Retargeting, also referred to as remarketing or behavioral retargeting, involves targeting consumers with advertising campaigns consisting of display advertisements based on specific prior actions by the consumers at the advertiser’s website. Since retargeting serves advertisements to a selected set of consumers who have already shown interest in the advertiser through their prior actions, with advertisement served typically soon after these actions, it is unclear if there is a causal effect of such advertising on consumer behavior. We investigate the causal effects of retargeting on consumer behavior by conducting a large-scale field experiment in partnership with an online retailer selling high involvement, high-value goods. We investigate the impact of retargeting on various consumer actions, including revisits to the advertiser’s website, the creation of shopping carts, orders for free product samples and purchase. We focus on retargeting campaigns triggered by two different actions at the website – the view of a product page without subsequent activity, and the creation of a cart without subsequent purchase. We investigate the effects of intensity of the campaign, in terms of the intended number of advertisements served to consumers every day, and its temporal pattern, in terms of how the ads are spaced out over time on consumer behavior. For this purpose, we implement an experimental design that randomizes consumers every week into one of three intensity conditions over a period of 4 weeks, and triggered by both product view and cart creation events. We document interesting effects of retargeting as a whole, and of specific temporal patterns of advertising intensity on consumer behavior.