

## Type-D personality mechanisms of effect: The role of health-related behavior and social support

Lynn Williams<sup>a,\*</sup>, Rory C. O'Connor<sup>a</sup>, Siobhan Howard<sup>b</sup>, Brian M. Hughes<sup>b</sup>,  
Derek W. Johnston<sup>c</sup>, Julia L. Hay<sup>c</sup>, Daryl B. O'Connor<sup>d</sup>, Christopher A. Lewis<sup>e</sup>,  
Eamonn Ferguson<sup>f</sup>, Noel Sheehy<sup>g</sup>, Madeleine A. Grealy<sup>h</sup>, Ronan E. O'Carroll<sup>a</sup>

<sup>a</sup>Department of Psychology, University of Stirling, Stirling, United Kingdom

<sup>b</sup>Department of Psychology, National University of Ireland, Galway, Ireland

<sup>c</sup>School of Psychology, University of Aberdeen, Aberdeen, United Kingdom

<sup>d</sup>Institute of Psychological Sciences, University of Leeds, Leeds, United Kingdom

<sup>e</sup>School of Psychology, University of Ulster at Magee College, Londonderry, Northern Ireland

<sup>f</sup>School of Psychology, University of Nottingham, Nottingham, United Kingdom

<sup>g</sup>School of Psychology, Liverpool John Moore's University, Liverpool, United Kingdom

<sup>h</sup>Department of Psychology, University of Strathclyde, Glasgow, United Kingdom

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### Abstract

**Objective:** To (a) investigate the prevalence of type-D personality (the conjoint effects of negative affectivity and social inhibition) in a healthy British and Irish population; (b) to test the influence of type-D on health-related behavior; and (c) to determine if these relationships are explained by neuroticism. **Methods:** A cross-sectional design was employed; 1012 healthy young adults (225 males, 787 females, mean age 20.5 years) from the United Kingdom and Ireland completed measures of type-D personality, health behaviors, social support, and neuroticism. **Results:** The prevalence of type-D was found to

be 38.5%, significantly higher than that reported in other European countries. In addition, type-D individuals reported performing significantly fewer health-related behaviors and lower levels of social support than non-type-D individuals. These relationships remained significant after controlling for neuroticism. **Conclusion:** These findings provide new evidence on type-D and suggest a role for health-related behavior in explaining the link between type-D and poor clinical prognosis in cardiac patients.

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### Introduction

Clinical risk factors for cardiovascular disease (CVD) are well documented (e.g., high blood pressure, diabetes, high cholesterol) [1–3]. In addition, research has also focussed on establishing psychological risk factors for CVD (e.g., depression [4], social support [5], hostility [6]). However,

there has been considerable uncertainty regarding the role of personality factors and risk of CVD. Much of this uncertainty stems from the controversy surrounding the contradictory findings regarding whether type-A behavior led to the development of coronary heart disease (CHD) (e.g., [7,8]). More recently, there has been resurgence in the interest in personality as a risk factor in the long-term prognosis of cardiac patients with the introduction of the “distressed” personality type or type-D [9]. Developed by Denollet, type-D refers to individuals who simultaneously experience high levels of negative affectivity (NA) and high levels of social inhibition (SI). In other words, type-D

\* Corresponding author. Department of Psychology, University of Stirling, Stirling FK9 4LA, United Kingdom. Tel.: +44 0 1786 466853; fax: +44 0 1786 467641.

E-mail address: lw18@stir.ac.uk (L. Williams).

individuals are thought to experience negative emotions and inhibit the expression of these emotions in social interactions, suggesting that it is not merely the presence of NA that should be considered as a risk factor but also how an individual copes with his or her negative emotions.

A series of studies conducted over the last 10 years by Denollet et al. has shown type-D to be predictive of adverse clinical and psychological outcome in cardiac patients. For example, in a 6- to 10-year follow-up study, cardiac patients who were initially classified as type-D had a fourfold mortality risk compared with non-type-D patients [10]. In a 5-year prospective study in a new sample of over 300 patients with CHD, three factors emerged as significant predictors of cardiac death or nonfatal myocardial infarction: left ventricle ejection fraction <50% (odds ratio=3.9), age <55 years, (odds ratio=2.6), and type-D (odds ratio=8.9) [11]. In a recent study of over 300 CHD patients, Denollet et al. [12] again found type-D individuals to have an increased risk of death or infarction at 5-year follow-up compared with non-type-D patients, independent of disease severity.

Type-D personality has also been linked to psychological distress in CHD patients, including symptoms of social alienation and depression [13,14], anger and anxiety [15], pessimism [16], and vital exhaustion [17]. In addition, type-D is a prognostic factor for the development of cancer in men with established CHD [16]. There is also evidence to suggest that cardiac patients with a type-D personality report having a poorer quality of life at 5-year follow-up postcardiac event [11]. In short, the evidence strongly suggests that cardiac patients with a type-D personality are at risk of psychological distress and are at increased risk of cardiac morbidity and mortality.

The type-D construct has been criticized by some theorists who argue that type-D personality is simply another measure of NA, or neuroticism, which tells us nothing new about the psychological risk factors associated with CVD [18]. However, Denollet argues that it is the *combination* of NA and SI that is crucial. A recent study of cardiac patients provided further support for the type-D construct by demonstrating that it is the interaction between high SI and high NA rather than negative emotions alone that predicted death, MI, and repeat revascularization at 9-month follow-up [19].

Although there is growing evidence to suggest a potential link between type-D and CVD, it is unclear which specific mechanisms relate type-D to CVD. These may operate (a) directly through psychophysiological factors, such as cardiovascular reactivity; or (b) indirectly through psychosocial mechanisms. Evidence in favour of (a) is provided by Habra et al. [20], who showed that the components of type-D—NA and SI—were related to dampened heart rate change and increased blood pressure reactivity in healthy men.

The current study investigates two possible psychosocial mechanisms (health-related behavior and social sup-

port) that may help to explain the link between type-D and adverse outcome. Health-related behavior represents one obvious possible mediator of the relationship between type-D and ill health. type-D patients may be more likely to engage in maladaptive health behaviors, such as smoking, not taking exercise, and having a bad diet. Therefore, type-D personality could lead to a poorer prognosis in CVD patients by influencing lifestyle choices and practices. Not only would establishing a relationship between type-D and health behavior be important in explaining a possible mechanism between type-D and ill health, but it may also suggest that type-D is a risk factor for poor health in general. Furthermore, the type-D construct has previously been criticized as not providing an obvious opportunity for treatment strategies [18] due to the fact that personality is generally considered to be stable across time and situations. However, if type-D is associated with health-related behavior, then this would provide a clear target for intervention, as health behaviors are potentially modifiable.

To date, the relationship between type-D and health behaviors has not been investigated specifically. However, Pedersen et al. [21] found a relationship between type-D status and smoking in their study of CHD patients. type-D individuals were more likely to smoke compared with non-type-D individuals (37% vs. 29%). In addition, it is known that socially inhibited individuals are less likely to engage in health-promoting behavior [22]. Therefore, a study investigating the relationship between type-D and health behavior is timely.

A further mechanism by which type-D may influence health outcomes is via social support. Social support can refer both to the number of a person's social contacts and their quality (including emotional and confiding support). People with type-D personality are known to experience higher levels of perceived social alienation and to be more socially withdrawn than non-type-D individuals [12], which may in turn lead to reduced social support. A number of studies have demonstrated that social support is vital for optimal health status. For example, an inverse association has been demonstrated between social support and mortality [23], demonstrating that individuals with higher levels of social support have better health outcomes. In addition, it has been demonstrated that widowed, divorced, or single individuals have higher mortality rates from heart disease than married people, suggesting that heart disease mortality is related to lower levels of social support [24]. Indeed, lack of social support is among the most robust risk factors for CHD. For example, a review from Hemingway and Marmot [25] found that the magnitude of the risk for lack of social support on all-cause mortality ranges from 1.33 to 5.62 after adjusting for cardiac disease severity. Patients with a lack of social support also report more cardiac symptoms [26,27] and suffer from increased psychological distress [28]. Therefore, type-D individuals may have a poorer outcome due to lower levels of social support.

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