

Friends and Health Across Time: Cumulative Long-term Links of Adolescent Social Functioning to Adult Physical Health

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(1): Symposium Title (2): Talk Title

- (3): Although as a field we have spent much of our time exploring the ways that adolescent social relationships influence future social functioning and mental health outcomes,
 - there is actually some good reason to think that these social processes might have a significant impact on physical health as well.
- Research going back more than 30 years has found, for example, that social isolation is linked to a range of negative physical health outcomes, up to and including the risk of dying early.
 - In fact several meta-analyses find that the negative effects of social isolation on health are as strong as those of well-recognized factors such as obesity or lack of exercise or even cigarette smoking!
 - And this is research that has been replicated again and again.
- (4): Mechanisms
- Initially, people thought that these effects were primarily due to problematic health behavior among isolated individuals.
 - And while such behaviors are important, they don't turn out to be able to for the links we observe.
 - People have also considered the possibility that poor physical health may actually create social isolation—that the causal arrow runs in the other direction—but again this does not come close to accounting for the findings we've observed.
- Rather, what we are coming to believe is that social isolation—that not being part of the human pack—creates a degree of stress,
 - stress which may be mild at times, but which tends to be chronic and to add up over time, creating what we've come to term allostatic load—which is the term for the cumulative wear and tear on the body due to stress—that ultimately takes its toll on health.
- (5): In brief the idea is that we humans are pack animals;

- that we evolved in packs, and that we need social contact to thrive not just mentally but physically.
- Okay, but so how does any of this really matter for adolescents, who are in one of the healthiest stages of the life span, and who might be thought to be relatively immune from these processes?
 - (6):
 - Can we identify social relationship characteristics of ordinary adolescents that might actually predict long-term health outcomes, extending into adulthood?
 - So that's our challenge in this talk, and to take it on
 - (7): Measure we're going to be examining predictions to a measure of global adult health assessed at age 25.
 - And we look at this with a very simple questionnaire,
 - a five item self-report scale, that has been incredibly widely used and cited, and that asks individuals to rate their overall health in several different ways as you can see on the slide.
 - (8): We use this simple measure because it has been linked not only to objective markers of current physical illness, but also to future illness, and even to predictions of early mortality.
 - In short it's a simple but very reliable, robust, and powerful measure.
- (9) Sample
 - We'll examine health outcomes using a community sample of 184 adolescents, who have been interviewed and observed repeatedly over more than a decade in interactions along with their parents and best friends, and then later with their romantic partners as well.
 - The sample was evenly divided between males and females,
 - Adolescents were initially assessed at age 13, and have been re-assessed annually ever since, currently through age 27, and today we'll be presenting data through age 25.
 - The sample was representative of the population of the surrounding community in both socioeconomic and racial/ethnic terms, as you can see on the slide.
 - We've been fortunate to maintain extremely low attrition over time (we've had two participants become deceased; one disabled, and in the current round of assessments we've still been able to get data on 98% of the remaining participants).
- (10): So our main question is: Can we prospectively identify adolescent relationship qualities that are going to predict our adolescents' health status as

adults?

- And to foreshadow where I'm going to go today,
- I'm going to start with two of the most intuitively plausible long-term predictors, Social acceptance and Social anxiety.
- But then I'm going to go on to present data on an unexpected but remarkably robust set of predictors –
 - focused on what happens when adolescents achieve something we've long thought of as a purely positive goal—establishing themselves as individuals, separate from the pack—but a goal that turns out not to be so great in terms of its links to future health.
- And then finally we'll put all of our findings together at the end in a single model, looking at the extent to which the factors we observe are unique and additive vs. overlapping, and we'll talk about what this all means.
- (11):Peer acceptance So the first predictor we want to look at is how well teens fare in terms of becoming accepted by their peers in early adolescence at age 14.
- And because we want to minimize concerns about method variance, we aren't going to use adolescent reports. Rather we're going to ask the close friends of our 14-year-olds to tell us about their
 - attachment to our target teen,
 - their overall friendship quality with our target teen and
 - how socially accepted our target teen appears to be, as you can see on the slide.
- (12): And what we find is a prediction even over a decade from a best friend's rating simply of how socially accepted a teen is at age 14, to how healthy that teen describes themselves as being at age 25.
- (13): We also look at this prediction in the context of several potentially important covariates,
- so now you see we have a model in which we covary
 - family income in adolescence,
 - gender, and we consistently find that females are healthier in the long term,
 - and in adulthood we covary Body Mass Index because we thought it was possible that obesity would perhaps carry some of the relationship between social factors and later health.
- And after co-varying all of these factors, we see the effects of social acceptance actually become somewhat *stronger* in predicting global health
 - and this is across measures, across reporters, and across a period of

about a decade

1. And in contrast to some of the other data you've seen here today and at this conference, these are NOT predictions from extreme social problems...but rather from a continuous measure of acceptance and friendship quality.
- (14): We next looked at what to some extent might be seen as the flip side of social acceptance: Social Anxiety.
 - If we hypothesize that it is feeling potentially cut off from the pack--cut off from other people--that creates a strain on health, then social anxiety seemed particularly promising to examine.
 - So we look at it and ages 19 and 20 using the social anxiety scale for adolescents, and we average results across both years.
 - (15): And we see that social anxiety at 19 and 20 also predicts poor health into adulthood.
 - (16): And that even after considering our covariates this prediction remains and in fact grows somewhat
 - So we now have two fairly intuitively plausible factors—social acceptance and social anxiety—as predictors.
 - And on the one hand we weren't surprised to find these predictions
 - on the other hand we find them over a considerable period of time and from a period—adolescence—
 - where people have not previously thought much about how normal social relationships—aside from extremes of victimization or risky behaviors—could be important for future physical health. (7:20)
 - (17): Okay, but now we want to turn to the what I think is the really intriguing part of our findings:
 - And this is the idea that individualism—that is going one's own way, being autonomous, or 'thinking different', and standing apart from the crowd could be risky.
 - This idea builds on some evidence from research on dominance and heart health and some evidence that more individualistic cultures are less healthy than more collectivist cultures, and I'll talk more about each of these a bit later bit later.
 - But the basic idea is simply that as much as we Americans value autonomy and thinking different, to quote a well-known Apple commercial, there may be a cost to that in terms of leaving the individual feeling a bit separated from the human pack in a way that creates stresses that take a toll on health over time.
 - So what I'm now going to do is show you a series of findings, any one of which we might be skeptical about, but that taken together, I think make a surprisingly

persuasive case.

- So let's start with peers' ratings at age 14 of our target teens as being followers.
- (18): Now being a follower is not something that we generally want for our adolescents.
 - And the scale we used included items such as
 - some teens do things just because other kids do them.
 - Some teens usually do whatever their friends tell them to do.
 - And the like.
- (19): But what we find is that these teens who were rated by their friends as followers at age 14 tend to see themselves as *healthier* as adults—
 - being a follower predicts *better* health.
- Now that's one perspective from an outside observer's ratings.
 - (20): But if we look at the complementary picture
 - if we ask the 14-year-old themselves to what extent do they see themselves as a leader
 - do they feel like they tell their friends what to do
 - set an example that other kids follow
 - are they copied by other kids,
 - (21): we see that perceiving oneself as a leader at 14 is related to poorer health in adulthood.
- But maybe this is just a fluke finding at one age.
 - (22): So at age 16, we ask peers to rate teens in terms of a slightly different question
 - we ask: to what extent our target teens easily influenced by their peers
 - and we ask this of their best friends who in the majority of cases are different from the best friends identified two years earlier.
 - And we ask how much the friend actually influences our teen in terms of
 - who they hang out with
 - how they treat other people
 - whether they drink or don't drink
 - whether they have sex or don't have sex,
 - and whether they follow their parents' rules.

- (23): And we see the exact same pattern:
 - easily influenced teens--teens that their peers feel like they can pull along to follow them in whatever they want to do—are healthier in the long run, *at least physically*.
 - I should probably stop to mention here that we've also examined our health outcome data pretty carefully and it's very normally distributed
 - there aren't any outliers there aren't any extreme cases are driving this.
- (24): If we go forward yet another year, and ask the question in yet a slightly different way:
 - At age 17, we ask how assertive is our target teen?
 - That is, how good are they getting people to go along with what they want
 - taking charge
 - sticking up for themselves
 - deciding what should be done.
 - (25): And consistent with what we've been showing you we find that assertiveness predicts poorer health over time.
- (26): And then finally as we continue moving across adolescence, we look at age 19 at the extent to which the teen says they value being self-directed,
 - with items like
 - I should be able to think for myself;
 - or a reverse scored items: I should obey parents, bosses or teachers.
 - (27): And again completely consistently we find that self-direction predicts poorer health in adulthood.
- So, these were unexpected findings that we found surprising at first—and they certainly don't fit with a simplistic view of human psychology, in which all good things go together,
 - But I hope I've convinced you that there's a pattern here that emerges across a five-year span in adolescence seen from the adolescents' own perspective and from the perspective of a variety of different peers assessing our participants in slightly different ways at different ages across this span
 - where being a leader, being assertive, or being self-directed is associated with poor health outcomes;
 - whereas being a follower and easily influenced is associated with positive

health outcomes.

- ~10.30
- (28): So, our next step was to put these measures together to create a composite measure of what we're currently calling rugged individualism
 - We threw out our self-report measures here, because we wanted to eliminate any methods confound, so we are using our three peer-report measures here:
 - 2. The first two are reverse scored
 - whether the teen was seen as a follower at age 14,
 - whether they were seen as easily influenced by peers at age 16
 - and whether they were seen as assertive by their peers at age 17.
 - These measures were standardized and then summed together to produce an overall composite.
 - (29): And not surprisingly given what you've seen already, this composite was strongly predictive of future health, with a $-.36$ beta weight accounting for almost 14% of the variance in adult health at age 25, and this is from measures collected from peers from 8 to 11 years earlier.
- Now one important question is whether this individualism composite is perhaps just capturing teens who are disaffected or alienated from their peers...
 - in other words is it just another indicator of not being connected or comfortable around peers?
 - (30): So to look at this, we examined this composite together in models that also included the two measures we've already described: social acceptance and social anxiety
 - and we see that our measure of individualism really does have a unique predictive effect in terms of future global health
 - And in fact, it's not even related to whether one is connected to a friend at 14 or socially anxious at 19 and 20.
 - a. It's its own construct
 - We also see that the three social measures together account for almost 30%, almost a third, of the incremental variance in health outcomes after considering other covariates
 - Finally, you'll note that we add an additional covariate in these analyses, by considering the effects of concurrent depressive symptoms at 25,
 - and we do this just to eliminate any possible effects of lingering depression as a third variable that might have been accounting for these relationships.
- We also tried to take these findings apart with several post hoc analyses:

- For example, we looked at standard measures of the Big Five Personality Factors in early adulthood, and found that including these in our models did not alter our results.
- We also looked at observer ratings of our teens' physical attractiveness at age 14
 - thinking that perhaps unhealthy teens would be both unattractive and have social difficulties as a result, but we found no evidence that this was driving our effects,
 - We also found no evidence that these effects differed by gender
 - they appear to apply equally to males and females, although as we said females were healthier overall. (12:30)
- (31): So where does this leave us? Well, first it provides we think quite powerful evidence that the social relationships that we and so many other people at this conference focus on—that these *social* relationships may have far broader implications than we've realized—not just for mental health and social functioning but for physical health and in the long-term
 - We also think that these results show that while teens are often ridiculed for treating the challenges of peer relationships as life-and-death issues, they may actually intuitively be onto something.
 - We humans are pack animals,
 - Teens may be onto this more than we realize, and while we adults may hesitate to acknowledge it, because it goes against our culture of individualism and because we worry about the influences of peer culture in adolescence, going with the crowd may have its advantages.
- (32): So how do we think about this somewhat unsettling finding?
 - Are we talking about the death of the rugged individualist
 - or at least the poor health the rugged individualist
 - These findings are surprising and counterintuitive in some ways
 - Although if we look, we find similar findings in other literatures.
 - For example, these findings are consistent with other observational research on dominance and independence in marriage conducted by Tim Smith at the University of Utah...that observed dominance and independence are linked to markers of cardiovascular difficulties.
 - More broadly Robert Sapolsky studies primate dominance hierarchies and has found that the assertive primate, the dominant primate, that goes his or her own way, and expects others to follow appears to take a significant health hit for doing so.

- Sapolsky and others have even suggested that if we look at other cultures,
 - for example if we look at East Asians who are quite collectivist and less focused on individualism compared to, for example, Europeans who are less collectivist or to Americans who are the most individualistic
 - We also see physical health markers that correspond to these differences with East Asians being healthiest Europeans next Americans least healthy.
- One possibility is that the rugged individualist experiences more conflict, or at least the threat of conflict...and that this takes its toll over time...
- (33): Now these findings have a number of limitations.
 - They are correlational not causal
 - there could well be third variables that account for both our social predictors and our health outcomes.
 - Although even if this were the case, these data suggest a powerful role of social factors as markers of future risk
 - We also do not have baseline health measures, although we are going back to try to retrospectively get these.
 - Most importantly, we now really need to understand possible mediating and moderating mechanisms that are at work. We're pursuing this currently looking at factors such as the HPA Axis, cardiovascular reactivity to stress, immune functioning and health risk behaviors all of which might carry some of these long-term effects of going against the pack.
- (34): But if these findings are confirmed they'd suggest
 - first that we need to recognize the bind that adolescents are in as we are pushing them to be autonomous and to pursue the individualism that is so highly valued in our culture
 - and yet this individualism may be physically stressful in very costly ways over time.
 - Also as pediatricians at well child visits are currently taught to screen adolescents for issues such as obesity or drug use or health risk behaviors that are known to predict long-term health outcomes, perhaps they should also be screening for social factors, which may be equally powerful.
- But of course that screening would be the most useful if we have something we can do about these factors.
 - A number of researchers at this conference are deeply engaged in efforts to enhance peer relationships and peer connections in adolescence
 - and our findings today suggest that those efforts may actually pay

dividends not just for social functioning and mental health, but for physical health as well

- and they maybe even more important than we'd already thought they were.

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