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# 55 years of personality research: a progress report and a personal history Given as recipient of the Jack Block Award— Society of Personality and Social Psychology

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# Preface

- 1. My colleague, good friend, and previous Jack Block Award winner, Dan McAdams, specializes in studying life stories.
- 2. Although I have frequently told him that I think that it is impossible to tell such a story in the terms he likes, I decided to try.
- 3. Here goes.

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#### The secrets of a lifetime career award

- 1. Good luck
- 2. Great mentors
- 3. Great colleagues
- 4. Great students
- 5. Live long enough
- 6. Good luck

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# Good luck

- I grew up on the coast of California with world class scientists and did not know that was unusual.
- 2. Climate change and the problem of CO2 was a typical dinner table conversation.
- When I was a less than happy 10th grader and surfer "wanna be", Anton Bruun, a visiting Danish oceanographer suggested that I should go to sea with him.
- 4. So, at age 14 I joined Anton on a 90 day oceanographic expedition from San Diego to Thailand that explored among other things, the Mariana Trench. This changed me from a not very good surfer to an aspiring young scientist.







The RV Stranger on the Chao Phys River, Thailand

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### Oceanography and nuclear tests

- 1. Two subsequent expeditions went from San Diego to Point Barrow, Alaska and from Fiji to Kwajalein to Samoa to Hawaii.
- On that last expedition, while on Kwajalein, I saw an high altitude nuclear test at Johnson Island, more that 1200 miles away. It made a lasting impression and partly explains my anti-nuclear concerns and active support of the Bulletin of Atomic Scientists.



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# From math to psychology

- 1. My first three years at Pomona College were spent in that classic liberal arts major: mathematics.
- 2. Interested in computer science and artificial intelligence I took an advanced course in learning theory and then spent the next summer doing an independent study on human learning.
- In my senior year, after reading Köhler and Lewin, and not wanting to build the next world threatening weapon (i.e. computers and artificial intelligence) I switched to a psychology major.
- 4. Answering John Kennedy's challenge, my fiancé and I applied to the Peace Corps and two months after our wedding (and my graduation) we were off to Peace Corps training.
- And who should be our Peace Corps Selection Officer but no other than Lew Goldberg with whom I have remained good friends for the subsequent 55 years.

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# From Social Psychology to Personality

- At Pomona I had been exposed to learning theory by Don Faust and to social psychology by Graham Bell. Don was the impetus to switch to Psychology, Graham to specialize in social psych.
- Even deep in the jungles of Borneo, after having read Ted Newcomb's reader on the best hits of social psychology I continued to think I would go into social psychology.
- However the local bookstore (60 miles or 10 hours downriver) in Brunei had three most inspiring paper backs by Hans Eysenck (Fact and Fiction in Psychology, Sense and Nonsense in Psychology and Uses and Abuses of Psychology). These three little books inspired me to study personality as a way to combine math and psychology.



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# Mentorship at the University of Michigan

- 1. After two years teaching 6th grade in the jungles of Borneo graduate work in Ann Arbor was an exciting change.
- 2. My graduate advisor, Donald Brown, was very tolerant of my interests in Eysenckian models of personality and as long as I could help Don and Ted Newcomb in their longitudinal study of the effects of experimental colleges upon their students, he was happy to let me do what ever I wanted.
- 3. Sharing an office at the Center for Research on Learning and Teaching with Assistant Professor James Kulik led us to develop a cluster analysis algorithm, ICLUST, which was my first serious introduction to programming psychometric applications. This interest has persisted and still absorbs my time. The only difference is that now I use R on my Mac rather FORTRAN on a mainframe.
- 4. Don also encouraged me to work with Dick Nisbett, Warren Norman, Clyde Coombs and Jack Atkinson.

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# Mentorship at the University of Michigan

- 1. Warren and Don specifically wanted me to spend some time with Jack Atkinson and so I spent a year TAing Jack's course on motivation.
- 2. We spent hours discussing personality and motivation as well as Jack's beliefs about how to conduct research.
- 3. Jack's theory of the *Dynamics of Action* inspired my interest in dynamic models of personality which has continued to this day. The use of differential equations in psychology was very appealing (at least to me).
- 4. TAing Jack's motivation course also led to my dissertation which tested predictions derived from Hans Eysenck theory.
- 5. Although none of the predictions were supported, my committee was tolerant and sent me off to Northwestern where I have been for the past 48 years.

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## Northwestern

- 1. Two of my colleagues at NU, Don Campbell and Ben Underwood informally ran a seminar for junior faculty (they called it coffee hour) where issues in theory construction and research methods were hotly discussed.
- 2. Two other very supportive senior colleagues were Win Hill and Carl Duncan. They both taught me the importance of collegiality and caring for our students and junior faculty.
- 3. My fellow assistant professors bonded quickly when we learned that there were just 3 tenure slots for the seven of us. Dick Bootzin and Bob Sekuler were able to resolve this problem but the mutual support of my junior colleagues was most reinforcing.

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# **Great Colleagues**

- 1. Mike Humphreys heard me talking with Peter Herman about an experimental result of the interactive effects of caffeine and personality on cognitive performance.
- Mike immediately told me how little I understood cognitive psychology and he spent the next several years educating me as we wrote papers together on personality and cognition.
- When we first started our papers were clearly written in two chunks: personality and cognition. After several years it was impossible to tell who had written what.
- 4. After three frustrating years of being able to replicate our own work only about half the time, we finally solved the problem



impulsivity, Carreine, and Time of Day: the effect on complex cognitive performance



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### Personality has consistent effects when you examine the situation

- We had discovered that complex cognitive performance was a systematic interactive effect of personality (introversion-extraversion), stress (caffeine) and time of day.
- Every study in the morning showed that caffeine helped extraverts and hurt introverts do complex reasoning. But every study in the evening showed the opposite pattern.
- 3. Although originally seen as experimental confirmation of the Eysenck's prediction that introverts should be more sensitive to arousal manipulations and that their performance should decline with stress, our results clearly showed that what was trait like introversion-extraversion could not be due to trait differences in arousal.











Impulsivity, Caffeine, and Time of Day: the effect on complex cognitive performance



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### Personality, motivation, and cognitive performance

- Mike and I tried to explain our findings, as well as those of others in a model to explain the Yerkes Dodson inverted U in terms of two opposing processes, both affected by arousal.
- We proposed that arousal helps Attention (a reviewer forced us to call this sustained information transfer) but to hurt short term memory.
- The combination of these two opposing processes produced the single peak function (the inverted U) of Hebb. If tasks differed in their memory load, then this also explained the Yerkes Dodson effect of task difficulty.
- 4. Achievement and anxiety effects were explained in terms of differential effort.







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# **Travel is broadening**

- 1. When Mike left NU to go to Brisbane, I realized I needed to learn some serious cognitive psychology.
- 2. So, Eleanor, our two sons and I spent a delightful year with Donald Broadbent and Jeffrey Gray at Oxford.
- 3. Donald ran, and Jeffrey and I attended, a seminar for one graduate student, two post docs and the two of us. Donald gave a history of cognitive psychology while Jeffrey discussed his biological model of personality.
- (Jeffrey always would say that he was really a rat psychologist who every 7 years or so would see what was happening in personality.)
- Besides a chance to learn cognitive psychology from one of its founders, and learn about biological models from one the leaders in the field, Oxford was a great base to explore England.

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# Personality was kept alive in Europe

- 1. During what I refer to as the "Dark Ages" in American Personality Psychology, personality theory was kept alive by many Europeans.
- 2. I was one of the original members of the International Society for the Study of Individual Differences and a frequent participant in the European Conference on Personality.
- 3. ISSID talks tended to emphasize the genetic and biological bases of personality as well as the study of intelligence.
- 4. ECP meetings tended to have more of a developmental focus but still did not question whether the study of personality was acceptable. Both organizations emphasized rigorous theory testing and programmatic research.
- 5. The ISSID and ECP meeting have always been a source of inspiration for my work and I missed attending the meetings this year.

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# Society of Multivariate Experimental Psychology

- 1. Another source of inspiration has been been my longtime membership in SMEP.
- 2. SMEP, founded by Ray Cattell, was a close relation to ISSID, founded by Hans Eysenck.
- 3. Although some thought of SMEP as an exclusive society, many of us think of it more as an obscure society.
- 4. Multivariate Experimental Psychology. Who actually does that?
- Personality psychologists who like complex data: Lew Goldberg, Warren Norman, Robyn Dawes, Len Rorer, Jerry Wiggins, Andrew Comrey, Pat Shrout, Dan Ozer and Jack Block;
- Quantitative psychologists who like substance: Jack and Pat Cohen, Leona Aiken, Steve West, Peter Bentler, Rod McDonald, Michael Brown, Jack McCardle, Keith Widaman, Niels Waller.

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# International Society for Intelligence Research

- 1. Yet another small (and obscure) society that allows for the discussion of complex ideas among friends (and others) is ISIR.
- 2. As lan Deary has suggested, one of the most important individual differences is that of cognitive ability.
- 3. The measurement and structure of cognitive ability is perhaps one of the greatest achievements of psychometrics.
- 4. Unfortunately, most American personality psychologists have not included this dimension in their studies.
- 5. This is partly because of the dark history of the study of intelligence.
- 6. But to not study ability is to leave the field to those with more complex motivations.
- 7. Europeans take a broader perspective and intelligence is indeed discussed at ISSID and ISIR meetings.

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# Luck and choosing great students

- 1. My research has always been driven by the interests of my students.
- My challenge has been to try to keep a reasonable set of hypotheses in the hopper that some of them might be interested in.
- 3. A strange characteristic of my lab has always been that rather than all of us working on one problem at a time, we are working on seemingly different projects that have one common theme:
- 4. The study of personality.
- 5. For personality is both the last refuge of the generalist but also the study of how all people are the same, some people are the same, and no person is the same.
- 6. Personality is the study of the ABCDs: Affect, Behavior, Cognition and Desire (how what you think and want affects how you feel and act embedded in the situational context).

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### Stress, Time of Day and Cognitive Performance

- 1. Two honors students, Susan Turriff and Phylis Amaral introduced me to complex, stressful tasks (the GREs) and to the use of caffeine.
- 2. One of my first graduate students, Kirby Gilliland, then showed me how to do this properly by dosing by body weight.
- Kirby also discovered that Extraversion measured by the EPI was not the same as that measured by the EPQ.
- 4. Lisa Simon then explored the effect of time of day on performance.
- 5. Years later, Erin Baehr examined individual differences in diurnal rhythms.



Impulsivity, Caffeine, and Time of Day: the effect on complex cognitive performance



Roubs, Barplays, Since and Gillion, 8255, 198



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## Personality, Arousal and Motivation: Theory testing

- Kris Anderson, first as a graduate student and subsequently as a research scientist and co-PI developed methods for testing complex theories of human performance. Studies included the effect of caffeine and personality on cognition.
- 2. Rick Zinbarg compared several theoretical explanations of the interactive effect of impulsivity and anxiety on a learning task.
- 3. Marjorie Leon and Angela Sabates examined speed accuracy tradeoffs in our accounts for the effect of anxiety on analogical reasoning.
- 4. Deb Loftus examined the effects of exercise induced arousal on short and long term memory.
- 5. Wendi Born demonstrated how social study groups reduced the negative effects of anxiety.



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### **Dimensions of affect between subjects**

- Eshkol Rafaeli took data collected from several years of mood measures collected in the PMC lab to show the dimensionality of affect is more complicated than some think.
- 2. Mood shows a clear circumplex structure with some interesting observations:
- 3. Positive affect is not the bipolar opposite of Negative Affect.
- 4. Nor is being happy just not being sad.
- 5. These Motivational State Questionnaire data are included as the msqR data set in the *psychTools* package for R.

2 dimensions of the Motivational State Questionnaire





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### Dimensions of affect between and within subjects

- Greg Rogers and Eshkol examined the within subject structure of emotion using Palm Pilots. We showed that people differ in their dimensional structure. We called this affective synchrony and were able to study these mixed emotions.
- Inspired by a suggestion from Katherine Funkhouser, an honors student, to use cell phones rather than Palm Pilots, Josh Wilt and I have examined the structure of affect with subjects.
- Although between subjects there is a clear two dimensional structure, within subjects the correlation between these two dimensions is a reliable individual difference



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### Measuring and manipulating the dimensions of affect

- Greg Rogers and Eshkol Rafaeli also explored the dimensionality of positive and negative affect and energetic and tense arousal by experimental methods.
- One manipulation was showing short (9 minute) video clips of the movies *Parenthood, Halloween*, a BBC documentary on the British entry to the Bergen-Belsen camp, and a nature documentary.
- These manipulations showed that although normally highly correlated, positive affect and enegetic arousal are separable constructs.



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# **Psychometrics**

- 1. I have been very fortunate to have had students who share my love for psychometrics.
- 2. Tom Rocklin and I examined the EPI/EPQ structures and also developed the Very Simple Structure test (VSS) for the number of factors.
- 3. Once Rick Zinbarg returned to Northwestern, we collaborated off and on about issues of reliability, in particular why you should not use coefficient  $\alpha$  but should rather use the  $\omega_h$  and  $\omega_t$  coefficients.
- David Condon also shares my love for quantitative psychology, and we continue to work on issues of reliability and measurement.
- 5. All of my students (and most of my colleagues) support my passion for open source software and the R language.



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# Synthetic Aperture Personality Assessment (SAPA)

- Started with a few honors students, including Greg Laun and Melissa Liebert, and my graduate student, Joshua Wilt, we started a new way of collecting data from the web.
- 2. Rather than give everyone the same items, we randomly sample the items to present. We then combine the signals in a manner analogous to the procedures in synthetic aperture radio astronomy.
- David Condon expanded this idea to what it has become now. Lorien Elleman has used SAPA to examine personality correlates at the zip code and state level. SAPA is the base for ICAR.
- 4. About 1,000 people per day are given random items chosen from a set of more than 5,000.



The SAPA Project



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# **Cognitive Ability**

- 1. After starting the International Cognitive Ability Resource in 2014, David Condon and our colleagues have examined the structure and validity of open source ability items. These items are free to all qualified investigators and have been used in more than 150 independent studies.
- 2. Using our SAPA methodology, we now have item statistics for hundreds of items for more than a million subjects.
- 3. Elizabeth Dworak is now examining the structure and changes in cognitive performance over the last 12 years.
- David is continuing to develop ICAR (adding new item types to SAPA).



26 / 28

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# Some students from long ago

- 1. I started this story with my Peace Corps experience teaching 6th grade in a small primary school in up river Sarawak.
- 2. My experiences there have made me very skeptical of cross cultural comparisons of ability.
- 3. No students had ever gone to secondary school before Eleanor and I arrived.
- 4. By the time we left, 21 out of 38 students had gone on to secondary school.
- The father of one of my students had been a head hunter. My student's daughter has a Ph.D. in computer science, and he is a proud grandfather; I am a proud teacher.



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# **Conclusion and thanks**

- 1. As I said when I started, I have been very lucky over the years to have had great (and tolerant teachers), helpful colleagues and wonderful students.
- 2. I am indeed honored to receive an award that many of my friends have been given as well. I have joined an exceptional set of personality scientists.
- 3. But this award really is in honor of my students who have done the work and given me inspiration and to my professors at Pomona and the University of Michigan who started me down this path.
- 4. Thank you for listening and the awards committee for this honor.