The Role of AA in Mobilizing Adaptive Social Network Changes: A Prospective Lagged Mediational Analysis

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Why have mutual-help (MHGs) grown so much despite increased availability of efficacious treatments? Burden of disease, Treatment costs and stigma

- Misuse of substances confers a massive (and increasing) burden of disease

- Addiction often has chronic course: 5-6 yrs from onset of dependence to help-seeking (Wang et al, 1995); 9 yrs from 1st tx to achieve FSR; Dennis et al, 2005); 4-5 yrs before risk of relapse <15%

- Professional resources alone cannot cope; stigma presents further barriers to access to formal care

- Perhaps, in tacit recognition, most societies seen increases in MHGs during past 70 yrs

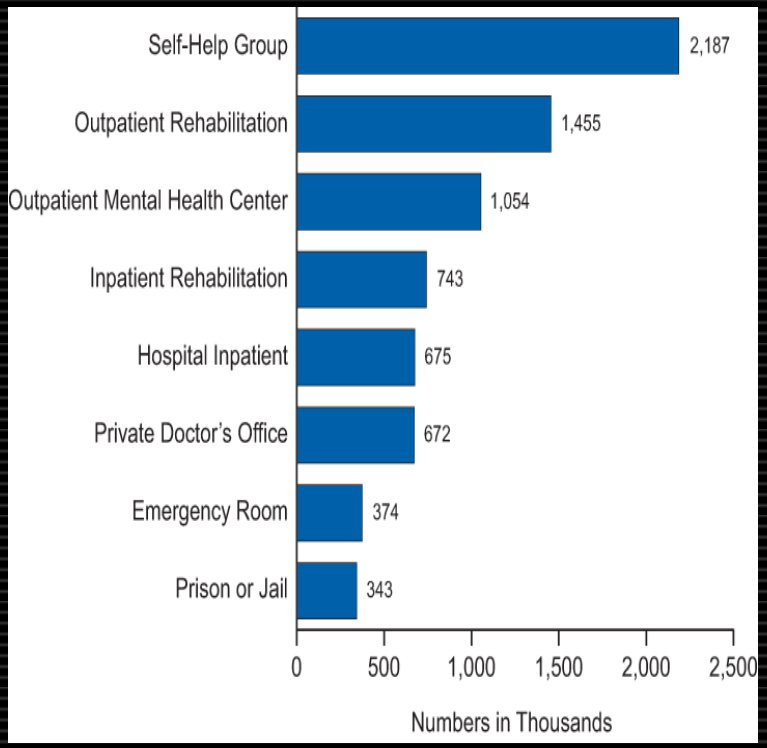


Table 1. Substance Focused Mutual-help Groups

Name	Year of Origin	Number of groups in U.S.	Location of groups in U.S.
Alcoholics Anonymous (AA)	1935	52,651	all 50 States
Narcotics Anonymous (NA)	1940s	Approx. 15,000	all 50 States
Cocaine Anonymous (CA)	1982	Approx. 2000 groups	most States; 6 online meetings at www.ca-online.org
Methadone Anonymous (MA)	1990s	Approx. 100 groups	25 States; online meetings at http://methadone-anonymous.org/chat.html
Marijuana Anonymous (MA)	1989	Approx. 200 groups	24 States; online meetings at www.ma-online.org
Rational Recovery (RR)	1988	No group meetings or mutual helping; emphasis is on *individual* control and responsibility	----------
Self-Management and Recovery Training (S.M.A.R.T. Recovery)	1994	Approx. 250 groups	40 States; 19 online meetings at www.smartrecovery.org/meetings/olschedule.htm
Secular Organization for Sobriety, a.k.a. Save Ourselves (SOS)	1986	Approx. 480 groups	all 50 States; Online chat at www.sossobriety.org/sos/chat.htm
Women for Sobriety (WFS)	1976	150-300 groups	Online meetings at http://groups.msn.com/ WomenforSobriety
Moderation Management (MM)	1994	Approx.16 face-to-face meetings	12 States; Most meetings are online at www.angelfire.com/trek/mmchat/;

Source: Kelly & Yeterian, 2008

Table 2. Dual-Diagnosis Focused Mutual-help Groups

Name	Year of Origin	Number of groups in U.S.	Location of groups in U.S.
Double Trouble in Recovery (DTR)	**1989**	200	Highest number of groups in NY, GA, CA, CO, NM, FL
Dual Recovery Anonymous (DRA)	**1989**	345	Highest number of groups in CA, OH, PA, MA
Dual Disorders Anonymous	**1982**	48	28 in IL
Dual Diagnosis Anonymous	**(DDA)**	56	38 in CA

Source: Kelly & Yeterian, 2008)

Table 3. Non-Substance Focused Addictive Behavior Mutual-help Groups

Name	Year of Origin	Number of groups in U.S.	Location of groups in U.S.
Gamblers Anonymous (GA)	1957	Approx. 1000 chapters	all 50 States
Sex Addicts Anonymous (SAA)	1977	Approx. 700 meetings	most States; Online meetings at www.sexaa.org/online.htm; Telephone meetings
Sex and Love Addicts Anonymous (SLAA)	1976	Approx. 1320 groups *worldwide*	(including in all 50 States), Online meetings at www.slaafws.org/online/onlinemeet.html; Regional teleconference calls
Overeaters Anonymous (OA)	1960	Approx. thousands of meetings	all 50 States; Numerous online (www.oa.org/pdf/OnlineMeetingsList.pdf) and telephone meetings (www.oa.org/pdf/phone_mtgs.pdf)

Source: Kelly & Yeterian, 2008)

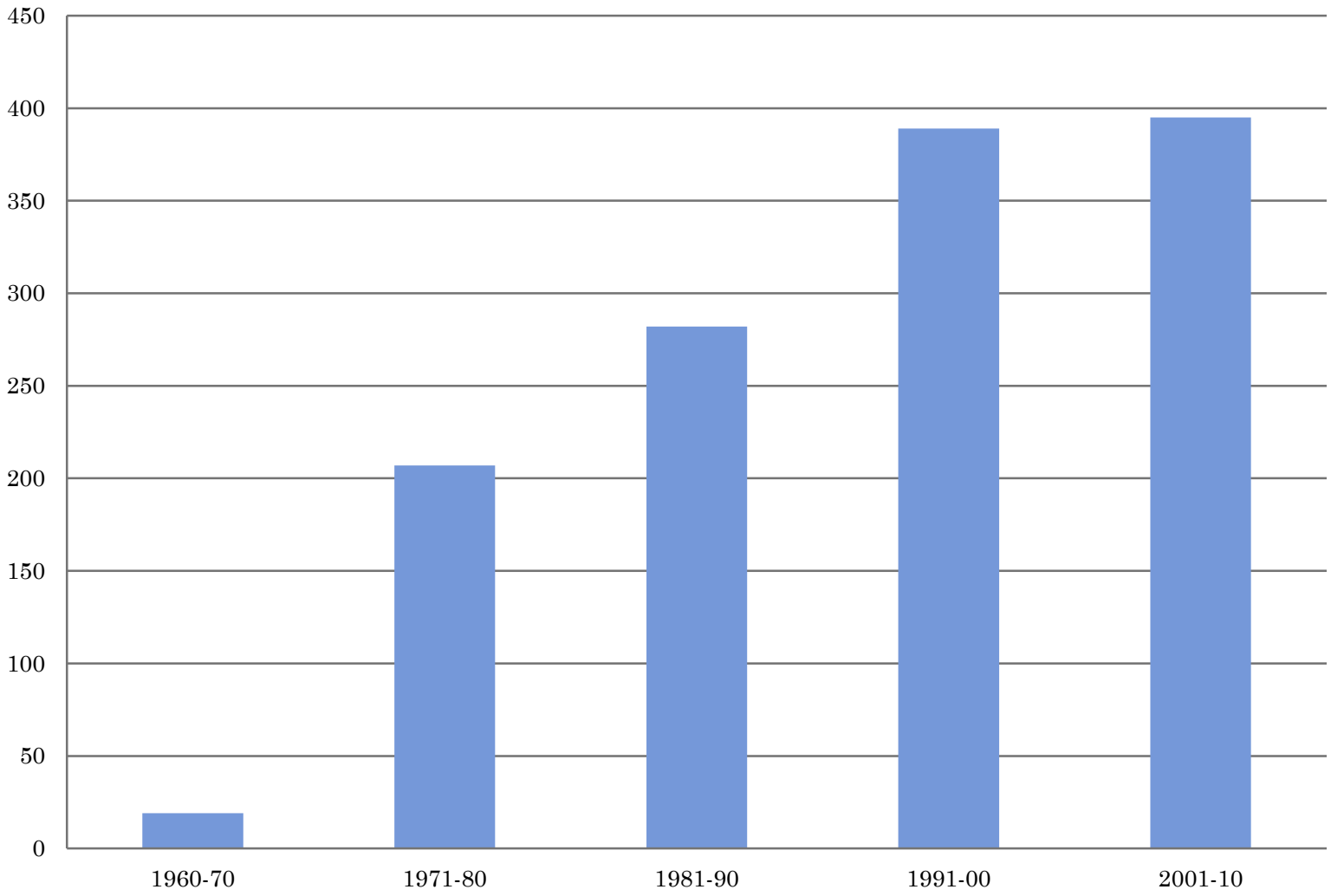
Potential Advantages of Community Mutual-help

- Addiction typically chronic/relapsing (ARE – Selye, 1956; "self-control strength" Muraven et al, 2006)
- Cost-effective -free; attend as intensively, as long as desired (Humphreys and Moos, 2001; 2007)
- Widely available, accessible at high risk times
- Low entry threshold (no paperwork, insurance); anonymous (stigma)
- Access to broad social network supporting recovery

Call for Research…

- In US, AA long been most commonly sought source of help for alcohol-related problems (Room et al, 1993; Weisner et al, 2005)
- In 1990 the Institute of Medicine called for more research on AA and especially on elucidating its mechanisms (IOM, 1990)
- "…The View From Mars" (Humphreys, 1997)- disparity between importance of MHGs and attention afforded them
- AA and related interventions -serious scientific endeavor with increasingly rigorous studies

Number of Publications on AA and NA 1960-2010



Source: Pubmed; Retrieved Feb-12-2010; Kelly, JF

TSF Delivery Modes

Stand alone
Independent therapy

e.g., Project MATCH Research Group (1997); Litt et al, 2009

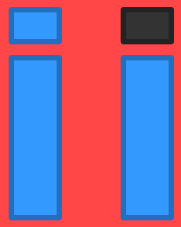
Integrated into an existing therapy

e.g., Walitzer et al, 2008;

Component of a treatment package (e.g., an additional group)

e.g., Kaskutas et al, 2009

As Modular appendage linkage component



e.g., Timko et al, 2006; 2007; Kahler et al, 2005; Sisson and Mallams, 1981

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How do people recover from alcohol dependence? A systematic review of the research on mechanisms of behavior change in Alcoholics Anonymous

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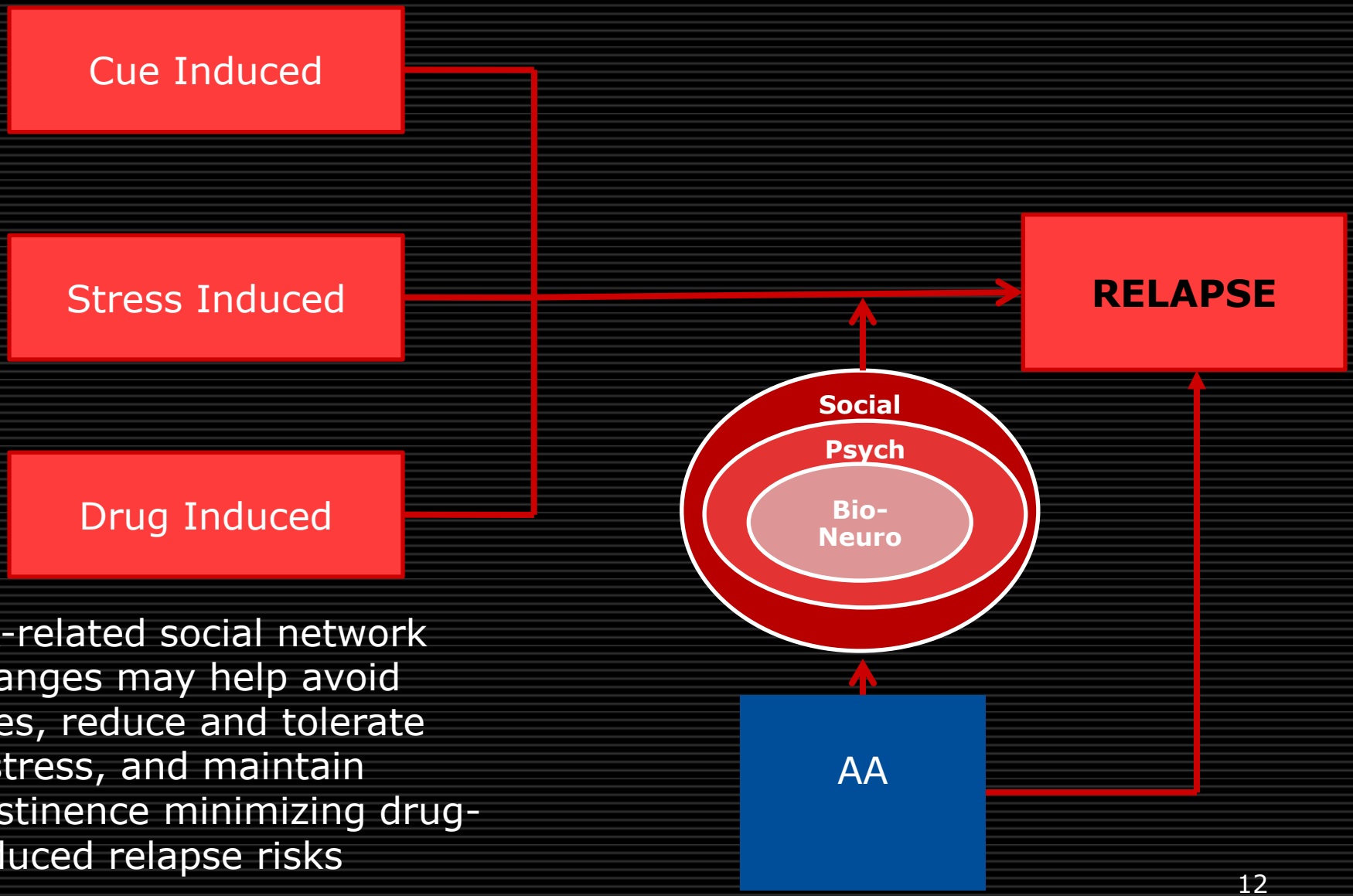
How might MHGs like AA reduce relapse risk and aid the recovery process?



AA-related social network changes may help avoid cues, reduce and tolerate distress, and maintain abstinence minimizing drug-induced relapse risks

Research Questions

- Does AA independently influence four social recovery processes?
  1. Reductions in pro-drinking social network ties
  2. Increases in pro-abstinence social network ties
  3. Reductions in drinking-related activities
  4. Increases in abstinence-related activities
- Do recovery-supportive changes among these four social processes relate to positive outcomes?
- **Can any observed beneficial effect of AA on alcohol outcomes be partially explained (mediated) by changes in these social processes?**

Project MATCH data

- Study participants (N=1,726; aftercare/ outpatient) were assessed at baseline, 3, 6, 9, 12 and 15 months following the end of the delivered MATCH treatments
- For missing data, we employed MI (Little & Rubin, 2002). Data missing for key variables ranged from 0.05% for baseline AA attendance to 7.8% for drinking data for months 13-15
- Transformed DVs: arcsine PDA & sq rt DDD

Project MATCH Research Group, 1997

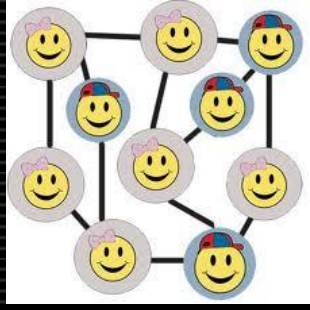
Key Study Measures

- **Alcohol use:** Form 90 (Miller, 1996; Miller & Del Boca, 1994), an interview procedure combining calendar "time-line follow-back" methodology (Sobell & Sobell,1992)
- **Alcoholics Anonymous Attendance:** Form 90 captured number of AA meetings attended at intake, 3, 6, 9, 12, 15m
- **Social Network Support and Activity measures:** These constructs were assessed using the Important People and Activities (IPA) Instrument (Clifford and Longabaugh, 1991). **This measure captures the drinking status and influence of the most important people in patients' networks along multiple dimensions including patients' social activities and whether they involved drinking**

Control variables

- Covariates:
  - Demographic:
    - age, gender, ethnicity, marital status, employment status
  - Clinical:
    - number of prior alcohol treatments, treatment assignment, treatment site, motivation, AA attendance, intake level of DV (4 social processes)

Data Analysis



- Ran separate models for OP and AC and for DDD and PDA
- Mediation tests conducted using MacKinnon (2002) approach (standardized product of a-b and b-c path weights)

Lagged Mediational Model: Variables must be significantly related

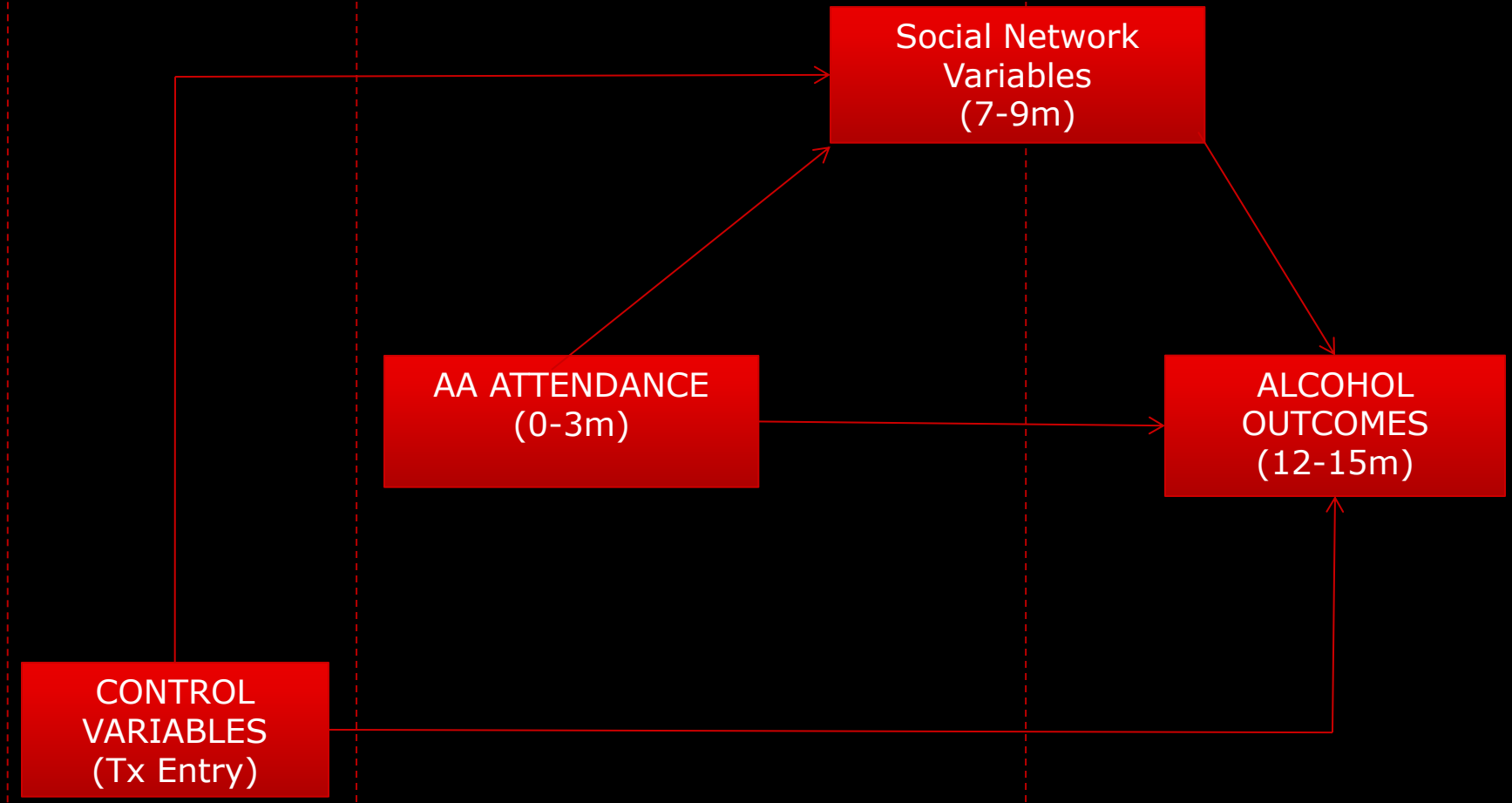


Table 1. GLM results for AA attendance (0-3m) predicting transformed PDA and DDD (13-15m) for the Outpatient and Aftercare samples

Variable	*b (se)*	t *(df)*	*p*
Outpatient Sample			
baseline PDA	.0046(.0005)	8.36(398)	<.0001
Lagged AA attendance	.0046(.0007)	5.83(409)	<.0001
Aftercare Sample			
baseline PDA	.0021(.0006)	3.21(481)	.0014
Lagged AA attendance	.0034(.0005)	6.49(462)	<.0001
Outpatient Sample			
baseline DDD	.0269(.0025)	4.33(462)	<.0001
Lagged AA attendance	-.0124(.0025)	-4.99(362)	<.0001
Aftercare Sample			
baseline DDD	.0237(.0052)	6.56(457)	<.0001
Lagged AA attendance	-.0118(.0018)	-6.37(465)	<.0001

Control and other variables included in models but not shown above include age, gender, ethnicity, marital status, employment status, number of prior alcohol treatments, treatment site, treatment assignment.

AA attendance during MATCH treatment predicted better alcohol outcomes at 15m irrespective of type of treatment received initially

Social Network Variables (7-9m)

AA ATTENDANCE (0-3m)

ALCOHOL OUTCOMES (12-15m)

CONTROL VARIABLES (Tx Entry)

Table 2. GLM results for AA attendance (0-3m) predicting network support (4-9m) for the Outpatient and Aftercare samples

Variable	*b* (*se*)	t (*df*)	*p*
Outpatient Sample			
baseline pro-abstinence network	.5564(.0595)	9.35(265)	<.0001
AA	.0107(.0021)	4.97(321)	<.0001
AA X baseline pro-abst network	-.0033(.0034)	-0.97(117)	.3345
Aftercare Sample			
baseline pro-abstinence network	.3583(.0754)	4.75(182)	<.0001
AA	.0058(.0014)	4.19(396)	<.0001
AA X baseline pro-abst network	-.0012(.0027)	-0.47(264)	.6402
Outpatient Sample			
baseline pro-drinking network	.2720(.0705)	3.86(415)	<.0001
AA	-.0064(.0021)	-2.97(300)	.0032
AA X baseline pro-drink network	-.0017(.0033)	-.53(427)	.5944
Aftercare Sample			
baseline pro-drinking network	.0900(.0611)	1.47(369)	.1413
AA	-.0044(.0012)	-3.56(216)	.0005
AA X baseline pro-drink network	-.0042(.0023)	-1.84(404)	.0664

Control and other variables included in these tested models but not shown above include age, gender, ethnicity, marital status, motivation for abstinence, employment status, number of prior alcohol treatments, treatment site, treatment assignment.

Table 2 (continued). GLM results for AA attendance (0-3m) predicting activities (4-9m) for the Outpatient and Aftercare samples

Variable	*b* (*se*)	t (*df*)	*p*
Outpatient Sample			
baseline abstinent activities	.3252(.0619)	5.25(253)	<.0001
AA	.0089(.0029)	2.98(269)	.0032
AA X baseline abstinent activities	-.0010(.0020)	-0.52(283)	.6067
Aftercare Sample			
baseline abstinent activities	.1826(.0745)	2.45(323)	.0172
AA	.0085(.0019)	4.43(171)	<.0001
AA X baseline abstinent activities	-.0050(.0019)	-2.62(207)	.0094
Outpatient Sample			
baseline drinking activities	.2166(.0613)	4.84(447)	<.0001
AA	-.0055(.0020)	-2.69(438)	.0074
AA X baseline drinking activities	.0011(.0028)	0.38(461)	.7055
Aftercare Sample			
baseline drinking activities	.1340(.0577)	2.32(430)	.0207
AA	-.0073(.0013)	-5.38(383)	<.0001
AA X baseline drinking activities	-.0031(.0023)	-1.35(370)	.1755

Control and other variables included in these tested models but not shown above include age, gender, ethnicity, marital status, motivation for abstinence, employment status, number of prior alcohol treatments, treatment site, treatment assignment.

AA predicted increases in pro-abstinent network ties and activities and decreases in pro-drinking ties and activities over and above initial levels and the effects of formal treatment

Social Network Variables (7-9m)

AA ATTENDANCE (0-3m)

ALCOHOL OUTCOMES (12-15m)

CONTROL VARIABLES (Tx Entry)

Table 3. GLM results for *network support/activities (4-9m) predicting PDA (13-15m) for the* Outpatient and Aftercare samples

Variable	*b* (*se*)	t (*df*)	*p*
Outpatient Sample (PDA)			
baseline pro-abstinence network	-.0400(.0126)	-3.18(407)	.0016
baseline pro-drinking network	-.0045(.0128)	-0.35(316)	.7258
baseline abstinent activities	.0135(.0100)	1.34(304)	.1822
baseline drinking activities	.0119(.0134)	0.89(395)	.3747
baseline PDA	.0044(.0005)	9.14(445)	<.0001
pro-abstinence network	.0693(.0124)	5.60(319)	<.0001
pro-drinking network	-.0972(.0122)	-7.97(428)	<.0001
abstinent activities	.0106(.0099)	1.06(262)	.2884
drinking activities	-.0222(.0174)	-1.28(309)	.2021
Aftercare Sample (PDA)			
baseline pro-abstinence network	-.0176(.0158)	-1.11(269)	.2667
baseline pro-drinking network	.0006(.0149)	0.04(340)	.9655
baseline abstinent activities	.0256(.0125)	2.05(340)	.0413
baseline drinking activities	.0466(.0166)	2.81(397)	.0051
baseline PDA	.0019(.0006)	3.45(347)	.0006
pro-abstinence network	.0395(.0147)	2.62(309)	.0076
pro-drinking network	-.1038(.0164)	-6.29(408)	<.0001
abstinent activities	.0262(.0123)	2.12(181)	.0350
drinking activities	-.0487(.0214)	-2.27(282)	.0238

[a] Control and other variables included in models but not shown above include age, gender, ethnicity, marital status, employment status, number of prior alcohol treatments, treatment site, treatment assignment, motivation, lagged PDA and lagged DDD.

Table 3(continued). GLM results for *network support/activities (4-9m) predicting DDD (13-15m) for the* Outpatient and Aftercare samples

Variable	*b* (*se*)	t (*df*)	*p*
Outpatient Sample (DDD)			
baseline pro-abstinence network	.0324(.0404)	0.80(435)	.4235
baseline pro-drinking network	.0374(.0406)	0.92(387)	.3585
baseline abstinent activities	-.0140(.0321)	-0.44(327)	.6633
baseline drinking activities	.0073(.0453)	0.17(380)	.8666
baseline DDD	.0331(.0061)	5.44(300)	<.0001
pro-abstinence network	-.0806(.0395)	-2.43(367)	.0158
pro-drinking network	.2649(.0401)	6.61(366)	<.0001
abstinent activities	-.0455(.0316)	-1.44(332)	.1501
drinking activities	-.0144(.0575)	-0.25(226)	.8032
Aftercare Sample (DDD)			
baseline pro-abstinence network	.0625(.0572)	1.09(256)	.2757
baseline pro-drinking network	.0442(.0546)	0.81(266)	.4187
baseline abstinent activities	-.0201(.0594)	0.45(319)	.6556
baseline drinking activities	-.1504(.0594)	-2.53(395)	.0117
baseline DDD	.0216(.0049)	4.43(438)	<.0001
pro-abstinence network	-.0697(.0623)	-1.16(77)	.2512
pro-drinking network	.2634(.0623)	4.23(234)	<.0001
abstinent activities	-.0560(.0483)	1.32(79)	.1859
drinking activities	.0993(.0749)	-1.16(417)	.2494

[a] Control and other variables included in models but not shown above include age, gender, ethnicity, marital status, employment status, number of prior alcohol treatments, treatment site, treatment assignment, motivation, and lagged DDD.

Increased Pro-drinking and decreased pro-abstinent network ties predicted greater abstinence and to a lesser extent less intense alcohol use

NETWORK TIES ONLY (7-9m)

AA ATTENDANCE (0-3m)

ALCOHOL OUTCOMES (12-15m)

CONTROL VARIABLES (Tx Entry)

Table 4. Lagged Mediational Tests: Proportion of Direct Effect (DE) of AA (0-3m) on subsequent alcohol use (13-15m) accounted for by each hypothesized social network mechanism(4-9m)

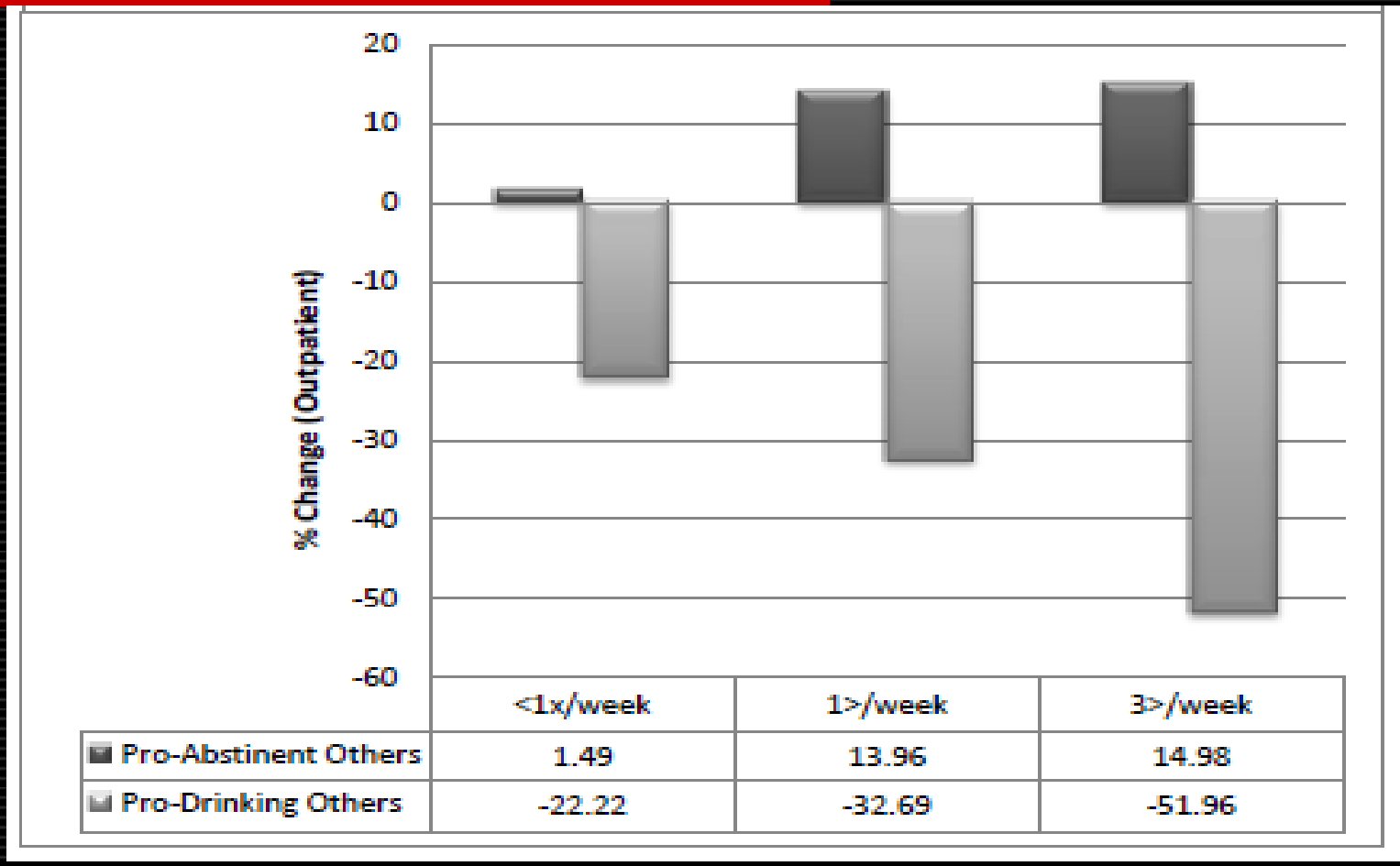
Similar mediation pattern for PDA across both arms, but among less severe outpts, AA may work more by increasing pro-abstinent network ties

AA's effect on reducing DDD worked by reducing pro-drinking network ties only

		Z Mack	p	% of DE mediated
OP (PDA)	Pro-abstinent network	3.72	<.01	16%
	Pro-drinking network	2.78	<.02	13%
	Abstinent activities	-	-	-
	Drinking activities	-	-	-
AC (PDA)	Pro-abstinent network	2.25	<.03	7%
	Pro-drinking network	3.10	<.01	13%
	Abstinent activities	-	-	-
	Drinking activities	-	-	-
OP (DDD)	Pro-abstinent network	-	-	-
	Pro-drinking network	-2.71	<.02	14%
	Abstinent Activities	-	-	-
	Drinking Activities	-	-	-
AC (DDD)	Pro-abstinent network	-	-	-
	Pro-drinking network	-2.72	<.02	12%
	Abstinent Activities	-	-	-
	Drinking Activities	-	-	-

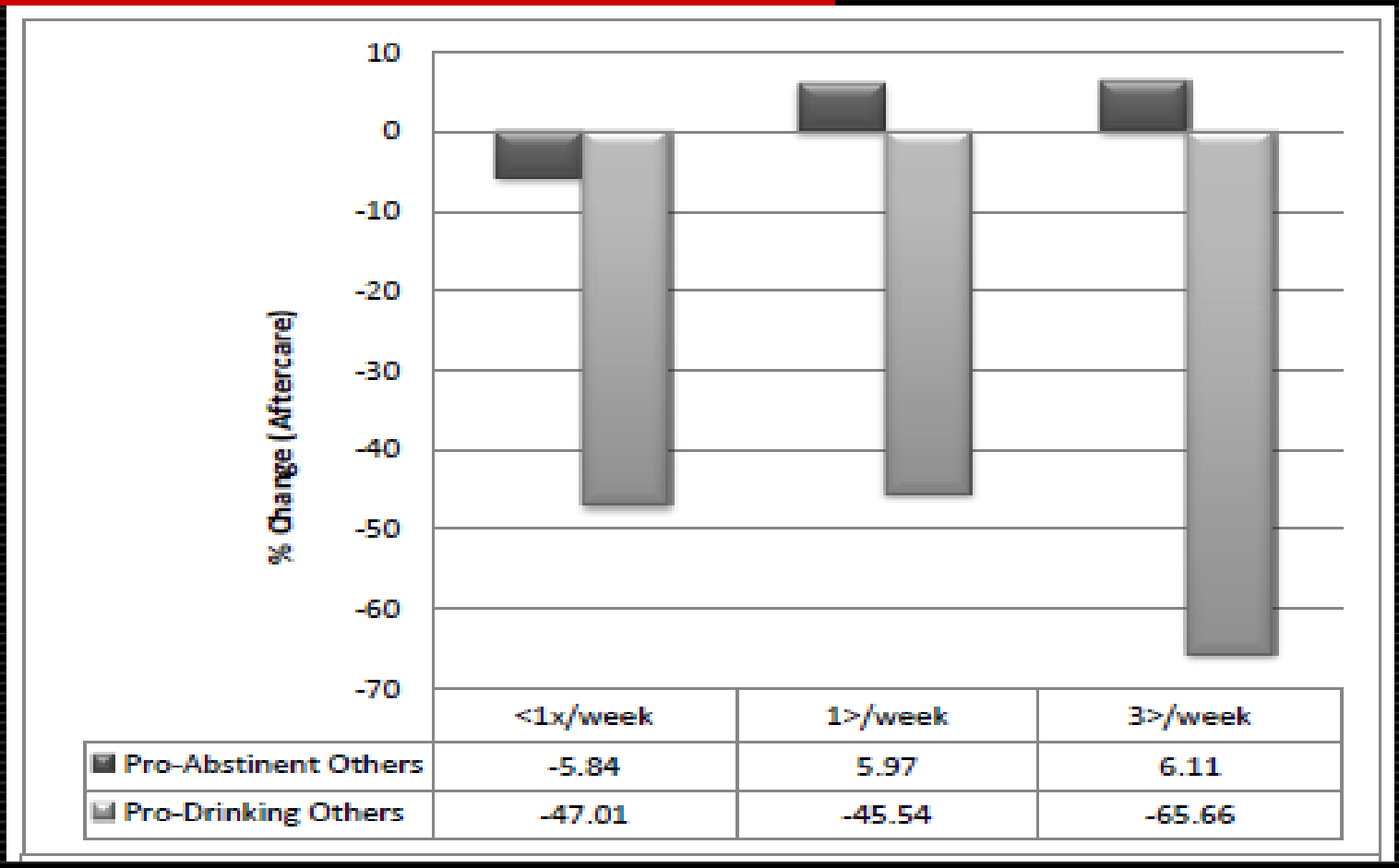
Less severe individuals may seek, or are able benefit from, greater engagement with pro-abstinent network members

Figure 2a. AA attendance and the % change in both pro-abstinent and pro-drinking network ties from treatment intake to the 9-m (OP sample)



	<1x/week	1>/week	3>/week
Pro-Abstinent Others	1.49	13.96	14.98
Pro-Drinking Others	-22.22	-32.69	-51.96

Figure 2b. AA attendance and the % change in both pro-abstinent and pro-drinking network ties from treatment intake to the 9-m (AC sample)



	<1x/week	1>/week	3>/week
Pro-Abstinent Others	-5.84	5.97	6.11
Pro-Drinking Others	-47.01	-45.54	-65.66

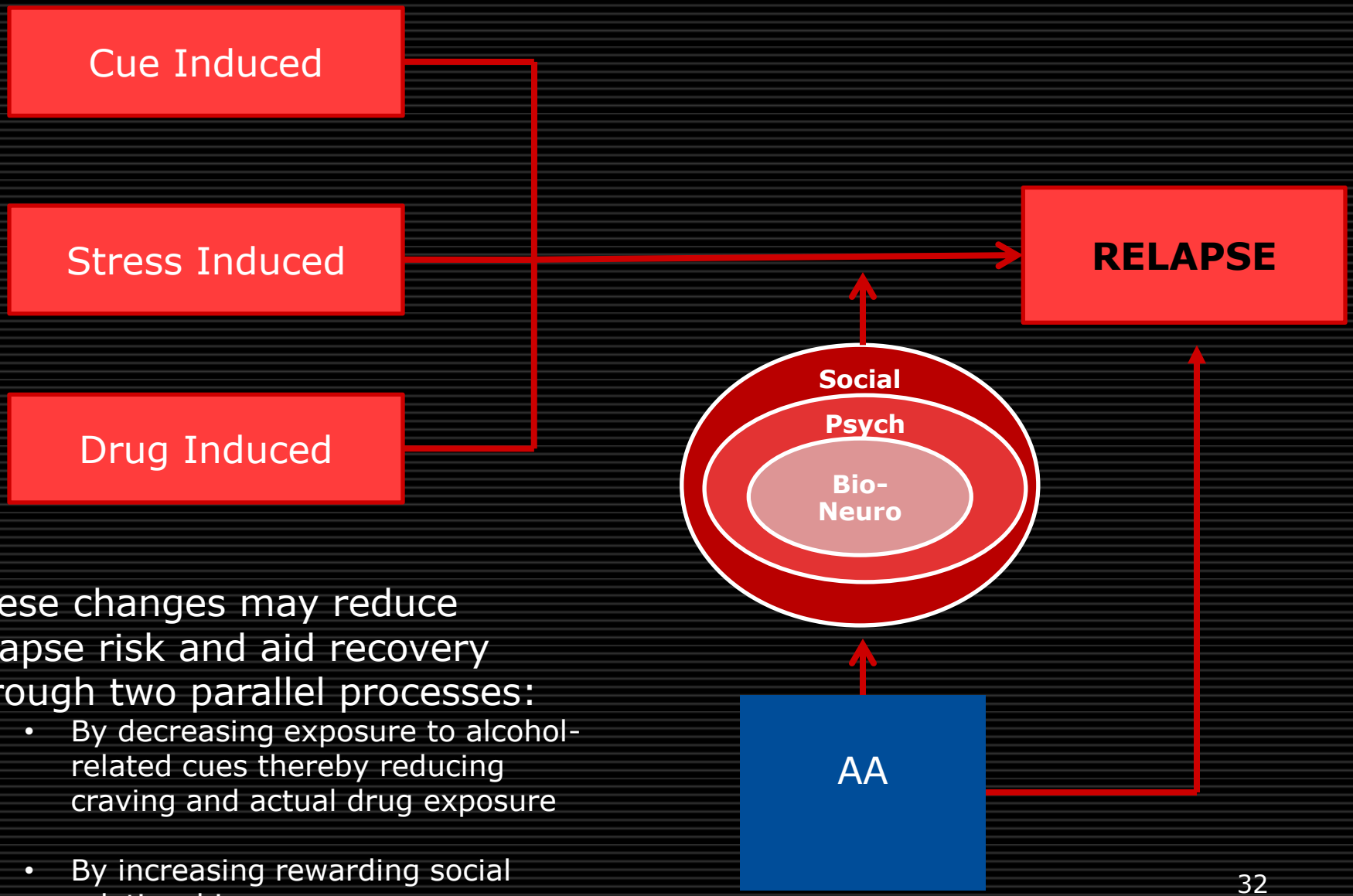
Results Summary

- AA attendance facilitated *decreases* in pro-drinking social ties and *increases* in pro-abstinent ties.
- AA attendance *reduced* engagement in drinking-related activities and *increased* engagement in abstinent activities
- However, when examined in the same model, activities' effects appeared to operate within the context of social network ties
- Thus, lagged mediational analyses revealed that it was by reducing pro-drinking ties and increases pro-abstinent ties that AA exerted its effect on abstinence and, to a lesser extent, on drinking intensity

Conclusions

- One pathway through which AA appears to facilitate recovery is by mobilizing adaptive changes in the social networks of attendees
- This appears to occur among individuals exhibiting a broad range of alcohol-related involvement and impairment.
- Specifically, by reducing involvement with pro-drinking ties but also increasing involvement with pro-abstinent ties - particularly for less severe pts in early recovery
- Thus, this social mechanism may be moderated by severity with less severe patients benefitting from AA not just by reducing pro-drinking ties but by more rapidly increasing pro-abstinent ties

Conclusions (contd.)



These changes may reduce relapse risk and aid recovery through two parallel processes:

- By decreasing exposure to alcohol-related cues thereby reducing craving and actual drug exposure
- By increasing rewarding social relationships

Thank you for your attention!