Chapter 5.3
Relationships and Etiquette with Technical Systems

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ABSTRACT

This chapter focuses not on technology mediation of human relationships, but rather on human-like relationships with technology itself. The author argues, with supporting reasoning and data from his work and that of others, that humans have a natural tendency to generalize social interaction behaviors and interpretations (that is, domain-specific "etiquette") learned for human-human interactions to interactions with any complex, semi-autonomous and partially unpredictable agent—including many machines and automation. This tendency can affect human trust, perceived workload, degree of confidence and authority, and so forth—all of which can in turn affect performance, safety, and satisfaction with a machine system. The author urges taking an "etiquette perspective" in design as a means of anticipating this phenomenon and either encouraging or discouraging it as appropriate.

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INTRODUCTION

In the description of this volume, "socio-technical systems" were defined as "computer technologies that enable social interaction of any type." Several examples were provided in all of which a machine mediates social interactions between humans. By contrast, my interest is not focused on computer-mediated human-human interaction, but rather on the ways in which humans interact with complex computer systems and automation on a

social level—as if the technologies themselves were social actors.

In this chapter, I will describe my personal introduction to the idea that humans interact with machines on a social level—and the resulting origin of the idea that social "etiquette" informs humans expectations and interpretations of the behaviors of both other humans and of complex machines and automation. Then I will define the notion of etiquette as it applies to human-machine interaction. In subsequent subsections, I offer various arguments and demonstrations of the relevance of such etiquette to human-machine interaction—first by illustrating its importance in human-human interactions (including those in work domains), then by offering analyses and case study evidence for the relevance of etiquette in human-machine interactions, and finally by providing experimental evidence of etiquette's relevance to human-machine work. In the final subsection, I describe our work with a specific type of etiquette—politeness behaviors—and a model which provides links from aspects of culture to perceptions of politeness and from there to impacts on decision making and responses to directives. Finally, in the conclusion, I offer some preliminary thoughts about how this study of human-machine etiquette may be applied to the design process to yield better, safer and more pleasing systems.

HUMAN-MACHINE ETIQUETTE: ORIGINS OF THE IDEA

In 2000, while co-chairing a AAAI Spring Symposium on Adaptive User Interfaces, I produced a soapbox polemic on the topic of Human-Computer Etiquette (Miller, 2000). I wanted to draw attention to a perceived flaw in much of the exciting work in adaptive and intelligent user interfaces. Specifically, that they all too often behaved like little children: interrupting ongoing conversation or work to show off what they can do, exhibiting capabilities primarily for the sake of showing off rather than to help advance the goals of their human users (their "betters"?), and persisting in exhibiting the same behavior long after it had ceased to be useful or interesting. While this pattern of actions was tolerable in young children and, perhaps, in young systems fresh from the lab, such systems needed to grow up and participate in the rules and conventions of the societies into which they hoped to be accepted.

In fairness, I wasn't just pointing a finger at the work of others, and I wasn't completely original. Eric Horvitz had written about a similar concern with regards to personal computer systems (e.g., Microsoft's Office Assistants™) a year earlier (Horvitz, 1999). And I had noticed similar tendencies in my own projects: for example, pilots deemed initial versions of the Rotorcraft Pilot's Associate (RPA) (Miller and Hannen, 1999) far more willing to provide aiding than was necessary.

Interestingly, however, in that rotorcraft project we had noted that human pilots spent nearly a third of their time in inter-crew coordination, discussing their intent and plans. We designed and implemented a simple interface which allowed RPA to participate in that conversation, taking instruction and declaring its intent all in ways that were functionally similar (though usually much simpler in form) to the ways pilots communicated among themselves. This modification seems to have resulted in improvement in human + machine system performance, as well as larger gains in user acceptance (Miller and Hannen, 1999).

It seemed as if designing complex automation that fit the existing etiquette of a helicopter cockpit made it easier and more pleasant to interact with. In hindsight, this is probably not surprising—after all, pilots had evolved this etiquette over years, trained newcomers in it, and expected it from new participants. The interface we implemented did not exhibit "etiquette" in the general sense of politeness, but it did behave according to the established rules and conventions of the role for which it was intended. Furthermore, it did so without much in