ORIGINAL PAPER

Direct and Indirect Associations Between Internalized Homonegativity and High-Risk Sex

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Abstract Recent meta-analytic work has endorsed a lack of any meaningful, direct relationship between internalized homonegativity (IH) and high-risk sex. It may not be possible to observe a direct association, however, if heterogeneity in response to IH is considered. This investigation used data from 1,669 men who have sex with men who completed an online survey of sexual behavior in 2005 to consider two potential intermediate variables (compulsive sexual behavior [CSB] and the frequency of sexual partnering) that could increase (CSB) and decrease (frequency of sexual partnering) the probability of having unprotected anal sexual intercourse. We used M*plus* (Version 5.1) to estimate confirmatory factor analysis and structural models. Statistical mediation models identified indirect associations through both CSB (positive association) and the number of male sexual partners (negative association). The different directions of association, when combined, cancelled out one another. This contributed to the observed lack of association between IH and high-risk sexual behavior. Future work on risk behavior that incorporates IH will need to consider heterogeneity in how individuals respond to the construct and how these different processes are associated with risk behavior.

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Introduction

Internalized homonegativity refers to the extent to which individuals accept negative societal attitudes about same-sex relationships and behavior (Shidlo, 1994). These negative social attitudes and the development of internalized homonegativity (IH) relate back to Goffman's (1963) work on stigma. In his conceptualization, individuals who possess a trait or characteristic that is stigmatized will often attempt to hide this characteristic from others. To achieve this goal, stigmatized individuals also avoid others who share the same trait or characteristic. Specific to IH, Nungesser (1983) described three manifestations: (1) disgust with one's sexual orientation, (2) a lack of comfort being associated with others who have the same sexual orientation, and (3) a purposeful avoidance of being identified as gay, lesbian, or bisexual. While individuals can vary in terms of the magnitude of IH, a common outcome is psychological distress and low self-esteem (Meyer, 1995). Given these mental health outcomes, researchers have explored the relationship between IH and sexual risk behavior for HIV transmission (Williamson, 2000), often with inconclusive results.

Recently, Newcomb and Mustanski (2009) synthesized the research on IH (referred to in their article as internalized homophobia) and high-risk sex. Using correlation coefficients from several studies, it was concluded that the bivariate association was indistinguishable from zero, and that internalized homophobia should be eclipsed by other, more compelling risk factors. Their examination of bivariate associations assumed that IH acted directly on high-risk sex. While Newcomb and

Mustanski indicated that indirect associations may exist, these associations were not considered in the meta-analysis.

Traditional analytic approaches to mediation follow the framework outlined by Baron and Kenny (1986). In this framework, the first step to investigating mediation involves the identification of a statistically significant direct association between the independent and dependent variable. Since the studies included in Newcomb and Mustanski's (2009) meta-analysis overwhelmingly showed a lack of a direct association, then it is logical to not consider indirect associations. Alternative approaches to mediation, however, argue that the identification of a direct association is not a necessary condition for mediation analysis (MacKinnon, Krull, & Lockwood, 2000). Reasons for this include issues of power (Shrout & Bolger, 2002), the association being filtered through a sequence of multiple intermediate variables (Shrout & Bolger, 2002), and suppression (Koeske, 1998; MacKinnon, Krull, & Lockwood, 2000).

Suppression, also called inconsistent mediation (MacKinnon, Krull, & Lockwood, 2000), occurs when there are two or more pathways between an independent and a dependent variable, and the direction of those pathways is in conflict. One example of this comes from the literature on job stress and overall health (Schieman & Reid, 2009). Schieman and Reid examined the relationship of job authority (managerial status) and physical and psychological outcomes. The bivariate associations with both outcome sets were indistinguishable from zero. However, Schieman and Reid hypothesized two possible pathways through which job authority could affect health outcomes: (1) higher job stress as a result of authority would lead to an increase in negative health outcomes, and (2) individuals with higher job authority would have greater resources, both in terms of autonomy and income, which would decrease negative health outcomes. While the overall association between job authority and the outcomes was zero, Schieman and Reid identified significant paths for both of the proposed indirect associations.

For IH, negative mental and sexual health outcomes are theorized to be a function of the distress that accompanies a negative self-view (Meyer, 1995). Men who have sex with men (MSM) who have higher levels of IH have to find a way to handle any perceived distress. In the framework of coping with stigma-related stress (Miller & Kaiser, 2001), individuals can invoke a multitude of coping strategies. These different strategies can be emotion-focused or problem-focused (Carver, Scheier, & Weintraub, 1989), with emotion-focused coping being used to handle distress, and problem-focused coping being specific to enacting certain behaviors to minimize the potential for problems as a function of the stressor.

Emotion-based coping in the form of avoidance coping has been identified as a determinant of high-risk sex (e.g., Martin, Pryce, & Leeper, 2005). McKirnan, Ostrow, and Hope (1996) postulated that certain behaviors, such as substance use, are forms of avoidant coping. This form of coping offers an opportunity to distract oneself or escape from emotional distress. Within the framework of avoidant coping, another observable outcome would be compulsive sexual behavior (CSB). CSB is defined as a preoccupation with sexual behavior and an inability to effectively regulate sexual urges (Coleman, Miner, Ohlerking, & Raymond, 2001). Goodman's (2005) discussion of CSB unifies this construct with other addictive or compulsive behaviors such as drug and alcohol addiction. The common thread between them is that regulating feelings of distress and anxiety is a major etiologic factor. This establishes theoretical plausibility that for some men, IH and its accompanying distress can precede an avoidant coping strategy such as CSB. From the literature, Dew and Chaney (2005) identified an association between IH and CSB, lending support to the theoretical association between the two constructs. While CSB can ameliorate feelings of distress and anxiety (Goodman, 2005), it also predisposes individuals to a higher likelihood of engaging in risk behavior through having more sexual partners and/or participating in high-risk behaviors (Benotsch, Kalichman, & Kelly, 1999; Benotsch, Kalichman, & Pinkerton, 2001; Chaney & Dew, 2003). In this case, an indirect association between IH and high-risk sex would show a positive association.

While CSB is one possible outcome, it would not apply across all individuals with the same stressor, and it may not be a uniform response over time within the same individual. Returning to the theorized manifestations of IH (Nungesser, 1983), MSM with higher levels of IH might isolate themselves from other MSM. This isolation would arguably serve as a form of problem-focused coping, wherein limiting interaction with other MSM precludes opportunities for distress (Carver, Scheier, & Weintraub, 1989). This isolation from other MSM could result in a reduced frequency of sexual partnering. This reduction in partnering, in turn, could yield an overall reduction in risk behavior as a function of reduced opportunity. Thus, if MSM with higher IH have fewer partners, then the indirect association with UAIMP would be negative. When considered with the indirect association that is a function of CSB, there would be two pathways, one showing a positive association with risk behavior; the other, a negative association. When considered overall, the different directions of association could cancel out, similar to the aforementioned study on job stress and health outcomes.

The aim of the present study was to examine direct and indirect associations between IH and unprotected anal intercourse with male partners (UAIMP) in a sample of MSM. We considered two intermediate variables, CSB and the number of male sexual partners, which are hypothesized as outcomes of two distinct forms of coping with IH. We hypothesized that CSB would contribute to a positive indirect association on UAIMP, while the indirect association through the number of male sexual partners would produce a negative indirect association.

Method

Participants

The Men's INTernet Study-II (MINTS-II) was a cross-sectional study conducted in 2005 among MSM. Potential participants were recruited via banner advertisements for a study on sexual health that were placed on social networking websites specific to MSM. The data collection methods have been detailed elsewhere (Rosser et al., 2009) and are briefly summarized here. To be eligible, participants had to be at least 18 years of age and indicate at least one male sexual partner in the year prior to the survey. To obtain a multi-ethnic sample with large enough groups for comparison, participants were over-sampled based on their primary racial/ethnic identification. Once deemed eligible, participants were asked to complete a series of items related to sexual health, psychosocial factors, and content acceptability for future interventions related to sexual health and HIV transmission.

At the end of data collection, 2,716 MSM completed the survey. For this analysis, we used data from the subset of participants who reported any sexual activity with a man in the three months prior to the survey. This was done to ensure an analytic sample in which all participants were at risk of having the outcome of unprotected anal intercourse with male partners (UAIMP). This resulted in an eligible sample of 1,699 men. Compared to the ineligible subset ($n = 1,017$), the eligible sample included a lower proportion of White men and a higher proportion of Latino men (26.11 vs. 32.25% and 22.88 vs. 16.91%, respectively, $p < .001$), more HIV-positive men (5.28% vs. 2.97%, $p = .005$), and fewer men who reported sex only with other men in the three years prior to the survey (82.05% vs. 85.45%, $p = .022$). An additional 30 men were excluded from the analysis for missing more than half the scale items for the two scales used in the study or having impossible or nonsensical response patterns. This yielded a final analytic sample of 1,669.

Characteristics of the analytic sample are presented in Table 1. Overall, included participants were young, well-educated, and tended to live in or near larger urban areas. The race/ethnicity distribution is consistent with the sampling design of the study, and the largest single group identified as white. The majority of respondents were HIV-negative, and over 80% reported sex only with men during the 3 years prior to the survey.

Measures

Internalized Homonegativity

Internalized homonegativity was measured using an 8-item scale that measured three factors (Smolenski, Diamond, Ross,

Table 1 Characteristics of the included participants ($n = 1,669$)

Variable	n	$\%$
Age (in years)		
18–24	578	34.63
25–34	687	41.16
35–44	279	16.72
$\geq$45	80	4.79
Missing	45	2.70
Race/ethnicity		
Asian	298	17.86
Black	276	16.54
Latino	353	21.15
White	410	24.57
Other	216	12.94
Missing	116	6.95
Residential area		
Rural	81	4.85
Small town	220	13.18
Medium-sized city	433	25.94
Suburb	392	23.49
Large city	529	31.70
Other	12	0.72
Missing	2	0.12
Education		
Through high school	216	12.94
Some college	506	30.32
College	517	30.98
Post graduate	429	25.70
Missing	1	0.06
Gender of sexual partners, last 3 years		
Only men	1,368	81.97
Both women and men	298	17.86
Missing	3	0.18
HIV-positive		
No	1,574	94.31
Yes	86	5.15
Missing	9	0.54

& Rosser, 2010). This scale is a revised version of the Reactions to Homosexuality scale (Ross & Rosser, 1996), and it demonstrates superior psychometric properties to the original as well as omits items criticized for being conceptually irrelevant to the construct. The three factors measured were: (1) personal comfort with a gay identity (3 items, sample item is "I feel comfortable being a homosexual man"), (2) social comfort with gay men (2 items, sample item is "Social situations with gay men make me feel uncomfortable"), and (3) public identification as gay (2 items, sample item is "I feel comfortable discussing homosexuality in a public situation"). Participants responded

to each item using a 7-point Likert-type format (1 = strongly disagree, 7 = strongly agree). All items were coded at analysis so that a higher score indicated higher IH. Coefficient α in this sample was .73.

Compulsive Sexual Behavior Inventory

The CSB Inventory includes 28 items that capture three domains: control, abuse, and violence (Coleman, Miner, Ohlerking, & Raymond, 2001). We used the 13-item control subscale for this analysis in line with other researchers since this subscale most closely relates to the theoretical construct and its associated lack of control over sexual feelings or urges (Raymond, Lloyd, Miner, & Kim, 2007). All items were measured using 5-point Likert-type scales (1 = never, 5 = very frequently). Sample items include: "How often do you have trouble controlling your sexual urges?" and "How often do you make excuses to justify your sexual behavior?" Coefficient α in this sample was .91.

Sexual Behavior

Participants were asked to provide data on the number of male sexual partners during the 90 days prior to the survey. In addition, they were asked to provide the number of UAIMP. While treating the number of male sexual partners as a count variable, the functional form of the variable would differ based on when it was modeled as an independent versus a dependent variable. To maintain a consistent functional form and to account for the observed skew in the distribution, we treated the variable as continuous with a square-root transformation. For UAIMP, this variable was only modeled as a dependent variable, so we used negative binomial regression to account for overdispersion of the variance.

Statistical Analysis

Measurement Models

Prior to estimating the direct and indirect associations of IH on high-risk sex, we conducted a confirmatory factor analysis of both latent variables. Based on Nungesser's (1983) theoretical framework of IH, the three factors measured in the current scale should measure a single, unifying construct, which would be IH. As such, we estimated a second-order latent variable model with the three first-order latent constructs (i.e., personal comfort, social comfort, public identification) serving as indicators of overall IH. For CSB, we estimated a single-factor model. Models were estimated using the raw data, and the scale for

each latent variable was set by assigning unit variance to each latent variable. Fit was assessed with the χ^2 value, the comparative fit index (CFI; Bentler, 1990), the Tucker–Lewis index (TLI; Tucker & Lewis, 1973), and the root mean squared error of approximation (RMSEA; Steiger, 1990). A value of .95 or above on the CFI and TLI and a value of .05 or below on the RMSEA were considered indicators of good model fit (Hu & Bentler, 1999).

Mediation Models

We assessed mediation using structural equation models as recommended by MacKinnon (2008). Two primary advantages of this analytic strategy were: (1) that we retained the measurement models for IH and CSB, thus reducing measurement error in the estimates of each latent variable, and (2) the ability to simultaneously model the direct and the indirect association between IH and UAIMP.

Statistical mediation analysis in the framework of structural equation modeling involved the estimation of the total association, the direct association, and the indirect association (MacKinnon, 2008). The total association is the regression coefficient for the bivariate association between the independent variable (IH) and the dependent variable (UAIMP). Direct and indirect associations are estimated in a structural model, which, in the case of a single mediation model, includes three paths: (1) α, the association between the explanatory variable and the hypothesized mediator, (2) β, the association between the hypothesized mediator and the outcome, and, (3) τ', the association between the explanatory variable and the outcome adjusting for the hypothesized mediator. We initially considered single mediation models of each of the hypothesized intermediate variables. We calculated the indirect association as the product of the α and β coefficients, and we evaluated statistical significance and precision of the indirect association using a 95% confidence interval. We used the Prodclin software (MacKinnon, Fritz, Williams, & Lockwood, 2007) to estimate 95% confidence intervals. This software uses the point estimates and standard errors to derive the asymmetric confidence interval.

Building on the single mediation models, we incorporated both mediators into a single model to estimate indirect associations of both CSB and the number of male sexual partners, taking into account their non-independence. All measurement and structural models were estimated using the robust maximum likelihood estimator in M*plus*, Version 5.1 (Muthén & Muthén, 2007). Incorporation of demographic covariates did not yield meaningful differences (change greater than 10%) to the unadjusted models, so we present the unadjusted models in favor of sample size and model parsimony.

Results

The measurement model that included the hypothesized measurement structures of both IH and CSB failed to produce adequate fit ($\chi^2 = 2027.68$, df $= 186$, $p < .001$; CFI $= .84$; TLI $= .81$; RMSEA $= .08$, 90% CI $= .08, .09$, SABIC $= 105290.09$). The modification indices identified two items in the CSB scale that cross-loaded on IH ("How often have you felt guilty or shameful about aspects of your sexual behavior" and "How often have you concealed or hidden your sexual behavior from others"). This implied that these items were measuring aspects of both CSB and IH, and retaining such items in the model could artificially inflate the correlation between the two latent variables. In addition, three items in the CSB measure had highly correlated residuals, suggestive of redundancy ("How often have you had trouble controlling your sexual (1) urges, (2) behavior, and (3) feelings?").

We removed the two cross-loaded items and retained the item with the highest factor loading (urges) from the redundant items. The final measurement model, which included two additional residual covariances, produced adequate fit to the data ($\chi^2 = 401.95$, df $= 98$, $p < .001$; CFI $= .96$; TLI $= .95$; RMSEA $= .043$, 90% CI $= .04, .05$, SABIC $= 87677.07$). While exploratory given the scale revision of CSB, the Pearson correlation between scores from this reduced, 9-item measure with the original 13-item measure was .98 (95% CI $= .97, .98$). Scale items and factor loadings are displayed in Table 2.

Higher scores on IH were associated with higher scores on sexual compulsivity and a reduced frequency of sexual partnering with other men (Table 3). Scores on IH were not associated with the frequency of UAIMP. Participants with higher scores on CSB had a greater frequency of both sexual partnering and UAIMP, and participants with more sexual partners reported a higher frequency of UAIMP.

While the total association between IH and UAIMP was very small and not statistically significant, both hypothesized intermediate variables had statistically significant indirect associations. For CSB (Fig. 1), higher scores on IH were associated with higher scores on CSB, which in turn, were associated with a higher frequency of UAIMP. The indirect association was .28 (95% CI $= .18, .40$). Once this indirect association was taken into account, the remaining direct association between IH had strengthened in magnitude and was statistically significant, suggesting a reduction in UAIMP for participants with higher IH scores who do not also report higher scores on CSB.

The other single mediation model showed a reduction in the number of sexual partners as IH increased (Fig. 2). The indirect association was $-.15$ (95% CI $= -.22, -.09$). Unlike the model that included CSB, the direct association here was approximately zero and not statistically significant.

Simultaneous modeling of the indirect associations of both CSB and the number of male sexual partners provided evidence

Table 2 Internalized homonegativity and CSB factor loadings from the final measurement model

Factor and items	Loading
Internalized homonegativity, first-order factors	
Personal comfort with a gay identity	
1. Even if I could change my sexual orientation, I wouldn't	0.63
2. I feel comfortable being a homosexual man[a]	0.80
3. Homosexuality is as natural as heterosexuality[a]	0.66
Social comfort with gay men	
4. I feel comfortable in gay bars	0.59
5. Social situations with gay men make me feel uncomfortable (R)	0.62
Public identification as gay	
6. I feel comfortable discussing homosexuality in a public situation	0.82
7. I feel comfortable being seen in public with an obviously gay person	0.73
Internalized homonegativity, second-order model	
Personal comfort with a gay identity	0.85
Social comfort with gay men	0.69
Public identification as gay	0.55
Compulsive sexual behavior—control subscale	
How often have…	
1. You had trouble controlling your sexual urges?[b]	0.55
2. You used sex to deal with worries or problems in your life?[b]	0.62
3. You made pledges or promises to change or alter your sexual behavior?	0.69
4. Your sexual thoughts or behaviors interfered with the formation of friendships?	0.73
5. You developed excuses and reasons to justify your sexual behavior?	0.83
6. You missed opportunities for productive and enhancing activities because of your sexual activity?	0.77
7. Your sexual activities caused financial problems for you?	0.58
8. You felt emotionally distant when you were engaging in sex with others?	0.52
9. You had sex or masturbated more than you wanted to?	0.55

Note: Correlation between IH and CSB was .45

[a] Correlated residual error of $-.32$

[b] Correlated residual error of .27

of three distinct pathways (Fig. 3). In the first pathway, participants with higher IH scores also had higher CSB scores and, ultimately, a higher frequency of UAIMP. This indirect association was .06 (95% CI $= .02, .11$). A second indirect association included the aforementioned indirect association in addition to a path linking CSB and the number of male sexual partners. The indirect association was .10 (95% CI $= .06, .14$). The third indirect association included only a reduction in the number of male sexual partners as the intermediate variable, with a point estimate of $-.25$ (95% CI $= -.33, -.17$).

Table 3 Unstandardized (*b*) and standardized (*B*) coefficients from bivariate regression models

Independent variable	Dependent variable					
	IH	CSB		No. partners		UAIMP
	b (SE)	*b* (SE)	*B*	*b* (SE)	*B*	*b* (SE)
IH	–	0.32 (0.04)*	0.45*	−.19 (0.04)*	−.15*	−.04 (0.14)
CSB	–	–	–	0.20 (0.05)*	0.10*	0.47 (0.11)*
No. Partners	–	–	–	–	–	0.78 (0.03)*
M (SD)	2.88 (1.22)[a]	2.52 (0.80)[a]		1.99 (1.15)		1.68 (4.14)[b]
Range	1–7	1–5		1–9.22		0–50

Note: *IH*, internalized homonegativity; *CSB*, compulsive sexual behavior; No. Partners, number of male sexual partners, last 90 days; UAIMP, number of unprotected anal intercourse male partners, last 90 days. Standardized coefficients are not reported for UAIMP since it was modeled using negative binomial regression

[a] Mean and SD from observed item average

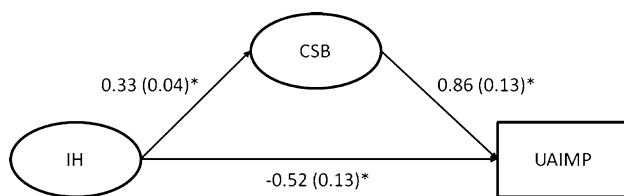[b] Median = 0, Interquartile range = 0–2

* *p* < .001

Fig. 1 Single mediation model of CSB as an intermediate variable between IH and UAIMP. Parameter estimates and standard errors are reported, and estimates with an asterisk (*p* < .01)
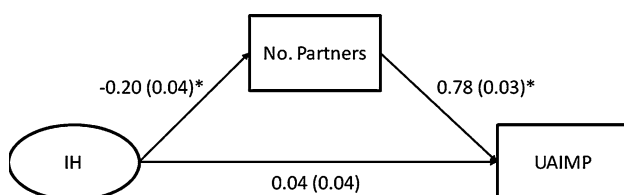

Fig. 2 Single mediation model of the number of male sexual partners (No. Partners) as the intermediate variable between IH and the frequency of UAIMP. Parameter estimates and standard errors are reported, and estimates with an asterisk (*p* < .01)

Fig. 3 Multiple mediation model of CSB and the number of male sexual partners (No. Partners) as intermediate variables between IH and the frequency of UAIMP. Parameter estimates and standard errors are reported, and estimates with an asterisk (*p* < .01)

Discussion

As expected from Newcomb and Mustanski's (2009) meta-analysis, we failed to identify a statistically significant, bivariate association between IH and UAIMP. After considering two intermediate variables that could indicate differential response to IH, we identified three indirect pathways of association between IH and UAIMP. For two pathways, participants reporting higher levels of CSB, which is a maladaptive form of coping with distress (Goodman, 2005), reported a greater frequency of UAIMP. Once the indirect association with CSB was accounted for, the remaining direct association strengthened, which suggested suppression. Thus, IH acted as a
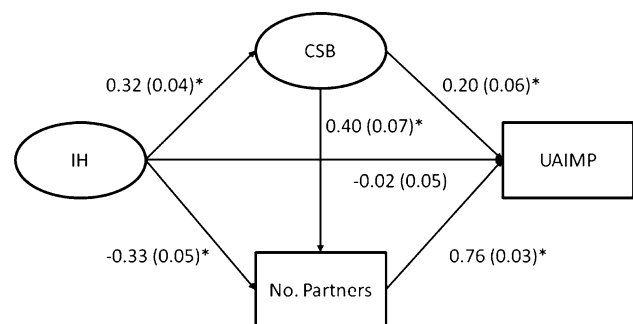
protective factor for men who did not also have higher CSB. This protective association was explained by considering the frequency of sexual partnering, with men with higher IH having few sexual partners overall. Together, the effects of the positively and negatively associated pathways cancel out one another, which explained the observed lack of an association in the bivariate analysis.

The evidence of mediation and suppression in the data suggests that IH is related to high-risk sex, albeit indirectly. Since the indirect associations were in different directions, this suggests that IH is associated with increased risk behavior for some individuals, but not for others. This represents heterogeneity in response, and is in line with the notion that there is substantial individual variation in terms of responses to stigma (Miller & Kaiser, 2001). Future work on risk behavior etiology and in planning interventions will benefit from considering the mechanisms through which the hypothesized variables can impact the defined outcome. In this case, had we not considered different responses to IH, we would have arrived at a

conclusion of no association, thus concurring with Newcomb and Mustanski (2009). While we cannot present conclusive proof of IH being an antecedent of the processes reported here, we do have initial evidence that the relationship between IH and high-risk sexual behavior is more nuanced than is assumed in a bivariate analysis.

This study had several strengths, including the large sample size and the use of structural equation modeling to account for measurement error in the latent variables. In spite of these strengths, our data were cross-sectional, and the pathways identified here will need to be evaluated in stronger, longitudinal study designs to improve inference. Moreover, we did not have data that explicitly measured coping styles of the participants in this study. The associations with the intermediate variable outcomes are in line with what would be expected in terms of responses to IH, but without measures of coping strategies, we cannot make any assertion as to whether or not coping is the driving force behind the observed associations.

Overall, the lack of a bivariate association between IH and high-risk sexual behavior in MSM suggests that IH has limited explanatory power, on average. This would make it a poor candidate variable for investigations aiming to develop purely predictive models of high-risk sex. The absence of a strong bivariate association, however, does not mean that the variable is not useful in understanding unique pathways that impact risk behavior, even if they are indirect.

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