Social Science & Medicine 96 (2013) 86–94

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Review

A systematic review and meta-analysis of antecedents of blood donation behavior and intentions

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ARTICLE INFO

Article history:
Available online 1 August 2013

Keywords:
Blood donation
Blood donors
Meta-analysis
Theory of Planned Behavior
Prosocial behavior
Prosocial motivation

ABSTRACT

This meta-analysis sought to identify the strongest antecedents of blood donation behavior and intentions. It synthesized the results of 24 predictive correlational studies of donation behavior and 37 studies of donation intentions. The antecedents were grouped into six research programs: (1) the Theory of Planned Behavior (TPB) and its extensions, (2) prosocial motivation, (3) affective expectations, (4) donor site experience, (5) past donation behavior, and (6) donor demographics. Antecedent categories were cross-validated by multiple coders, and combined effect sizes were analyzed using a random-effects model. For donation behavior, medium positive associations were found with five of the constructs from the extended TPB: intentions to donate, perceived behavioral control, attitude toward donation, self-efficacy and donor role identity. Other antecedents displaying a positive association with donation behavior included anticipated regret for not donating, number of past donations and donor age. Donor experiences at the collection site in the form of temporary deferral or adverse reactions had a medium negative association with behavior. For donation intentions, strong positive associations were observed for perceived behavioral control, attitude, self-efficacy, role identity and anticipated regret. Medium positive associations were observed for personal moral norm, subjective norm, satisfaction, and service quality. All other potential antecedents had weak or non-significant associations with behavior and intentions. Several of these associations were moderated by between-study differences, including donor experience, the period of data collection in which donation behavior was observed, and the use of a nominal (yes/no return) versus a ratio measure of donation behavior. Collectively, the results underscore the importance of enhancing donors' attitudes towards donation and building their perceived behavioral control and self-efficacy to donate. Further, minimizing the risk of adverse reactions and enacting re-recruitment policies for temporarily deferred donors will help protect future donation behavior. Implications of these findings for blood collection agencies and researchers are discussed.

Since the 1950s (Walsh & Clemens, 1956), hundreds of studies conducted worldwide have investigated factors that motivate and discourage blood donation. Given the large quantity of studies yet mixed findings, synthesizing the results is essential to both researchers and strategists within blood collection agencies (BCAs). A robust synthesis guides researchers to invest in areas that show promise or are underexplored, assists BCAs in their donor management practices, and informs public health campaigns (Adams, Erwin, & Le, 2009).

At least six major research programs have been undertaken to understand the antecedents of donation behavior and intentions. First, many studies have applied the Theory of Planned Behavior (TPB; Ajzen, 1991), proposing that the decision to donate depends on a positive outlook towards blood donation (attitude), perceived social pressure to donate (subjective norm), and beliefs that donation is under the individual's control (perceived behavioral control). This basic model has subsequently been extended with additional factors that have each increased the model's predictive power (e.g., Masser, White, Hyde, Terry, & Robinson, 2009). Notably, these factors include the extent to which individuals are confident in their capability to give blood (self-efficacy), and perceptions of whether significant others (family, friends or work colleagues) are donating (descriptive norm). The importance of

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http://dx.doi.org/10.1016/j.socscimed.2013.07.022

being a blood donor to the self (donor role identity) has also been included in extended TPB models. Based on Identity Theory (Stryker, 1980), individuals are attracted to the favorable image of donors, believing them to be altruistic and responsible (Piliavin & Callero, 1991).

Second, motivational differences in altruism and felt obligation have been investigated as possible drivers of donations. Altruism has typically been defined as a general desire to increase the welfare of other people with no explicit benefit to oneself (Batson, Ahmad, & Tsang, 2002). Conversely, obligation has been defined as a moral belief that one *ought* to help others (Callero, Howard, & Piliavin, 1987). Measures of obligation have typically been based on Schwartz's (1977) theory of personal moral norms: that people possess internal standards of how they should behave, which are activated by particular situations (e.g., a request to donate). Both altruism and personal moral norms can be thought of as forms of prosocial motivation, in that they represent a desire to have a positive impact on other people or social collectives through blood donation.

Third, several studies have examined the influence of anticipated affective reactions. While the TBP assumes people make decisions rationally, emotional outcomes are known to play an important role (Conner & Armitage, 1998). Studies on emotional outcomes have primarily focused on pre-donation anxiety (e.g., concern about pain), which has frequently been reported as a barrier to donation (e.g., Lemmens et al., 2005; Robinson, Masser, White, Hyde, & Terry, 2008). Other studies have investigated whether anticipated regret for not donating influences return behavior (Godin et al., 2005). The anticipation of positive emotions such as satisfaction or pride following donation has also been studied. This concept has been termed "benevolence": an "impure" type of altruism motivated by the prospect of feeling good about oneself (Ferguson, Farrell, & Lawrence, 2008).

Fourth, studies have examined the influence of positive and negative experiences at the collection center. In terms of positive experiences, perceived service quality (including competence and courtesy of collection staff) and overall satisfaction with the service experience are thought to be important in encouraging donors to return (France, Ditto, France, & Himawan, 2008). Conversely, the experience of adverse reactions such as dizziness, nausea, or fainting, discourages donors from returning (Ferguson & Bibby, 2002). Temporary medical deferrals, such as for low hemoglobin, also reduce the likelihood of repeat donations (Custer et al., 2011; Hillgrove, Moore, Doherty, & Ryan, 2011), although this outcome can be redressed through telephone or mail re-recruitment of donors (Delage & Dubac, 2007).

Fifth, research has investigated how donor career stage influences return donation behavior. Stage models of donation behavior (Ferguson, 1996; Piliavin, Howard, & Callero, 1991) assume that novice donors carefully weigh up the perceived benefits and costs of donating, while donating becomes habitual for experienced donors. Thus, experience with blood donation influences both intentions and actual donation behavior (Piliavin et al., 1991).

Finally, studies have investigated how donor demographics (e.g., gender, age, culture and education) influence donation behavior. The typical donor has been described as an educated, middle-aged Caucasian male (Shaz, James, Hillyer, Schreiber, & Hillyer, 2011; Veldhuizen, Doggen, Atsma, & De Kort, 2009). The prevalence of males is due to females being more frequently deferred (Misje, Bosnes, & Heier, 2010).

To date, several reviews of the donor motivation literature have been produced (Ferguson, France, Abraham, Ditto, & Sheeran, 2007; Gillespie & Hillyer, 2002; Masser, White, Hyde, & Terry, 2008; Piliavin, 1990). However, these reviews have all been qualitative summaries of the literature, which may lead to a distorted subjective summary of the empirical data (Hedges, 2009). In contrast, a meta-analysis provides a highly systematic and objective approach to reviewing empirical literature, by outlining a strategy for collecting primary studies, applying selection criteria, developing and cross-validating variable categories, and synthesizing findings across studies. By combining study results, a meta-analysis has high statistical power to detect small effect sizes; it can reveal diversity of findings across studies and explain between-study differences.

Meta-analytic reviews of the blood donor literature have examined the efficacy of interventions for promoting blood donation (Godin, Vézina-Im, Bélanger-Gravel, & Amireault, 2011), and the prevalence of self-reported motivators and deterrents for donating (Bednall & Bove, 2011). However, with the exception of an early meta-analysis (Ferguson, 1996), which focused primarily on factors associated with the TPB, none of the aforementioned meta-analyses have reviewed literature investigating factors that influence subsequent donation behavior. The current study updates Ferguson's review by incorporating the substantial body of literature on donation antecedents produced in the last two decades. It additionally incorporates findings from the five other research streams, including factors related to donor motivational differences, affective reactions, collection center experiences, career stage, and demographics. Moreover, it assesses the impact of methodological and contextual differences between studies via moderator analyses.

The first aim of this review is to identify the strongest antecedents of donation behavior and intentions. We present findings associated with each outcome in separate analyses; we then compare each set of findings and discuss their joint implications for each of the six research programs. The second aim is to assess the impact of between-study differences on the effects of each antecedent. The first moderator we examine is donor experience (i.e., donors vs. non-donors, and mean number of past donations), as donors' career stage is thought to influence their motivation to donate (Piliavin et al., 1991). For studies of donation behavior, we additionally examine the impact of the length of data collection (i.e., the number of months between the assessment of each antecedent and subsequent donation behavior), as intention–behavior relationships are thought to diminish over longer periods (Sutton, 2006). We also assess the impact of using *retention* (i.e., donated or did not donate) versus *frequency* (i.e., number of donations) as the measure of donation behavior, given that dichotomization can reduce the size of correlations (Sheeran, 2002).

Method

Fig. 1 presents a summary of the procedure used for selecting the studies for this meta-analysis, including the literature review, application of exclusion criteria, and development and cross-validation of predictor categories.

Literature search

Our review attempted to achieve an exhaustive coverage of studies investigating antecedents of blood donation behavior (as measured by actual attendance records) and self-reported intentions to donate. We investigated populations of current donors and eligible non-donors who had the opportunity to donate for the first time during each study's data collection period.

We collected both published and "grey" literature (Rothstein & Hopewell, 2009), including dissertations and conference papers. Studies were collected using multiple methods: (1) a manual search through the Australian Red Cross Blood Service electronic library of