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The lingering effects of work context: Ambient work-unit characteristics and the impact of retirement on alcohol consumption

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Abstract

While it is well established that workplace demands and culture can affect employee well-being, to what degree might these same factors have lingering implications on individual wellbeing after employees retire? To begin to answer this question, in this paper we propose and test a model explaining how retiree alcohol consumption may depend on pre-retirement contextual conditions. Specifically, we propose and test a moderated-mediation model in which two ambient work unit characteristics—work-unit stress climate and work-unit drinking norms—moderate the indirect effects of retirement, via distress, on modal alcohol consumption (i.e., the typical quantity and frequency of alcohol consumed). Using a prospective study design and a multi-level, zero-inflated negative binomial model for predicting modal alcohol consumption, our findings lend partial support for the proposed model. We found retirement (vs. continued employment) to be associated with a heightened probability of being an abstainer after retirement eligibility (i.e., at Time 2), regardless of the hypothesized unit-level moderators. Still, retirement had mixed effects on the level of modal consumption among those not abstaining at Time 2, with these effects being partially mediated by distress and contingent upon unit-level stress climate and unit-level drinking norms.

Keywords

Alcohol; coworker norms; prospective design; retirement; stress climate

Alcohol misuse, namely the use of alcohol in a manner not consistent with legal or medical guidelines (WHO, 2017), is a serious health problem among older Americans, with direct healthcare costs exceeding \$20 billion per year (Yan, Xu, Ettner, Barnes, & Moore, 2014). At-risk and binge drinking prevalence for older adults (i.e., those aged 50) are estimated at 10% to 15% (Wu & Blazer, 2014). This is likely to worsen: the number of older adults with such problems is expected to increase from 1.7 million in 2010 to 4.4 million in 2020 (Han, Gfroerer, Colliver, & Penne, 2009). Moreover, the impact of alcohol on the body increases as individuals age due to physiological changes such as a decrease in total body water and a diminished ability of the liver to process alcohol (Kuerbis, Hagman, & Sacco, 2013).

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Although the factors explaining alcohol consumption in later life remain relatively unclear, retirement has been identified as potentially playing a key role (Kuerbis & Sacco, 2012). Several studies have found transition to retirement to be associated with heavier and more problematic¹ patterns of alcohol consumption than continued employment (e.g., Henkens, van Solinge, & Gallo, 2008). However, others found retirement to be associated with a reduction in alcohol consumption (Rodriguez & Chandra, 2006) or with no major shift in alcohol consumption or problem drinking (Platt, Sloan, & Costanzo, 2010). Such inconsistent evidence and the various factors potentially accounting for it have been extensively reviewed in the literature on retirement and alcohol misuse (e.g., Kuerbis & Sacco, 2012, Bamberger, 2015).

To address these inconsistent findings and identify the potential boundary conditions governing the relationship between retirement and drinking, we draw from social identity (Tajfel, 1978; Turner, 1982) and continuity (Atchley, 1989) theories to propose a model highlighting the lingering implications of pre-retirement work contexts on post-retirement alcohol consumption. Social identity theory suggests that retirement increases psychological distress to the extent that the pre-retirement work context reinforces a work-centric identity that hinders retirement adjustment. Psychological distress is defined here as the emotional and physiological reactions experienced when an individual confronts a situation in which the demands exceed his/her coping resources (Lazarus, 1993; Lazarus & Folkman, 1984). Continuity theory suggests that psychological distress experienced during the retirement transition exacerbates drinking behaviors to the extent that the pre-retirement work context precipitates or normalizes drinking in response to distress. Thus, consistent with the life course perspective, both theories suggest that pre-retirement work context may help explain the varying effects of retirement on drinking via distress.

Focusing on modal alcohol consumption, which captures the individual's typical quantity and frequency of drinking (Bacharach et al., 2010), we propose and test a moderated-mediation model (see Figure 1) in which ambient work unit characteristics condition the effect of retirement on drinking via distress. Ambient work unit characteristics refers to stimuli pervading the unit that are available to all unit members and that affect both individual- and unit-level processes (Chen & Kanfer, 2006). Two such characteristics are considered here. The first, *work-unit stress climate*, captures the degree to which unit members collectively experience interpersonal and task-related stressors at work (Bliese & Jex, 2002). High levels of collective workplace stress reinforce a work-centric identity at the expense of non-work identity domains (see, e.g., Kossek & Lautsch, 2012); therefore we examine this condition as a moderator of the link between retirement and distress. The second characteristic, *work-unit descriptive drinking norms*, captures the extent to which unit members' drinking is indicative of a sub-culture that supports and facilitates heavier patterns of alcohol consumption (Frone, 2013). It is examined here as a moderator of the link between distress and changes in modal alcohol consumption, on the grounds that permissive drinking norms in the pre-retirement work unit may legitimize and embed a repertoire of alcohol-based tension-reduction behaviors.

¹Problem drinking is defined as drinking behavior that causes (physical, psychological, social, legal, economic, and spiritual) problems for the individual, and/or his family and close others (Daley & Marlatt, 1997; Lee & Cranford, 2008).

We argue that the indirect effect of retirement on modal alcohol consumption via distress can be at least partially explained by two aspects of the pre-retirement work context: stress climate and permissive drinking norms. We test our model on a sample of 688 exempt employees from 51 work units in three employment sectors using a prospective study design, and a mode of analysis that differentiates the effects of retirement on abstinence from its effects on the level of consumption among those who drink.

In exploring the conditioning role of pre-retirement work-unit characteristics on the distress-mediated effects of retirement on alcohol consumption, our study offers several important theoretical and empirical contributions. First, most research on retirement adjustment examines whether and how individual attributes, job characteristics, and family and socio-economic factors influence retiree wellbeing (Wang & Schultz, 2010). Our model contributes to this line of research by explaining how lingering effects of the ambient work context may shape retirement adjustment and the wellbeing of older adults even after they disengage from the workforce. Second, we offer a theory-based explanation for inconsistent findings regarding the association between retirement and drinking behavior. Finally, our study offers an important empirical contribution by testing hypotheses on prospective data collected from a large sample of workers from a distributed set of diverse work units.

Retirement, psychological distress and drinking

The retirement transition is a dysphoric and stressful life event for many older adults in that it can threaten the individual's senses of agency, control, and self-identity (Wang, 2007; Wang & Shultz, 2010). In addition, retirement may be accompanied by financial (Belogolovsky, Bamberger, and Bacharach, 2012), marital (Kim & Moen, 2001), and social (Wang & Shultz, 2010) challenges.

Drawing on the stress and coping perspectives on alcohol misuse, the scholarly literature on retirement and retiree wellbeing suggests that alcohol is a potent and readily accessible means of self-medication when individuals are faced with retirement-related stress (Kuerbis & Sacco, 2012). Specifically, tension-reduction (Conger, 1956) and self-medication (Frone 2013) theories posit that psychological and physical stressors induce alcohol consumption to mitigate tension, strain, and pain (Frone, 2013). Alcohol may reduce tension, strain, and/or pain by reducing self-awareness and redirecting focus away from stress-producing cues (Frone, 2013).

Consistent with such a perspective, numerous studies suggest a link between retirement stress and drinking in retirement. For example several studies (e.g., Perriera & Sloan, 2001; Henkens et al., 2008) found a positive association between retirement and alcohol use. Moreover, in one of the few studies directly examining the impact of particular stressors on retiree drinking, Belogolovsky et al. (2012) found a positive association between marital and financial strain during the retirement transition and retiree drinking behavior. Taken together, these studies suggest that heightened levels of post-retirement alcohol consumption may be explained by individuals' use of alcohol as a coping device to regulate the negative emotions associated with retirement. Thus we posit:

Hypothesis 1: Psychological distress mediates the effect of retirement (vs. continued employment) on modal alcohol consumption.

Moderators of the effect of retirement on drinking via psychological distress

Despite the support noted above for the role of psychological distress in the relationship between retirement and alcohol consumption, empirical evidence suggests that this distress-mediated relationship may be conditional, not universal. For example, some studies found retirement (vs. continued employment) to be associated with a reduction in alcohol consumption (Rodriguez & Chandra, 2006), while others found that retirement does not predict any change in alcohol consumption (e.g., Brennan, Schutte, & Moos, 2010). These varying effects call for the investigation of moderators, with the goal of identifying for whom and under what conditions the distress-mediated relationship does or does not apply.

To date, research aimed at identifying moderators of the distress-mediated effect of retirement on alcohol consumption has focused largely on individual differences, with mainly inconclusive results. For example, studies examining the moderating role of problem drinking history have found both attenuation (Brennan et al., 2010) and amplification effects (Perriera & Sloan, 2001). Similarly, some studies focusing on gender differences have found women less likely than men to use alcohol to cope with stress (e.g., Cooper, Russell, Skinner, Frone, & Mudar, 1992), while others have found the opposite (e.g., Rodriguez & Chandra, 2006). Underlying these findings are arguments that for some retirement is not necessarily dysphoric (hence making alcohol-based coping unnecessary), or that while some individuals (e.g., men) may use alcohol as a basis for coping, others (e.g., women) may not (Belogolovsky et al. (2012). Accordingly, individual differences offer a rather limited explanation for the varying effects of retirement on alcohol consumption via psychological distress.

In the following sections, we draw from identity (Tajfel, 1978; Turner, 1982) and continuity (Atchley, 1989) theories to propose a model focusing on the lingering implications of pre-retirement work conditions. This model proposes unit-level pre-retirement contextual factors as an alternative set of moderators that explain the varying impact of retirement on older adults' modal alcohol consumption.

The lingering effects of unit-level pre-retirement work contexts

From a life course perspective (Elder, 1985), retirement serves as a central life transition in the context of the broader lifespan, with prior experiences influencing retirement adjustment (Wang, 2007; Wang & Shultz, 2010). That is, while the uncertainty and disruption that accompany retirement may generate negative emotional states such as distress (Kraaij, Arensman, & Spinhoven, 2002), pre-transition conditions (e.g., retirement planning, pre-retirement roles) can serve as risk or protective factors, either amplifying or attenuating the effects of the transition on distress.

Research on identity (Ashforth, 2000) and continuity (Atchley, 1989) in transition processes helps explain how the pre-retirement context may amplify or attenuate an individual's vulnerability to distress during the retirement transition. According to social identity theory (Tajfel, 1978; Turner, 1982), an important part of one's self-concept is derived from his or her membership in one or more salient groups. For many, the work context is the salient group, serving as the source from which the individual draws meaning and value in his/her personal life. From this perspective, retirement may create an "identity crisis" (Miller, 1965), requiring a search for a new personal identity beyond the work context (Cox, 1984). This search is a challenging psychosocial process, generating anxiety and discomfort as the person struggles to re-define who s/he is (Turner, 1978).

Indeed, consistent empirical evidence indicates that it is more difficult to sustain or create new meaning, values, and self-evaluations upon disengagement from the workforce among individuals whose personal identity prior to retirement centers on the work domain, with these difficulties impeding individual adjustment and well-being (for a review, see Wang & Schultz, 2010). For example, meta-analyses indicate that the more cognitively invested individuals are in their work, the more negative the impact of work disengagement on well-being (McKee-Ryan, Song, Wanberg, and Kinicki; 2005; Topa, Moriano, Depolo, et al., 2009). Summarizing these and other similar findings, Wang and Schultz (2010) conclude that "retirees' work role identity is negatively related to retirement transition and adjustment outcomes." Moreover, they suggest that conditions that intensify individuals' pre-retirement work-based identities and/or complicate individuals' interest or ability to develop "alternative salient identities" (p.178) may adversely affect the retirement transition and adjustment.

Continuity theory is grounded on the notion that individuals develop patterned approaches or repertoires for handling various types of situations, a notion consistent with research on behavioral automaticity and habit formation (Graybiel, 2008). Accordingly, it suggests that in adapting to transitions, middle-aged and older adults tend to use strategies developed from their past experiences to preserve and maintain existing internal and external structures. (Atchley, 1989). But rather than predicting a static pattern of behavior, continuity theory suggests that experiences and circumstances shape how individuals respond to changing conditions and situations as they age, including how they experience age-related transitions such as retirement (Kim & Feldman, 2000). As such, continuity theory suggests that patterned responses to distress prior to retirement may serve as a template for responses to distress in retirement.

The integration of the theoretical perspectives noted above suggests that (a) pre-retirement work context plays an important role in the varying effects of retirement on drinking via distress (tension reduction/self-medication theories); (b) retirement likely increases distress to the extent that the pre-retirement work context reinforces a work-centric identity, which hinders retirement adjustment (social identity theory); and (c) psychological distress experienced during the retirement transition is likely to exacerbate drinking to the extent that the pre-retirement work context routinizes and legitimizes drinking to cope (continuity theory). Here, we test this integrative perspective by focusing on two moderators of the link between retirement, distress, and drinking. Specifically, *work-unit stress climate* is examined

as a moderator of the link between retirement and distress because high levels of collective workplace stress are known to reinforce a work-centric identity that hinders retirement adjustment. *Work-unit descriptive drinking norms* is examined as a moderator of the link between distress and modal alcohol consumption in that permissive pre-retirement work-unit drinking norms can legitimize and embed a repertoire of alcohol-based tension-reduction behaviors.

Work-unit stress climate as a moderator of the retirement–distress relationship

In general, workplace climate constructs reflect a set of shared perceptions regarding the “relatively enduring quality of the environment” characterizing the work unit or the organization as a whole (Tagiuri & Litwin, 1968, p. 25). Distinct from affective or evaluative individual reactions, “climate reflects descriptive beliefs individuals hold regarding properties of their organizations... [and] captures the meaning employees ascribe to the overall pattern of organizational activities” (Seibert, Silver, & Randolph, 2004, p. 334).

Bacharach, Bauer & Conley (1986) define *stress climate* as those shared perceptions of stress stimuli characterizing the work unit. Perceptions of such stimuli are likely to be shared by members for several reasons including common exposure to work-related factors (e.g., unit policies, tasks and agents) that may serve as stress stimuli, and common supervision and information flow (Seibert et al., 2004). Additionally, dynamics relating to social availability (i.e., those based on social identity and self-categorization, as well as those based on attraction-selection-attrition) may also homogenize perceptions of workplace characteristics as more or less stressful.

Given that stress climate captures pervasive and shared experiences of stress, its implications on the individual employee differ from specific, individual-level stress experiences (Tucker, Sinclair, & Thomas, 2005). Specifically, evidence suggests that individual-level stress experiences are expected to both weaken work identification (Braine, & Roodt, 2011), and heighten distress, from which retirement likely offers relief (Wang, 2007). In contrast, the pervasive and shared experiences of stress among work unit members are expected to reinforce a work-centric identity at the expense of non-work identities which are key to retirement adjustment. Hence, work-unit stress climate is expected to enhance retirement-related distress, regardless of the stress experienced by an individual employee.

The social identity perspective suggests that stress climate represents one of the most critical forces at work in shaping and reshaping an individual’s basic goals and directions in life (i.e., their identities), beyond his/her personal experiences of stress. More specifically, social identity theory posits that employees internalize the normative expectations associated with their membership in a particular social unit at work, with work-related requirements and demands giving purpose, meaning, direction, and guidance to their lives (Ashforth, 2000). Building on these ideas, Ashforth and Humphrey (1993), posit that shared experiences of demands and stressors in the workplace stimulate internal (psychological) and external (organizational) pressures to identify with the work role. Burke (1991, 1996) highlights the role of stress experiences in identity changes, proposing that stress (e.g., work demands)

might lead to destruction of social ties and identifications (e.g., non-work identities), which produce distress and anxiety; this leads to the subsequent formation of a new (e.g., work-centric) identity, as a way to reduce distress. The shared sense of high demands among work-unit members likely facilitates this social identity-shifting effect as individuals tend to identify more with others in similar circumstances (McKenna & Green, 2002).

The shared and pervasive nature of stress climate is, for several reasons, expected to facilitate a work-centric identity even among employees who experience relatively modest levels of individual-level work demands. First, shared (rather than personal), experiences of stress dictate a normative standard in which work-related demands supersede non-work needs and values (see Kossek & Lautsch, 2012, for a review). These normative standards often explain why many employees put in long hours of face time at work, regardless of their personal job demands, simply to display loyalty, commitment and capacity relative to other employees (Maume, 2004; Burke & Cooper, 2008; Karreman & Alvesson, 2004). Second, these collective experiences facilitate the development of interpersonal attraction among unit members and hence the strengthening of work-based social networks. Finally, collective experiences of work demands and other stressors generate empathy, which increases enactment and involvement in the work domain (Ashforth & Humphrey, 1993) and further strengthens work-based social relations (Halbesleben & Wheeler, 2015).

A work-centric identity is maladaptive in the context of the retirement transition because it hinders the ability to sustain a consistent set of meanings, values, and self-evaluations once the work role is lost (Topa et al., 2009). Indeed, empirical evidence suggests that an individual's earlier life course protects against retirement-related distress to the extent that it offered opportunities to construct a personal identity around goals, interests, talents, expectations and relationships independent of work (Wang, 2007). A work-centric identity may also delay retirement planning and complicate the development of alternative social networks. Research on retirement planning suggests that spending time and effort actively planning for this process can reduce distress and improve adaptability by allowing individuals the opportunity to prepare for retirement emotionally (e.g., by developing a sense of control) and practically (by nurturing non-work networks of support; Wang et al., 2011). As noted by Wang (2007, p. 457), "non-work life spheres are important for retirement adjustment because they provide retirees with alternative salient identities after retirement and offer opportunities for postretirement engagement."

Overall, although retirement may provide some relief from specific, individual-level, job-based stressors (Wang, 2007), theory and empirical evidence suggest that a more demanding shared work context can place practical, social, and psychological constraints on the employee's ability to develop the salient non-work identities that are critical for successful retirement adjustment (Wang & Schultz, 2010). Accordingly, retirement-related stressors may be more disruptive for those retiring from units characterized by higher versus lower stress climates. Thus, we posit:

Hypothesis 2a: Work-unit stress climate moderates the relationship between retirement and psychological distress, such that the effect of retirement (vs.

continued employment) will be more detrimental among those affiliated with more stressful pre-retirement work units.

Work-unit drinking norms as a moderator of the distress–drinking relationship

Workplace drinking norms capture “the normative support within one’s work environment for the use of alcohol,” as reflected in actual substance use by members of one’s social network at work (descriptive norms), as well as the legitimacy attributed to a particular pattern of use by these same individuals (injunctive norms; Frone, 2013). Studies examining the impact of both descriptive and injunctive drinking norms on alcohol consumption generally support the notion that the alcohol-related normative context of the workplace is positively associated with the drinking behavior of its members both at work and away from it and can serve as a critical precipitating factor for employee alcohol misuse (Frone, 2013, Liu, Wang, Bamberger, Shi & Bacharach, 2015).

Building on continuity theory (Atchley, 1989), we suggest that the drinking norms characterizing the pre-retirement work unit may have important lingering effects on employees, influencing their responses to psychological distress even after they disengage from work. Specifically, continuity theory suggests that patterned responses to the structural contingencies individuals experience before retirement elicit the behavioral routines or stimuli-response repertoires that retirees carry into retirement. Hence, when retirees face situations or emotional states similar to those faced prior to retirement, they may use these behavioral routines or repertoires almost like habits. Indeed, Atchley (1989) suggests that habituation is the implicit psychological mechanism underlying this tendency to carry over behavioral patterns from one context to another, noting that “We learn habits that allow us to cope routinely with environmental idiosyncrasies” (p. 188).

Research in neuroscience lends strong support to the notion that culturally based rituals and regimes precipitate behavioral routines and patterns that can become habitual through learning and can be retained even when stimulus is removed (Graybiel, 2008). This suggests that individuals may initially engage in goal-directed behavior aimed at facilitating their response or adaptation to contextual cues. With repetition, certain behaviors operate largely outside of individual awareness when triggered by a particular cue (Graybiel, 2008). For example, in their research on newcomer sales associates, Liu et al. (2015) demonstrated that while drinking with clients was initially goal-directed behavior, in a relatively short period of time it generalized into a stable pattern of alcohol misuse.

Aside from providing a neurobiological explanation for at least some of the continuity in behavioral patterns observed by Atchley (1989), this research importantly suggests that older adults’ drinking behavior may not only be driven by tension reduction or social affiliation motives, but also be somewhat automatic, operating without the knowledge, awareness or conscious control of the individual (Bargh & Williams, 2006). To the extent that this is true, normative characteristics of the workplace known to precipitate employee alcohol misuse may also determine the impact of retirement on older adults’ drinking behavior.

Workplaces are considered to have more permissive drinking norms when a greater number of employees either drink or deem it acceptable to drink on a regular basis (Bacharach, Bamberger, & Sonnenstuhl, 2002). While employees may initially be motivated to drink for affiliation and social integration (Frone, 2013), over time such behavior may become automatized, with employees habitually linking alcohol with stress coping. Continuity theory and the neurobiological research noted above suggest that mental representations linking alcohol with such stress coping are unlikely to be deactivated simply because one disengages from work. Rather, they may carry over into retirement, with those retiring from work units with more permissive drinking norms continuing to automatically use alcohol as a response to distress and/or frame alcohol as a legitimate and reasonable coping mechanism. Accordingly, we posit:

Hypothesis 2b: Work-unit drinking norms moderate the relationship between psychological distress and modal alcohol consumption, such that a positive association between psychological distress and modal alcohol consumption is amplified among individuals associated with work units characterized by more permissive drinking norms.

Method

Sample

We obtained data from nine unions representing workers in three employment workforce sectors in the USA: transportation, manufacturing, and construction. Survey data were collected from a sample of individuals meeting their union's criteria for regular or early retirement-eligibility. The sample ranged in age from 42 to 70 (mean = 56). Empirical evidence suggests that the effects of significant life events often unfold over a two-year period (Bonnano, 2004); thus, telephone surveys were conducted twice, at approximately 6 months (+/- 2 weeks) before the retirement eligibility date (T1) and two years (+/- 2 weeks) after T1 (T2).

The total number of respondents at T1 was 1,279 (out of a target sample of 2,812; overall response rate=46%; 933 from the transport sector, 178 from manufacturing and 168 from construction). Of the 1,279 T1 respondents, 1,055 participated in the T2 survey (dropout rate=18%).² Of the 1,055 observations, 267 were excluded because participants were affiliated with work units failing to meet our two unit-level inclusion criteria—minimum 50% within-unit response rate and minimum of three participants from the work unit. Eighty-eight were excluded due to missing or invalid data on one or more core demographic or outcome variables, and 12 were excluded because they switched employers or their working status was unknown. Our final sample (n=688; 52% male) were employed in 51 work units at T1 (mean work unit size=28 employees). At T2, 206 of these had retired and 482 were still employed in their career jobs. Note that many of those eligible to retire at full benefits opted not to do so for a variety of reasons including feeling too young to do so (many entered their job before age 21 and could retire with full benefits at 30 years), social

²In order to ensure a low dropout rate, we periodically contacted participants to update contact information, and sent them a short newsletter featuring articles on retirement issues.

ties to work, desire to build stronger economic base before retiring, and spouse still working. In none of the unions studied were there any retirements based on down-sizing early retirement packages.

We checked for sample bias by testing for differences between those individuals dropped from the sample for any of the reasons above ($n=367$) and those who remained ($n=688$) (Goodman & Blum, 1996). There were no significant differences with respect to any of the theoretical or demographic variables in our analyses with the exception of baseline modal consumption. Although those who dropped out engaged in significantly less modal consumption at baseline, the odds ratio for this effect was very small ($OR=0.99$).

Measures

Dependent variable (T2)—Based on Bacharach, Bamberger, and Biron (2010), to assess *modal alcohol consumption* we calculated the product of responses to two items: (1) “On how many days in the last month did you consume an alcoholic beverage such as beer, wine or liquor” (frequency); and (2) “On those occasions when you drank alcoholic beverages, what was the average number of drinks consumed each time” (quantity). In order to ensure the standardization of an alcoholic beverage or drink, each time we asked about the consumption of an alcoholic beverage or drink, we supplemented the phrasing: “by which we mean a glass of wine, a shot of liquor, or a 1/2 pint or more of beer”.

Independent and Mediator variables (T2)—*Retirement* was assessed by asking participants whether they had retired. All those indicating they had retired ($n=206$; 30% of the effective sample) also indicated that they had (a) left their career job, and (b) started collecting retirement benefits. *Psychological distress* was assessed using Caplan et al.’s (1975) Somatic Complaint Scale (sample item = “how often in the last month have you experienced a sense of anxiety or nervousness?”; $\alpha=.85$; scale coded from *never* (1) to *frequently* (5)).

Unit-level moderators (T1)—Research indicates that individuals tend to draw signals about their ambient work environment from those with whom they have close associations, rather than from the formal organization or work unit as a whole (Bamberger & Biron, 2007). Unit-based cohort peers are often the source of these signals. In fact, a central tenet of research on organizational demography suggests that individuals who enter an organization at similar points in time or who are in the same phase of their organizational career “will typically be closer to and more influenced by each other” than by others entering or planning to leave at other or points in time (Harrison & Carroll, 2006, p. 148), and that these individuals will typically rely on their cohort peers for insights into the nature of their common work environment and norms (Pfeffer, 1983). Hence, unit-level moderators were assessed with respect to retirement-eligible cohort members of the work-unit.

Work-unit peer stress climate—To assess work-unit peer stress climate, we focused on stressors involving or highly visible to unit members, as Bliese & Halverson (1996) recommended. More specifically, we used three items drawn from the stress subscale of the Life Stressors and Social Resources Inventory (LISRES) (Moos & Moos, 1994). These

items capture work-related stressors that involve or that are likely to be noticed by unit members, including work demands and relational problems at work (e.g., “In the past year, how much has your life been troubled by troubles with the boss or coworkers”). For each item, participants provided answers on a Likert scale from 0 (*not at all troubled*) to 5 (*most troubled I’ve ever been*). We averaged responses to form a single score ($\alpha=.68$). In a multi-level data analysis, this stress-climate scale demonstrated the expected convergent validity, positively predicting both self-report psychological distress ($b=0.21$; $p<.01$) and depression ($b=0.23$; $p<.01$) at the individual level. We aggregated these individual scores to yield a single score for each work unit (mean r_{WG} across 51 work units = 0.73; median r_{WG} = 0.88; ICC(1) = 0.09; ICC(2)=0.54).

We assessed the construct validity of the unit-level stress climate variable using multi-level confirmatory factor analysis (MPlus: Muthén & Muthén, 2010). This analysis compared the fit of a three-factor model distinguishing between unit-level stress climate, satisfaction (Kahai, Sosoik, & Avolio, 2003), and collective efficacy (Jex & Bliese, 1999) relative to a one-factor model. Unit-level satisfaction was assessed using a 4-item measure based on Pond and Geyer (1991). Unit collective efficacy was assessed using a 17-item measure based on Sherer et al. (1982). The results indicate adequate fit for the three-factor model ($\chi^2_{(249)}=543.96$; CFI=.90; TLI=.89; RMSEA=.04; SRMR=.04), but not for a single-factor model ($\chi^2_{(252)}=1479.57$; CFI=.59; TLI=.55; RMSEA=.08; SRMR=.09) ($\chi^2_{(3)} = 935.61$; $p<.001$). Convergent validity is evident from the expected inverse correlations between unit-level stress climate and satisfaction ($r = -.10$; $p<.01$), as well as between unit-level stress climate and collective efficacy ($r = -.05$; $p<.01$).

Work-unit permissive peer drinking norms—These can be assessed both descriptively, focusing on alcohol use by members of one’s workplace social network, and injunctively, focusing on the normative approval of such alcohol use (Frone, 2013). We adopted the former approach, assessing work-unit drinking norms in terms of the pervasiveness of hazardous drinking among cohort members in the work unit at time T1. We opted to focus on hazardous drinking because descriptive norms are likely to be more salient to the extent that they are based on stronger behaviors (i.e., those whose consequences have clearer and more significant implications; Meyer, Dalal & Hermida, 2010). To the extent that such a pattern of drinking is more pervasive among unit cohort peers, individuals in that unit cohort are more likely to infer that heavier patterns of drinking are legitimate and acceptable (Frone, 2013). All study participants were asked about their average number of drinks consumed on those occasions when they drank alcoholic beverages in the last month. Based on this measure we calculated whether the participant engaged in hazardous drinking in the past month; consistent with prior studies (Kuerbis & Sacco, 2012), hazardous drinking for older adults was defined as more than one (women) or two (men) drinks at a time (Kuerbis & Sacco, 2012). Then, following Bacharach, Bamberger, and McKinney (2006), we computed *work-unit permissive drinking norms* as the proportion of cohort peers within the work unit that engaged in hazardous drinking in the past month (i.e., number of cohort peers engaged in hazardous drinking patterns/number of cohort peers in the unit).

Control variables (T1)—We controlled for several individual-level variables such as age, gender, and health/illness, which have been shown to be correlated with alcohol consumption (Frone, 2013). *Diagnosed illness* was assessed on the basis of the Lifetime History of Physician-Diagnosed Illnesses measure (11 items), an instrument used in epidemiological studies of older populations (Colsher & Wallace, 1990). To assess *household income*, at T1 individuals reported on an ordinal scale the total income they and their spouse/partner earned in the past year. To account for baseline modal alcohol consumption, we controlled for T1 modal alcohol consumption and, in models in which the outcome was T2 modal alcohol consumption, for whether or not participants used alcohol on a regular basis at T1. To account for baseline psychological distress, we controlled for T1 distress in models in which the outcome was T2 distress. Additionally, while our primary interest is in the moderating effects of the *level* (i.e., mean of individual responses across unit members) of work-unit stress climate and drinking norms, we took the *strength* of these factors (i.e., the extent to which individual responses vary between unit members) into account in all models tested below. Finally, because retirees experiencing very high levels of distress may lack the financial resources to purchase alcohol or be on medication limiting or precluding alcohol consumption (Kuerbis & Sacco, 2012), we controlled for a possible curvilinear association between distress and modal alcohol consumption.

Analytic strategy

We first investigated whether distress at T2 mediates the effect of retirement between T1 and T2 (vs. continued employment) on modal alcohol consumption at T2. However, since employees are nested in work units (Level 2), multi-level models were applied to investigate whether the Level 1 effects of retirement on psychological distress (*path a*) and the Level 1 effects of psychological distress on modal alcohol consumption (*path b*) vary across work units. Statistically significant variance in these effects across work units justifies the investigation of Level-2 moderators to explain between-unit variability in how retirement affects psychological distress and how, in turn, psychological distress affects modal alcohol consumption. Next, using cross-level moderated mediation models and centering all Level-1 and Level-2 variables (Raudenbush & Bryk, 2002), we investigated whether the effect of retirement on psychological distress (*path a*) is moderated by work-unit stress climate, and whether the effect of psychological distress on modal alcohol consumption controlling for retirement (*path b*) is moderated by work-unit drinking norms.

The main and moderated effects of retirement on psychological distress were assessed via linear multilevel random-coefficient models (Raudenbush & Bryk, 2002), using the SAS 9.4. MIXED procedure. In these models, we controlled for psychological distress at baseline, such that the analysis captures the effect of retirement (vs. continued employment) on changes in distress from T1 to T2. The main and moderated effects of psychological distress on modal alcohol consumption, as well as the total effect and moderated total effect of retirement on modal alcohol consumption were assessed via a multilevel zero-inflated negative binomial (ZINB) model utilizing SAS 9.5 NLMIXED. ZINB is appropriate when the dependent variable is count-based, and is characterized by over-dispersion and excessive zeros. It is a mixture model with two parts. The first part consists of a binary response model for predicting the probability of a zero count (vs. a nonzero-count). The second part consists

of a negative binomial model for predicting the full range of count data, accounting for the overlap in estimated zero counts (Hilbe, 2011).

In the current setting, the dependent variable is a zero-inflated count variable that integrates two distributions. One captures individuals who do not drink at T2 (i.e., abstainers) and hence are certain to have zero drinks at T2. The second distribution captures individuals who are non-abstainers at T2 and hence can have any number of drinks (including zero) at that time. Descriptive analyses of this outcome indicate that a ZINB model fits the data better (AIC=4210, BIC=4260; smaller is better) than other alternatives, such as the Poisson (AIC=13089, BIC=13121), negative binomial (AIC= 4382, BIC=4418) or zero-inflated Poisson (AIC=11084, BIC=11130) models. To account for possible impact of baseline values of modal alcohol consumption, we included an indicator for whether or not the participant reported to be abstinent at T1 as a covariate in the model for predicting T2 abstinence. Additionally, in the models for predicting the count of drinks at T2, we followed Venables and Ripley's (2002) approach and (a) used T1 consumption as a covariate; and (b) used the natural log of T1 consumption as an offset variable, hence modeling the participant-reported outcome values at T2 relative to those reported by the same participant at T1 (i.e., T2 consumption/T1 consumption).

Results

Descriptive statistics and zero-order correlations are summarized in Table 1. Noteworthy are the positive correlations between the level of work-unit drinking norms and modal alcohol consumption at both times ($p<.001$), whereas the level of unit stress climate was unrelated to modal alcohol consumption at both T1 and T2. Still, the strength of unit stress climate was significantly related to modal alcohol consumption at T2 ($p<.05$), with a stronger (less variable) stress climate associated with increased modal consumption at T2.

Probability of abstinence at Time 2

Also noteworthy are the general patterns of results based on the ZINB models we fitted to predict modal consumption (Models 1, 3, 4 and 6 in Table 2). These models predict simultaneously two types of processes with respect to modal consumption: the probability of being an abstainer at T2 and the extent of drinking among those who drink at T2. Only two variables consistently emerged as significant predictors of the probability of abstinence at T2. The first is whether or not the participant was drinking regularly at T1 (effect estimates range from -4.12 to -4.28 , $p<.001$ across all models)—those who drink regularly at T1 are less likely to be abstainers at T2. The second is retirement between T1 and T2 (effect estimates range from 1.38 to 1.59 , $p<.001$ across all models)—those who retire between T1 and T2 are more likely to abstain from drinking than those who do not retire, controlling for whether or not they were alcohol abstainers at baseline. None of these effects varied significantly between work units; any inclusion of random effects in the abstinence model yielded zero between-unit variability. Further, hypotheses testing for H1 and H2b yielded no significant results with respect to the abstinence model, as distress failed to significantly predict the probability of abstinence ($b=0.18$, ns) or to demonstrate any between-unit variability in its effect on the probability of abstinence. Hence, to simplify the discussion of

results and enhance computational speed for estimating the multi-level ZINB models, we removed non-significant fixed and random effects from the abstinence model. Below, we report the results with respect to the count model, which predicts the extent of drinking at T2 among non-abstainers.

Results of mediation analyses

H1 suggests that psychological distress mediates the effect of retirement (vs. continued employment) on changes in modal alcohol consumption. Table 2 presents the results of the mediation analysis (Models 2 and 3). These results indicate that neither the association between retirement and distress ($b=-.06$, ns), nor the linear association between distress and modal alcohol consumption ($b=0.24$, ns) were significantly different from zero, although the curvilinear association between distress and modal alcohol consumption was significant [$b=-0.31$; $p<.05$], suggesting an inverse-U-shaped relationship. Hence, H1 was not supported. This is not surprising, given that we posited that the distress-mediated relationship between retirement and change in modal alcohol consumption is likely to be moderated by unit-level factors. Indeed, the results of Models 1–3 show significant variability across work units with respect to both the *total effect* of retirement on changes in modal alcohol consumption (estimate=.75, $p<.05$), the effect of retirement on changes in distress (estimate=.01; $p<.05$), justifying the investigation of unit-level moderators of these effects. By contrast, between-unit variability in the effect of distress on modal alcohol consumption was only marginally significant (estimate=0.35; $p=.10$), failing to justify the investigation of unit-level moderators of this effect.

Analysis of stress climate as moderator

H2a suggests that retirement (vs continued employment) relates to increased psychological distress to the extent that the individual's work unit is characterized by a more stressful climate. The results presented in Model 5 support this hypothesis, showing that the level of work-unit stress climate significantly moderated the effect of retirement on distress (i.e., *path a* is moderated by work-unit stress climate; $b=.27$, $p<.05$). Consistent with H2a, simple slopes analysis (see Figure 2) indicates that when work-unit stress climate is low (1.5 SD below the sample mean), retirement is inversely associated with increased distress ($b=-0.28$, $p<.01$). Figure 2 illustrates the practical significance of these findings, showing a standardized difference of 0.48 (moderate; Cohen et al., 1988) in T2 psychological distress (controlling for T1) between individuals who retired from and those who remained employed in high-stress climates. In contrast, in high-stress work climates (1.5 SD above the sample mean), the effect of retirement on distress, while only marginally different from zero, was in the direction suggested by the hypothesis ($b=0.15$, $p=.10$). As shown in Figure 2, this simple slope corresponds to a standardized difference of 0.27 (small to moderate; Cohen et al., 1988). Overall, these findings are in line with H2a, suggesting that with respect to distress and relative to continued employment, retirement offers less of a relief and may be more harmful among individuals whose work units are characterized by a more (as opposed to less) stressful climate.

Work-unit drinking norms and curvilinear effects of distress

H2b suggests that psychological distress relates to increased alcohol consumption to the extent that the work unit is characterized by more permissive drinking norms. Our results fail to support this hypothesis. As noted earlier, between-unit variability in the effect of psychological distress on modal alcohol consumption was only marginally significant (see Model 3), failing to justify the investigation of unit-level moderators of this effect. Hence, Model 6 only includes the linear and quadratic effects (non-moderated) of psychological distress on modal alcohol consumption, controlling for retirement and its interactions with work-unit stress climate and work-unit drinking norms. The results indicate that psychological distress is significantly associated with increased alcohol consumption ($b = 0.26$, $p < 0.05$ for the linear effect; $b = -0.32$, $p < .01$ for the quadratic effect) in an inverse U-shaped manner (see Figure 3). Specifically, the association between psychological distress and modal alcohol consumption, while positive on average, attenuates to the extent that psychological distress increases.

Analyses of indirect, direct, and total effects

Analysis of the average indirect effect was conducted based on the procedures recommended by Preacher and Selig (2010) for assessing multilevel mediation using Monte Carlo methods. The results of this analysis indicate that the indirect effect of retirement on modal alcohol consumption through psychological distress is positive to the extent that the work-unit stress climate exceeds sample mean (e.g., $ab = 0.17$; .05 Monte Carlo confidence interval = [.02, .37] when unit-level stress climate is 2.5 SD above sample mean and distress is below sample mean); and negative to the extent that work-unit stress climate is below sample mean (e.g., $ab = -0.18$; .05 Monte Carlo confidence interval = [-.39, -.03] when work-unit stress climate is 1.5 SD below sample mean and distress is below sample mean).

Noteworthy is the indirect (Model 6) and total effects (Model 4) of retirement on modal alcohol consumption. The total effect was found to be significantly moderated by both work-unit stress climate ($b = 1.30$, $p < .01$) and drinking norms ($b = 3.60$, $p < .01$). While not a necessary condition for establishing moderated mediation, the results with respect to the moderated total effect provide additional support for our overall model by suggesting that retirement is associated with increased alcohol consumption to the extent that the individual's work unit is characterized by a more stressful climate and more permissive drinking norms (see Figure 4 for simple slopes analysis and practical significance). Among individuals whose work units were characterized by a more stressful climate and more permissive drinking norms, the total effect of retirement on modal alcohol consumption was found to be positive and significantly different from zero ($b = 1.89$, $p < .001$). The indirect effect established above (i.e., the mediating effect of retirement on modal alcohol consumption through psychological distress when unit-level stress climate is high) was found to explain 9% of this total effect. Among individuals whose work units were characterized by a low stressful climate and low permissive drinking norms, the total effect of retirement on modal alcohol consumption was found to be negative and significantly different from zero ($b = -2.31$, $p < .001$). The indirect effect established above (i.e., the mediating effect of retirement on modal alcohol consumption through psychological distress when unit-level stress climate is low) was found to explain 8% of this total effect.

The direct effects of retirement (i.e., the effect of retirement that remains after accounting for the mediator), sheds additional light on these findings. The results in Model 6 indicate that the main effect of retirement remains significantly different from zero ($b=1.59$, $p<0.01$) after accounting for the mediator. The interaction between retirement and unit-level stress climate also remains statistically significant ($b=1.22$, $p<0.05$), yet with reduced magnitude compared to the total effect shown in Model 4 ($b=1.30$, $p<0.01$). Finally, the interaction between retirement and work-unit drinking norms remains statistically significant with increased magnitude ($b=3.84$, $p<0.01$) compared to the total effect shown in Model 4 ($b=3.60$; $p<0.01$). Overall this suggests that while psychological distress is useful in explaining why the total effect of retirement on drinking varies depending on unit-level stress climate, it is not useful in explaining why the total effect of retirement on drinking varies depending on work-unit drinking norms.

Sensitivity analyses

Sensitivity analyses indicated that the results reported above did not appreciably change in either effect magnitude or statistical significance when taking either time of retirement or employment sector into account.

Discussion

We proposed that two aspects of the pre-retirement ambient work environment moderate the extent to which retirement leads to distress-induced drinking. Drawing from the social identity perspective, we suggested that retirement generates increased distress to the degree to which the work unit is characterized by a stressful climate—an ambient work context that is known to reinforce a work-centric identity at the expense of non-work domains, hence hindering retirement adjustment. Building on continuity theory, we suggested that distress experienced during the retirement transition is likely to exacerbate drinking behaviors to the extent that the pre-retirement work context is characterized by permissive drinking norms, which precipitate and normalize drinking in response to distress.

Our findings lend partial support to both propositions. Results indicated that retirement is associated with an increased probability of abstinence. More specifically, the probability of being an abstainer subsequent to retirement eligibility (i.e., at T2) is heightened among those who retire, regardless of abstinence status prior to retirement eligibility (T1). This is consistent with evidence suggesting that once individuals leave their work environments, some of the social situations in which drinking occurs (e.g., happy hour after work), as well as some of the social motivation to drink (e.g., to reinforce social bonds within one's work group), no longer exist (Bacharach, Bamberger, Cohen & Doveh, 2007). Hence, for some, retirement eliminates key drinking opportunities and motives, thus resulting in reduced consumption. And to the extent that for many, alcohol consumption while at work was moderate to begin with, this effect may in fact facilitate abstinence. However, we cannot discount the possibility that for some of those in our sample, retirement was prompted by some health-related issue which also required abstention.

Still, for those not abstaining, the association between retirement and alcohol consumption appears to be contingent upon the pre-retirement context and to operate partially via distress.

More specifically, our findings indicate that retirement has mixed effects on the level of modal consumption among those *not* abstaining at T2, with these effects partially mediated by distress and contingent upon the two ambient unit factors that we examined, namely work-unit stress climate and work-unit permissive drinking norms. Figure 5 summarizes the scientific model proposed by the current findings.

Consistent with the hypothesized model, we found that a stressful unit-level work climate amplified the association between retirement and distress, thus amplifying the association between retirement and the severity of alcohol consumption (i.e., greater severity of alcohol consumption to the extent that the pre-retirement work unit is characterized by a more stressful climate). However, in contrast to the hypothesized model, we found no evidence of unit-level variance in the association between distress and modal alcohol consumption and, therefore, no basis for estimating the conditioning effect of unit-level drinking norms on this relationship. Furthermore, we found the relationship between distress and modal alcohol consumption to be curvilinear, with the positive association between psychological distress and severity of consumption attenuating as a function of increasing distress. Nevertheless, we found evidence that the *total* effect of retirement on modal alcohol consumption *is* moderated by work-unit drinking norms in a manner consistent with our model: for non-abstainers, retirement is associated with higher levels of consumption among those exiting units with more permissive drinking norms, and with lower levels of consumption among those exiting units with less permissive drinking norms. These findings warrant further elaboration.

With regard to the conditioning role of work-unit stress climate, our findings that retirement-related distress is amplified by work units with more stressful climates and attenuated by those with less stressful climates directly contrast with stress process theories (Pearlin & Radabaugh, 1976) and empirical evidence (Wang, 2007) suggesting that retirement attenuates drinking as it eliminates (i.e., offers relief from) exposure to stressful work environments (Pearlin & Radabaugh, 1976). While such evidence focuses on personal stress, namely individual-level *demands*, the integrative perspective that we propose highlights the implications of stress climate on how individuals experience the retirement transition. Leaving a highly demanding job might facilitate relief and enhanced adjustment in retirement, but pervasive work-related stress that is shared among members of the work unit places significant constraints on employees' ability to develop salient non-work identities (Ladge et al., 2012). Thus, regardless of the relief afforded by retiring from a stressful job, a stressful work climate increases vulnerability to stressors associated with the retirement transition itself.

Consistent with the explanation above, in a post-hoc analysis the moderating effect of stress climate remained robust when controlling for these same stressors at the individual level and for the interaction between these individual-level stressors and retirement. Interestingly, we found individual-level stressors to be unrelated to post-retirement distress ($b = 0.02$, *ns*) and only marginally related to the extent of alcohol consumption ($b = 0.16$, $p < .10$). Moreover, individual-level stressors did not significantly moderate the effect of retirement on modal alcohol consumption: the interaction between individual-level stressors and retirement was not significantly different from zero ($b = -0.14$, *ns*), although its direction was consistent

with the notion of retirement as relief (i.e., retirement associated with reduced drinking to the extent that individual-level stressors were high). Overall, this supports the idea that a stressful climate increases employee vulnerability to retirement distress despite any relief afforded by retiring from a more demanding job.

Second, with regard to the association between distress and non-abstainers' alcohol consumption, we found an "n"-shaped, curvilinear relationship, in contrast to the positive linear effect suggested by our model: from low to mean levels of distress, increasing distress levels are significantly associated with increased consumption, albeit at a diminishing rate. This may be explained by the physiological limitations of older adults to metabolize alcohol as noted earlier (Kuerbis et al., 2013) and, hence, the likelihood that increased levels of consumption become more self-limiting. Furthermore, to the extent that extreme levels of distress in this population may be disproportionately health-related (Barnes, Alexopoulos, Lopez, Williamson, & Yaffe; 2006), health-based restrictions may account for the (non-significant) inverse association between distress and modal consumption at such heightened levels.

Finally, we found no evidence of a conditioning effect of permissive drinking norms on the distress-consumption relationship. However, among non-abstainers we *did* find a robust vulnerability effect of permissive drinking norms on the *total* effect of retirement on modal alcohol consumption. With regard to the non-significance of unit drinking norms on the distress-consumption relationship, it may be that *non-work* drinking norms (i.e., the norms governing drinking behavior in other social contexts), the salience of which do not necessarily diminish as a function of retirement, are what governs older adults' use of alcohol as a means by which to cope with distress. As for the moderation of the *total* effect, it appears that ambient unit drinking norms amplify the impact of retirement on modal alcohol consumption on the basis of some mechanism other than distress. One such mechanism may be reduced social control (Bacharach et al., 2002). To the degree that retirement frees older adults from the constraints of employment, it may be that particularly among those exiting work units with more permissive drinking norms, such freedom provides a heightened opportunity for alcohol consumption.

Theoretical and empirical contributions

Our findings offer theoretical contributions to several bodies of work. First, they offer a theory-based resolution to inconsistent findings regarding the impact of retirement on drinking behavior. More specifically, we found retirement to be detrimental among those exiting units with more permissive drinking norms and more stressful work climates, and beneficial among those exiting units with less permissive drinking norms and less stressful climates. The results also demonstrate, for the first time, what is often simply assumed in such models—that (under certain conditions) psychological distress is an important mediator explaining the effect of retirement on the severity of alcohol consumption among those not abstaining. Consistent with identity (Tajfel, 1978; Turner, 1982) and continuity (Atchley, 1989) theories, our findings lend support to the idea that the extent to which retirement generates or attenuates distress (and, in turn, affects alcohol-related behavior) is conditioned by pre-retirement ambient workplace conditions. Earlier attempts to isolate the boundary

conditions governing the retirement-drinking relationship focused primarily on individual-level factors as moderators of a direct retirement-drinking relationship and generated inconsistent findings. By explicating a distress-mediated model, we offer a more nuanced and robust explanation as to whether, when, and how retirement may be expected to affect alcohol consumption.

Additionally, our findings suggest that beyond the individual differences or personal job characteristics explored in previous research, unit-level ambient work contexts may have implications for individual behavior even after leaving the work unit. Specifically, extant studies suggest that work units characterized by aversive/stressful conditions or greater social availability may increase employees' alcohol-related vulnerabilities (see Frone, 2013, for a review). In the current study, these same conditions were found to have lagged effects on behavior even after the employee was no longer directly exposed to them. We are not proposing that ambient work environments always have lingering effects on the behavior of retirees, or that "high-risk" work contexts may impose their greatest costs well after the individual disengages from them. However, the integrative perspective proposed and supported by the findings suggests that these and other ambient workplace characteristics may have similar lagged, conditioning effects on a variety of affective and behavioral consequences of retirement.

Finally, our findings suggest that in seeking to understand how retirement affects drinking it is important to distinguish between those abstaining from alcohol after retirement and those continuing to drink. While our findings suggest that social identity and continuity theories contribute primarily to our understanding of this relationship among non-abstainers, they also offer some important insights into how these same theories may be used to explain abstinence.

Limitations and further research

The contributions noted above should be considered in the context of several study limitations. First, while our theoretical arguments are consistent with the perspective of retirement as a process rather than a discrete event (see Mutchler, Burr, Pienta, & Massagli, 1997), our study design ultimately collapses this process to two points in time (i.e., T1 and T2). Although this approach offers significant benefits over a cross-sectional comparison, such a design cannot fully encompass the nature of retirement as an adjustment process. Nevertheless, the prospective design does allow us to model the cross-level interaction of work-unit-level characteristics and individual-level effects of retirement.

Additionally, our sample consists of only retirement-eligible workers (at T1). While this is a reasonable choice for studying retirement-related issues, it poses difficulties with respect to the assessment of work-unit norms and climate variables because retirement-eligible employees are only a small portion of the work unit, and certainly not a random sample of employees from that work unit. Accordingly, our assessments of the unit-level ambient environment likely reflect, at best, a cohort-based representation of unit-level norms and climate.

Further, we based our theorizing regarding the conditioning effects of stress climate on the assumption that such climates intensify the kind of work-centric identity that has been found to adversely impact retirement adjustment (Wang & Schultz, 2010). In the interest of model parsimony, we neither modeled nor tested this identity-mediated moderation of the retirement-distress relationship by unit stress climate. We deem the exclusion of this mediated-moderation element from our model justified in that, decades of research consistently indicate that (a) an ambient environment characterized by demanding work conditions is conducive to the emergence of a more work-centric identity (Kossek & Lautsch, 2012), and (b) that such a work-centric identity, by delaying or precluding the development of alternative salient identities and making it more difficult for individuals to generate alternative, non-work-based social networks, adversely impact retirement adjustment (Schultz & Wang, 2010). Consistent with this idea, in secondary data analyses we found work-unit stress climate to be significantly associated with lower involvement in family-related activities ($b = -0.37$; $p < .05$), reduced contact with close family members other than spouse ($b = -0.74$, $p < 0.01$), enhanced pressure from family members to retire ($b = 5.07$, $p < 0.05$), and reduced likelihood of planning for retirement ($b = -0.80$, $p < .01$). Nevertheless, research is warranted on the effects of unit-level stress climate on employee identity and well-being.

Another possible limitation might concern the direct consensus approach taken in this study to measure work-unit stress climate. A referent-shift consensus model (Chan, 1998), might be an alternative approach for measuring this construct, whereby participants are asked to rate the demands experienced by people in their unit, instead of their own perceived experiences.

Additionally, the relatively low response rate at T1 (ZINB%) might limit the representativeness of the current sample and undermine the validity of our findings. Still, the response rate in the current study is consistent with response rates for surveys used in organizational research with the retention rate (82%) being higher than in most similar studies (Baruch & Holtom, 2008).

Overall, our findings offer a number of exciting new avenues for multi-level research on retirement adjustment in general, retirement and older adults' substance use and misuse, and retirement-related decisions. Some of these avenues involve (a) exploring other unit- and organization-level factors with the potential to moderate the impact of retirement on substance misuse, and (b) testing the degree to which unit and organizational norms (e.g., retirement norms) and climates (e.g., empowerment) moderate the impact of various individual-level antecedents (e.g., age, income) on the decision to retire.

Conclusion

The current study is the first to propose and test a model that highlights the lingering implications of pre-retirement work context on post-retirement drinking behavior. Our findings suggest that while retirement predicts a heightened probability of abstinence among older adults, it is also associated with higher levels of consumption among non-abstainers to the extent that the pre-retirement work context is characterized by a more stressful climate

and more permissive drinking norms, with some of these effects explained by the heightened level of distress that retirement may elicit. Beyond offering a theory-based resolution to the inconsistent findings regarding the impact of retirement on drinking reported in the literature, the results of the current study highlight the importance of designing targeted pre-retirement interventions that take into account the ambient context from which employees retire.

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Figure 1.
Theoretical model.

Figure 2.
Effect of retirement on psychological distress moderated by work-unit stress climate.

Figure 3.
Effect of psychological distress on modal alcohol consumption.

Figure 4.
Total effect of retirement on modal consumption moderated by work-unit drinking norms and stress climate.

Figure 5.
Model suggested by current findings.

Table 1

Descriptive statistics and zero-order correlations (N=688)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Modal alcohol consumption T1	17.88	37.61													
2 Modal alcohol consumption T2	19.10	34.26	.60***												
3 Psychological distress T1	1.75	.55	.05	.02											
4 Psychological distress T2	1.68	.56	.04	-.01	.62***										
5 Gender (1=male; 2=female)	1.40	.50	-.03	-.03	.29***	.20***									
6 Age	55.63	4.38	-.03	-.02	-.12***	-.05	-.19***								
7 Health (lower the better)	.93	.99	.02	-.05	.22***	.17***	-.02	.09*							
8 Retired	.31	.46	-.01	.02	.02	-.03	-.25***	.23***	.06						
9 Household income	10.9	1.72	-.02	0	-.13***	-.16***	-.17***	-.03	.02	.01					
10 Drinking regularly at T1	0.69	.46	.32***	.34***	.04	-.02	.12***	-.10***	-.07	-.04	.02				
11 Unit-level stress climate (level)	.73	.29	.01	-.05	0	.01	-.27***	-.10***	.06	.11**	-.04	-.03			
12 Unit-level drinking norms (level)	.20	.11	.15***	.12***	.08*	.02	-.09***	-.08*	-.03	.07*	-.01	.16***	.15***		
13 Unit-level stress climate (variance)	.58	.44	-.04	-.08*	.06	.05	-.09***	-.05	.06	.05	-.11**	-.02	.72***	.01	
14 Unit-level drinking norms (variance)	.16	.07	.15***	0.11	.06	.02	-.12***	-.06	.02	.08*	.02	.15***	.09*	.91***	-.04

Notes: SD = standard deviation; T = time.

* $p < 0.05$;** $p < 0.01$;*** $p < 0.001$

Multi-level mediation and cross level moderated mediation analysis (N=688, nested in 51 work units)

Table 2

Variables	Total effect X→Y Model 1			Multilevel mediation models				Model 4: Moderated total effect X→Y			Multilevel moderated mediation models			
	Est		SE	Model 2: X→M		Model 3: M→Y		Est		SE	Model 5: X→M		Model 6: M→Y	
	Predictors of abstinence			Predictors of abstinence		Predictors of abstinence		Predictors of abstinence			Predictors of abstinence		Predictors of abstinence	
Intercept	0.83**		0.23	-1.16**	0.26	0.66**	0.26	0.79**		0.22	-1.43**	0.29	0.80**	0.23
Drink regularly T1 (yes=1)	-4.13**		0.39			-4.17**	0.40	-4.28**		0.42			-4.26**	0.42
Retirement between T1 and T2 (1=yes)	1.38**		0.39			1.52**	0.40	1.59**		0.42			1.59**	0.42
Psych. distress at T1 linear				0.63**	0.03	-0.06	0.38				0.62**	0.03		
Psychological distress at T2 quadratic						0.49	0.37							
Intercept	1.72		1.05			1.77	0.98	2.27*		0.96			2.52**	0.96
Alcohol consump. at T1	-0.01**		0.001			-0.01**	0.00	-0.01**		0.00			-0.01**	0.001
Household income at T1	-0.04		0.03	-0.03**	0.01	-0.04	0.03	-0.05		0.03	-0.03**	0.01	-0.05	0.03
Gender (1=male; 2=female)	-0.55**		0.17	-0.03	0.04	-0.62**	0.12	-0.66**		0.15	0.03	0.04	-0.70**	0.15
Age	0.01		0.02	0.006	0.00	0.01	0.02	0.001		0.01	0.01*	0.00	-0.001	0.01
Physical health at T1	-0.04		0.05	0.04*	0.02	-0.07	0.05	-0.07		0.05	0.04*	0.02	-0.08	0.05
Retirement between T1 and T2 (1=yes)	-0.27		0.22	-0.06	0.04	-0.25	0.14	-0.21		0.12	-0.08	0.04	-0.23	0.12
Unit-level stress climate (level)								-0.89**		0.39	0.002	0.10	-1.80**	0.39
Unit-level stress climate (strength)(variance)								0.03		0.29	-0.04	0.06	0.04	0.29
Unit-level stress climate (level) × retire								1.30**		0.43	0.27*	0.12	1.22**	0.44
Unit-level drinking norms (level)								-1.79		1.05	-0.78*	0.40	-1.79	1.05
Unit-level drink norms (strength)(variance)								-1.45		1.70	1.10	0.60	-1.65	1.69

Variables	Total effect X → Y Model 1			Multilevel mediation models						Model 4: Moderated total effect X → Y			Multilevel moderated mediation models					
	Predictors of abstinence			Model 2: X → M			Model 3: M → Y			Predictors of abstinence			Model 5: X → M			Model 6: M → Y		
				Est	SE		Est	SE					Est	SE		Est	SE	
Unit-level drinking norms (level) × retire																		
Psychological distress at T2 linear							0.24		0.17							3.84**	1.23	
Psychological distress at T2 quadratic							-0.31*		0.15							0.26*	0.12	
Variance of level 2 intercepts	0.56**			0.01*					0.20*							-0.32**	0.12	
Variance of level 2 slopes (retirement)	0.75*			0.02*					0.04							0.07	0.06	
Variance of level 2 slopes (distress)									0.35†								0	
-2 log likelihood	4190			828.6					4150; Models 1-3 = 40(5)				782.4; Models 1-5 = 46.2 (6)			4104; Models 3-6 = 9(2)*		
The curvilinear effect of psychological distress																		
Simple slope at -2SD of distress							0.61*	(0.29)								0.65**	(0.24)	
Simple slope at -1SD of distress							0.42†	(0.22)								0.45**	(.17)	
Simple slope at the mean level of distress							0.24	(0.17)								0.26*	(0.12)	
Simple slope: +1SD of distress							0.05	(0.16)								0.06	(0.09)	
Simple slope: +2SD of distress							-0.13	(0.20)								-0.12	(0.12)	
Simple effect of retirement (i.e., difference between retirees and non-retirees) contingent by unit-level climate measures																		
Simple effect of retirement: high unit-level stress climate										.63*	(.31)		0.15†	(0.10)		0.57	(0.31)	
Simple effect of retirement: low unit-level stress climate										-1.05**	(.34)		-0.28**	(0.11)		-1.01**	(.31)	
Simple slope of retirement: high unit-level drink norms										1.05*	(.44)					1.11**	(0.44)	
Simple slope of retirement: low unit-level drink norms										-1.47**	(.45)					-1.57**	(0.45)	
Simple slope of retirement: unit-level stress climate and drinking norms high										1.89**	(0.44)					1.91**	(0.44)	

Notes: Est = estimation; SE = standard error; T = time; SD = standard deviation.

† p=0.10;

$10.0 > d$
**
 $5.0 > d$
*

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