

Natural History of Alcohol Dependence and Remission Events for a Native American Sample*

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ABSTRACT. Objective: Examining the progression of a disorder cross-culturally may help distinguish elements common to addictions from those that are differentially shaped by culture. This study sought to construct a combined sequence of both problem emergence and recovery efforts with Native Americans. **Method:** In a cross-sectional sample, 44 adult Native Americans (61% men) who had resolved alcohol dependence completed face-to-face interviews at a research center. The Alcohol Related Behaviors Survey and the Change Effort Card-sorts along with measures of alcohol involvement and current quality of life were administered. **Results:** This sample's sequence of alcohol-related events was compared to that reported for Jellinek's historical white male sample ($r_s = .46, p = .001$), a recent Navajo sample ($r_s = .33, p = .024$), and a

recent Mission Indian sample ($r_s = .28, p = .24$). This sample's sequence of change efforts was compared to that in the Navajo sample ($r_s = .33, p = .182$). **Conclusions:** Despite the small sample size precluding generalizability, there was greater concordance between this intertribal sample and Jellinek's white male sample than between this sample and a Mission Indian sample, indicating both cross-cultural and intracultural variation. In addition, change efforts begin during the development of alcohol problems rather than waiting until the person "hits bottom," as suggested by previous research. Integrating the pathology of substance-use disorders with the process of resolving those disorders extends our understanding of the course of alcohol dependence. (*J. Stud. Alcohol* 67: 675-684, 2006)

UNDERSTANDING THE NATURAL HISTORY of alcohol dependence informs diagnosis, early detection, prevention, and treatment (Schuckit et al., 1995; Valliant, 1995). Cross-cultural examination of addictions may help distinguish both common elements and those differentially shaped by culture. Within and outside of Native cultures, focusing on drinking problems has led to negative stereotypes (e.g., Westermeyer, 1974) and pessimism about the likelihood of remission. More recently, research on change processes has suggested routes for the resolution of alcohol dependence (Bezdek et al., 2004; Fletcher, 2001; Prochaska et al., 1992; Quintero, 2000; Sobell et al., 1993; Valliant, 1995). Including change efforts highlights the resiliency of cultures and individuals (Hazel and Mohatt, 2001). Constructing a combined sequence of problem emergence and change efforts may offer a more complete picture of the course of alcohol dependence.

Development of alcohol dependence

Jellinek (1946, 1952) conducted the first empirical evaluation of the development of alcohol dependence, yielding a sequence of alcohol-related events ("symptoms"). Research-

ers have found partial support for Jellinek's progression (Orford and Hawker, 1974; Park, 1973; Park and Whitehead, 1973; Trice and Wahl, 1958). However, idiographic support is missing; individuals neither experience all alcohol-related events, nor experience them in the same order (Jellinek, 1952).

Schuckit and colleagues (2002) have argued for a unitary course of alcoholism across genders, severity of dependence, care, and comorbidity (Schuckit et al., 1995, 1998, 2002). In contrast, others have found evidence for dependence subtypes, characterized by varied courses (Babor et al., 1992; Cloninger et al., 1996; Jellinek, 1960).

Cultural and gender differences

Examining the robustness of addiction models across cultures provides evidence for the utility of current conceptualizations. Addiction models have historically been developed based on predominantly white American male samples. Replicability across cultures would inspire confidence in unitary models and concepts of addiction. Cultural differences in the development of alcohol dependence could clarify the impact of well-documented sociocultural differences in drinking practices (MacAndrew and Edgerton, 1969; Room and Mäkelä, 2000). Although a recent study reported very high correspondence in the course of alcoholism between a predominantly white American sample (Schuckit et al., 2002) and a Mission Indian sample (Ehlers et al., 2004), Venner and Miller (2001) found that the

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reliability of Jellinek's model was reduced as the culture and gender of the samples diverged from Jellinek's original sample of U.S. men. For example, Navajo who were highly acculturated (identified with mainstream culture) evidenced a higher correlation with Jellinek's model than those with lower acculturation (identified with traditional culture). These discrepant cultural findings merit further investigation.

Believing women's phases of alcoholism were more erratic than those of men, Jellinek (1952) excluded women from his models. However, researchers who have assessed Jellinek's model with women have reported significant gender differences in both mainstream (Piazza et al., 1986) and Native (Venner and Miller, 2001) cultures.

Pathways to resolving alcohol dependence

Although many researchers have examined the development of alcohol problems, much less is known about the sequential development of efforts to resolve those problems. In 1958, Glatt described a U-shaped curve depicting the descent into alcohol dependence as well as the ascent toward remission. Unfortunately, no data were provided for Glatt's remission progression.

Recently, Forcehimes (2004) used items from Glatt's (1958) recovery curve among Alcoholics Anonymous (AA) members and found support for Glatt's hypothetical sequence.

Combining development of alcohol problems and recovery

This article examined the interplay of the onset of alcohol-related behaviors and change efforts among Native Americans with alcohol dependence in sustained, full remission (according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision [DSM-IV-TR]; American Psychiatric Association, 2000). We specifically examined developmental sequencing of alcohol problem/dependence symptoms and efforts to resolve them. We also examined within-sample differences in sequencing related to gender and cultural identification and those found by other researchers.

Method

The authors conducted the 75 phone screens and 47 interviews. Recruitment efforts included strategies found to be useful with hard-to-reach populations (i.e., Heckathorn, 1997; Patrick et al., 1998), such as mailed letters and fliers, newspaper advertisements, and word of mouth. Before participation, all participants underwent a half-hour phone screening for substance dependence and abuse using the Structured Clinical Interview for the DSM-IV-TR (First et al., 2002). Of those participating in the 75 phone screens, 17 people (22.7%) were ineligible for being in early, full

remission (less than 1 year; $n = 13$), not meeting lifetime alcohol dependence ($n = 3$), or current drug dependence ($n = 1$). Nine participants (12%) were eligible but not scheduled because of time conflicts and inaccurate contact information. Three people (4%) began the interview but did not complete it because of cognitive limitations ($n = 2$) or non-attendance ($n = 1$) for the second appointment.

Participants who demonstrated alcohol dependence in sustained, full remission (according to the DSM-IV-TR; American Psychiatric Association, 2000); fluency in English; and no evident psychosis or dementia were encouraged to set up an appointment for the 3-5 hour interview at the University of New Mexico Center on Alcoholism, Substance Abuse, and Addictions. Participants were compensated \$50. Participants who traveled 25-50 miles and more than 50 miles were provided an additional \$20 and \$40, respectively, for travel expenses. This study was completed in compliance with the University of New Mexico's Institutional Review Board and with a certificate of confidentiality from the Department of Health and Human Services. All interviews were conducted during the period of March 2003 through February 2005.

Measures

Participants completed the following measures as part of a larger battery of questionnaires and interviews. First, participants completed a demographic questionnaire that gathered information about gender, current marital status, tribal identification, age, living situation, highest level of education achieved, employment, annual income, and first language.

Second, participants received a brief assessment of what their drinking patterns were during their self-reported heaviest 60-day drinking period (QFV-60, revised from Form 90 QFV-30 [Quantity, Frequency and Volume of drinking]; Miller, 1996; <http://casaa.unm.edu/inst/Form%2090%20QFV%2030%20days.pdf>). The four items of interest were quantity, frequency of drinking, frequency of heavy drinking (number of days during which they had five or more drinks), and social drinking (tendency to drink alone, sometimes with others, or generally with others). Supporting its concurrent validity, Grant et al. (1995) found that the quantity-frequency measure positively correlated with dependence and alcohol-related consequence measures, including a calendar timeline follow-back (TLFB) measure and Skinner and Horn's (1984) Alcohol Dependence Scale (ADS).

Third, participants completed the 25-item ADS reporting on their heaviest year of drinking. This measure has been found to have high internal consistency ($\alpha = .92$), high 1-week test-retest reliability ($r = .92$), and moderate convergent validity ($r = .69$) (Skinner and Horn, 1984). Moreover, the ADS is relied on in clinical and research settings to yield measures of drinking behavior that

correspond with DSM diagnoses of alcohol dependence (Allen and Columbus, 1995).

Fourth, participants completed an Acculturation Questionnaire (May, 1982), regarding their current ideas, thoughts, and practices. Developed for work with Navajo, Apache, and Pueblo youth residing in the southwestern United States, this measure is composed of 13 items, yielding scores from 12 to 31. Participants were rated on a polarity marked by identification with either mainstream (i.e., white) culture (maximum score of 12) or Native culture (maximum score of 31) on each extreme. Internal consistency for this sample was found to be high (Cronbach's $\alpha = .70$).

Fifth, participants completed the World Health Organization Quality of Life Survey (WHOQoL-BREF; WHOQoL Group, 1998). Composed of 25 questions, this measure yielded four subscales: physical health, psychological health, social relationships, and environment. Developed in 15 centers around the world, this measure has demonstrated moderate to high internal consistency (α 's range from .65 to .94) (da Silva Lima et al., 2005; Saxena et al., 2001; Skevington et al., 2004) and reliability (Guttman coefficients = .80-.90; Saxena et al., 2001) across a wide range of cultures and ages in community (Saxena et al., 2001; Skevington et al., 2004) and alcohol-dependent samples (da Silva Lima et al., 2005).

Sixth, participants completed the Alcohol-Related Behaviors Survey (ARBS). Developed by Venner and Miller (2001) and previously tested with a Navajo sample, the ARBS was composed of 55 cards including a combination of alcohol abuse and dependence criteria from DSM-III-R

(American Psychiatric Association, 1987) and events derived from Jellinek's (1952) phases. With a Native sample, Feldstein et al. (in press) found that the total score for this measure was highly correlated with alcohol dependence (ADS; Skinner and Horn, 1984) and alcohol-related consequences (Drinker Inventory of Consequences [DrInC-2R; Miller et al., 1995]) measures ($r = .74$ and $.64$, respectively).

Seventh, participants completed the Change Efforts Card Sort (CECS; Willoughby, 1996). The CECS was composed of 18 items depicting efforts to overcome a drinking problem. The CECS was developed by Venner and Miller for use with a Navajo sample (Willoughby, 1996). Data are not yet available regarding this measure's reliability and validity.

Results

Participants

Participants included 44 (61% men) adult American Indians with an average age of 48 years who met lifetime DSM-IV (American Psychiatric Association, 1994) criteria for alcohol dependence who had been in sustained, full remission for at least 1 year (see Table 1). On average, their annual income was \$30,915 with an range of \$700 to \$120,000. On average, the sample had achieved 10 years of abstinence at the time of interview. Participants were members of Southwestern Pueblo (36.4%), Athabaskan (36.4%), Midwestern/Plains (13.6%), Southwestern mixed with another (9.1%), and Northwestern (4.5%) U.S. tribes. Participants learned about the study through newspaper

TABLE 1. Sample demographics

Demographics	Mean (SD)	Median	Range
Age, in years	48.02 (7.66)	49.00	31.00-64.00
Annual income, in U.S. \$	30,915.37 (24,718.70)	28,000.00	700-120,000
Education, in years	13.91 (2.36)	14.00	9.00-19.00
Age of first drink	12.61 (3.88)	13.00	5.00-22.00
Age when began heavy drinking	25.14 (9.50)	22.50	12.00-48.00
Heaviest lifetime period of drinking			
ADS total score	27.58 (9.83)	26.00	9.00-45.00
Days drank, out of 60 days	49.84 (15.13)	60.00	4.00-60.00
No. of drinks per occasion	17.22 (13.41)	12.00	2.00-62.00
Days had >5 drinks, out of 60 days	42.18 (17.98)	46.50	4.00-60.00
Age of first change effort	21.89 (5.65)	21.00	13.00-35.00
Years of drinking until start of sobriety	12.76 (8.60)	13.25	1.00-31.25
Age at the start of sobriety	37.59 (8.50)	38.13	19.00-54.50
Length of abstinence, in years	10.47 (7.98)	9.13	1.00-28.00
	%		
Marital status			
Single	18.2		
Legally married/cohabiting	38.6		
Separated/divorced/widowed	43.2		

Note: ADS = Alcohol Dependence Scale.

advertisements (29.5%), fliers (20.5%), radio broadcasts (4.5%) soliciting "Native Americans who have overcome an alcohol problem," and word of mouth (45.5%).

Describing their heaviest lifetime period of drinking, participants reported having drunk on 83% of 60 days and having consumed an average of 17 drinks per drinking day (see Table 1). In accordance with common drinking practices, one drink was defined as one 12-oz serving of regular beer, one 4-oz serving of wine, or one 1.5-oz serving of 80-proof distilled spirits and may represent an underestimation as compared with the use of a standard drink (0.5 oz of ethanol per drink). During the heaviest drinking period in their lifetime, this sample reported drinking five or more drinks on 70% of 60 days. Their ADS (Skinner and Horn, 1984) scores reflected a substantial level of alcohol dependence with physical dependence likely. Most had drunk primarily with others ($n = 20$, 45.5%) or sometimes with others ($n = 16$, 36.4%), although a few were solitary drinkers ($n = 8$, 18.2%). Only one significant correlation emerged between length of sobriety and the alcohol and psychosocial measures (length of sobriety and ADS total score: $r = .32$, $p = .04$), indicating that drinking, related problems, and change efforts variables did not significantly vary by length of sobriety.

In terms of current functioning at the time of the interview, measures of cultural identity and quality of life are presented. Based on a single continuum, this sample fell in the middle range between mainstream and traditional identification (mean [SD] = 20.1 [3.7]). The majority of this sample continued to practice their tribes' traditional ceremonies ($n = 31$, 70.5%). Quality of life (maximum of 100) was reported as high in the domains of physical (mean = 79.9 [13.1]) and psychological health (mean = 81.3 [11.3]), social relationships (mean = 77.9 [15.4]) and environment (mean = 80.0 [12.7]).

Sequence of alcohol-related behaviors

Participants were administered the ARBS and the CECS sequentially using the card-sorting method of Venner and Miller (2001) and Yeager et al. (1992). Specifically, an interviewer presented the cards to the participant one at a time in a random order and queried the participant regarding whether they had experienced each and age of onset. Thus, each individual's chronological order of alcohol-related behaviors or change efforts was described.

Almost three quarters of the 55 alcohol-related events applied to most participants (mean = 40.6 [8.8] out of 55, median = 42.0). When looking across the samples' progression of alcohol-related events (see Table 2), participants reported their first drink (mean = 12.8 [4.7] years) and intoxication (mean = 14.1 [4.6]) in early adolescence. During their early 20s, they reported the beginning of their alcohol-related problems (i.e., blackouts, legal problems,

and drinking alcohol in risky situations). During their late 20s, their reports of clinical impairment and dependence items emerged: Most drank before going out, failed to meet responsibilities, and were regularly drinking in the mornings. Around this time, most participants also reported experiencing pressure from friends and family to reduce their drinking and a shift away from nondrinking friends and toward drinking companions. By their early 30s, 77% said they had "admitted defeat" (decided they could not control their drinking) for the first time. Items endorsed by approximately half of the sample or less concerned severe dependence items such as tremors, inability to make fine motor movements, and hallucinations, along with drinking nonbeverage alcohol (e.g., mouthwash).

Sequences of alcohol-related behaviors across gender and culture

Spearman's rank correlation coefficient compares the rank order of one sequence of events to another, so that a correlation of 1.0 reflects perfect correspondence and 0 reflects no correspondence. Comparing the development of alcohol-related problems for men and women in this multitribes sample, the Spearman's rank correlation coefficient ($r_s = .70$, $p < .001$) indicated concordance, with 48.4% shared variance suggesting gender similarities in progression. Post hoc t tests were conducted to test for gender differences at the item level. Three items yielded significant gender differences and in each case the item occurred earlier for women than for men: decrease in moral standards (mean = 22.5 vs 27.6; $t = 2.05$, 36 df, $p = .048$); change in their family's activities (mean = 22.7 vs 29.5; $t = 2.44$, 26 df, $p = .022$); and not thinking clearly (mean = 25.5 vs 32.2; $t = 2.37$, 29 df, $p = .025$). Differences could not be tested for the item "drinking nonbeverage alcohol," because only one woman and three men reported this behavior.

Listed in descending order of convergence, these data were also compared with the sequences of alcohol-related events reported for Jellinek's (1952) predominantly white community sample ($r_s = .46$, $p = .001$), Venner and Miller's (2001) Navajo sample residing in a detoxification facility ($r_s = .33$, $p = .024$), and Ehlers and colleagues' (2004) San Diego County Mission Indian community sample using 20 similar items ($r_s = .28$, $p = .24$). When comparing the resolved sample to Jellinek's sample, the largest difference was that "being generally afraid" occurred earlier for the resolved sample than for Jellinek's (32 out of 46 ranked positions). For example, being generally afraid was the ninth alcohol-related item to occur for our sample and number 41 for Jellinek's sample. Subtracting 9 from 41 yields a difference of 32 ranked positions out of a possible 46 items. Other items occurring markedly earlier for the resolved sample were as follows: low frustration tolerance (23 ranked

TABLE 2. Mean age of onset and percentage endorsing alcohol-related behaviors and change efforts

Order	Alcohol-related behavior/ change efforts	Mean (SD)	% endorsing	Order	Alcohol-related behavior/ change efforts	Mean (SD)	% endorsing
1	First drink of alcohol	12.8 (4.7)	100	37	Quitting jobs ^b	28.6 (7.2)	50
2	First intoxication	14.1 (4.6)	98	38	Tremors ^b	28.9 (7.6)	52
3	First blackout ^b	22.1 (9.4)	91	39	Feeling guilty about drinking ^b	28.9 (10.2)	98
4	Gulping drinks ^b	22.4 (6.8)	75	40	Realized hurting others ^a	28.9 (8.5)	100
5	Acting big ^b	23.1 (8.0)	73	41	Constant relief drinking ^b	29.0 (8.8)	91
6	Legal problems	24.4 (8.6)	89	42	Decided to cut down ^a	29.0 (9.6)	75
7	Drank in risky situations	24.5 (7.5)	93	43	Social/relationship problems	29.0 (8.0)	91
8	Blaming others	24.6 (6.9)	61	44	Regular morning drinking ^b	29.2 (8.7)	73
9	Moving away to escape problems ^b	24.9 (8.6)	50	45	Avoiding nondrinking activities ^b	29.3 (9.6)	73
10	Decrease in moral standards ^b	25.3 (7.9)	86	46	Promised others to change ^a	29.4 (7.7)	66
11	Heavy drinking episode, 2 days ^b	25.4 (8.6)	98	47	Avoided talking about alcohol ^b	29.5 (10.0)	50
12	Aggression ^b	25.4 (7.8)	89	48	Constant drinking ^b	29.5 (9.0)	80
13	Being generally afraid ^b	25.5 (8.9)	57	49	Drinking with inferiors ^b	29.6 (8.1)	75
14	Occasional relief drinking ^b	25.5 (8.9)	73	50	Not thinking clearly ^b	29.8 (8.2)	71
15	Quitting for a while ^b	26.0 (8.3)	86	51	First hospitalization ^b	29.8 (8.7)	43
16	Drinking in preparation ^b	26.0 (8.1)	84	52	Hallucinations ^b	29.9 (6.2)	30
17	Prescription medication ^a	26.3 (5.1)	25	53	Seeing friends differently ^b	30.3 (10.8)	71
18	Feeling sorry for yourself ^b	26.4 (8.7)	86	54	Prayed/asked for God's help ^a	30.4 (9.8)	96
19	Making excuses ^b	26.4 (9.1)	91	55	Dropping friends ^b	30.5 (9.2)	66
20	Low frustration tolerance ^b	26.4 (9.6)	77	56	Decided to stop drinking ^a	30.6 (8.8)	100
21	Not meeting responsibilities	26.5 (7.3)	84	57	Decreased sexual drive ^b	31.2 (6.5)	57
22	Quit for few days ^a	26.6 (8.1)	86	58	Talked with professional ^a	31.2 (9.2)	84
23	Secret drinking ^b	26.7 (8.5)	68	59	Loss of tolerance ^b	31.4 (8.6)	52
24	Loss of control ^b	26.7 (9.1)	93	60	Drinking nonbeverage alcohol ^b	31.5 (10.0)	9
25	Losing other interests ^b	27.1 (8.8)	82	61	Realized hurting self ^a	31.6 (9.1)	96
26	Change in family's activities ^b	27.3 (7.5)	64	62	Unable to make fine movements ^b	32.1 (7.2)	32
27	Strong jealousy ^b	27.4 (9.7)	61	63	Avoided drinking situations ^a	32.1 (9.3)	89
28	Continued drinking despite problems	27.5 (8.7)	98	64	AA or other 12 step ^a	32.4 (8.5)	84
29	Feeling bad often ^b	27.6 (10.1)	91	65	Admitted defeat ^b	32.5 (9.1)	77
30	Frequent blackouts ^b	27.7 (9.1)	80	66	Sweat lodge, sing, etc. ^a	32.6 (12.2)	46
31	Increased tolerance ^b	27.8 (8.9)	91	67	Avoided heavy drinkers ^a	32.8 (8.8)	71
32	Pressure from others ^b	27.8 (9.3)	80	68	Residential treatment ^a	32.9 (7.5)	50
33	Setting rules or limits ^b	27.9 (7.9)	71	69	Removed alcohol from home ^a	32.9 (7.8)	39
34	Hiding alcohol ^b	27.9 (9.7)	66	70	Read book/information ^a	33.4 (9.1)	68
35	Vague religious/spiritual desires ^b	28.2 (10.4)	75	71	Kept busy with other things ^a	34.3 (9.0)	82
36	Not eating right ^b	28.6 (8.6)	91	72	Detoxification program ^a	34.9 (6.0)	21

Note: AA = Alcoholics Anonymous. ^aDenotes a change effort; ^bJellinek items.

positions), geographical escape (20 ranked positions), not eating right (29 ranked positions), and heavy-drinking episode (≥ 2 days) (27 ranked positions). The items that occurred later were as follows: feeling guilty (22 ranked positions), constant relief drinking (29 ranked positions), avoiding talk about alcohol (25 ranked positions), and dropping friends (22 ranked positions).

When comparing the resolved sample to the Navajo detoxification sample, many large discrepancies were apparent. Three items differed more than 30 ranked positions: gulping drinks and acting big occurred earlier for the resolved sample, whereas dropping friends occurred later. Eight items differed more than 20 ranked positions. The resolved sample reported heavy episodic drinking, losing other interests, and a change in their family activities earlier than the Navajo sample. In contrast, the resolved sample reported quitting jobs, a low frustration tolerance, hallucinations, and loss of tolerance later than the Navajo sample. When comparing this resolved sample to the Mission Indian sample (20 similar items), the three most discrepant

rank orderings were as follows: legal problems (occurring 15 ranks earlier in resolved sample), social and relationship problems (occurring 14 ranks later in resolved sample), and dropping friends (occurring 14 ranks later in resolved sample).

Sequence of change efforts

The vast majority of participants began change efforts on their own without professional help (see Table 2). By their mid to late 20s, most reported that they realized their drinking was hurting others, reduced their drinking, tried quitting for a few days, and promised others they would change. Around age 30, most prayed or asked God for help and made their first decision to stop drinking.

For this sample, the first decision to quit was rarely successful in achieving sustained abstinence, but it did mark the transition to a new help-seeking stage. Realizing that drinking was hurting themselves as well as others, about four out of five sought some form of professional consultation

or went to their first AA meeting, and 68% sought out reading material and other information about alcoholism. Their early 30s were also characterized by stimulus control efforts (avoiding drinking places, avoiding heavy drinkers, removing alcohol from home) and using distraction strategies. If these efforts were unsuccessful, residential treatment, Native American healing ceremonies, or both often followed in the mid-30s. About 20% had used medical detoxification services. Of those who used a traditional healing ceremony, 30% had gone to a hospital or other program for detoxification services.

Sequences of change efforts across gender and culture

How similar were change efforts of men and women? The observed convergence ($r_s = .62, p = .006$; 38.9% common variance) supports similarity of recovery processes across gender within this multitribe sample. Post hoc *t* tests revealed no significant differences at the item level. We also compared our current sample with the sequence of change efforts reported by Venner and Miller's (2001) Navajo sample residing in a detoxification facility. The Spearman's coefficient ($r_s = .33, p = .182$) reflected only 10.8% of variance shared between these two Native American samples. The largest discrepancy was that the resolved sample decided to cut down 14 ranked positions (out of 18) earlier than the Navajo detoxification sample. Other change efforts that occurred earlier (7 ranked positions) for the resolved sample were praying, talking with a professional, and realizing their drinking was hurting themselves. The change efforts that occurred later for the resolved sample as compared with the detoxification sample were staying in residential treatment (7 ranked positions), reading material (11 ranked positions), and keeping busy (9 ranked positions).

The interplay between developmental and change sequences for alcohol problems

With alcohol-related problems worsening for this Native American sample around their mid-20s, it is unsurprising that the efforts to change their drinking commenced around the same period. Specifically, most participants (86%) began to test the waters of their alcohol problems by not drinking for a few days or more around age 27 (see Table 2). Around the same period of their emergent relationship problems in their late 20s, everyone realized that their drinking was hurting others and most began to promise other people that they would cut down their drinking. During their early 30s, this sample reported taking strides toward sobriety through praying or asking for God's help to overcome a drinking problem, deciding to stop drinking, and talking with a professional person (i.e., counselor, healer, doctor). Finally, during the period when

many in the sample had admitted defeat, they also reported engaging in multiple strategies such as staying away from places that encouraged drinking, going to AA, and keeping busy with other things in order not to drink. Less than half of the sample reported trying religious ceremonies, like sweat lodges and sings, or residential treatment centers.

Including both alcohol development and change effort items (73 items), acculturation effects were tested. A median split based on cultural identification scores from May's (1982) questionnaire was used to conduct Spearman rank order correlation coefficients. The obtained convergence ($r_s = .64, p = .001$) indicated similarity between those who were more traditional and those who were more acculturated.

In sum, this sample of Native Americans began drinking at age 13 and escalated to heavy drinking by age 25 (see Table 1). The present period of sobriety started at age 38, thus 13 years elapsing from the start of heavy drinking to sobriety. The age at which this sample first made an effort to change or overcome their drinking problem was 22 years. About 16 years passed between the first change effort and the onset of sobriety.

Discussion

To understand the normal course of resolving alcohol dependence, it is helpful to examine the sequence of problem development in relation to change efforts. Furthermore, there may be significant cross-cultural differences in how these sequences interact, and culture-specific studies are warranted. This study provided an opportunity to examine the sequences of problem development and of change efforts, as well as the interplay between the two.

Interplay between alcohol development and change sequence

Change efforts appear to begin during the development of alcohol problems rather than after the person "hits bottom" as suggested by the Glatt (1958) curve. To reflect this paradigm, we provided a new graphic representation of the natural history of alcohol dependence to include the interplay with efforts toward remission (Figure 1). After the onset of the first 12 alcohol-related behaviors, the first change effort, taking medication, occurred around age 26 (only 25% of the sample). The majority of the sample began their change efforts on their own by stopping drinking for a few days or more during the same year they experienced not meeting responsibilities and losing control. Many promised others they would quit drinking after experiencing relationship problems due to drinking. Two years lagged between the onset of spiritual desires and praying to overcome alcohol problems. Notably, by the end of the alcohol curve, the sample had tried an average of 13 out of 18 change efforts queried (range: 7-18 efforts). Furthermore,

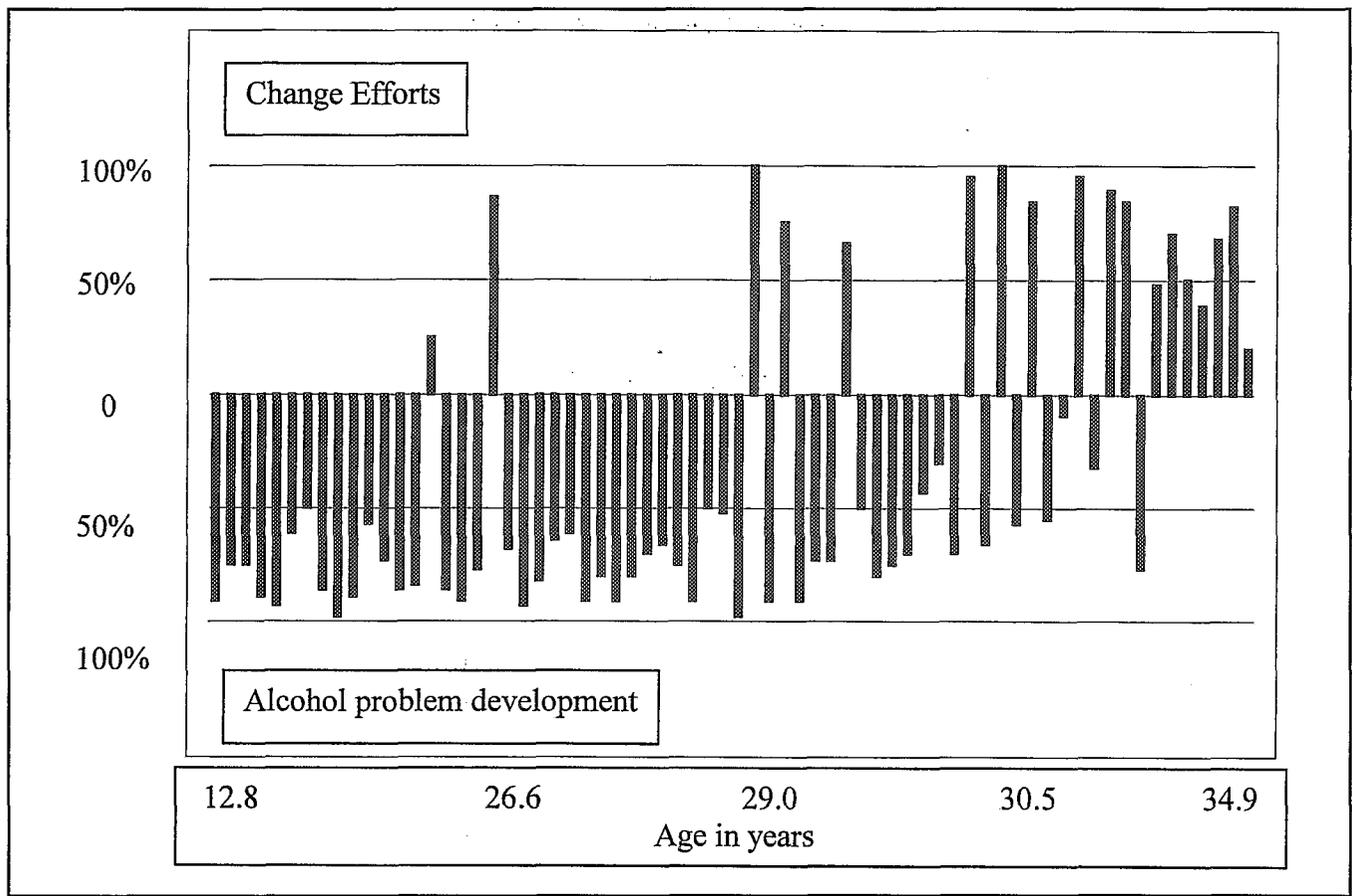


FIGURE 1. Interplay between development of alcohol problems (bars represent percentage endorsed and fall below x axis) and recovery events (bars above the x axis)

16 years passed from the age of first change effort to the onset of sobriety. After the onset of the final change effort, an average of 3 years elapsed before their final stage of abstinence began and an additional year claimed their alcohol dependence in full remission.

These findings are in concordance with the earlier study of Kamilla L. Venner examining the sequence of alcohol problems and change efforts in a Navajo sample in a detoxification facility (Willoughby, 1996). This juxtaposition revealed that, in general, change efforts began about halfway into the development of Jellinek's 46 alcohol-related behaviors. About two thirds of the change efforts had been tried *before* participants reached the end of their sequence of alcohol-related events. Thus, it appears that efforts to overcome drinking problems are a normal part of their progression, in contrast to popular conceptions of denial. This is in line with Schacter's (1982) finding that cigarette smokers averaged three to four serious quit attempts before they were able to maintain those changes. Indeed, unsuccessful attempts to quit or cut down are part of the diagnostic criteria for alcohol dependence (American Psychiatric Association, 2000) and thus represent a few events that are

characterized by both problem development and early efforts to change.

The variation in alcohol development and recovery sequences seemed to vary between and within ethnic heritage as well as gender. Comparisons across studies have indicated that differences in sequence may be more discrepant intertribally than cross-culturally (white vs Native American). Differences resulted between Native American (Venner and Miller, 2001, present recovered sample) and predominantly white samples (Jellinek, 1952) and were even greater between Native American samples that differed in both tribal enrollment as well as stage of recovery (Ehlers et al., 2004; Venner and Miller, 2001; present recovered sample). Two samples focused on a single tribal group (Ehlers et al., 2004; Venner and Miller, 2001), whereas the resolved sample was crosstribal. Furthermore, samples varied from reservation-based to near-reservation to urban living. Acculturation level appears more traditional for the Mission Indian sample living on the reservation (Venner, 2002), whereas the Navajo detoxification sample and the resolved sample fell in between traditional and acculturated identification (Venner and Miller, 2001). However, within the resolved, multitribal

sample, differences in cultural identification yielded similar sequences; therefore, factors besides culture are likely contributing to these discrepant sequences.

These variations in alcohol sequences indicate the need to attend to individual uniqueness and consider rival hypotheses. For example, rural versus urban residence may account for differences for a variety of reasons including the availability of AA meetings from which Jellinek's model (1946, 1952) was based. Another possibility is that level of treatment seeking is related to the development of alcohol dependence. For example, those in a detoxification facility primarily owing to protective custody have both a different course of alcohol dependence and a different change effort sequence than those who have resolved alcohol dependence. This resolved sample tried to reduce drinking earlier than did the detoxification sample, which may be associated with protective factors such as a lower threshold for alcohol problem recognition. Finally, only 20% of this resolved sample had ever experienced medical detoxification, which may account for differences between the course of alcohol dependence and remission with the Navajo sample.

In addition, gender differences were pronounced in the Navajo sample at a detoxification center (Venner and Miller, 2001) but not in the present recovered sample for either the alcohol or recovery sequences. Piazza and colleagues (1986) argued that Jellinek's model described women with alcohol abuse or dependence "in general" but may not describe subtypes (1986, p. 370). Other studies not using Jellinek's items have not found cultural (Ehlers et al., 2004) or gender differences (Ehlers et al., 2004; Schuckit et al., 1995). Despite these discrepant findings, care should be taken to ensure cross-cultural appropriateness of assessment and treatment procedures (e.g., Kinzie and Manson, 1987). Future research is needed to further understand how cultural differences, broadly speaking, influence the development and remission of alcohol problems.

Clinical implications

By the time people start therapy, many have already tried several strategies to change their drinking on their own. With these data indicating that people do not wait until hitting bottom to commence change efforts, at least two clinical recommendations emerge. First, professional counselors, therapists, and concerned significant others ought not to wait for intervention until the person with alcohol problems hits bottom or is "ready" to seek professional treatment. Given the likelihood the individual has already tried a number of strategies, counselors and therapists may intervene by asking what the person has already done to overcome alcohol problems. This is a natural entry to motivation and can guide future efforts by helping to assess the benefits of previous efforts and suggesting what else could be tried. Relatedly, remaining open to many possible change

strategies and pathways to recovery rather than championing one strategy seems to fit these data.

An early goal for family members and loved ones may be to help people realize that their drinking is hurting others (without nagging), as this was one of the first change steps in the change sequence. Perhaps these outside influences could increase the pace of the recovery process with a greater chance of success, especially if they use efficacious procedures such as those offered by the Community Reinforcement and Family Training (CRAFT) approach (Meyers et al., 2001). Prochaska and DiClemente (1992) concluded that pressure from others instigated change efforts, but as soon as the pressure was off, most people resumed previous drinking behaviors. Therefore, those who intervene should be aware of this likely outcome, but remember that resolving alcohol dependence involves an average of 13 out of the 18 change efforts we queried—it appears normative to try many strategies to overcome drinking problems before one is successful. In addition, helping patients realize how their drinking is hurting themselves remains an important goal, as this was temporal to the onset of many change events.

Limitations

The conclusions must be considered in light of the study's limitations. First, retrospective interviews involved recalling events sometimes occurring decades before the interview. Other researchers have also used retrospective data as a cost-efficient way to attain such data. Future prospective research is needed to overcome potential memory errors and document the onset of alcohol development and change-oriented events. Second, generalizability is precluded by small sample size, nature of self-referral, exclusion of other ethnic groups besides Native Americans, inclusion of any tribe, and the narrow focus on a group who had resolved alcohol dependence. This sample may be more representative of an urban Indian population as compared with the Navajo (Venner and Miller, 2001) or Mission Indian (Ehlers, et al., 2004) samples.

Conclusion

This study represents an important move to bring positive outcomes of addictions into focus as well as to broaden our conceptions of alcohol dependence to include the process of remission. As the field of addiction strives to move forward, we offer three recommendations. First, we need to consider the balance between reducing our addiction concepts to the core that is applicable across cultures and expanding our concepts to help explain cross-cultural differences. For example, previous authors have found similar developmental sequences of alcohol problem development across genders, diagnoses, treatment experiences

(Schuckit et al., 1995) and culture (Ehlers et al., 2004) with the explanation that they only used the objective items while omitting more subjective items. Venner and Miller (2001) and this present study found discrepant sequences of alcohol problem development between our Native American samples and Jellinek's (1952) predominantly white male sample as well as with another Mission Indian sample (Ehlers et al., 2004). It may be that using more subjective items will help explain the well-known findings of socio-cultural variability in drinking practices in general (MacAndrew and Edgerton, 1969) and among Native American tribes in particular (May, 1982; Spicer et al., 2003).

The second recommendation centers on Native American and other cultural groups. Most addiction research has focused on the damage wrought by alcohol abuse and dependence in general and with Native American populations in particular (notable exceptions include Bezdek et al., 2004; Hazel and Mohatt, 2001; Quintero, 2000). This study represents an early effort to embrace positive outcomes for Native Americans to provide a better understanding of the process of alcohol problem development and remission, counteract negative stereotypes, and highlight the hopeful message that Native Americans resolve alcohol problems. This is also an early effort to compare the progression into and remission from alcohol dependence in a heterogeneous urban/reservation Native sample with other more homogeneous Native samples. It is unclear what the differences in alcohol and change effort sequences among these Native samples mean. Future research examining potential subtypes of alcoholism and the relationship between different sequences and other variables such as severity of alcohol dependence and prognosis would lead to clearer intervention recommendations. Collaboration among researchers working with different populations would advance our understanding more rapidly.

The third recommendation involves broadening addiction concepts to include remission. Specifically, this study describes the sequential onset of change-oriented efforts in addition to the onset of alcohol-related problems. With the relatively new emphasis on remission from alcohol disorders, the integration of the pathology of substance-use disorders with the process of resolving those disorders promises to provide new insights and more holistic perspectives regarding etiology, course, prognosis, and treatment recommendations.

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