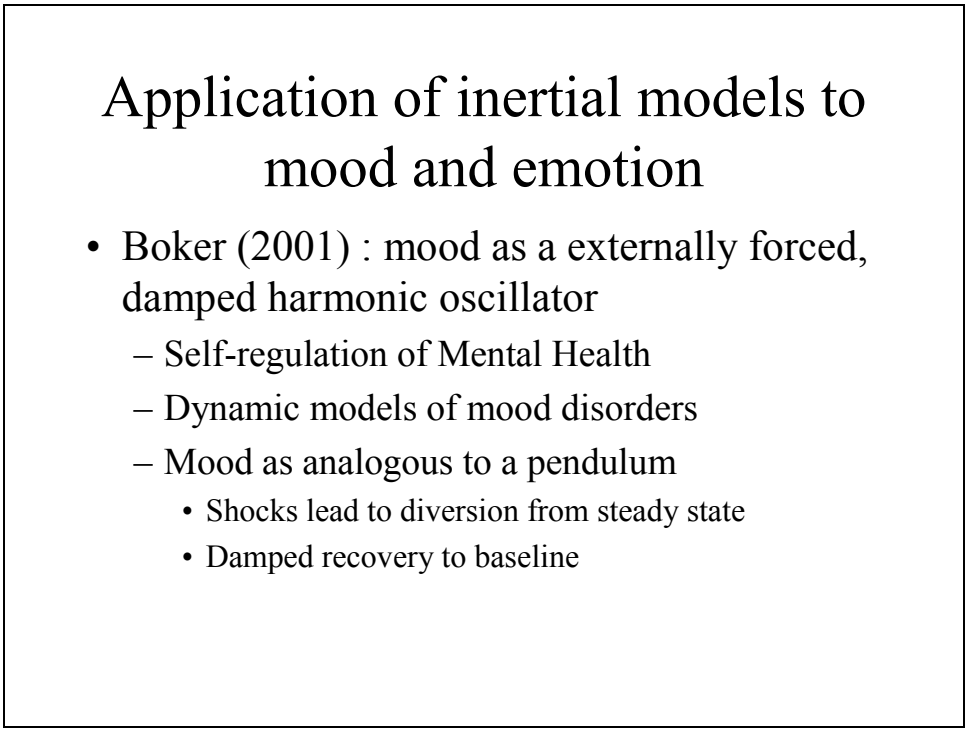
Mood, emotion motivation as dynamic systems

- Atkinson and Birch (1970): dynamics of action
  - Motivational forces and action tendencies have inertial properties as analogous to classical physics ("an action tendency at rest will remain at rest …")
    - Physical Force:Velocity::
    - Psychological force:Action Tendency
  - Revelle and Michaels (1976); Kuhl and Blankenship (1978): achievement motivation as dynamic system
  - Revelle (1986, 1995) : Stable personality traits are the rates of change of emotional states
    - Mass:Acceleration:: Trait: State

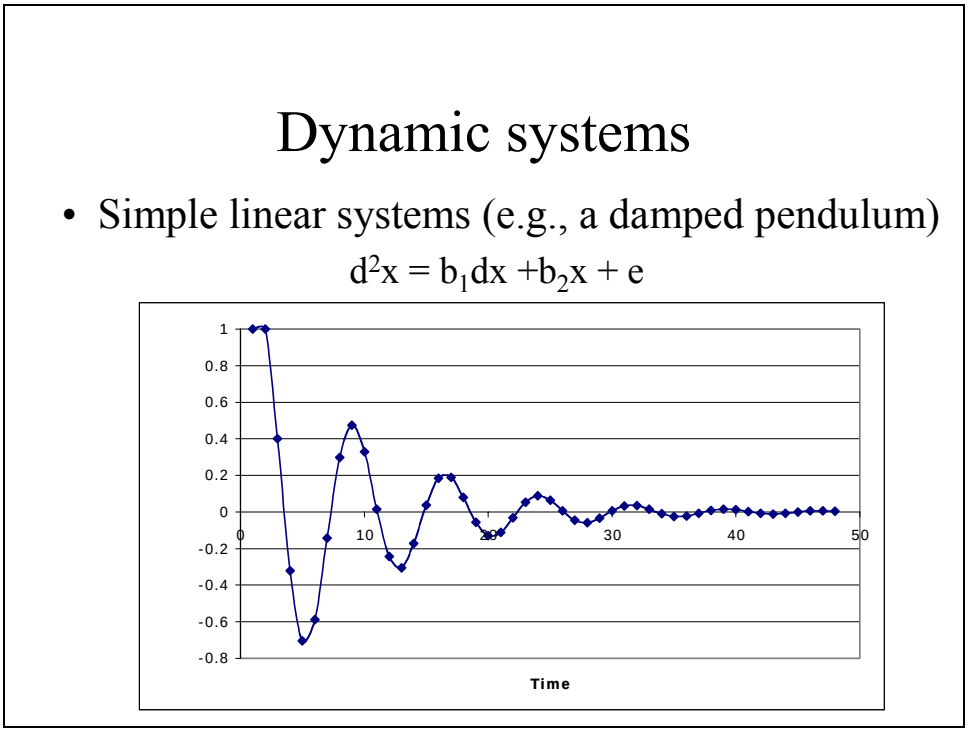
Jack Atkinson and Dave Birch did some very nice work on this that unfortunately was written in an incomprehensible style, they really hid some very nice ideas in some very abstract math. But basically, they were rediscovering Newton's three laws and applying Newtonian physics to the study of personality and motivation. Physical force is to velocity as psychological force is to action tendencies. A variety of us have applied this to achievement motivation and I've been arguing for quite a while that what's stable in us is how rapidly we change. So personality traits are, in fact, the first derivative of emotional states. What is stable is our rates of change.



The first thing about dynamic systems, is time is the essential element of any dynamic system. We have to think about how states change over time and then the types of measures we take actually change. We think about frequency measures, latency measures, and persistence measures. Persistence is, in some sense, the inverse of latency, the persistence of doing "A" is the latency of doing "not A" and then switching off to "B." Now, much of this early thinking has been looking at very simple linear systems, such as damped harmonic motion, and looking at the first and second derivatives of damped harmonic motion as in using the model of the pendulum.



Steve Boker from Notre Dame has done some very nice work on this. And you can map mood in terms of using a sort of pendulum type model of mood and actually going beyond that in terms of more dynamic models of mood disorder. And you can think of mood, for instance, as responding to a shock, leading to some diversion from your steady-state value, and then what is the recovery rate towards baseline from that diversion.



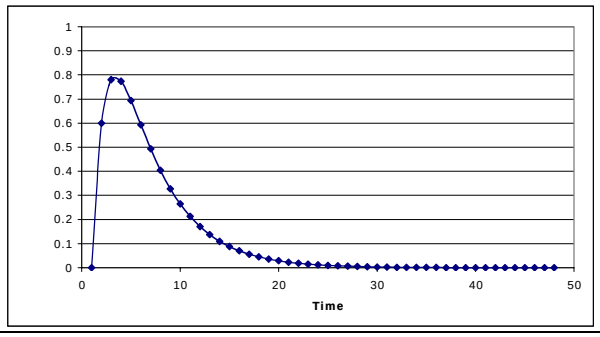
So for instance, this is the model of a classic damped pendulum. You can swing a pendulum out, think of this as over time, it will then come back and if it's in some viscous medium, it will damp out over time. And this is described by a very simple differential equation, where you can get parameters of the two dampening coefficients.

Emotion as a dynamic system

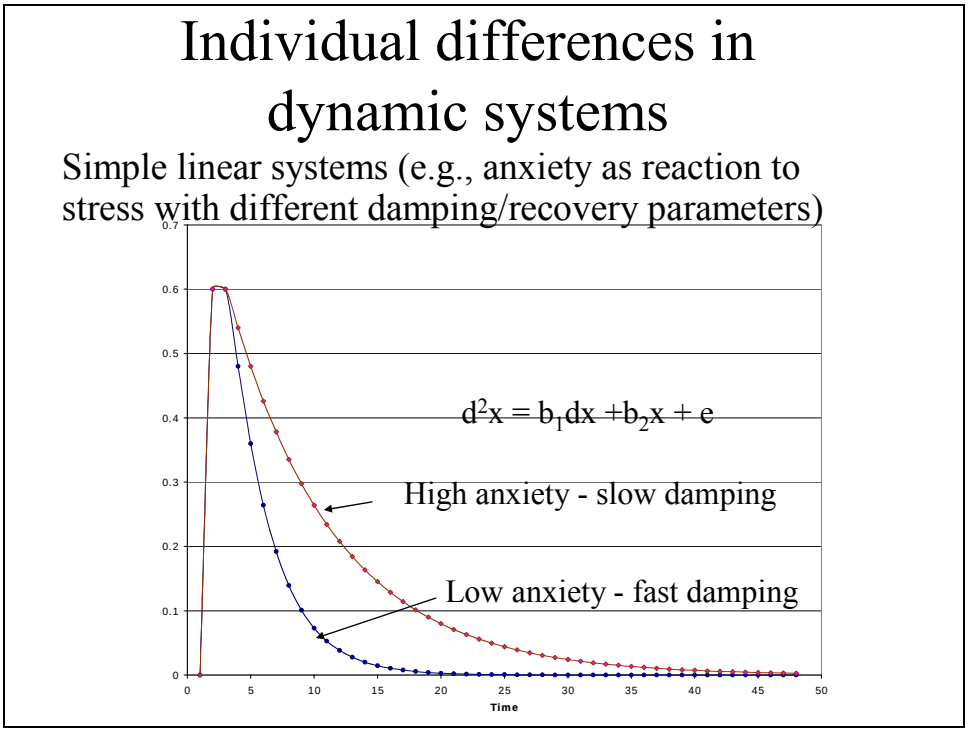
- Simple linear systems (e.g., anxiety as reaction to stress with damped recovery)

$$d^2x = b_1dx + b_2x + e$$

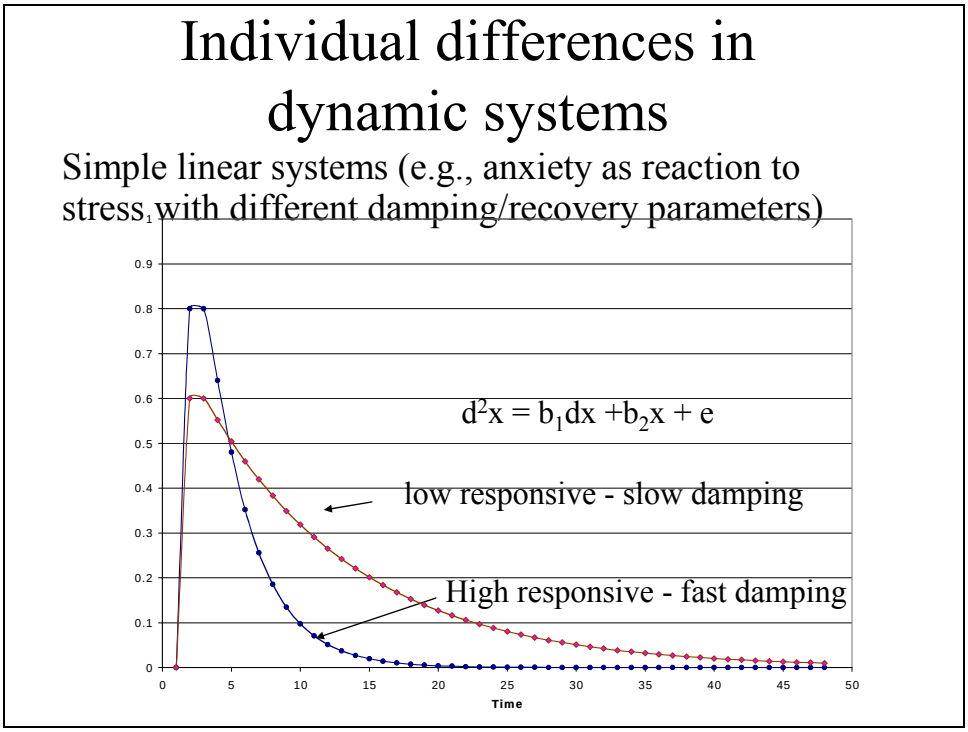
Gilboa and Revelle (1994) examined speed of recovery of emotional Stroop following mood induction



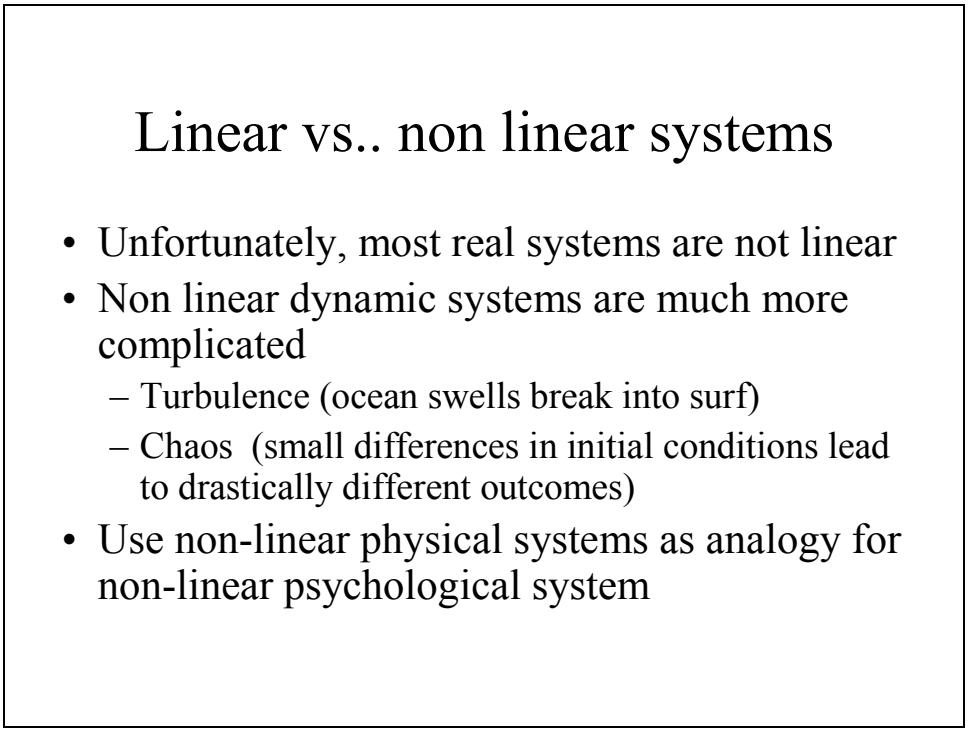
Eva Gilboa and I applied this type of work to the study of anxiety in 1994, looking at the speed of recovery to the emotional Stroop task. In this task, we made people anxious and then looked at how long it took them to recover in terms of their performance on the Stroop. The Stroop effect basically went away over time; they had a very big emotional Stroop which got progressively smaller over time. The recovery curve was the fundamental component we were interested in.



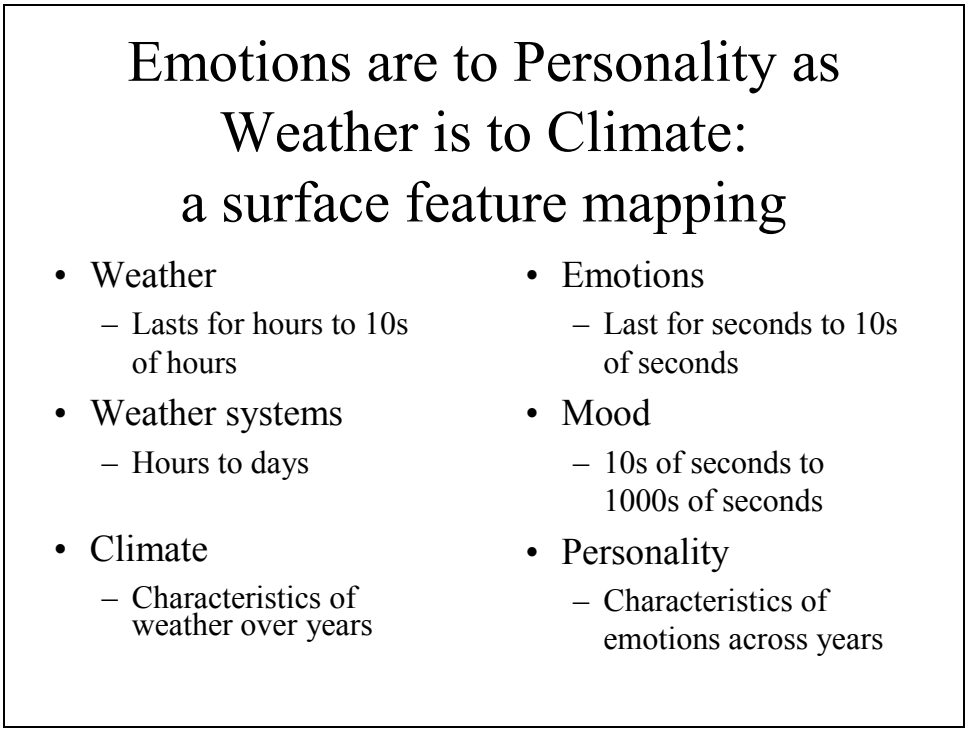
The high anxious individuals actually had a slower damping coefficient than the low anxious individuals. Both high and low people were showing emotional Stroop effects, but the high anxious continued showing emotional Stroop much longer than the low anxious individuals.



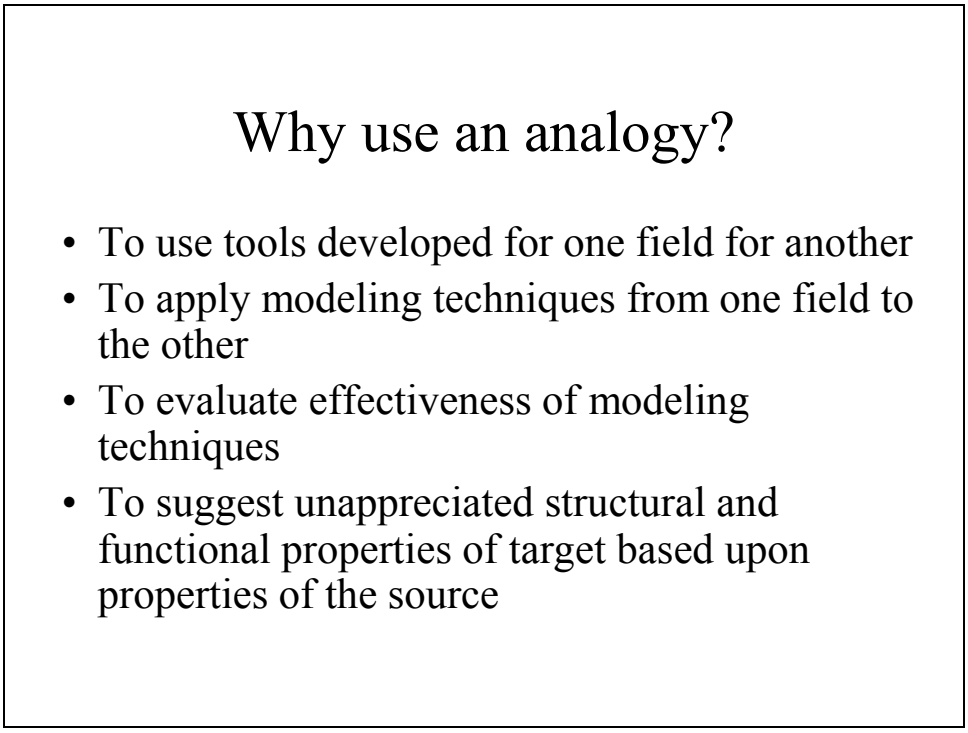
You can play this game in thinking of another parameter here, how far do you respond to the stress? So you have both the recovery time and how sensitive you are to the initial shock. Here, I have a case of some person who is very responsive and has a fast damping coefficient and here is someone who is not as responsive and who recovers slowly. Of course, you can have other combinations of this.



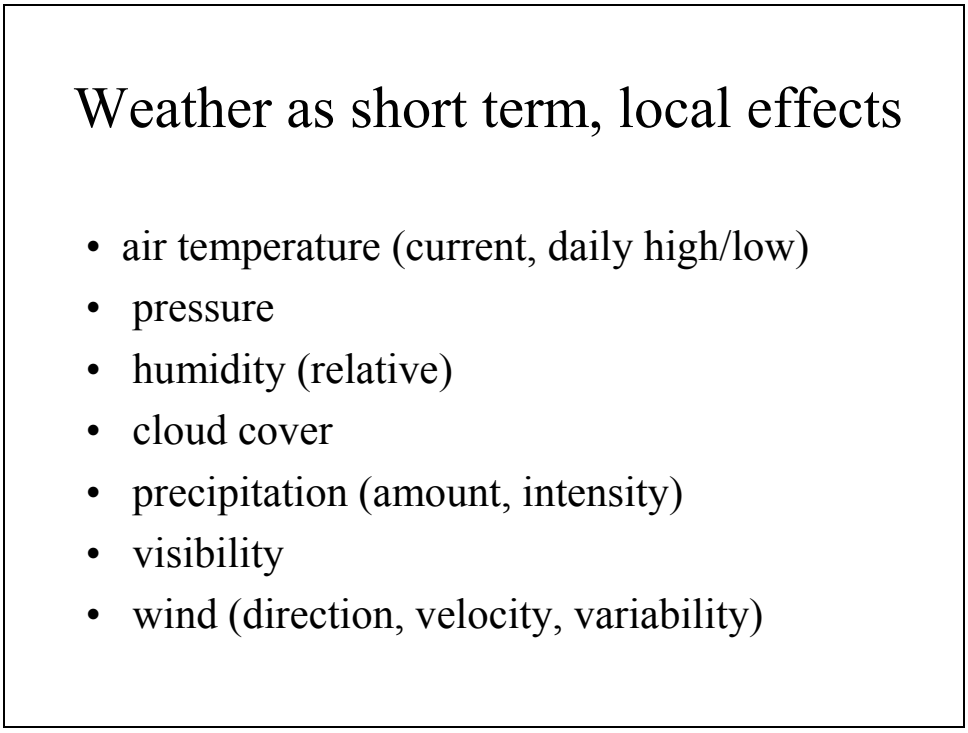
Unfortunately, most real systems are not linear; they are not linear differential equations. It's really too bad because linear differential equations are so easy. In the physical sciences they talk about turbulence, and the classic example is that ocean swells break and they turn into breaking waves and you have the issue of turbulent surf, which is a chaotic phenomenon. And the question is, can we take what we've learned about non-linear physical systems and apply it to non-linear psychological systems? And this leads to a very simple analogy, which I think is a deeper analogy than surface structure.



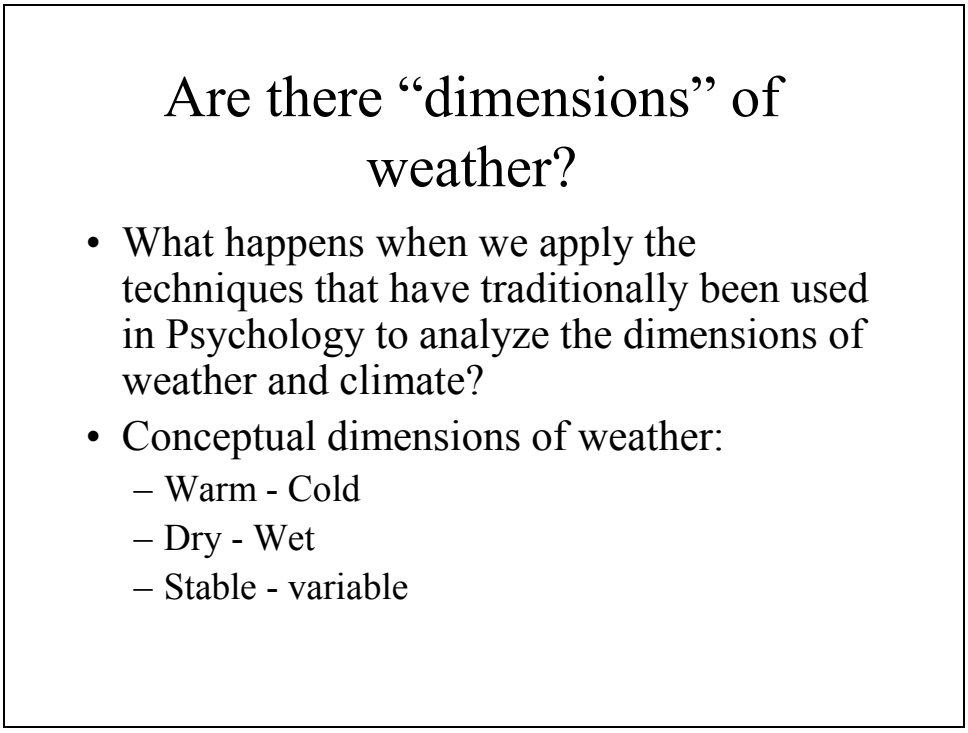
Perhaps emotions are to personality as the weather is to the climate. What do we mean by weather? We typically are thinking about weather as a local phenomena lasting for hours or 10s of hours. We think about weather systems - hours to days, we think about climate which is basically average weather over years and decades and centuries. Similarly, emotions tend to last for seconds to 10s of seconds; moods – 10s of seconds to 100s of seconds perhaps 1000s of seconds. The personality characteristics that some of us study are characteristics that stay with you over the lifespan and you can think of these, a lot of work in personality has thought of it this way, as looking at emotional responsivity over long periods of time, perhaps averaged values over time.



What I want to do with this analogy is to see what happens when we apply techniques that we as psychologists use to study emotions and personality. What happens when we apply these techniques to the weather and to the climate, and do we learn anything about using those techniques with physical sciences? Do we learn anything about whether our techniques actually work, looking at the psychological science? The idea behind all this is that we can use the tools from one field in another field. This is where the natural sciences have progressed quite well by using tools across the fields. Can we use modeling techniques from one model to the other? And, does it lead to any discoveries about how to study the psychological phenomena? And that's one of our questions.



Thinking weather again, and the one I'm going to focus on is the one you can get the best data from the newspaper, is air temperature. You can also measure, of course: pressure, relative humidity, cloud cover, precipitation, visibility, and wind direction. The easiest data set to get is the air temperature, both current temperature or daily highs and lows.

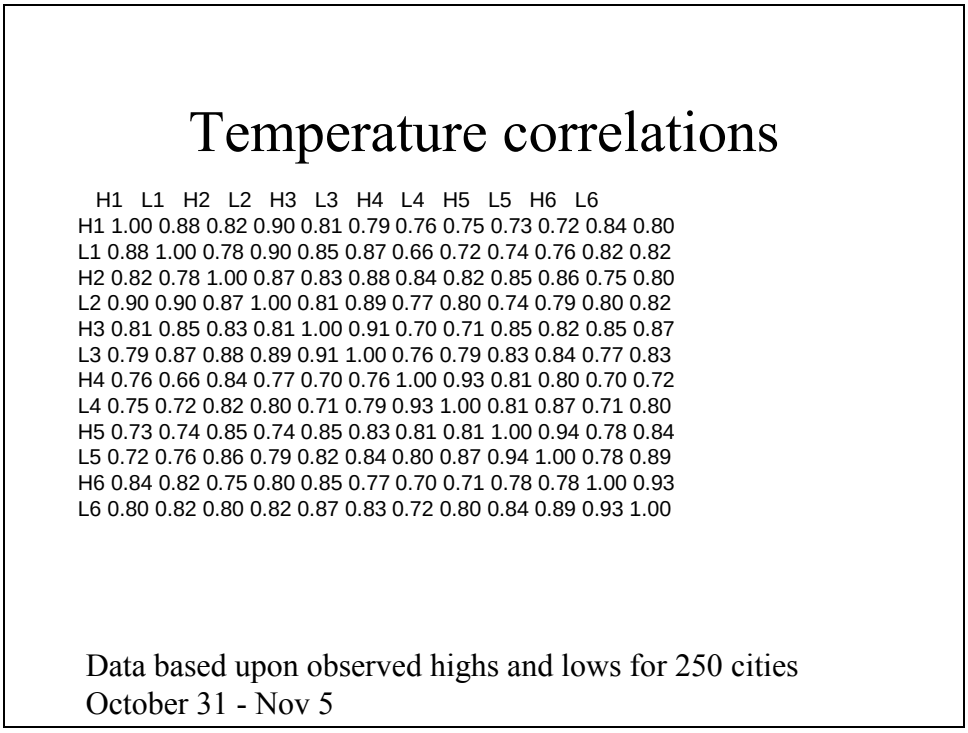


And we've heard very nice discussions early this afternoon about what are the dimensions of affect. What happens if we apply those exact same techniques to the question of what are the dimensions of weather? Conceptually, we know the answer, warm or cold probably is important, dry or wet is important, stable or variable is important. Can we capture that by applying our standard techniques?

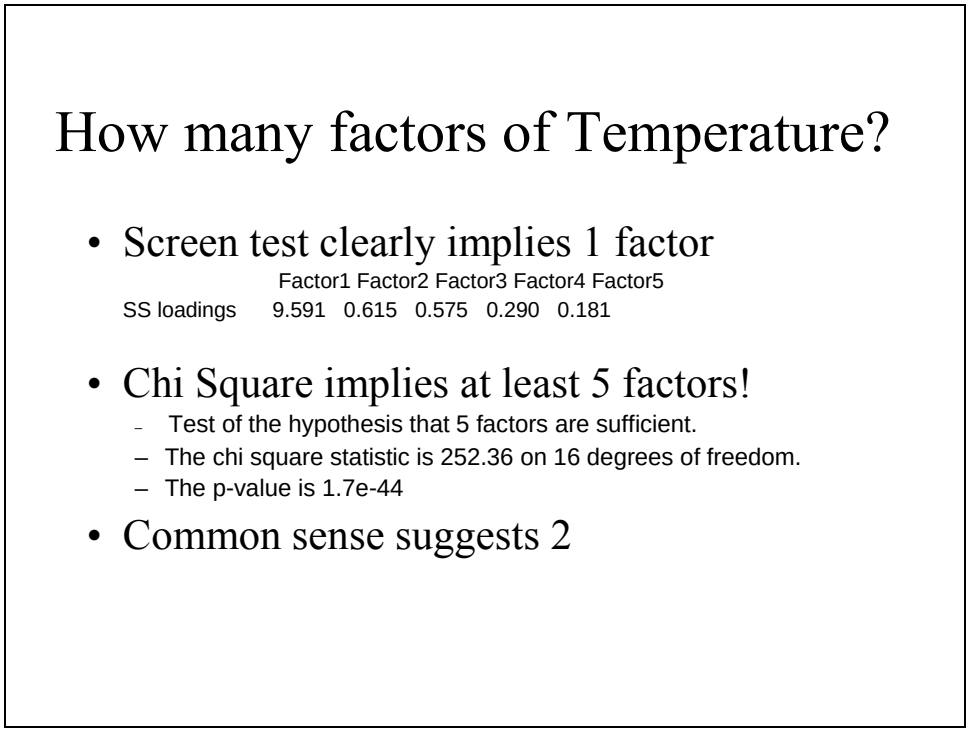
Structure of affect:Structure of weather

- What are the appropriate ways to measure differences in affect?
  - Affect (positive vs. negative) and Arousal or
  - Positive Affect and Negative Affect
  - Usually discussed in terms of factor analyses and rotations of affect data
- What happens when we measure temperature
  - High and Low vs.
  - Average and Variability
  - Consider what happens when we factor temperature data

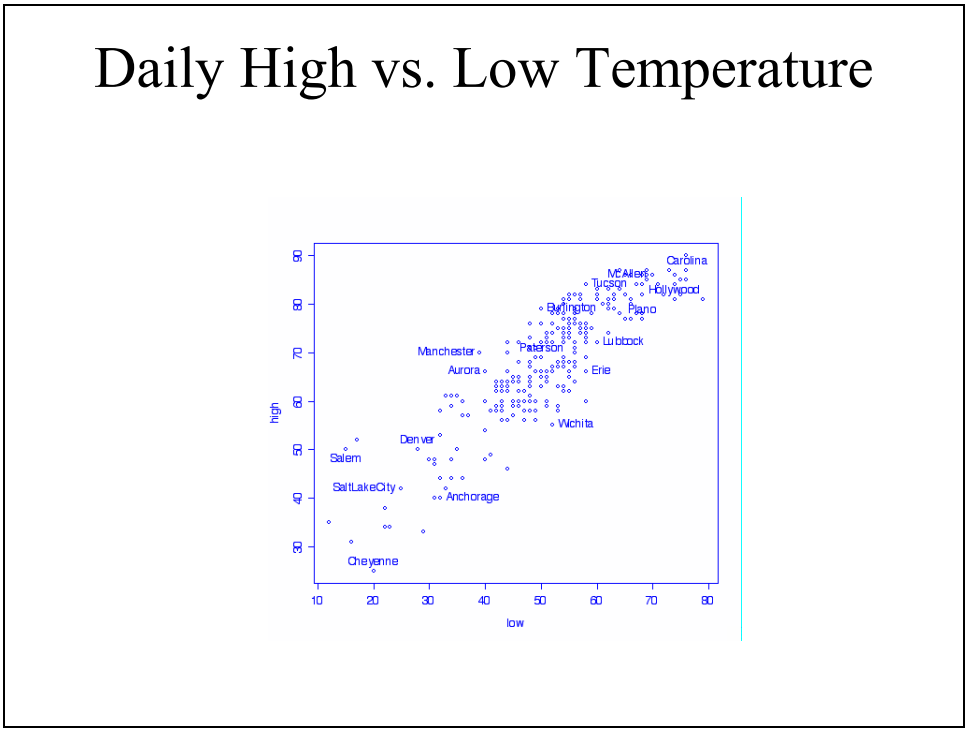
So this is structure of affect is to structure of weather. Can we look at the two techniques across these and see what happens? With affect, we know we can talk about positive versus negative affect and arousal, or perhaps, positive affect versus negative affect as two separate dimensions. Typically, we come up with these solutions using factor analytic techniques and we argue about rotations. We argue about whether we have simple structure, or circumplex structure and the like. But what happens when we do the exact same set of analyses and look at simply high and low temperatures?



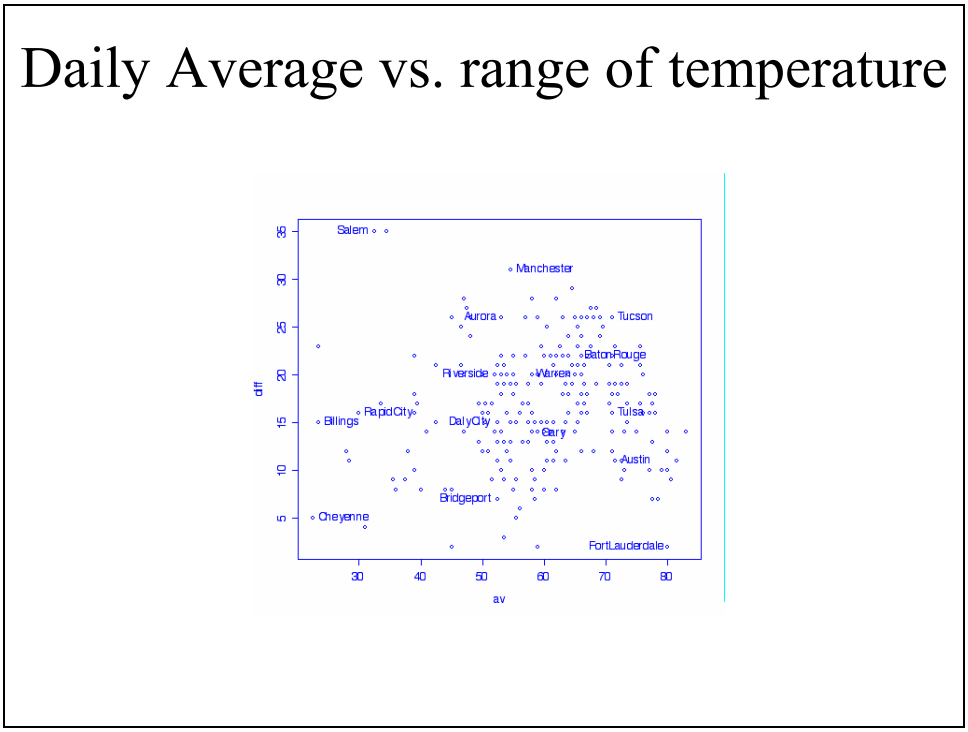
Here is a correlation matrix of highs and lows for 250 cities from October 31st to November 5th. Basically, all of the numbers are .8 and above, it's a very, very positive manifold.



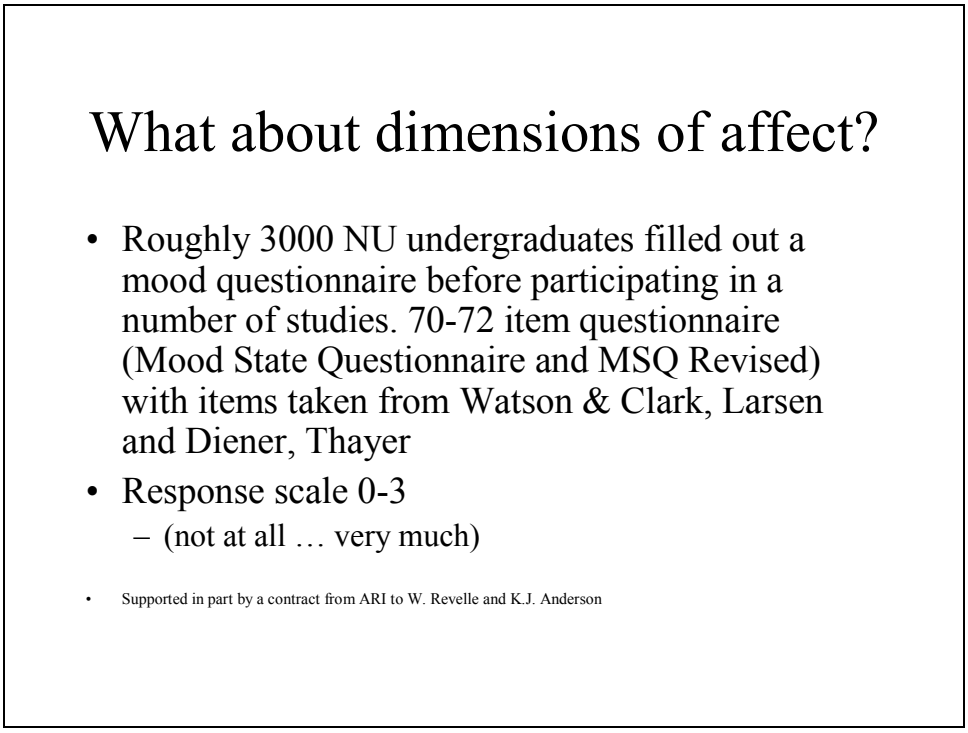
You look at that and say clearly, there is one factor. Putting it through factor analysis, the Scree test says there's clearly one factor; eigenvalues go from 9.5 down to .6, clearly evidence for one factor. What's interesting is when you do maximum likelihood factor analysis, after five factors I was tired of taking out factors, they were still very significant, that matrix was so strong and so solid that five just wouldn't do it. Even though the answer is clearly one, actually common sense suggests there are two dimensions. So we have two very well established rules, Scree test - good rule, gives 1, chi square, which is the standard rule, gives five or six factors. But I think when we think about temperature we might want to think about two dimensions.



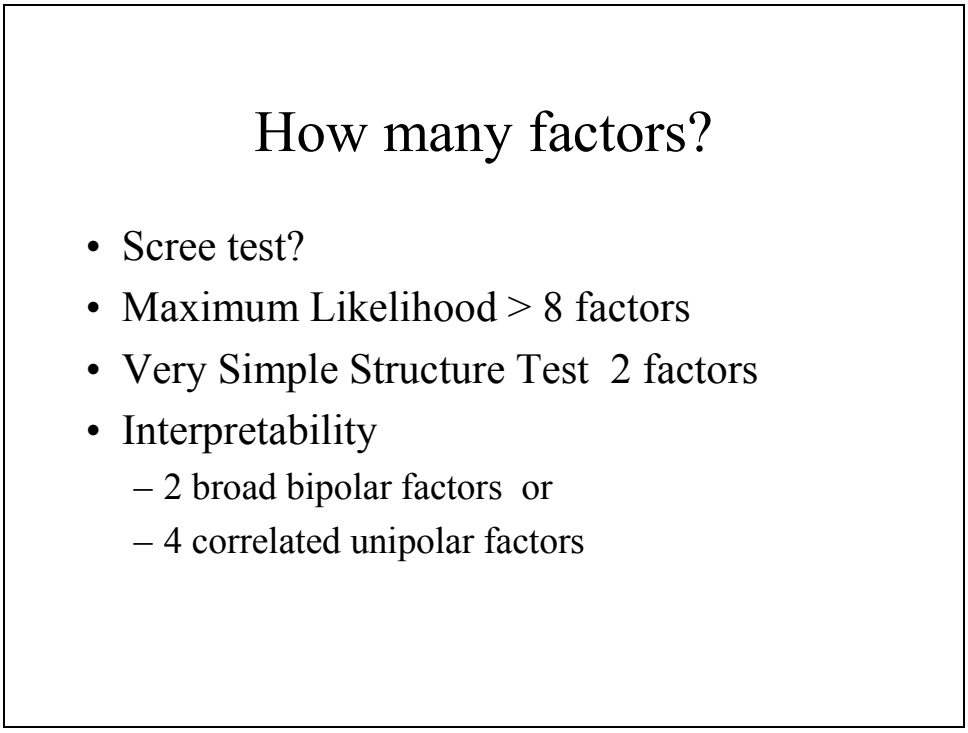
Here is what happens when I plot daily high and low against each other. This happens to be Cheyenne, Wyoming, Salem, Oregon and this is some place in Puerto Rico. Clearly, there is a one-factor solution; there is a very, very high correlation between highs and lows, but that's actually not what you really care about with the weather.



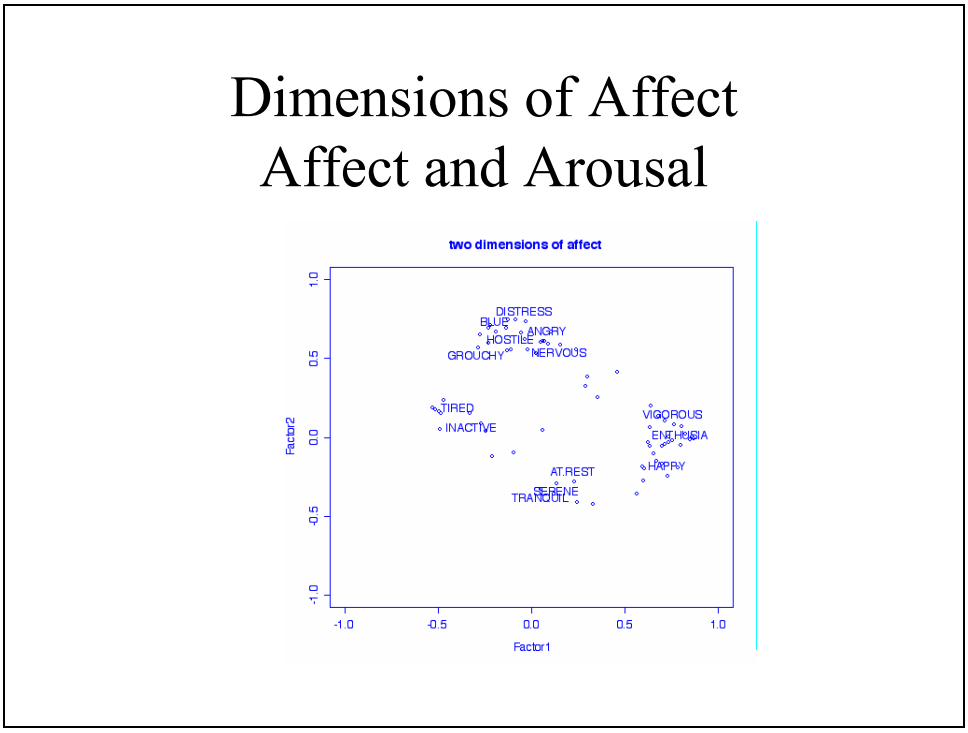
What you want to know is what is the variation of the weather? You don't want to know what the average temperature is, you want to know what the low is at night and in the day, you want to know what the high is going to be. And in fact, both Fort Lauderdale and Tucson have an average of 80, but Fort Lauderdale has almost zero variation on highs and lows whereas Tucson had a variation of 25 degrees. This suggests that what's important, when looking at the weather at least, is that you need two factors to think about the weather. Whereas, when you are looking at the standard techniques applied to factor analysis, you get the wrong answer.



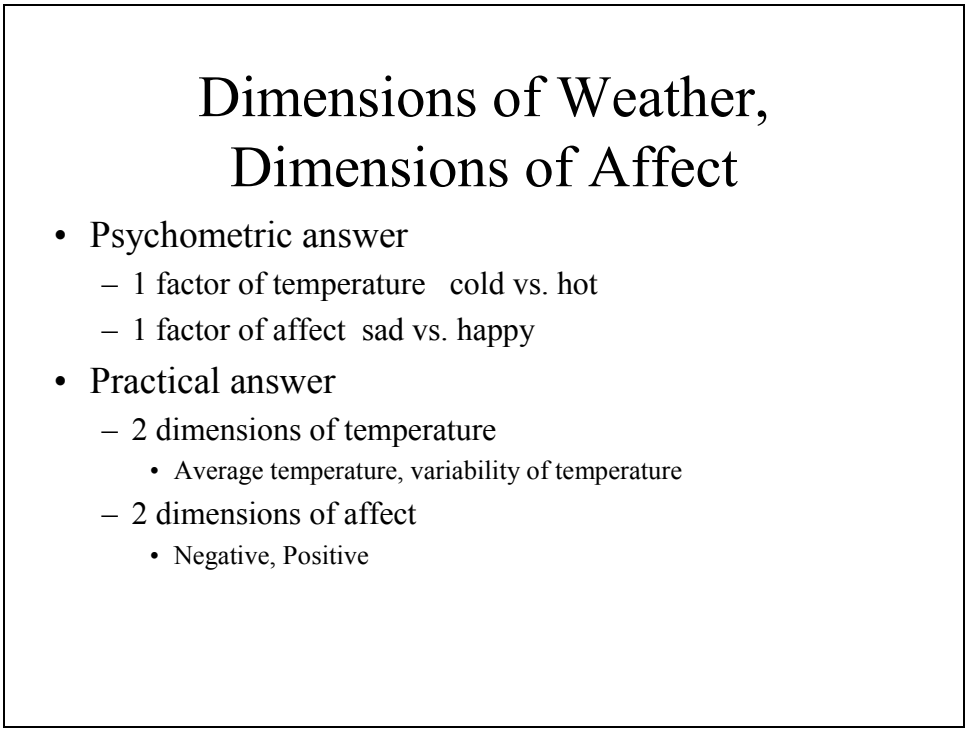
How about dimensions of affect? Let's do the same techniques and apply it to the dimensions of affect. This work was actually sponsored by ARI, but a good number of years ago. Over about 10 years, roughly 3,000 undergraduates went through our lab doing all kinds of time of day studies, caffeine studies, etc. But, the first thing they always filled out was a mood questionnaire, which has had a variety of names, sometimes it's known as the Motivation-State Questionnaire, sometimes it's called the Motivation-State Questionnaire Revised. These items were taken shamelessly from Watson and Clark, Larsen and Diener and Bob Thayer, they are very compatible with items that others have used and we've used a unipolar response scale, from zero (not at all) to 3 (very much).



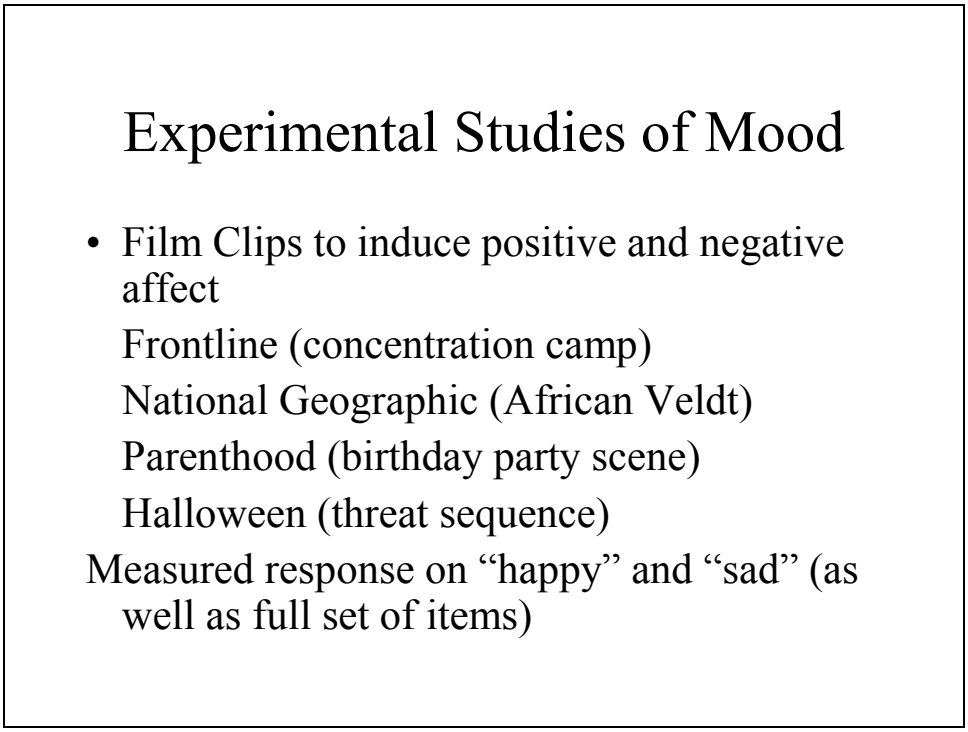
How many factors are in the data? When you have 3000 subjects, let me tell you that the chi-square test is not the test to use, you will take out 20 factors. The Scree test suggests that you could argue for two, you could argue for four, maybe even six. In terms of interpretability, two broad factors come out of the data and four uncorrelated unipolar factors come out, suggesting some effects of skew.



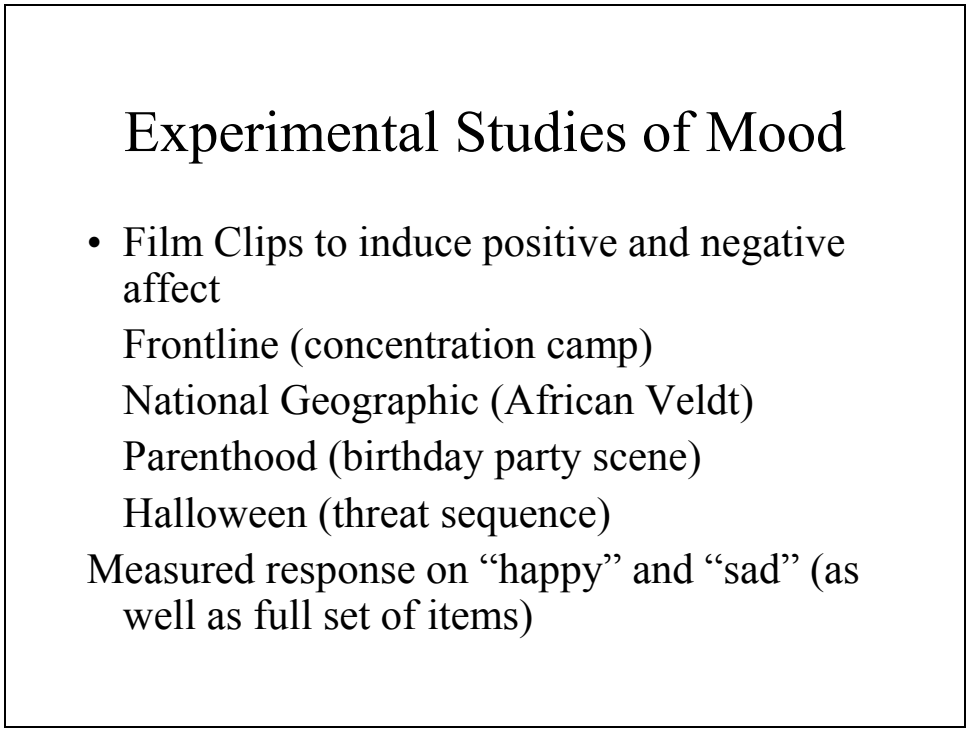
Plotting this, and you don't need to see these words because these are identical words that we've already seen from Lisa, it's the standard vigorous/enthusiastic versus tired/inactive, at rest versus stressed out. This is the standard solution of affect and arousal. Or you can look at it in a rotated solution and rotate it yet another way, and it's basically the same solution we all get. There is great debate among the twenty of us who actually care a lot about which axis is the right axis, but Lisa made the point, it doesn't really make much difference, the solution is fairly solid.



So, dimensions of weather and dimensions of affect. The psychometric answer suggests that you can get a positive versus negative affect dimension and a hot versus cold dimension. The practical answer suggests two dimensions of temperature - the average temperature and a variation in temperature, and perhaps two dimensions of affect - positive and negative. The practical answer is different than what actually comes out from the factor structure. This is a really useful thing to be aware of.



What happens when you look at mood experimentally? The logic here is that the weather does have other manipulations that are happening to it; not what we can do to it necessarily. To a smaller set of people we gave four different movies: nine minutes of Frontline - a very depressing concentration camp movie, it's filmed as the British arrive at a concentration camp and it's the nine most discouraging and depressing minutes that you can get on film; National Geographic is a fairly boring control shot; Parenthood - which is only a nine-minute sequence which was clearly humorous everything else was sort mixed emotions; and, Halloween - there is a nine-minute scene in which nothing actually happens but you know something is about to happen, and it's petrifying to watch. We used 72 words, but I'm only going to report looking at just happy and sad on these four movies. One would hope, given the expertise in this group, that you would think you're very sad when you see a concentration camp movie and probably not at all happy. And you'd be right if you predicted that. National Graphic, shouldn't do much for you. Parenthood, should make you fairly happy and not very sad. What about Halloween, what should it do to you? We have the world's experts on emotion here, what should a frightening movie do to your happiness or sadness? Any prediction?



PARTICIPANT: I can make a prediction but I know what you're going to show.

DR. REVELLE: What's it going to show?

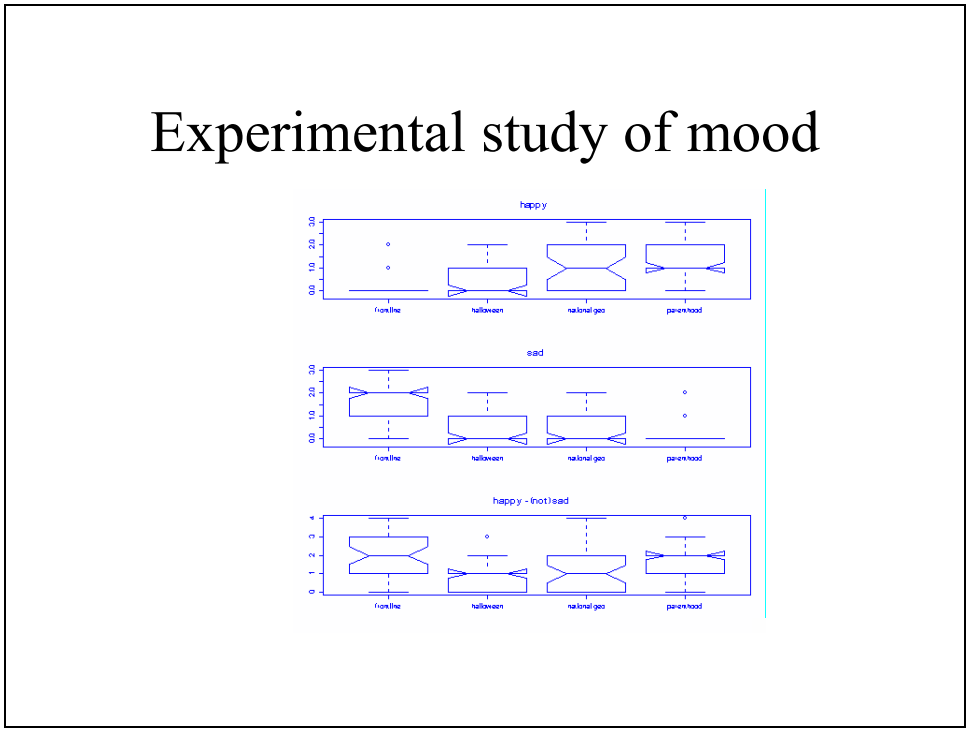
PARTICIPANT: What is the time-frame rating?

DR. REVELLE: All of my questionnaires were, "How do you feel right now?"

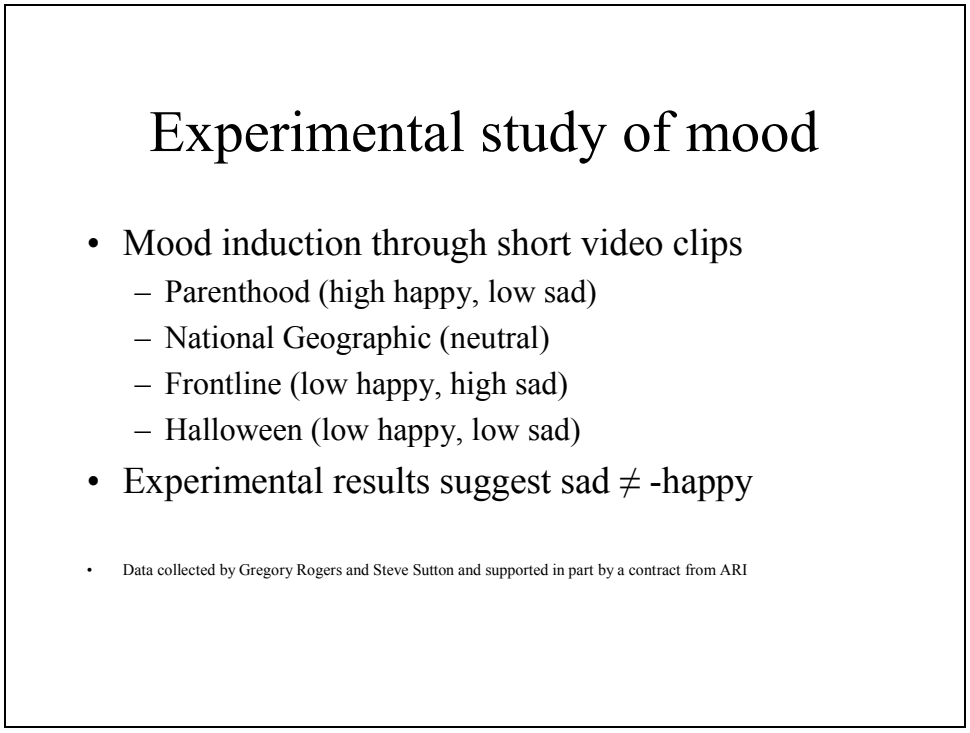
PARTICIPANT: At the end of the movie?

DR. REVELLE: At the end of the movie.

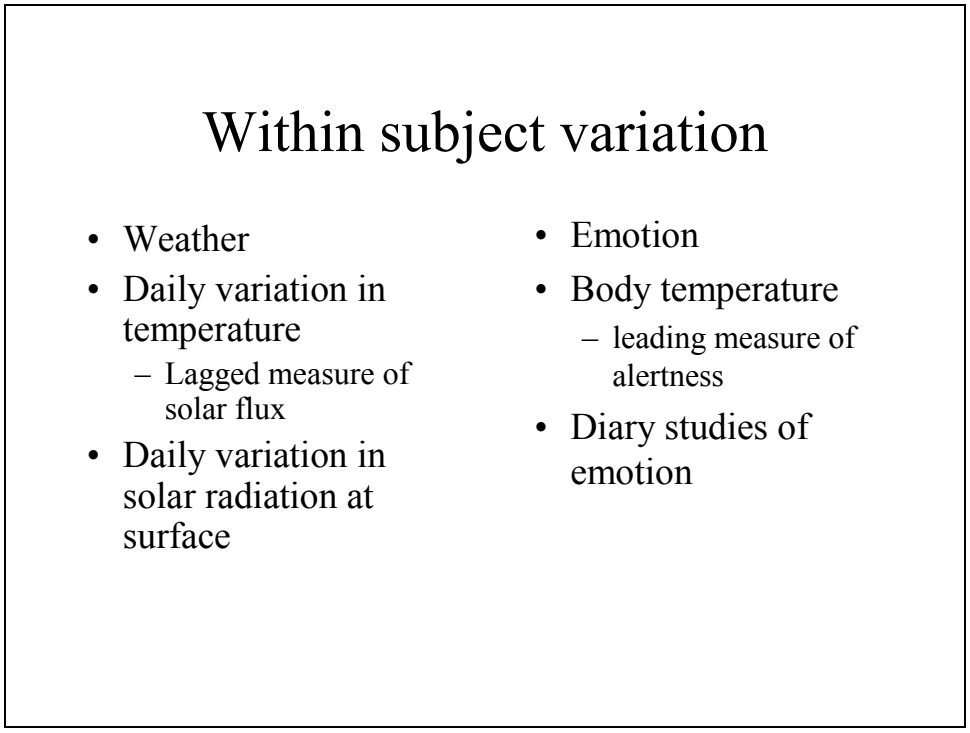
PARTICIPANT: That they feel both happy and sad.



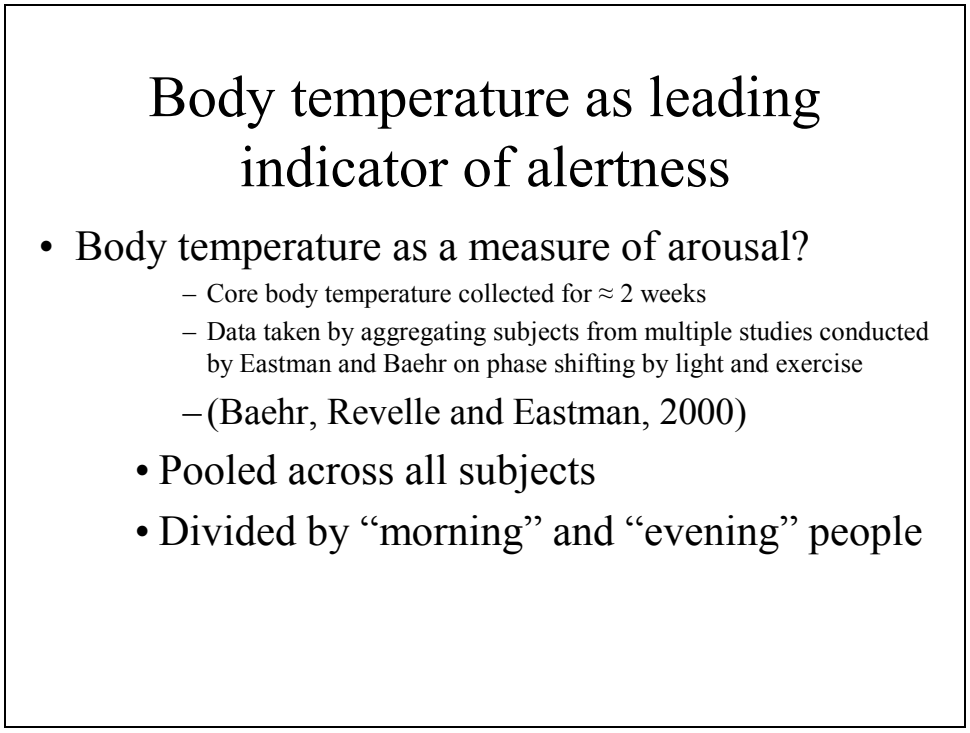
DR. REVELLE: We have one brave person, but she knew what was coming. Basically, you're not at all happy; there is zero happiness, although there are two outlying subjects for some strange reason. The medians here these are notched box-plots, so the notches are the confidence intervals around the medians.



Basically, you are very happy after Parenthood and very unhappy after Frontline, and Halloween is putting you at somewhat happy but not very sad either. You take the difference of happy and sadness, if they are simply a unipolar axis, you shouldn't be getting this pattern of results. Clearly, we need at least two dimensions to capture happy and sad they are not just bipolar opposites, but both happy and sad do respond to affective manipulations. Happy is not the opposite of sad, as we know, and vice-versa. Halloween makes you low happy and low sad, and everything else is exactly what you would expect.



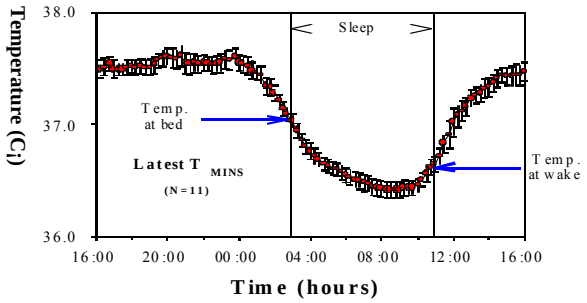
Let's look at daily variation in temperature and then try to map that over to daily variation of characteristics in individuals. Now, what actually drives temperature in the day is, of course, solar flux. The hottest time of the day, as we all know, is late in the afternoon. Even though the solar flux peaks at noon, it's the balance between the input and the output of the system, so daytime temperature lags the solar input temperature.



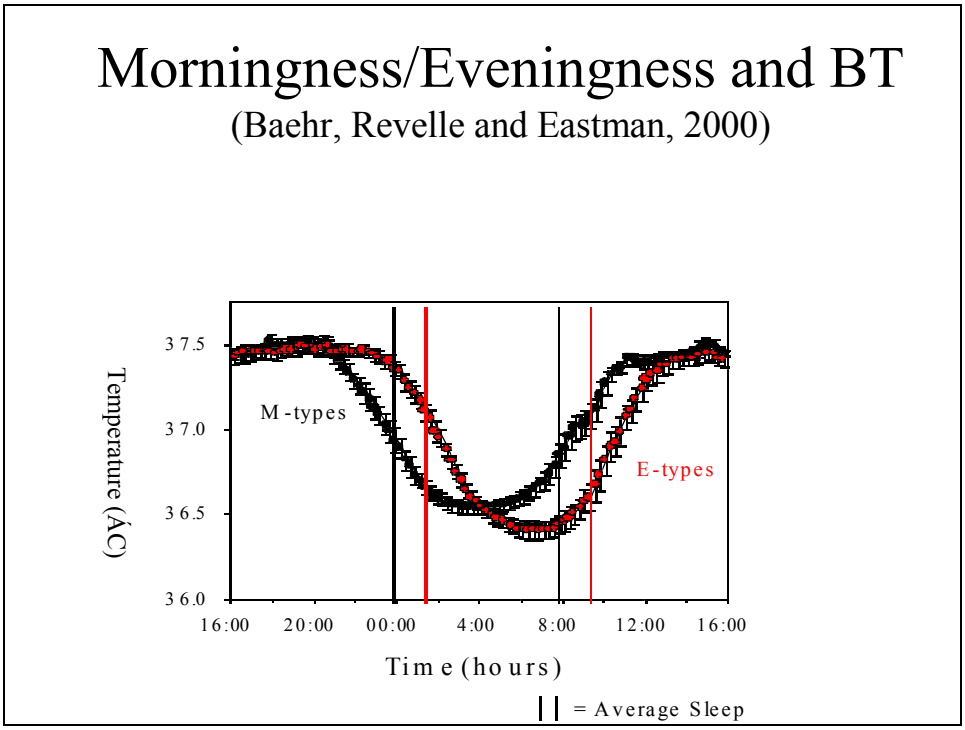
Now let's see what happens when we do various measures of alertness and arousal. One measure of physiological alertness and arousal is body temperature. For other reasons, Charemane Eastman and Erin Baehr collected core body temperature for about two weeks; they were looking at phase shifting. Pooling across many of these small studies and looking at first, overall body temperature, body temperature has a fairly big shift over the evening time; it drops about a degree Celsius.

Body Temperature as f(time of day)

(Baehr, Revelle & Eastman, 2000)



This is what time people go to bed and what time people wake up.



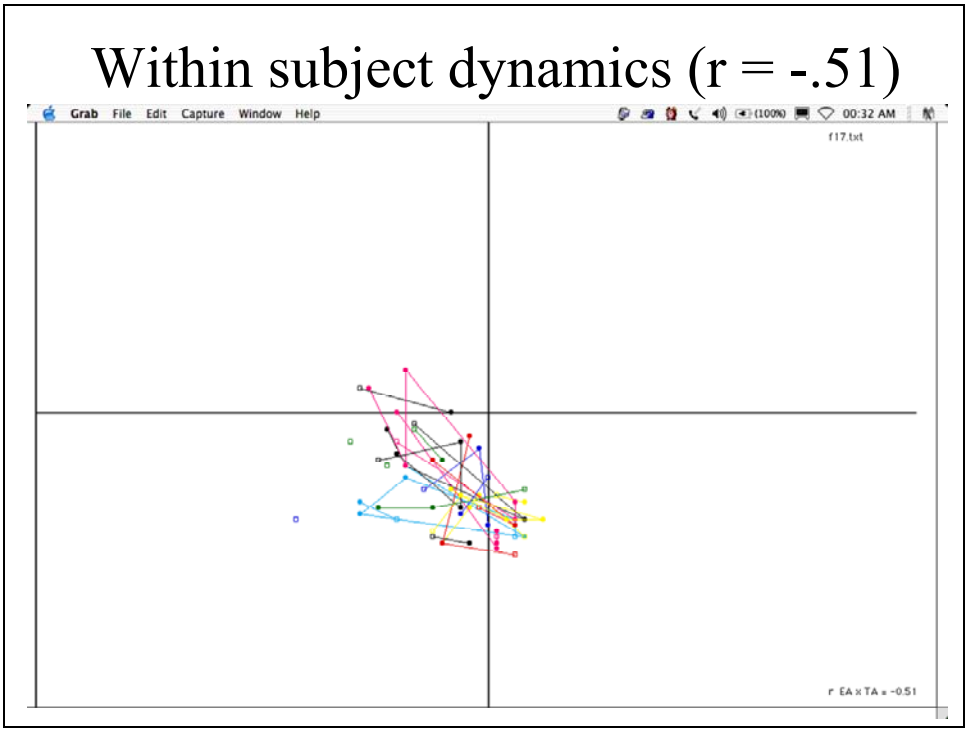
If you ask them if they are morning types or evening types, you find a nice combination of physiology and social psychology. For morning types, their body temperature is coming down, but in some sense morning types stay up later, is the way I interpret these data, because they're trying to be nice to these poor evening people who themselves are going to bed earlier than they want to. The consequence is disastrous the next morning, when we discover that the morning people are waking up when their body temperature is half way up to baseline again, whereas the evening types are waking up an hour later, but their body temperature is lagging by two hours so they are not worth a damn in the morning. And the morning types aren't worth a damn in the evening, evening types aren't worth a damn in the morning, which summarizes 20 years of our work on personality and cognitive psychology.

Measuring the dynamics of personality

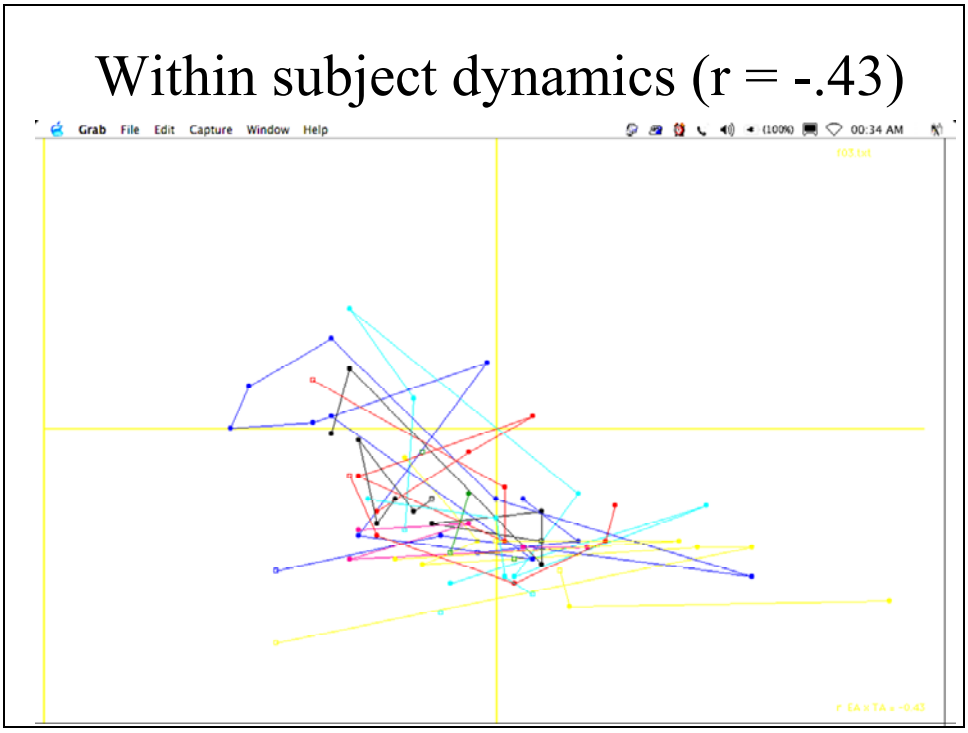
- How do people differ in their experience of emotion?
- Measurements taken every 3 hours during waking day (palm pilots or diaries)
- We can observe within subject change in positive and negative affect over a day, replicated each day
- Note that while people differ in their pattern, within each person, the pattern is consistent
- (data from Eshkol Rafaeli and from Gregory Rogers)

How do you vary in the experience of emotion? Using palm pilots, we tracked people and asked them every three hours 16 questions of how alert, happy, sad, energetic, do you feel right now, and what are you doing right now?

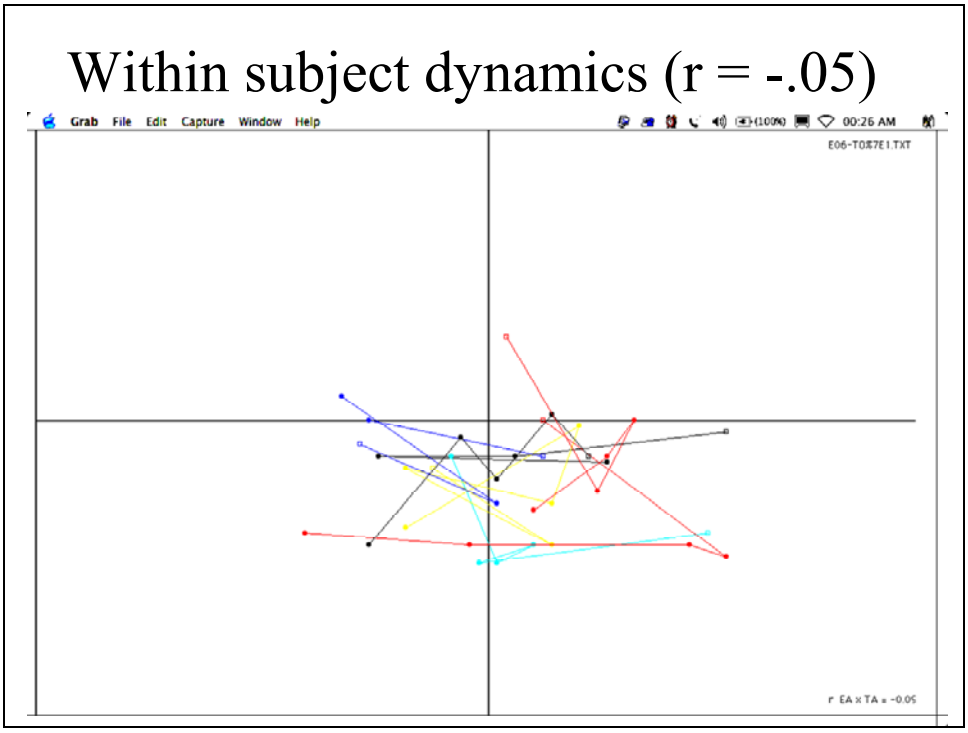
I'm going to show you about four or five different people, so you can see the difference of the pattern. I want you to notice that people are responding differently but, each person is responding in a fairly stable way across two weeks.



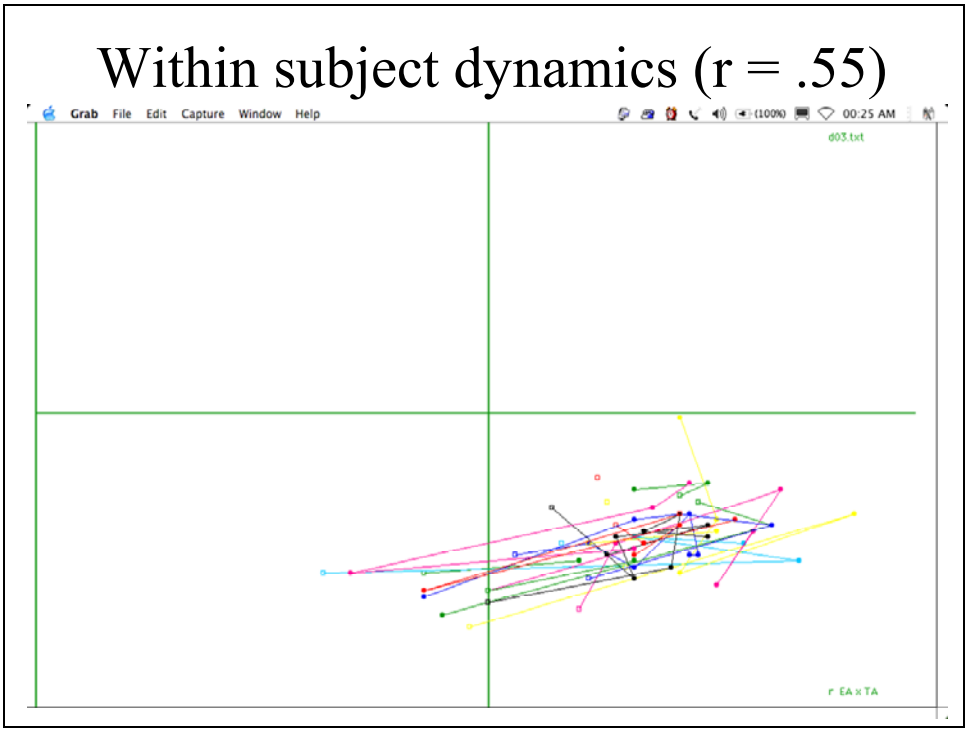
It's the same scale for everybody, positive affect, negative affect. This person is not moving very much, but when she is moving, she is moving back and forth this way. And the correlation for this individual of positive and negative affect, across two weeks is negative .51.



This person is moving around a lot more in this space, with a negative correlation between positive and negative affect of negative .43.



Here is this person who is wandering around; there is no correlation of positive and negative affect.

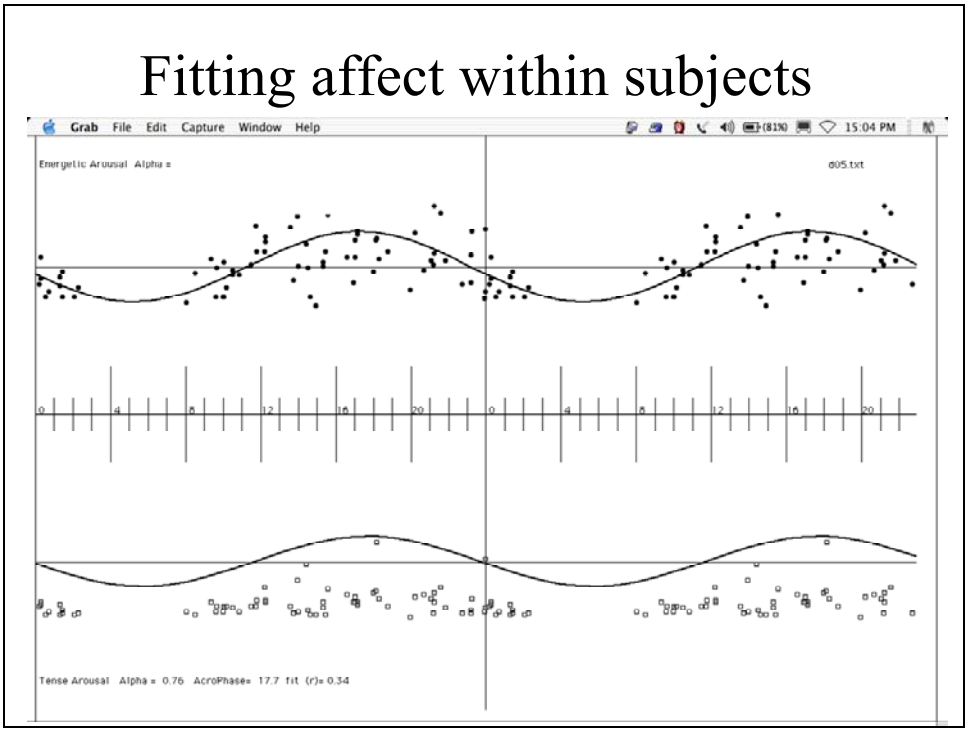


This person is back and forth when they are calm, they're also neither happy nor sad and when they're moving up. They're moving up both in positive affect and negative affect resulting in a correlation of .55.

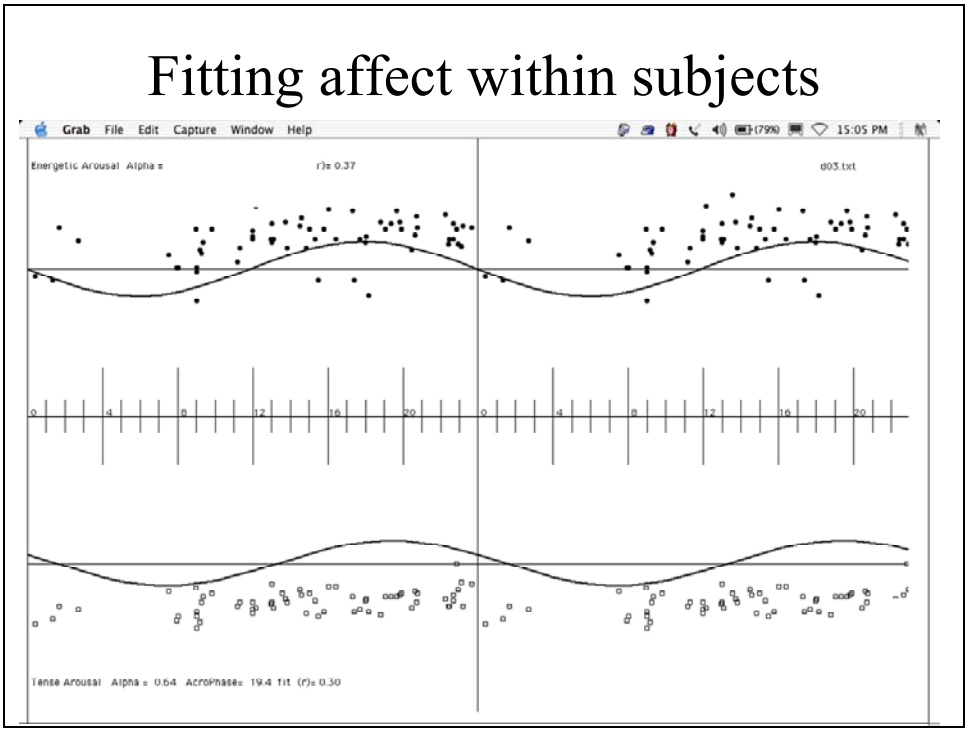
Daily variation in mood: Is it systematic?

- Body temperature shows systematic diurnal effect. What about positive and negative affect (or energetic and tense arousal)?
- Fit cosine curves (period = 24, best fitted phase) to self report measures
- "double plot" to highlight circadian variation
- Circadian fits are much better for Positive Affect/Energetic Arousal than for Negative Affect/Tense Arousal

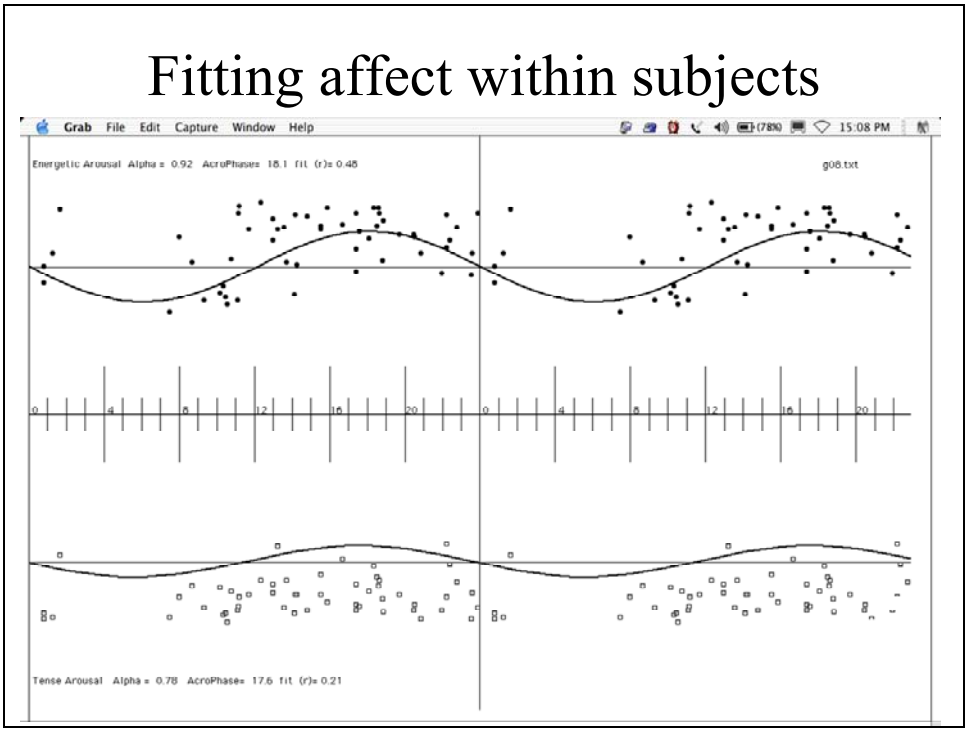
Is it systematic however? It looks somewhat systematic, going back and forth, but can we model it in any way, given this notion that we have models of temperature for instance? Actually, we tried fitting these data with co-sign curves best fitted to phase differences for each subject, so for each person we're optimally finding what the best fit in terms of diurnal rhythm is and double plotting it so you can highlight the circadian rhythm.



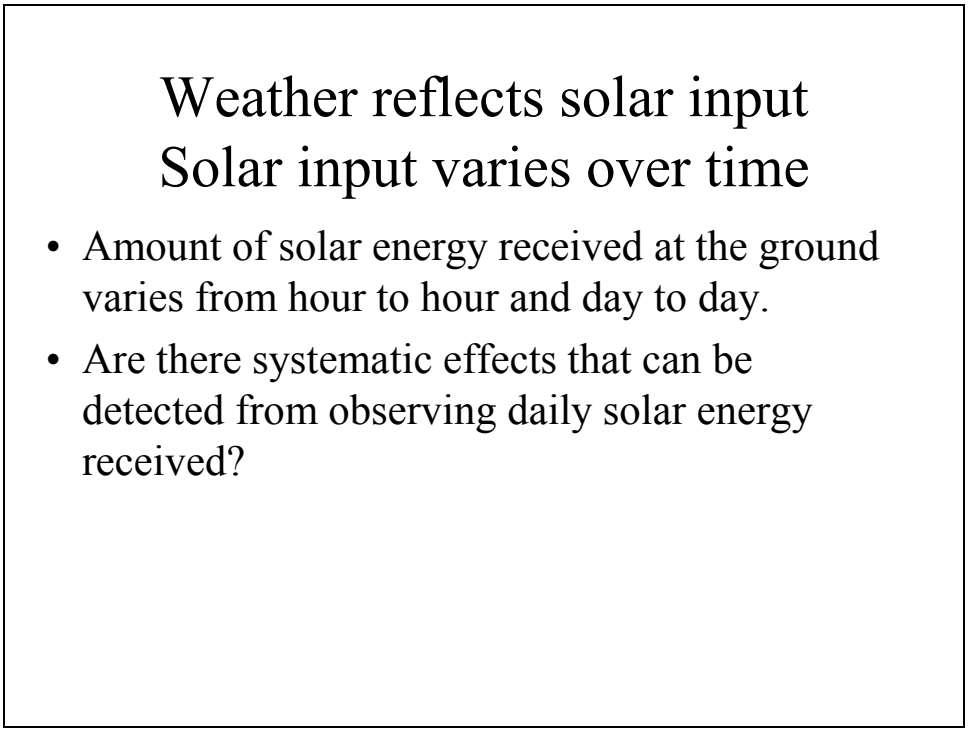
Here is someone who is at the peak arousal which is happening at about 1600 hours. These are college students who actually have the highest alertness later in the afternoon.



The peak arousal of this person is about 4 o'clock in the afternoon.

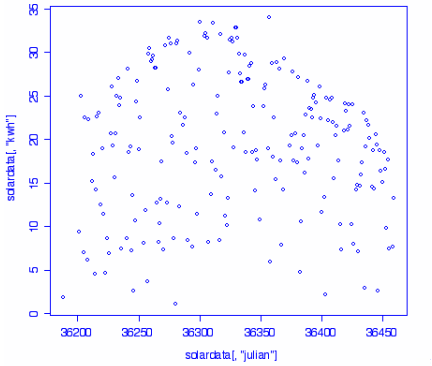


This person isn't fit as well, the correlation is about .48. I want you to notice here is that the fits are better on the top bar, which is energetic arousal and there are terrible fits on tension. Tension is responding to something else, not diurnal rhythms.



Going back to the weather, we know that weather reflects solar input and solar input varies over time and the amount of solar energy received in the ground varies from hour to hour and day to day. So, are there systematic effects that can be detected by observing daily solar energy?

Solar input over 6 months



Data=observed PV output of a solar house in Evanston, Illinois

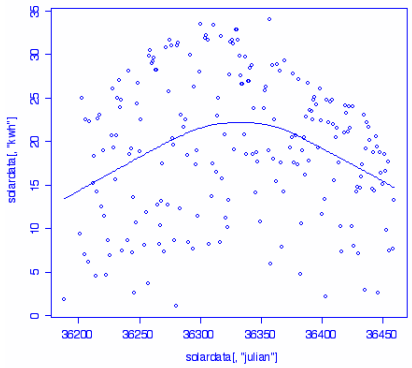
If you observe solar output over the day, this is what happens over six months. Each one of those data points is a separate day and you say there is nothing there. In fact, there's a very systematic effect which is called the seasons. This is mid summer, and at mid summer you get a lot more daylight and get a lot more power coming off your roof than you do in January or February or in October.

Running averages as smoothes of data

- Smoothing removes daily signal but detects longer term effects
- Smoothed daily solar input shows seasonal effects
- When emotional state is measured daily, smoothed data show more consistency of individual differences than do daily data.
  - (Epstein)

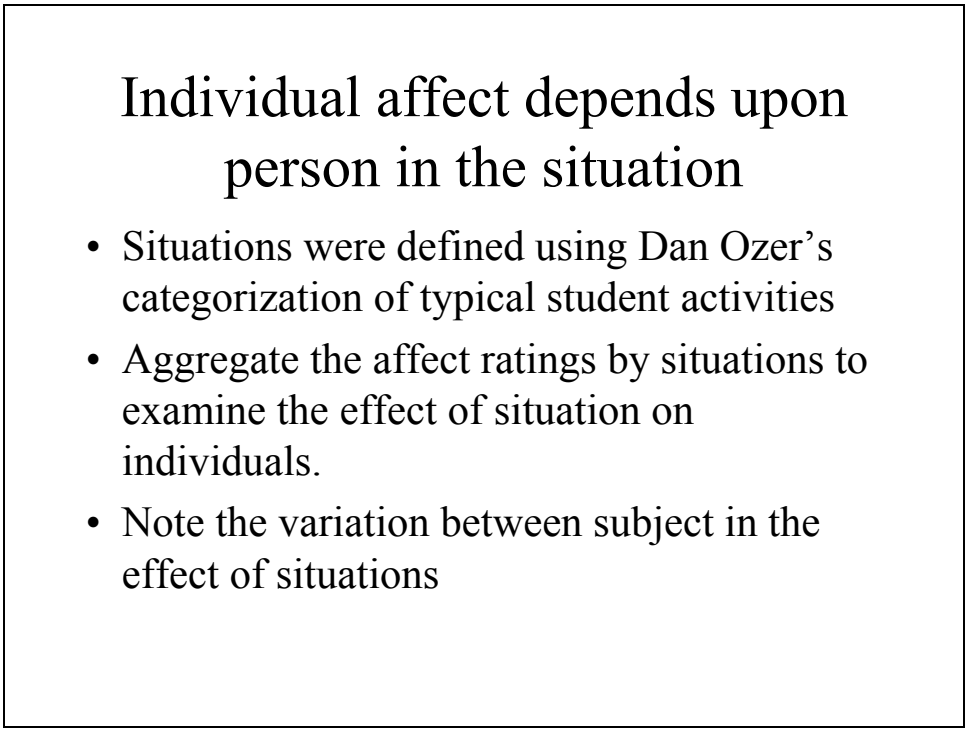
So, by smoothing, you do get some fairly nice results. In fact, Epstein figured that same thing out when he looked at emotions in humans over day to day periods of time.

Solar input over 6 months (smoothed)

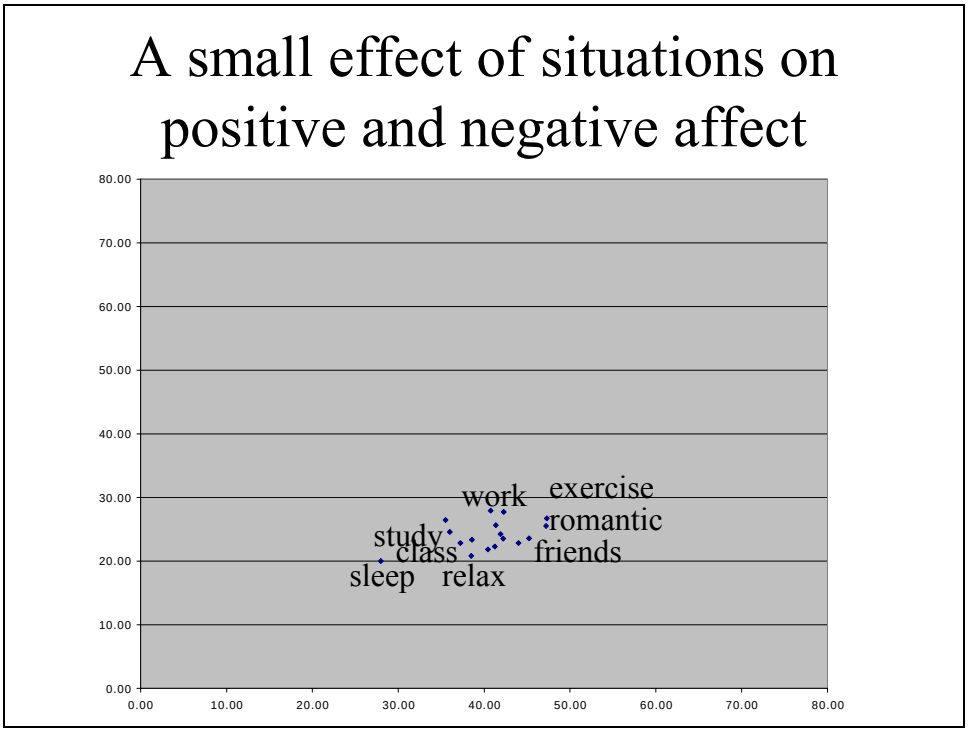


Data=observed PV output of a solar house in Evanston, Illinois

Let's look at once again, going back to solar flux, let's go back to find the seasonal effects that you just saw. Can we map those into situational affects?



Now, I am going to report in several different ways. First of all, what's the average emotion in a variety of situations? These situations are taken from Dan Ozer who has a nice little checklist of about 16 important situations for college students. We can ask what the emotion in the situation is and then we can look at what's the emotion for the individuals in those situations. So the categories again are from Dan Ozer and we can aggregate them in multiple different ways.

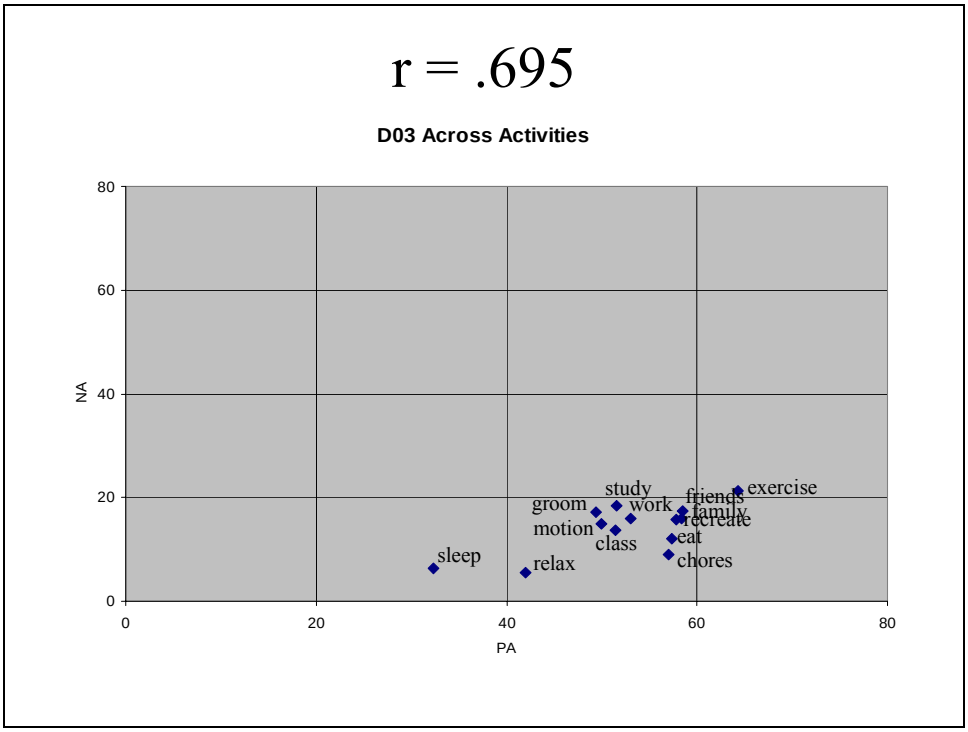


Overall, in general, sleeping, as one would hope, is less exciting than exercising. Surprisingly enough, exercise is just about as exciting as being romantic, being with friends, relaxing, and unfortunately these Northwestern students find class fairly low in terms of how energizing it is. That is the group data.

Individual differences in response to situations (or situational choice)

- Mood measurements taken every 3 hours
- Situations reported at the same time
- Plot situations in the affect space (Positive and Negative Affect)
- Plot each individual pattern across situations in the affect space

What happens if we de-aggregate it and look at individuals? Looking at the same people, same palm pilots, we're going to look at the situation for the individual plotted by an affect space for that same individual.

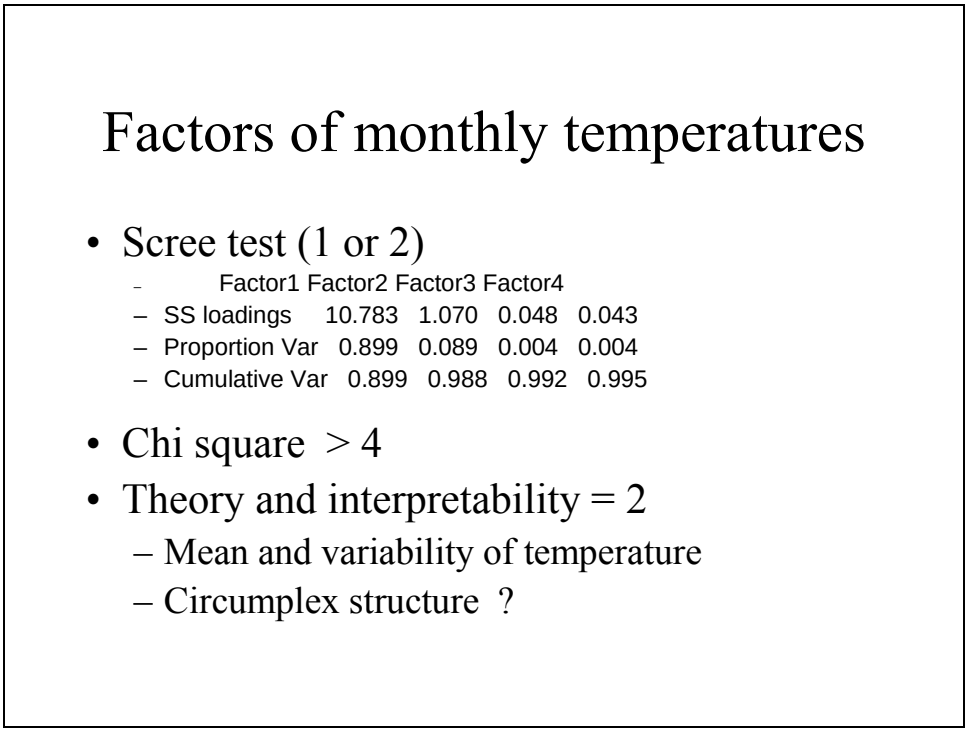


Once again, trying to get the feeling of what's going on, here we have sleep is very low, exercise the highest thing they're doing; people are differing greatly in the way they are organizing and responding and feeling about those situations. What I'm plotting here is the correlation between positive and negative affect averaged across the situations for that individual. There is a lot of individual difference here that we need to try and model. And it differs a great deal; it's not just the standard zero correlation that we get across subjects. There is a systematic difference in the correlation between the affects that differ systematically across individuals. It's partly size of the space and the angle is changing drastically also.

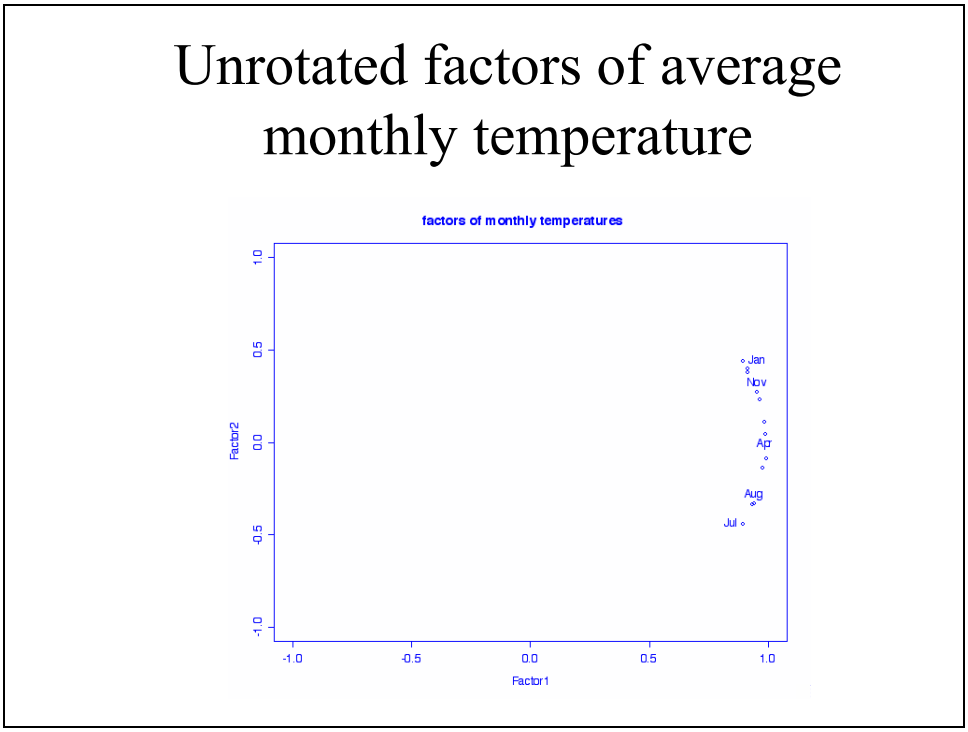
Correlations of Monthly Averages 250 American cities

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	1.00	0.99	0.96	0.89	0.80	0.68	0.60	0.69	0.84	0.92	0.96	0.99
Feb	0.99	1.00	0.98	0.92	0.84	0.72	0.65	0.74	0.87	0.94	0.96	0.98
Mar	0.96	0.98	1.00	0.98	0.92	0.82	0.76	0.83	0.93	0.97	0.98	0.97
Apr	0.89	0.92	0.98	1.00	0.98	0.92	0.86	0.91	0.97	0.98	0.95	0.92
May	0.80	0.84	0.92	0.98	1.00	0.98	0.93	0.96	0.98	0.95	0.89	0.84
Jun	0.68	0.72	0.82	0.92	0.98	1.00	0.98	0.98	0.96	0.88	0.80	0.72
Jul	0.60	0.65	0.76	0.86	0.93	0.98	1.00	0.99	0.92	0.83	0.73	0.64
Aug	0.69	0.74	0.83	0.91	0.96	0.98	0.99	1.00	0.96	0.89	0.81	0.73
Sep	0.84	0.87	0.93	0.97	0.98	0.96	0.92	0.96	1.00	0.97	0.93	0.87
Oct	0.92	0.94	0.97	0.98	0.95	0.88	0.83	0.89	0.97	1.00	0.98	0.95
Nov	0.96	0.96	0.98	0.95	0.89	0.80	0.73	0.81	0.93	0.98	1.00	0.98
Dec	0.99	0.98	0.97	0.92	0.84	0.72	0.64	0.73	0.87	0.95	0.98	1.00

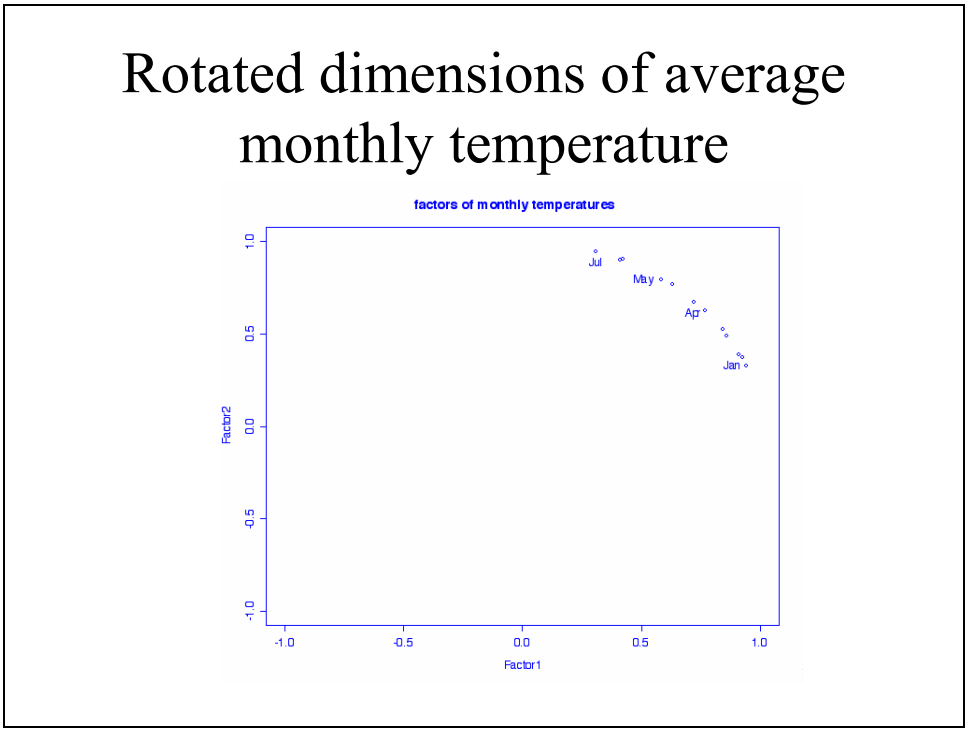
Personality, suggested by many, is averaged emotion across much longer periods of time. Let's look at weather averaged across time for a variety of cities. This is what we think of as climate in cities. Those of us who live in Chicago and come from California are extraordinarily sensitive to the difference in climate between these two locations. Here is the correlation of monthly averages, January through December of 250 American cities. And if you look at the correlation matrix and you have enough psychometric training, you'll say it has a very interesting circumplex structure to it. The correlations right off of the diagonal are the .98s and the .99s, and as you get progressively further and further away from the diagonal the correlations go down to about .6 and then go back up again as you get farther away from the diagonal once again.



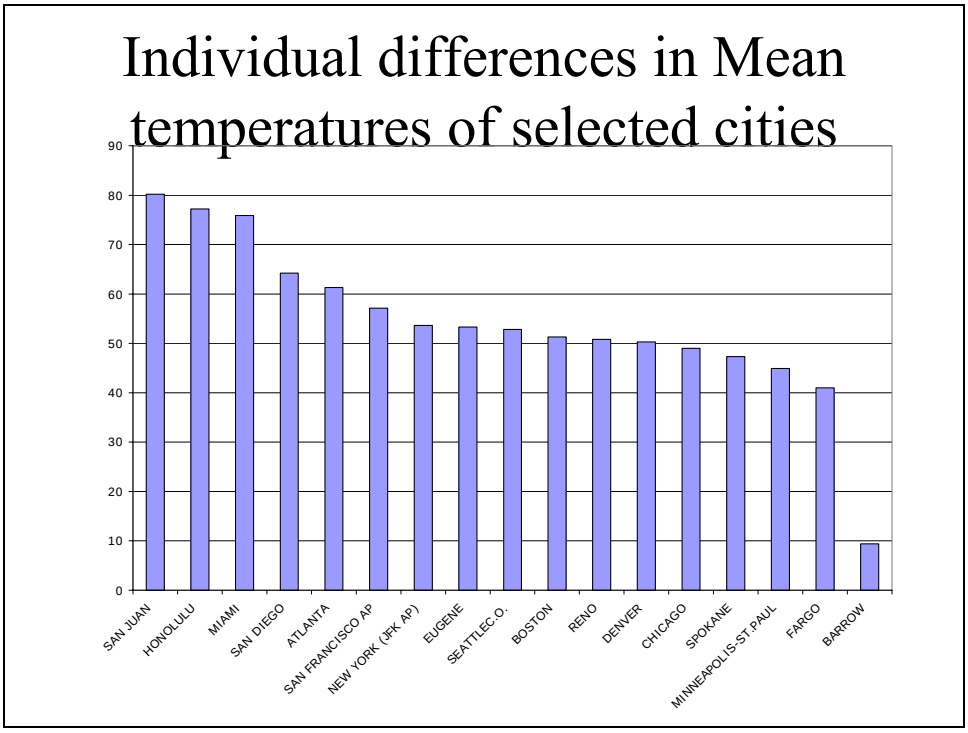
How many factors are in the data? Once again, the Scree tests say one maybe two factors; chi-square is useless in this case. Theory and interpretability suggest two is probably the right answer in terms of the climate.



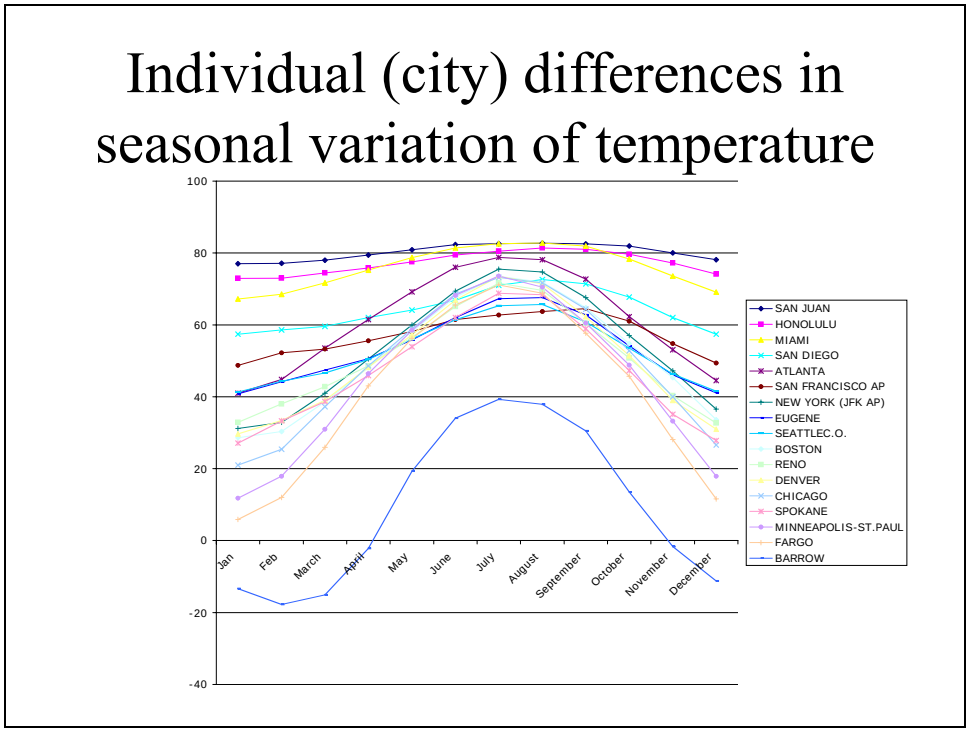
But, what are the important dimensions here? Let's see if we can plot those two factors. The unrotated solution says there's one big factor and there is a subtle difference in this other factor. The top one is January and November and the bottom is July and August.



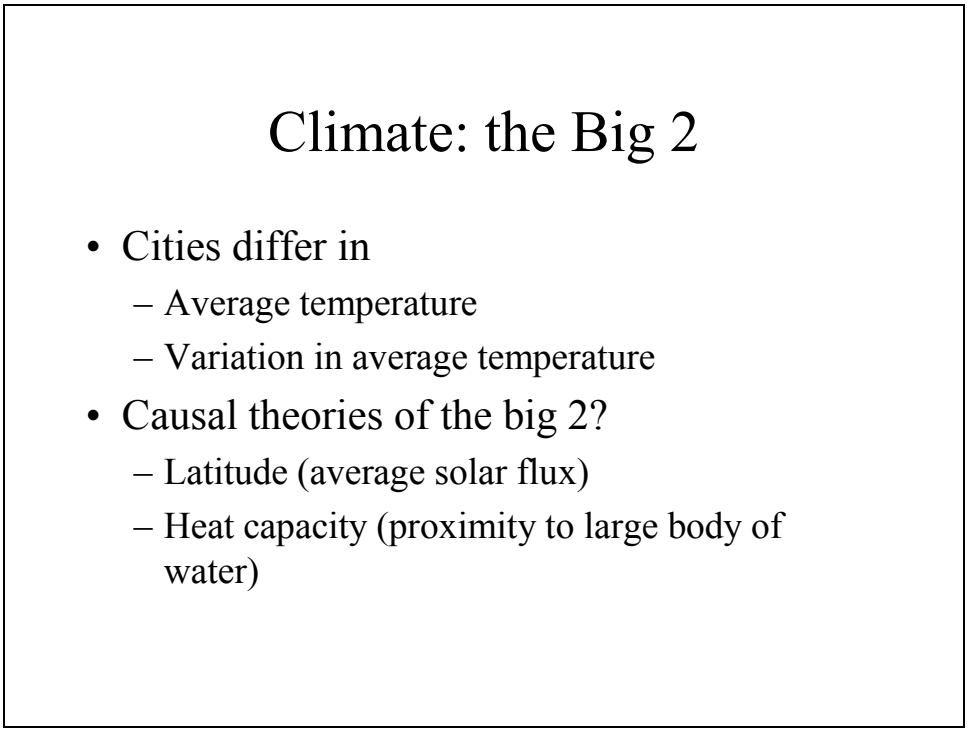
You can rotate that to try and see if it makes any better sense. Or, you can think about it in terms of the kinds of data we like to report.



This is average temperature, which is something that most people like to think about. San Juan, is of course much hotter than Barrow, Alaska. The average temperature in San Juan is 80 degrees, the average temperature in Barrow is nine degrees. Chicago, its average temperature is about 50 degrees as is Eugene, Oregon, and Boston.



But what's missing? What's missing is individual differences in situational patterns. Barrow shows a completely unique pattern because it's above the Arctic Circle, so it doesn't get any sun for six months of the year. The rest of the cities are organized from San Juan at the top right on down to Barrow. Chicago is cold in the winter and fairly warm in the summer. San Francisco is a much more a pleasant climb, only five degrees warmer, but shows much less variation. So, we come out from this saying could we, from our factor analyses from our correlation matrix, come out with the right answer? Means and variances are important, rather than this strange factor solution. Saying one factor is basically mean and the other factor is winter versus summer. But I think a more reasonable way of summarizing is saying within-city variance is perhaps the variable we want to look at.

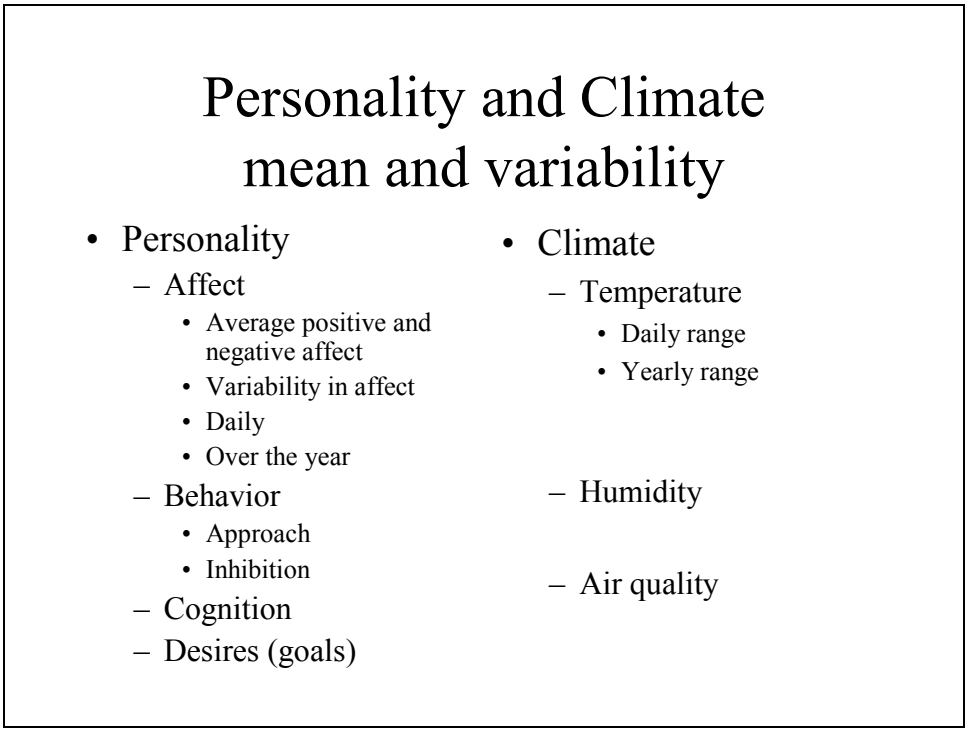


Going back to our analogies here, we have climate the "Big 2." Cities differ in average temperature and variation and we have causal theories of the Big 2, latitude is one, and how close you are to the ocean, is the other component.

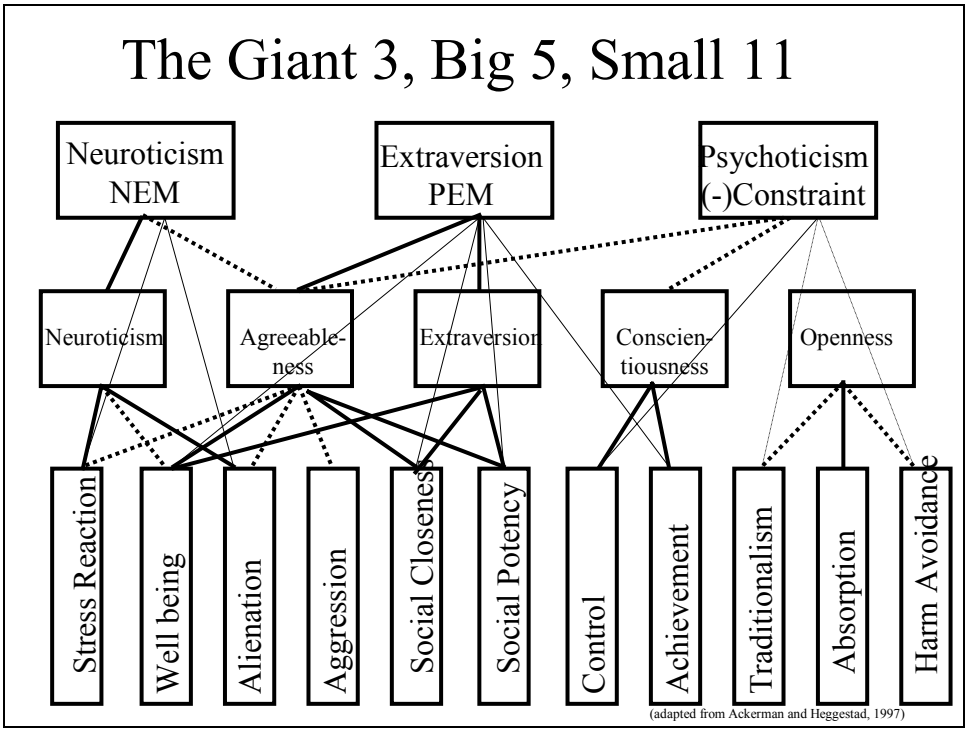
Personality: the Giant 2

- People can be described in terms of
  - Extraversion
  - Neuroticism
- Causal theories of the Giant 2
  - Extraversion as a sensitivity to cues for reward, sensitivity to reward, strong behavioral activation system, and results in typically Positive Emotion
  - Neuroticism as a sensitivity to cues for punishment, sensitivity to punishment, strong behavioral inhibition system, and results in typically Negative Emotion

Now let's jump to personality. There are two big approaches to the study of individual differences in personality; there is the Giant 2 of extroversion and neuroticism and also the Big Five, which relates less clearly to the study of emotions. Extroversion is seen variously as a sensitivity to cues for reward, sensitivity to reward itself, strong behavioral activation and perhaps all of these seem to result in general positive emotion. Similarly, neuroticism is sometimes seen as a sensitivity to cues for punishment or sensitivity to punishment; those are separate concepts.



Just as we have dimensions of personality, there is more to climate than just daily range and mean to the daily range of climate. There are also other factors of course, humidity, air quality; and in terms of personality, there are other variables other than just the affect dimensions. You can think about behavioral components, cognitive components and desires; Andrew Ortony, Don Norman, and I refer to this as the "ABC" model of personality – it's the affect, behavior, cognition and we throw in the "d" for desires and had to add "e" for environment.



Thinking about the "Giant 3" of neuroticism, extroversion and psychoticism/constraint, this also relates to the Big Five. It turns out that measurement of the Giant 2" and two of the Big Five is different. Although we use the same words, we use different techniques and different scales; we don't measure the same stuff. This is an unfortunate characteristic that you need to be aware of if you are studying emotion. Just because a scale is called "extroversion" doesn't mean it is the same extroversion as another scale of extroversion.

Poor fit between inventories?

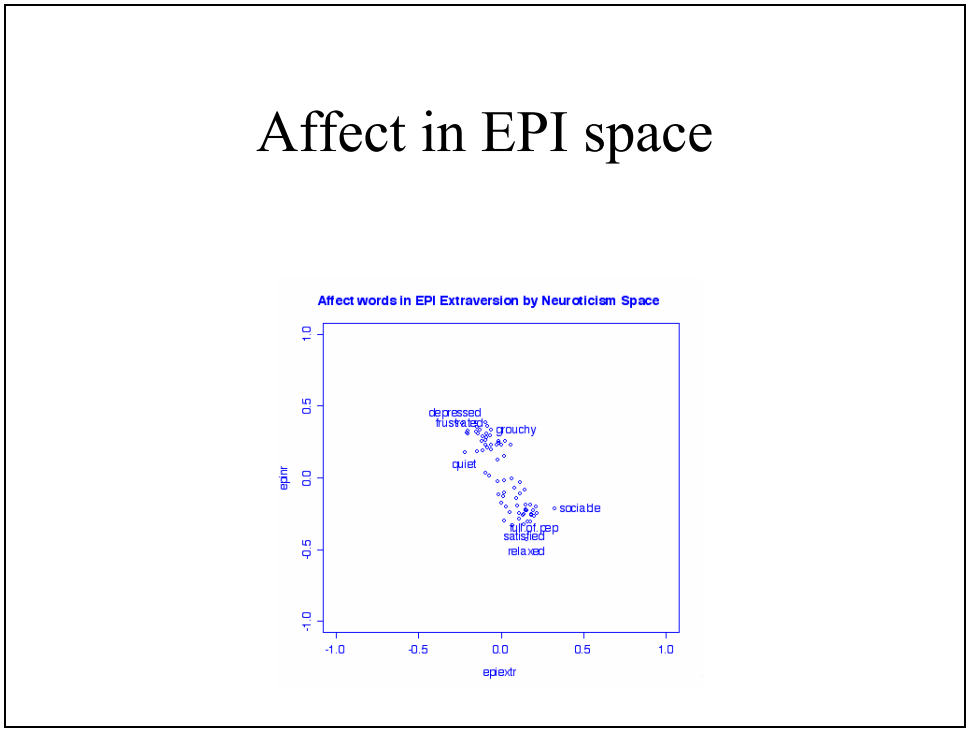
	epiE	epiS	epiImp	epilie	epiNeur	bfagree	bfcon	bfext	bfneur	bfopen
epiE	1	0.85	0.8	-0.22	-0.18	0.18	-0.11	0.54	-0.09	0.1
epiS	0.85	1	0.43	-0.05	-0.22	0.2	0.05	0.58	-0.07	0.1
epiImp	0.8	0.43	1	-0.24	-0.07	0.08	-0.24	0.35	-0.09	0.0
epilie	-0.22	-0.05	-0.24	1	-0.25	0.17	0.23	-0.04	-0.22	-0.1
epiNeur	-0.18	-0.22	-0.07	-0.25	1	-0.08	-0.13	-0.17	0.63	0.0
bfagree	0.18	0.2	0.08	0.17	-0.08	1	0.45	0.48	-0.04	0.3
bfcon	-0.11	0.05	-0.24	0.23	-0.13	0.45	1	0.27	0.04	0.3
bfext	**0.54**	0.58	0.35	-0.04	-0.17	0.48	0.27	1	0.04	0.4
bfneur	-0.09	-0.07	-0.09	-0.22	**0.63**	-0.04	0.04	0.04	1	0.2
bfopen	0.14	0.15	0.07	-0.03	0.09	0.39	0.31	0.46	0.29	1

These scales have very different patterns of correlations with affect. The Big Five scales of extroversion are very different from the Eysencks' scale of extroversion which are very different from the scales developed by David Watson, for instance. This correlation matrix is saying the two extroversion measures only correlate to .5. Neuroticism and Big Five extroversion is about .6; these are not at all close to each other.

Relating Personality to Emotion

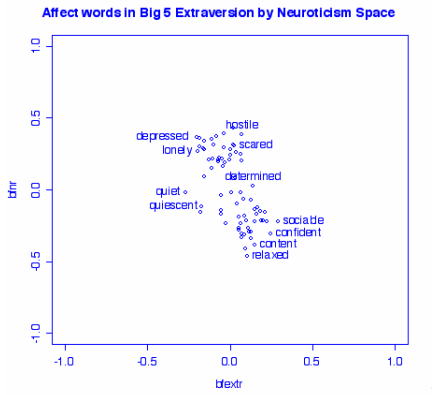
- Conventional interpretation
  - Extraversion = ∑ positive affect = Positive Emotionality
  - Neuroticism = ∑ negative affect = Negative Emotionality
- But, are all measures of E and N the same?
  - EPI, EPQ
  - NEO
  - BFI
  - IPIP

This almost leads us to a conclusion that is becoming the conventional interpretation; that extroversion can be seen as a sum of positive affect (and it's called positive emotionality), and neuroticism as negative affect (and it's called negative emotionality). But, it depends on how you measure it and we need to be very sensitive in our theories of personality as averaged emotion.

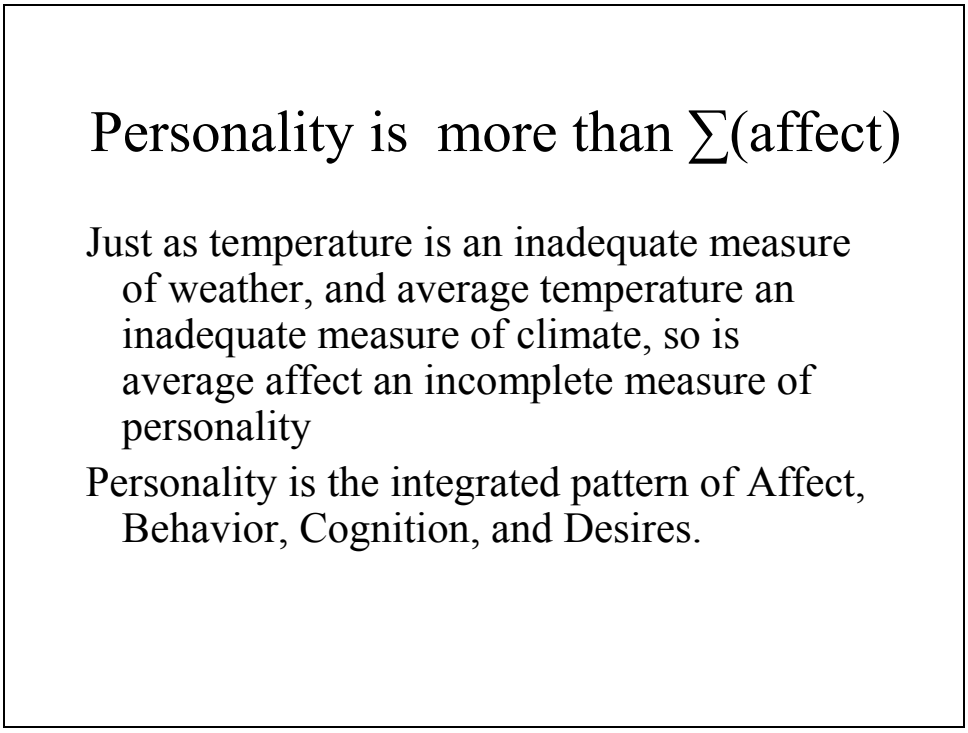


This is a slide looking at affect in EPI space with axis of EPI neuroticism by EPI extraversion. Basically, neuroticism relates to both positive and negative affect. The items here are basically the same mood items we have shown before. For the mood items, the negative ones relate negatively to neuroticism, but the positive ones are very slightly related to extroversion.

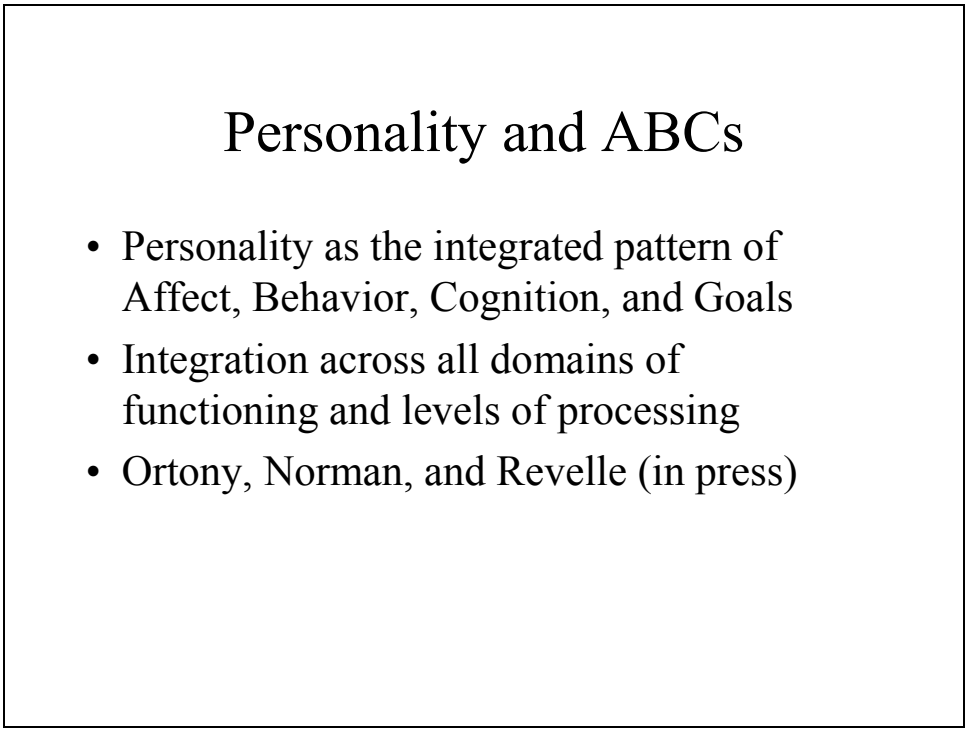
Affect in Big Five space



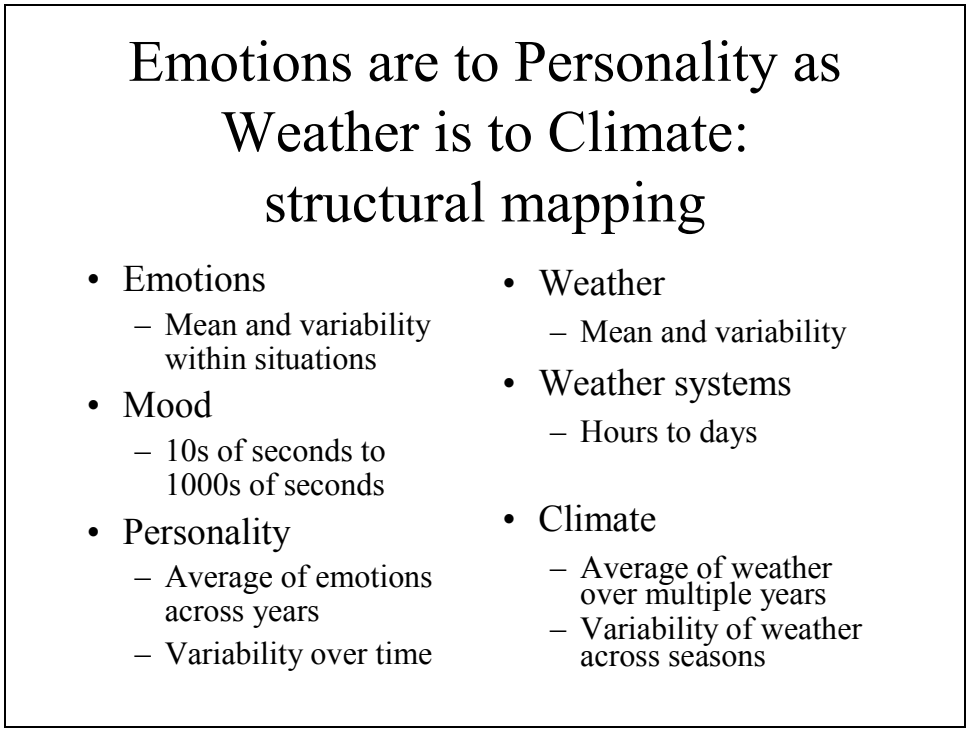
Big Five space, the same problem, it is not nearly clear as our literature would like you to think it is. Extroversion is not just positive affect, at least not at Northwestern, maybe elsewhere.



Personality is more than just average affect. Temperature is an inadequate measure of weather, average temperature is an inadequate measure of climate, so average affect is an incomplete measure of personality. We need to think about affective components, behavioral components, cognitive components, and goals and plans and desires. We need to put all those together into a theory of personality. It does link somehow, somewhat closely to affect, but it's more than that.



This is our “ABC” model trying to integrate all of these across all domains of functioning and we also have levels of processing that goes far beyond the scope of the two minutes I have left.



Let's conclude with thinking about this analogy again. I hope I've not left you with a feeling that you should live in San Francisco and not Chicago. That's not the purpose of the exercise. The purpose of the exercise is to think the analytic techniques that we use in thinking about weather and climate can in fact be useful surrogates for us to test our techniques when we think about the really hard problems of turbulence and chaotic emotions, moods, and personality. And, it's useful to learn from our friends in meteorology and the geophysical sciences, to learn from them what math techniques they have, as we go back and forth on this.

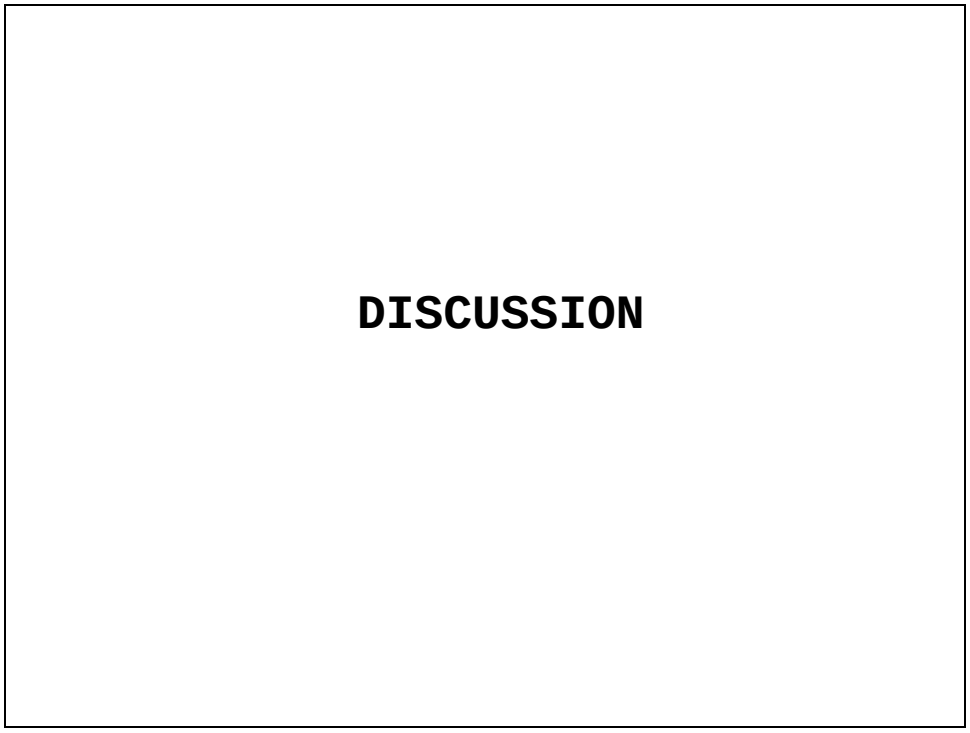
DISCUSSION

DISCUSSION

DR. MAYER: When you think about the arrangement of sensitivity and so forth, I agree with you first of all that factor analysis is a terrific technique on one hand but on the other hand, it has to be used judicially because it doesn't always give you what you want. But, in terms of the meteorological tables that you're displaying some of them used causal explanations like sunshine and so forth. Maybe I'm wrong about this, but when you were showing us the tables of cities I think you are being consumer-driven and you're saying what do people want to know when they choose what city to live in? So I take, as the parallel, as a personality psychologist, what traits do you want to have when you get to know somebody? That's not exactly a causal explanation, that's more consumer-driven, is that right?

DR. REVELLE: That does work because there are many personality characteristics or individual differences that are not included in standard personality discussions. What do want to know about someone on the first date? What do you want to know about someone after 20 years? Basically, this is the whole purpose behind the lexical approach to studying personalities. I'm not a big fan of this, but this is where the Big Five came from. So, what are the words that people use to describe other people? And it turns out that's where the Big Five came from.

DR. MAYER: Only that's a slightly different question than what do people want, that's what people see but it's not necessarily what they want to know.

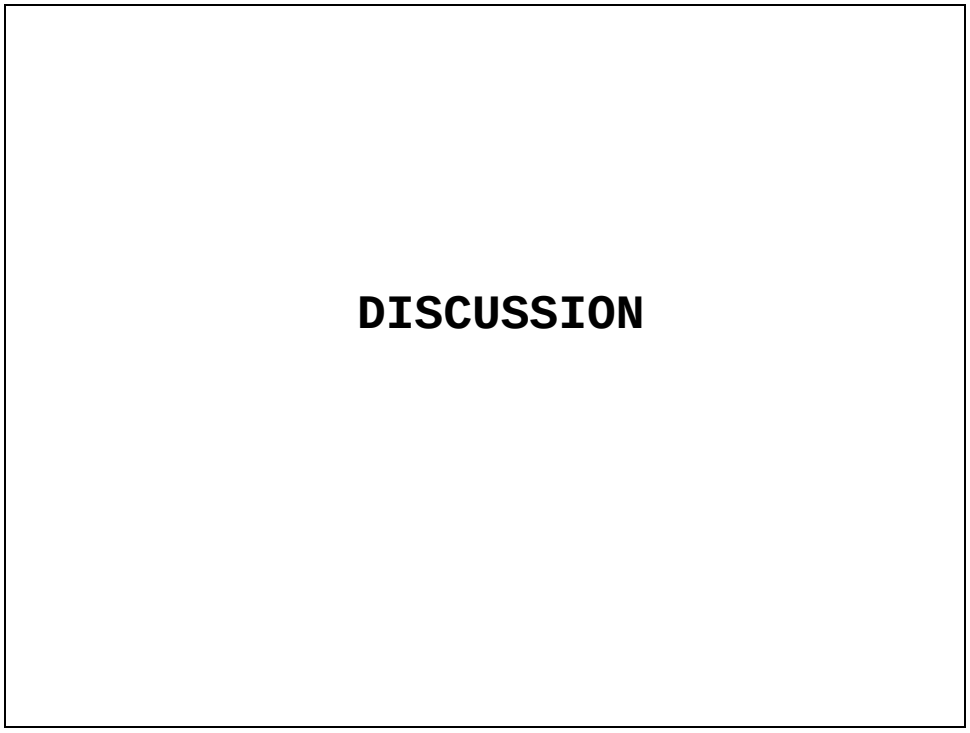


DR. REVELLE: Do they want to know that?

DR. MAYER: Right.

DR. REVELLE: What will they pay you to know? What they'll pay to find out is everything except neuroticism. The most popular personality questionnaire in the world is the Myers-Briggs and what it doesn't do is measure how unstable you are. It measures four of the Big Five, but it carefully doesn't measure neuroticism. And people pay a lot of money to be told everything except that they are neurotic.

PARTICIPANT: I really like the analogy you are making, I think it works on a lot of levels, but I actually thought you were going to suggest a big difference than you did at the end. You say emotions are best captured by the means and variability's of the situation; I thought your data were a great example of that. And then you say personality, I'm just going to pick variability of time, I thought that the data you presented were really a nice illustration on the dynamics of personality. Do you know where they make this argument that, it's not enough to just look at the average behavior, you have to look also at situational analysis of personality and so it's a little bit different than what you've got there, I just want you to comment.



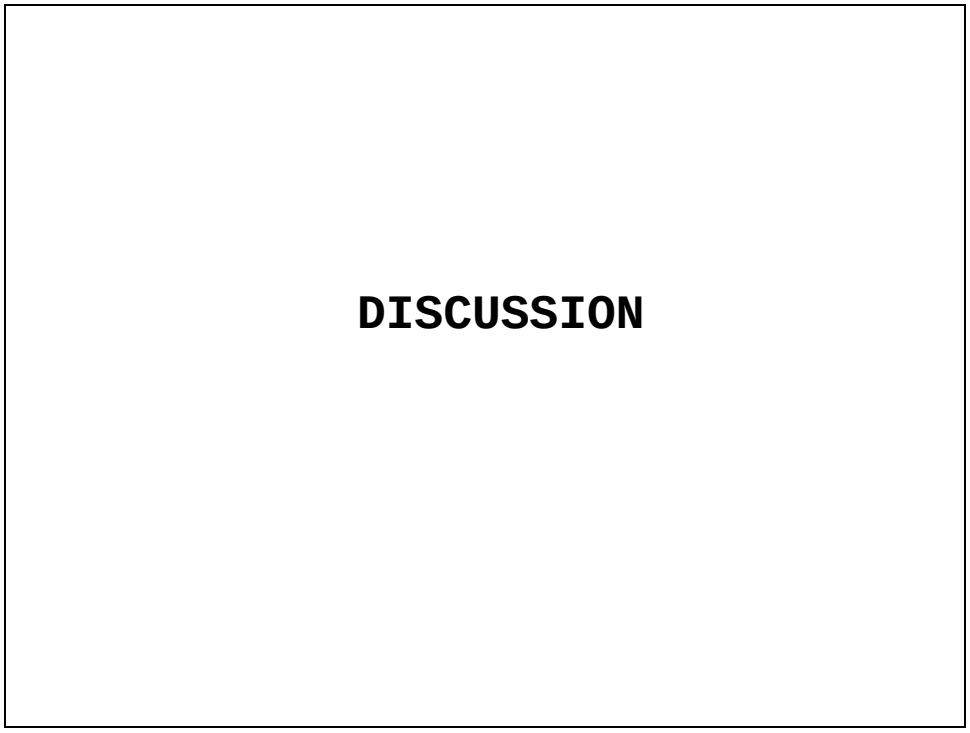
DR. REVELLE: You have to nest them in the situations, and what's tricky is that part of the complexity here is, of course, the situations the person is choosing to be in and that makes it even more complicated. It's not just what is the effect of the situation on your mood, and furthermore, those mood data are much more complicated than I'm letting on because people are doing those activities at drastically different rates. And so, the situation makes them tense, where some people react and never do it, while others love it. I think the personality is working both ways on this. Stay tuned because I don't know how to answer that question.

PARTICIPANT: Actually, I think what you did makes sense, the difference between data is that you described the situation for those kids, and take into account situations and the subjects by themselves.

DISCUSSION

DR. REVELLE: I hope people paid attention to Lisa's talk because of the technology of doing this experiment; the constant measurement of emotions and Rosalind Picard's talk, where you can get it down to as they're walking around. That, I think, is where the action is, in terms of the personality-emotion interface; looking at those individual differences in patterns, systematically across situations. I think we also need to think about some of these are so hard and we cannot predict, and this goes back to the weather example. We cannot predict the weather more than six days out, it's a very hard problem, because of the turbulence effects. I think some of the emotional effects are at the turbulence level that we just can't get a grip on it; we need to recognize that.

DR. SCHERER: One of the things I'm wondering about is that the personality trait names do not really match, as you convincingly demonstrated. I think the same is true for emotion vocabulary. When you ask people to describe three times a day or four times a day what they are feeling, I'm not sure whether they have an emotion. But yet we talk all the time about emotion at this point. So, shouldn't we be a bit more careful about what we call an emotion, just like we should be very careful of what we call a personality?



DR. REVELLE: For this audience, I was calling it emotion. Our scale is carefully called Motivational State. I am completely neutral because some of these "motivational states" are feeling tired. And I don't know if Paul has identified a facial expression as feeling really tired that is recognized across all cultures. Maybe it is, if your eyes are shut, you're sleeping. Most people don't think of some of these motivational states that we are talking about as emotions at all, particularly, the far left quadrant of the slide you can't see. As you know we are interested in diurnal rhythms and we are interested in putting people to sleep, and we do. Those words, "I'm feeling really tired and drowsy right now", our words are very important to us. But they're not emotions, they are motivational states. It just happens that there are many people in this room that use those exact same words and call them affective space, some people slip in and call it affect, and some people call it emotion. You are right, it's motivation.

DR. STRICKLAND: Thank you sir, we appreciate you coming. That's it for today's sessions.

Editors Comments

This is the end of Volume I. Proceedings are continued in Volume II.