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Episode name: 'Fatness and the Body' Episode 1: Childhood adversity and adiposity: Examining differences by sociocultural context

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Transcript

Some of this is work that that I've done and it's been published and then some of the work towards the end, is more of the sociocultural context work. It's actually really data that we've collected in this project, but that it's ongoing. So it'd be great to hear your thoughts on what we're doing. And so we have some interesting findings and some I'm happy to share.

I'm sure there's not really a need for a formal introduction other than saying that you were the faculty of epidemiology in the Rollins School of Public Health at Emory University, and that the work that you do examines impacts of social determinants of health, focusing on violence, housing, neighbourhood factors, across the life course. So my interest in this is in relation to. neighbourhood effects with respect to food, physical activity, obesity and chronic disease.

And you're interested in learning how these social factors affect health through stress pathways, and again, we've just published work with Danish and Swedish colleagues on stress, stress pathways to childhood obesity. So, I think there's some synergy there. So I'll be very happy to have the talk and also start a conversation.

That sounds great. So let me get started. I might skip over some things or just go maybe a little bit briefly over some stuff. So I work on early life adversity and cardiometabolic health and I kind of like to talk about how I think and define child adversity because I know there's various definitions of how people put together this construct of early childhood adversities.

So I think of it as, you know, these external events or conditions, really not just events, that may threaten the child's body, the familial, their social safety or security, the child. And then there's, you know, a host of different things that we can characterize as a child

adversity. But they're mainly fall into these buckets of household dysfunction, child maltreatment, violence. That's not maltreatment or domestic violence or violence that a child may encounter at home. I mean in the neighborhood or dating or at school. And then there are other adverse experiences that, depending on the population that we're focusing on, may, you know, experience, you know, more often really, based on sort of neighborhood environments and socio demographics to a certain extent. And so in the US, the Centers for Disease Control have sort of depicted this, you know, as pyramids of how like these adverse experiences impact health across a lifespan, sort of noting that they have these impacts on development and social, emotional kinds of impairment, and you know, risky behaviors and disease, disability and then early death. And I'm interested in how these processes, basically mostly through the behavioral pathway, are impacting cardiometabolic health, but I'm really interested in the whole lifespan. The impact of it all the way from conception to early death. And so if we think of it as within the sociological model, we're really thinking about these factors mostly that I focus on, and are in the family, sort of individual level family, the family environment.

And so in in the US, the experiences are highly prevalent, this is prevalence data from the BRFSS Assessment Survey, which is this, you know, nationally representative phone survey of adults, and then one of the modules that was included in 23 states was this module and adults were asked to retrospectively report about their experiences. At least one adverse experience in the US is 59%, which is really high, and then there's this gradient, the socioeconomic gradient, where adults who were having less than a high school education as their highest educational attainment, have a higher prevalence of a number of these cases. So if you look at, for example, experience and physical abuse, you're looking at 26% compared to 13% at the highest education level.

Stanley: Can I just ask you whether this is a nationally representative survey?

So it's, you know, it's supposed to be nationally representative. However, the way that the BRFSS works is that there's a standard survey that all 50 states have to administer every year. So it's kind of like a panel, right? You get is a cross-sectional panel. It's a phone survey. And then states can opt of what modules are going to include. What additional questionnaires are? Adverse experience isn't one of those additional modules, and not every state has assessed it. So there's 23 states that included it, but not every state. So it's representative to a certain extent, but it's not capturing the entire the entire US or not representative of every state in the US.

Stanley: But in terms of Sociodemographics, is it representative?

Yes, it is diverse in terms of sociodemographics, yes, race, ethnicity and education level with the caveat that you need to have a phone and people need to find you. You need to pick up the phone. That's sort of the catchment of. It, but yes it's representative.

So you know with a number of these adverse cases, there's this gradient where if you have a high, or the highest level of education, you're problems of adverse experiences, it's lower. Something similar has been done, but then not asking adults about retrospective experiences. But then this is asking parents about their kids current experiences, so this is the National Survey of Children's Health, which is also supposed to be representative of children in the United States. And they ask the parents to report on their kids experiences. And there is this disparity or this difference by race, ethnicity. When we look at kids who identify as black or African American, or kids who identify, identify as Hispanic or Latino, they are more likely to have one at least one adverse experience and then black children are more likely to have two or more of these, as well as children who belong to another race or ethnicity, not captured within these four groups.

And so part of the rationale for this is that these adverse experiences are at the individual family level, but the root causes of it are really at, you know, deeper levels than just individual family levels. So there's all these, you know, neighborhood levels. Sociopolitical factors, social factors that are influencing the likelihood of a child's experience, any one of these eight factors, so that this is sort of like the reason why we're seeing these disparities across SES and across and race and ethnicity. And so it's true that the factors that we're focusing on adverse experiences at the family individual level, but then there's these, you know, neighborhood and socio political factors that are also influencing these individual and family level factors.

And so then with that background, jumping into the work on cardiometabolic health. So one of the earliest, you know, studies to look at is a study on in the US using the Kaiser Permanente Health Insurance data where they retrospectively asked adults to report on whether they had experienced any of these things. Experiences prior to age 18, and they then they found these, you know, dose response gradient with these cases and a number of chronic health conditions in adulthood. One of those being heart disease, which is the focus on my work, and so this is one of the papers they published on heart disease, where as the number of these cases increases, the odds of heart disease increases. So you have this dose response. And a number of what they call the traditional risk factors of cardiovascular disease. And, you know, other psychological risk factors. The association, as you know, is persistent, particularly when you're looking at, you know, experiencing adverse experiences. And so this been has been replicated in a number of different studies.

This is a systematic review looking at the accumulation of adversity and cardiometabolic disease where they still find this consistent association across a number of studies. There's another systematic review that specifically looked at childhood maltreatment, not all the ages, but maltreatment. And they also note that there was this consistent association in 22 of the 24 studies reviewed, with cardiovascular disease. And then this is one study specifically on obesity, which is what I'm going to focus on moving forward, really looking at child maltreatment and obesity. And again you have this consistent association with maltreatment and obesity in adulthood.

Stanley: Can I just ask you? Sorry again. The early studies seem to show a much bigger effect than the later studies. Do you think there's been a change in methodology or definition that might have contributed to that or?

That's, you know, interesting, I need to go back and see. Like, you know, if there is some sort of commonality with it? From working in the field, I do think we've gotten a little bit better about characterizing child maltreatment and maybe like, you know, with more refined scales and measures. So that might be what we're, you know, getting, maybe more precise estimates. So they're, you know, they're bigger estimates, you have wider confidence intervals too, so it's possible that's one of the reasons why, but I'm going to go back and actually check and see. Like, what if there's some commonality across these these, or whether it's the sample size, you know. This is a paper from 2014, but these long term questions are now included in larger surveys which I think in the 90s we wouldn't have these maltreatment measures included in very large surveys. So maybe this, also a possibility is smaller studies. Like I know some of these studies, the more recent studies, have been done in larger cohorts. So that might be the precision issue too.

Stanley: It's a dumb question. Do you think the definition of childhood maltreatment is reasonably uniform across countries? Looking at the authorship, there's the US, but also a lot of European studies in there as far as I can see.

I wouldn't assume that it is uniform. Yeah. I think now if studies are using like you know the childhood trauma questionnaire or some other validated scale, then yeah, well I should say validated. Some more widely used scales, but I wouldn't assume that it's uniform because I've seen sort of how some studies may ask certain questions, so that there may be some difference in how they're it's being defined, yeah.

Stanley: OK: thank you.

No, those are really good good points and so in regards to cardiometabolic health, I work with the American Heart Association with a number of colleagues in trying to sort of come to a conceptual framework of how we think that these adverse experiences, either

individually or cumulatively, may be impacting cardiovascular disease. And so this is a, you know, a diagram depiction of what we were thinking of as the potential pathways. And it's complex because the relationships are complex, so the idea here that these adversities are impacting health behaviors is one of the pathways that they're impacting physiological mechanisms, which is, you know, another pathway and then impacting, as a third pathway, substance use and mental health. And there's varying degrees of evidence for each one of these. Potential mechanisms where, you know, maybe we have like a lot of data, for example on the impact of adversity and substance use and mental health, and maybe now more emerging data on like physiological mechanisms, the bidirectional arrows between the pathways sort of represent the fact that each one of these pathways is also able to impact another pathway. So we know that mental health is going to impact your health behaviors and it's going to impact your physiological mechanisms. And vice versa, and these behaviors are going to impact physiological mechanisms. So it does really become rather complex and you know how these relationships are operating. And so it's not that it's just adversity impacts this and this impacts cardiovascular disease. There's sort of this interplay between all these different pathways. And then those pathways together or, you know, individually, are impacting these cardiovascular risk factors to development of obesity, hypertension and diabetes and that's largely the work that I do.

So I focus more on the younger population. And the impact on these cardiovascular risk factors. Personally, I'm just more interested in how these processes happen to increase the risk prior to the development of cardiovascular disease. It's sort of my, my, my particular interest, but then we also have these other physiological mechanisms and then ultimately cardiovascular morbidity and mortality. And then in this box over here, which I'll talk about, is the fact that there are a number of factors that may moderate or change how a particular population may be impacted by adversity in relation to cardiometabolic health. So you know, based on your race or ethnicity, you just may be more likely to experience some of these adverse experiences. Some types of adversities that other people are not experiencing as well, so maybe have a differential response to those adversities. We've seen a lot of differences across sex at birth, which I'll show in a minute, and then there's other potential factors of how individual. neighborhood environment may just modify, how the adversities are impacting some of these processes.

So one of the first analyses that I worked on really involving the cumulative nature of these factors was with the fragile families and child well-being study, which is not called fragile anymore. They finally changed the name and I can't remember what the name is, but it's now a much more positive term, the study. I don't know if you're familiar with the study, but it was called fragile families because it was designed to look at the majority of the population, focusing single female headed households. So unwed, mothers who were

raising their children and, you know, they're, I guess that's where the fragile term came and how their children develop. And so this is a birth cohort in the US representative of that population of single female headed households. They followed the kids longitudinally. They did assessments from birth to age 13, and now there's an adolescent assessment. And so this work that I first did was really to look at how to understand how early in the life course we could see this impact of these social factors on childhood obesity. And so we looked at the mothers' reporting of these different factors and obesity of the kids at age 5. So moms were reporting on these things at age 1 and 3, and then obesity age 5.

We have a metric, you have housing and security and food insecurity that was really prevalent in this cohort. So it just makes sense to include it because that was part of the cumulative social risk. This is not, you know, what we've defined as adversity per se, but what are the social risk factors that cumulatively these kids are experiencing? So what we saw is that the odds of obesity are much higher for children who have experienced one or, you know, two to three or four or more as we categorize it, but that the association was really with the girls and we were just not seeing an association with the boys. And so we dug a little deeper on this to try to understand that this association was explained by some of these behaviors or some of the behavioral problems that have been assessed in the cohort. And so we looked at externalizing behaviors and internalizing behaviors. We looked at sleep duration. This is kind of crude. It's just less than 9 hours of sleep duration, whether the kids were watching more than two hours of TV, which is sort of like the recommended maximum metric from the American Academy of Pediatrics. You know, use of TV and then more than three drinks of soda and juice. And of physical activity or diet in early childhood. And so these are sort of markers to try to get at, is there something that's behavioral? And so we included this in the model and you know it didn't affect the estimates. We still see this persistent association among girls that we just don't see among boys, although we do see as expected that externalizing problems are still associated with obesity. As well as short sleep duration, increased TV watching, but only among the boys. I have a hypothesis, but not a clear explanation of why we would see this just in the girls and not in the boys at this very late early age. So there are sex differences that we've seen, you know, in adolescence or in adulthood. And so there's, you know, pubertal developmental differences. Hormonal differences, that may account for the impact of stress on some cardiometabolic outcomes, there may be differential coping mechanisms. That sometimes we see, and so there's this hypothesis that women are more likely to cope with stress with like a sedentary lifestyle, and you know, different eating behaviors. And, you know, younger boys may cope with more physical activity. But that's not the case here. These are five year olds, right? Maybe what we've hypothesized is that within this context of single female headed households, girls may be more internalizing more of the adversity or,

you know, whatever trauma or stress that the moms are experiencing. And that may be why we're seeing this association here. That the way that moms were experiencing - the kids experiences were really like the moms experiences of mental health, housing and security, food insecurity that the moms just have differential parent behaviors depending on the kids. One of the studies that fragile families did later on is that they noted that if there was a violent neighborhood, the girls physical activity decreased because moms wouldn't let girls play outside if they live in a violent neighborhood. But they would let the boys you know, play outside. So you know in parallel there are potential parenting practices which are different. You know, sexual norms, different sex norms, differences in parenting behavior that may be playing a role here in addition to potentially this internalizing of experiences that maybe the girls are having. And not the boys. Again, this is sort of like my own hypothesis of why we see these differences. We have no kind of way of actually not testing that. Carrie Clark's a colleague who's now also here at Emory, did this work and I collaborated with her looking at the impact of both child maltreatment and experiences of dating violence and domestic violence in young in adolescence and young adulthood, and how BMI was changing from adolescents to young adulthood. And we do see this increase in domestic increase in BMI change from adults into adulthood among women who experience domestic violence. It's not there among men, and then we see it again among women who experience abuse and we just don't see it among men and with the maltreatment, I don't think I have the slide here. Actually, I don't. But with the maltreatment, what we later saw is that there's an interaction within between sexual abuse and domestic violence. And the impact is much higher among women who experience both sexual abuse and domestic violence. It is true that the prevalence of experience of sexual abuse is much higher among women compared to men, so part of this is just differential exposure in terms of, you know, the impact, but we also see this sex difference even among, you know, the men who experience maltreatment, we just don't see an association.

You know, we looked at the fragile families study, so we looked at trauma treatment and characterized eating behaviors in terms of not just eating, but eating and potential sedentary behaviors in a way to look at them as potentially excessive or like addictive behaviors. So characterizing not just in terms of do you have a healthy diet, do you have an unhealthy diet? But like, are you consuming really large amounts of certain foods or really watching, you know, a lot of TV and computer usage? So there's no kind of real clinical way to characterize it. So we did this data-driven approach where we looked at just the you know the top 10th percentile, the 90th percentile cut off of consuming a lot of sugar beverages, sort of like using the sugar as a marker for coping with sugar or fast food consumption or just using a lot of computer. And TV use. And the advantage with ad health

is that it actually has a really nice detailed measure of child maltreatment and this kind of gets in the at your earlier question of are we measuring all treatment the same way? So they included questions on who was a perpetrator of the abuse, parent or caregiver or a non parent caregiver, when it was related to sexual abuse, and even when, as far as looking at, you know, physical force or non physical threat on sexual abuse. These are sort of characterizations that we often don't really see in large surveys. So ad health is somewhat unique on that. And so we did some kind of detailed analysis on type of perpetrator, but then also sort of like more detail on on sexual abuse, but what I'll show you is in the cumulative maltreatment measure. So when we looked at cumulative mood treatment, this is among men, we do see that men who experience two or more of different types of child maltreatment exhibited more or engaged in more of these excessive behaviors of consuming a lot of sugar sweetened beverages and fast foods, and using a lot of TV and video excessively.

And then we look at women. The association is even higher. And then we also see it with just one experience of child maltreatment, and not with the two that we had seen with men. So there's a suggestion that potentially women are engaging more in these addictive, or we can classify them as addictive excessive behaviors, than men, which may explain some of the differences that we've seen with BMI changes and other cardiometabolic health associations with maltreatment and sex differences across men and women. So I mentioned these moderators and this conceptual framework. And so the work, this is a little bit more of the ongoing work that is not completely posted. Some of it is published, but the work on adipose and early adversity is not published. This is a project that I've been working on within a cohort. This is a project that I've been working on with a Puerto Rican population that's living in two different social contexts. So one is Puerto Ricans in the South Bronx, NY, and one is in San Juan, Puerto Rico.

I'll talk a little bit about the study design of what we're doing in that way. So I mentioned that you know, there's the potential moderators that could impact how adversities have an impact on cardiovascular risk factors. And this is one study that directly addresses that and the rationale is that potentially the context is gonna influence the timing, the duration or the type of adversity that children are experiencing, but that also that these factors may have, there's maybe positive factors or other resiliency factors that may modify how these adversities are impacting health outcomes and so broadly, you know, biological, psychological, physical health. And so I mentioned this the beginning. So you know we have this focus on individual level markers, but there are these neighborhood and these other socio political factors that are influencing the impact of these adversities and how families may able to cope if they experience one of these adversities or the likelihood that they may experience these adversities within racial and ethnic populations, and

particularly Latino populations. You know, they may experience particular types of factors that other groups may not experience. So this is why I do a lot of work that's sort of like within a particular group.

Within the Latino population, because they might may just, they have just these unique characteristics that other groups, you know don't have. I'm an advocate for within group analysis to get at the nitty gritty of like. You know, what are these distinct socio political sociocultural factors that may be influencing or changing how these factors are impacting health and would help us potentially then address how these adverse experiences are impacting health?

So just a little bit of background. So there's a huge population of Latinos across the United States, largely immigrants from different Latin American countries. And, you know, they're not homogeneous groups, even though Latinos in the US are often classified as this one group, they're like Latinos. But the country of origin, you know, obviously there's very different lived experiences because these populations are coming from different cultural backgrounds, different political socio political backgrounds that they've experienced in their country, different immigration histories in the United States. And Puerto Ricans in particular have their own kind of sociopolitical history, but then, compared to other Latino groups in the United States, they unfortunately experience more adverse child adversities and other Hispanic groups in the United States, and they also experience more mental and physical health issues. Outcomes compared to other Latino groups and a lot of this data comes from a study that's called the Hispanic Community Health Study. The study of Latinos, which is a study in the United States that recruited a Latino adults of four different origins in four different states. To try to get at this heterogeneity of the Latino population in the United States and so they're able to compare Latinos in the US of different countries of origin and how they're protective in relation to risk factors in relation to cardiometabolic health.

This is where the majority of this this data is coming from. This is a picture of Puerto Rico that I took when I was there not too long ago, so I was born and raised there, and so the survival of kind of personal connection to this study and what I've sort of sought out doing this work. If you're not familiar, Puerto Rico is, you know, a tiny island in the Caribbean that was under Spanish rule up until 1898, and then it became a US territory. It's essentially a colony of the United States. Puerto Ricans are have US citizenship, and they've been granted US citizenship for many years now. They have they have their own government, but they're also are subject as a US territory to some federal rules. But then they don't have the advantages of being a state, so economically it's a more, you know, a disadvantage, because there's some policies that are impacting the island. It's gone through a big

political and economic crisis in recent years, along with natural disasters. So it's suffered a number of different crises at a different number of levels, if you will. And I should say that in the States there's a huge population of Puerto Ricans because there was a mutually beneficial migration for Puerto Ricans to come to the US to work and for the US to actually promote and encourage Puerto Ricans to come to the US to work back in the 1950s and 60s, and New York was one of the sites where a lot of Puerto Ricans settled. So there's a big population of Puerto Ricans in the US and particularly in New York. And so this cohort is tapping into that population of Puerto Ricans in New York, particularly in the South Bronx of New York City. This population of Puerto Ricans has been there for many years. So these are not like recent, you know, families who have recently migrated, and the study was designed to look at this population and look at this comparable population and a parallel population in the metro area in San Juan, PR.

The study was designed in 2000 to look at how child development differed across these two different social contexts. And they recruited children between 5 and 13 years of age. The only criterion was that the caretaker identified as being of Puerto Rican background. It was a household probability sample. So it's the samples representative of the South Bronx and is representative of the San Juan area. There's been three waves of data collection. And then one wave of data collected in young adulthood. And then I developed an ancillary study, which is this cardiovascular health subset, in a sub-sample of the participants in young adulthood. And so they've collected a number of measures of adversities prospectively. So they asked the parents, and when developmentally appropriate, they asked the children to also report on a number of these experiences and they collected them repeatedly. So at every wave they attempted to collect these measures. And unfortunately, there is a really high prevalence of these adversities in the cohort. There are some differences across the site, across sites, but still, you know, kind of high levels of adversities. So in the Bronx, you have really high prevalence of parental divorce and separation. Compared to Puerto Rico and then you have a higher prevalence of maltreatment, particularly physical abuse and emotional abuse. And then in Puerto Rico, you actually have a higher prevalence of mental health problems with the caretakers, substance use problems, and of intimate partner violence. As you do in the Bronx. But still, overall, it's it's an unfortunate population that experiences or experienced a lot of adversity in childhood. And so we've looked at these adversities as they relate to a different number of behavioral factors and then physiological factors.

So we looked early on at these factors in the cohort and childhood and see these really high prevalence ratios, when we're looking at experiencing two or more of these factors and those things like trouble falling asleep or daytime sleepiness and bad dreams and nightmares, we don't actually see differences. So not every analysis that we've done we've

noted that there's differences. This is one, for example, where we were noting the same association between adversity and sleep problems. And then we've looked at the timing of parental development and the tempo of pubertal development with this thought that adversity may, or that pubertal development may, be one of the, or early or late period development may be in the pathway between adversity and cardiometabolic risk. And so again this is one of these analyses where sex was not a factor, so there were no sex differences that we noted. But we do know that sex differences, and that girls who experience two or more adversities have earlier pubertal development and more accelerated pubertal development. No differences with the tempo of growth. So because they accumulate over development over time, we're able to see the rate of change of pubertal development over time. But we couldn't, we didn't really see, any differences based on tempo. But for the boys, what we do see in terms of timing is the opposite what we have seen for the girls - that boys who experience adversity actually have a later pubertal development than boys who don't experience adversity. So you know these sex differences that we've seen, what a lot of this work is showing is that there are different potential mechanisms by which we adversity influences cardiometabolic health. So these are, you know, pubertal adolescent boys, we're seeing these differences that may drive what we may be seeing, some differences in cardiometabolic health. Use of behaviors as coping mechanisms so that there's potential multiple factors that may be driving why we see some sex differences over different time periods in the life course.

And then in regards to adiposity measures, we're seeing in this cohort is unfortunately high levels of of adiposity, so there's a high prevalence of obesity in our population in the South Bronx and even in our population. In Puerto Rico. High prevalence of waist circumference across the cohort and of body fat. In an analysis that we're sort of grappling with or understanding how this relationship between adversities - and here I'm showing you the treatment specific analysis - the adiposity measures by site. So this is in New York where we're seeing consistent to what we have seen before and in other work in the US, that the relationship between maltreatment or adversity is among women, and now we don't see it among men. And so you have these high, higher estimates of body fat with circumference and obesity for women who are exposed to emotional abuse and also women who are exposed to sexual abuse. And we just don't see these associations among men. But when we look at our cohort in Puerto Rico, we just see something completely different. And so here the association is in the opposite direction where what we're seeing is among men and to some extent among women. That the association between maltreatment and these adiposity measures is lower. Oh, and this should say beta estimates. These are beta estimates so that physical abuse, sexual abuse is predicting a lower waist circumference, lower obesity. So how is the sociocultural context changing, or sort of modifying, these

associations is something that we're trying to understand as the next step of what could potentially be driving these factors. And so we're looking at, we have measures of, diet, smoking and substance use in this cohort. So that's one of the things that we're looking at. If the potential helping behaviors are helping with these potential behavioral factors. We do also have coping that we can look at in the cohort. And you know other potential factors that may explain this difference. There was this cohort actually that compared similarly two different contexts looking at cardiometabolic health and adolescence, and I've gone through this and it sort of resonates with the findings that we're having, where within the ALSPAC cohort they do find this association. And then comparably in a very different context, they actually don't see this association at all. There was actually a sort of a suggestion of a decrease in the BMI as we see in our cohort though that was not statistically significant. So there's some evidence that context may change, but what is it and how is it that context changing and it's open for for discussion. One of the things that we've thought about, which is, you know, potentially maybe what factor that may be operating here is the fact that the maltreatment may be representing a more disadvantaged environment and more socioeconomically this advantage of environment may not lead to this higher adiposity measure as it does in a high income country. That maybe something similar to what we're seeing in Puerto Rico.

And I think actually I said maybe some of these things that I was mentioning that you know the impact of maltreatment and adiposity just may depend on this moderating factor is what we see is a lot of differences across sex, and now we're seeing these sociocultural contextual differences and that there's variation also potentially in the maltreatment across these contexts. They may actually be representing something maybe slightly different, which may result in these differential health effects. And then within the Puerto Rican cohort we have a number of measures on families, cultural identity, social support, things that are very particular to this population that I'm really interested to look deeper into, to try to understand why we're seeing these potential differences.

I kind of always like to end with this slide because I like to acknowledge the things that I don't talk about. So this is a recommendation from another group that I work with in the National Institutes of Health because I, talk a lot about the negative, but there's a lack of studies looking at resilience, which I did not talk about it all and these positive factors and these intervention studies and studies that really are capturing, you know, how may we begin to address these adversities, natural experiments, you know, other types of studies that would inform how we could move forward and actually address these adverse experiences and potentially prevent worse health outcomes. Yeah. And that's my info, how people can find me if they have questions or want to reach out.