

Transference of technology in the field of addiction treatment: The brief intervention programme for adolescent subjects, challenging tasks and perspective

Kalina Isela Martínez Martínez,¹ María Elena Medina-Mora Icaza²

Update by topics

SUMMARY

The knowledge provided by the science of Psychology must aim to the resolution of different sets of problems; that can only be achieved when the findings yielded by scientific evidence are available to other scientific groups and to social nuclei, so that these manage to take hold of them and use them to resolve problems, improve their quality of life or prevent a potentially hazardous situation. Nonetheless, several barriers for the effective usage of knowledge are often to be found. Besides, there pervades the misguided impression that the research within the sciences of health is not addressed towards the necessities of the social entities which may benefit from it. Given this contextual frame, the present article displays a general overview of the concept of transference of technology, the models which have been developed for its realization and an example of how the transference of one program of intervention for addictions in Mexico has begun; which are the challenging tasks in its development and its probable utilization in centers for the treatment of addiction.

The authors conclude that in order to comply with the incorporation of treatments at addiction treatment institutions, it is essential to evaluate the effectiveness of the brief intervention program in clinical settings, adhere to all the CONSORT indicators for randomized clinical trials and incorporate four main aspects into the transfer process: 1. foster closer relations with health professionals; 2. allow for the re-invention of the program within a context of collaboration between the parties involved and evaluate this process; 3. consider the constraints, resources, objectives and practices of the institution to which the program is to be transferred; and 4. provide long-term monitoring to assess the success of the adoption of the innovation.

Key words: Technology transfer, programs with scientific evidence, brief interventions, addictions.

RESUMEN

Los conocimientos que proporciona la psicología deben dar respuesta a diferentes problemáticas, lo que sólo puede lograrse cuando los hallazgos obtenidos por evidencia científica son asequibles a otros grupos científicos, y núcleos sociales, a fin de que éstos logren apropiarse y usarlos para solucionar problemas, mejorar su calidad de vida o prevenir una situación potencial de riesgo. Sin embargo, con frecuencia se observan diferentes barreras para la utilización efectiva de los conocimientos. Además, se tiene la falsa impresión de que la investigación en las ciencias de salud resulta una actividad poco responsiva ante las necesidades de los actores sociales que podrían beneficiarse de su uso. En este contexto, en el presente artículo se presenta una revisión general del concepto de transferencia tecnológica, los modelos que se han desarrollado para llevar a cabo ésta y un ejemplo de cómo se ha iniciado la transferencia de un programa de intervención en el ámbito de las adicciones en México y cuáles son sus retos para el avance de dicho proceso y su posible adopción en centros de atención a las adicciones.

Se concluye que, para cumplir con la incorporación de tratamientos en instituciones de atención de adicciones, hace falta evaluar la efectividad del programa de intervención breve en escenarios clínicos, cumplir con todos los indicadores CONSORT de los ensayos clínicos aleatorizados e integrar al proceso de transferencia cuatro aspectos principales: 1. propiciar un mayor acercamiento con los profesionales de la salud; 2. permitir la "reinención" del programa dentro de un contexto de colaboración entre los actores involucrados y evaluar dicho proceso; 3. considerar limitaciones, recursos, objetivos y prácticas de la institución donde se pretende transferir el programa y 4. ofrecer seguimiento a largo plazo para evaluar el éxito de la adopción de la innovación.

Palabras clave: Transferencia de tecnología, programas con evidencia científica, intervenciones breves, adicciones.

¹ Psychology Department. Center for the Social Sciences and the Humanities. Autonomous University of Aguascalientes.

² General Directorate, National Institute of Psychiatry Ramón de la Fuente Muñiz.

Correspondence: Kalina Isela Martínez Martínez. Psychology Department. Center for the Social Sciences and the Humanities. Autonomous University of Aguascalientes. Avenida Universidad 940, 20131, Aguascalientes, Ags., México. E-mail: kimartin@correo.uaa.mx

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"Technological innovation is but a small contribution to a complex social system. Instead of its being considered as the most important means of change, it is better to perceive it as raw materials which can stimulate the creation of something new".¹

INTRODUCTION

Technology is the employment of the basic scientific knowledge to address concrete social needs.² The technological contribution coming from Psychology is carried out through analysis, assessment, modification and prediction of behavior in its relation with environmental factors and given particular settings. Thus, transference of technology is the abridgement between the field of Psychology and society, for this latter to acquire knowledge and benefit from it.

The systematization of the assessment procedures and the modification of behavior presently becomes a fundamental issue for the application of psychological knowledge.³ Especially, researchers in clinical psychology are interested in the development of therapeutical procedures which can be empirically validated. According to the American Psychological Association –APA–,⁴ an empirically validated program is defined as the one which has demonstrated its usefulness by means of experiment and it ought to fulfill the following requirements:

1. To bear, as a minimum, two experiments with a cross-group design that proves its effectiveness in being better than another treatment or equivalent to one that has already been accepted, with adequate sample numbers; or, in its stead:
2. A great quantity of experiments with single-group design and demonstrated efficacy in the utilization of experimental designs, besides the comparison of the intervention with another treatment.
3. The experiments must be carried out on the basis of treatment manuals.
4. To specify the characteristics of the samples.
5. The results ought to be attained by a minimum of two separate investigators or research groups.

Some authors claim that a sound research methodology, including control groups, must be held if scientific evidence in interventions is to be pondered. In addition to this, they mention random clinical trials as yielding the best evidence on the effect of interventions.⁵⁻⁷

Due to the thoroughness with which data are obtained from scientific evidence, the programs based on this latter are presumed to result in benefit for the subject (patient) cared for with such procedure. Despite this, the very same procedures, when replicated within clinical settings, do not always obtain equivalent outcomes; or these remain unknown, mostly because there is no follow-up around their efficacy and effectiveness.⁴

The scientific evidence of the intervention programs poses a series of difficulties by itself: it is not enough that the

researcher issues a new technology or procedure useful for psychological treatment; the trouble lies in the transference of knowledge in such a manner that the pertinent personnel can make use of it, and so have their patients and institutions benefit from it.

Transference of technology is an epithet for a range of activities around the development of technologies and their possible applications. The attempts to expound the process involved may be classified into three main approaches: a) the appropriation model, b) the dissemination model c) the "useful knowledge" model.⁸ Though there exists a fourth, emerging tendency: d) the Model of communication.^{8,9}

- a) The Appropriation Model holds on to the rationale that technologies sell well.¹⁰ Therefore, the intentionally established systems for transference are unnecessary. Once the researcher develops the idea, they make the results available through several means of communication, such as technical reports and specialized publications.
- b) The approach of Dissemination of Technologies, made to be known by Rogers,¹¹ has its basis in considering that the diffusion of innovation is more adequate when the specialists directly inform the potential users about the pertinent technology. The norming hypothesis of this model states that, when the means of diffusion are adequate, technologies may be transferred in a natural fashion to the users and that, during the very process they may undergo adaptations to the environments of acquisition.⁸
- c) The "Useful Knowledge" Model is an increasingly recurred perspective on transference of technology. This paradigm has its foci in the strategies employed to explain the usefulness of the knowledge which the receptor would obtain.¹² According to this model, the personal interchange between the researchers of technology and the clients bears an important function. The underlying rationale is that knowledge is an object of independent existence, valid, complete and universally applicable. Whereof it is the duty of the producers to transfer knowledge through proper channels; if it should not be accepted, that would be caused by a lack of understanding from the acquirer. The solution for this would then be the search for better ways of teaching. Otherwise, an argument arises stating that the Useful Knowledge Model seems linear in its structure,¹³ since it reduces the process chronologically (investigator to client); besides, practice proves the model to be complex and interactive.⁸

Notwithstanding this, in practice this transference becomes complex and the aforementioned models may

show some shortcomings: for example, the problem posed by translating basic scientific knowledge into usable products and the transference of innovation in technology towards the population. Another aspect to be criticized is that the feedback processes among the several parties involved are not accounted for.¹⁴ Yet another matter is the lack, within the very model, of consideration about the peculiarities of the users and the medium where the innovation is to be implemented once accepted, for whose cause the established communication does not attain depth into the sociocultural and structural facets of the acquirer; this in turn causes the innovation to be unsuccessfully applied.

Concretely, the process of transference of knowledge is a highly complex one which requires, among others, the multidisciplinary labor of the various participants, the assessment and overcoming of communication barriers and the cooperation of the several institutions, as well as the utilization of cybernetic networks. Within this frame, a fourth perspective is rendered, aiming to overcome the mishaps mentioned above:

- d) The concept of Doheny-Farina et al.⁹ constitutes the fourth model. In it, the transference of technology is conceived as a process of creation of contextual knowledge by means of cooperative learning. Three theses are proposed around knowledge: 1. Its construction is subjective in nature; knowledge is a belief about a portion of reality, rendered by a community of educated persons. 2. It requires an adaptation to the new context. For a community to accept knowledge from a distinct collectivity, the information must be configured or adapted to fit into the system of significance of the receiving community. 3. It is incomplete and an efficacious adaptation may depend on a creative synthesis of the different modes of thinking, so as to produce new knowledge.

The previous discussion leads to the explanation of a different model for the implementation of innovations, in which, the participants who take part in a process of transference of technology modify the innovation in such a manner that it befit the institutional limitations and their very practice and aims; at the end, several adaptations of the original object emerge. Thereof, the effective transference of technology requires the creation of new knowledge through cooperation and mutual learning. Thus considered, it embodies more than the transmission of information on the utilization of knowledge, because transference and acquisition need the coining of new knowledge (re-invention).

The former facts turn out to be quite relevant, given that the pioneering studies on transference of technology¹¹ stated that the innovative idea did not change during its dissemination. Nonetheless, the current perspectives highlight the fact that the acquirers are used to modifying the initial concept of the innovation¹⁷ dealt with. In other terms, they exercise re-invention.

Re-invention may be defined as "the extent to which an innovation is modified by some user during the process of acquisition or implementation". This does not mean the infringement of the epistemological, conceptual and methodological boundaries of the innovation.¹¹ In this perspective, the knowledge and experience of others are considered to be fundamental for collaborative learning.

In the same fashion, the process of transference necessarily involves various actors and settings, among which the researcher is primordial, though without obscuring the importance of health-care personnel and that of the user who shall finally acquire and utilize the information. Based upon this, one must take into consideration the governmental policies on science directed towards the acquisition of knowledge, which may in turn facilitate or obstruct such transference.

Consequently, the necessary creation of an auspicious frame should arise from the information about every party and setting involved in the process of technology transfer. Doubtless, this frame is complex and in its making are interwoven several politically driven factors; for instances, the macro-economic conditions of the nation, and the governmental legislation and policies related to it.¹⁸⁻¹⁹

Therefore, the transference of technology to the community greatly depends on the ability of the various parties to divulge, transmit, translate, acquire, utilize and apply scientific knowledge.¹⁸⁻²¹

During the attempts of transference, a set of barriers is to be confronted for health-care personnel to accept an innovation; these must be detected and overcome so that the distance between scientific knowledge and practice diminishes. In order to overcome obstacles and accomplish closing the gap between knowledge and its implementation, some researchers^{22,23} inform about a number of strategies, jointly discussed further ahead.

BARRIERS AND STRATEGIES IN THE TRANSFERENCE OF TECHNOLOGY

1. One resource employed to abridge the distance from scientific evidence to clinical practice has been the development of manuals for the innovative procedures based on scientific knowledge.; yet, these may become barriers in themselves.²⁴
2. The opinions on the usage of treatment manuals are often polarized. The ones in opposition^{22,25,26} consider that manuals impose restrictions to their professional judgment and autonomy. The ones in behalf,^{23,27,28} on the contrary, sense manuals as an aid within the frame of treatment, flexible in its steps, thus enabling the realization of the objectives.²⁹
3. Another relevant obstacle is that, in a number of occasions, the data obtained through investigation cannot

be generalized for differentiated populations and clinical settings on account of varying conditions. Therefore, a process of re-invention may be carried out for the innovation to be utilized within the clinical field.³⁰ Altogether, it is very important to research and render solution to every possible barrier for the transference of technology and the adaptation of such to the necessities and workings of an institution; otherwise, it is impossible to regard the knowledge obtained by the researcher as insusceptible to change during the process of its transference.

4. Transference of technology and innovations quite often cause the personnel to feel powerlessness because it seems to have been imposed on them. Thus, many a time processes of change are not completed, due to the perception of them as blunt interferences in their work routines, inasmuch as other activities must be done, bringing higher demands in quality and even being under supervision sometimes. From there, one manner of minimizing defensive reactions when the personnel be faced to transference is to assure the participation of the health-care personnel in the design of the intended innovation. They ought to take part in the selection of new technologies and the rationale supporting the acquisition and their setting into practice. Nevertheless, there is not enough information about this issue, because the research centered around transference of technology, either in public sector or the private, remains at a minimum.^{31,32}
5. Another facet, commonly disregarded about transference of technology, is willingness towards change. Most of the times, a person needs the sense of reward for a change effected, besides participating in the planning of the proposals. The models of transference have got to consider the fears, objections and anxieties that change provokes. When these are ignored, either failure or reduced effect will ensue for the processes.³³

The guidelines proposed in the literature of the behavioral sciences state that the willingness towards change must be fostered, both individually, by the health care personnel and the users, and across the organisation. Schein³⁴ affirms that the reason for which several efforts of change cause resistance or fail is that an efficacious system to ready the transference was not considered at all. Whereof, interventions to improve the preparedness are possible and may increase the success of the process. The investigations of the behavioral sciences show that the probability of success diminishes when a low level of disposition leads to reduced motivation for change or, in its occasion, to the emergence of resistance.³⁵

Armenakis et al.³⁶ defined the individual and organizational readiness for change as the involvement in the beliefs, attitudes and intentions regarding the extent to which changes are needed, and the perception of both the indi-

vidual subject and the organization about their capacity to effectively make the changes. The assessment of willingness is particularly important; Kanter³⁷ names it the active agent of change. Traditionally, internal and external agents have reacted to the difficulties that the environment already exhibits. This means that the intervention should aim to influence the beliefs, attitudes and intentions of the possible "acquirers of technology", community leaders, or other persons who take part in the process of transference.

Thus, the model of communication emphasizes that the active and continuous communication may foster the readiness for change and should take place during the whole of the transfer process. In fact, the potential effect on the readiness for change embodies the firstly willingness of the developers of the innovation (e.g. the investigators) to participate during the activities of transference and the efforts in the long term to enhance the duration of the innovation, once it has been effectively transferred.³⁴

The formerly mentioned studies about the barriers suggest that the probability of change inside the organization and the acceptance of new technologies for treatment may be greater when the necessity of improvement is readily observable, when the health care organizations foster professional improvement and bear a straightforward sense of duty. One review, by the U.S. Institute of Medicine, about research focused on transference of technology, spotted six core components which must be displayed in order to start and sustain the usage of programs in new environments:³⁸

1. The personnel who can put into practice the programme must be carefully selected.
2. Constant training in the newly acquired technology is required.
3. The exercise of continuous supervision should provide feedback to the personnel for the improvement of its performance.
4. The assessment of the entirety of the program and the possible adaptations which may be performed by the acquirers.
5. To foster the application of the model by means of economic support for the intended acquirers.
6. To facilitate the implementation and sustainability through supporting management.³⁹

Medina-Mora,^{18,21} in Mexico, has stated that a seventh component is the political willingness to promote the measures whose enactment is intended. If this does not occur, there may not be any form of support for any decision which may in its turn enable the transference of technology.

The permanent assessment in a process of transference of technology is fundamental; in this manner the actors are able to receive feedback on the effectiveness of the program. If activities do not develop as expected, re-assessment should ensue, together with the emendations which may save time and money in the long term. Despite its ben-

efits, this continued evaluation of the technology transfer process is often neglected, especially if such evaluation was not foreseen or budgeted in advance within the protocol of the researcher.

Once the models for transference of technology, their barriers and strategies have been reviewed in concept, the following section shall deal with the analysis of their relevance in the prevention and treatment of addictions in Mexico, having as clinical example the first efforts for the transference of the Brief Intervention Programme for Adolescents (Programa de Intervención Breve para Adolescentes, PIBA) aimed at young persons who have just begun to consume alcohol and other drugs.

TRANSFERENCE OF TECHNOLOGY IN THE PREVENTION AND TREATMENT OF ADDICTIONS. ONE CLINICAL CASE AND SOME EXAMPLES.

The problems stemming from the usage of alcohol and other drugs are so important for the users, their family and the society at length that they justify the pertinence and need of developing programs for prevention and treatment which permit positive results. Unfortunately, the communication between the ones who develop and assess programs in the field of addictions and the ones who could acquire such technologies is not accomplished every time; yet, in other cases, even when it has started, it lacks continuity and so it is unknown whether the technology (programme for intervention) was truly accepted by the personnel or which adaptations, if any, have been made for its implementation.

Fortunately, on an international trend, some institutions like the National Institute on Drug Abuse (NIDA) and the Substance Abuse and Mental Health Service Administration (SAMHSA) in the United States have been working on the matter through the coordination of relevant labor for the transference of technology in the field of prevention and treatment of addictions. Thus, SAMHSA established the *Addiction Technology Transfer Center Network* (ATTC) with an aim to translate, divulge and promote the acquisition of practices based on scientific evidence.⁴⁰

In the case of Mexico, there is a pioneering study about transference of technology which required the collaborative labor of the Mexican Institute for Social Security (Instituto Mexicano del Seguro Social, IMSS) and the National Autonomous University of Mexico (Universidad Nacional Autónoma de México, UNAM). The project, named "Development, Assessment and Spreading of a Model of Secondary Prevention for Problem Drinkers within IMSS" ("Desarrollo, Evaluación y Diseminación de un Modelo de Prevención Secundaria para Bebedores Problema en el IMSS"), had for its main objective to spread a program for secondary prevention of short duration, based on the Model of Self-change

aimed at Problem Drinkers, throughout clinical facilities of IMSS for primary health care, by means of the Dissemination Model of Rogers.¹¹

To achieve the implementation of this project, the researchers faced several difficulties. Among the most important, there existed the lack of disposition of some directive officials to permit the medical personnel to attend training sessions; also, some medical practitioners disregarded the possibilities of behavioral modification through the self-change model. Another obstacle, especially significant, was the lack of time to assist users who were problem drinkers. Unfortunately, at the time of the project there existed no possibility of change in the policies of IMSS to allow some health-care personnel to work with the users as much time as necessary. On the other hand, the researchers responsible for the program showed uneasiness towards the "re-invention" of the program for its adaptation to the characteristics of the institution. Additionally, a follow-up period for the assessment of the acquisition process of the technology was not scheduled.

Nonetheless, the experience was different when the same model was disseminated into some "Youth Integration Centres" (Centros de Integración Juvenil, CIJ). In this Project, the therapists who would put into practice the model were exhorted to participate, thus producing by themselves a manual for the procedures of the program. Even more, there was a follow-up of eighteen therapists who were trained in the model of intervention. Yet another important factor was that they showed a high level of interest to join the program before, during and after the training. Actually, at the end of the training, significant changes in practice and knowledge were observed. For one, the features of brevity and scientific evidence of the effectiveness of the brief intervention program were compatible with the values and the necessities of the institution, which accounts for the interest in the acquisition of the model. Otherwise, it was not consonant with the psychological stance held by the therapist.

In pondering the results of this experience, it is possible to elicit two important aspects related to the success of the transference: 1. The selection of those who would possibly be interested in the acquisition of the model according to profiles which enable the incorporation of the technology into their clinical practice, 2. The systematic evaluation of the possible adaptations or re-inventions of the model, which allow to adjust to the characteristics of the institution, and more importantly, to the characteristics of the subjects to be treated, so that they receive a really useful strategy for the prevention or treatment of addictions.

A separate mention shall be made of the current work carried out by the National Centre for Prevention and Control of Addictions (Centro Nacional para la Prevención y Control de Adicciones, CENADIC), the National Institute of Psychiatry "Ramón de la Fuente Muñiz" (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, INPRFM) and the

Faculty of Psychology at UNAM, which have managed to accomplish transference processes by means of three main strategies: firstly, through the support bestowed by public health policies which acknowledge the need to assist drug consumers across the full spectrum of the ailment in an escalating model and pondering brief interventions as the main strategy of attention for users who have recently started a problematic consumption of drugs.²¹ Secondly, the publication of procedure manuals for some brief intervention programmes.⁴²⁻⁴⁴ Thirdly, the creation of "New Life Centres" (Centros Nueva Vida, CNV) and the training of their therapists for the brief intervention programmes.⁴⁵

In this transfer process, an outstanding line of work was inaugurated, at the National University (UNAM), dealing with brief intervention programs in the field of addictions, aimed at problematic drinkers, cocaine consumers and adolescent subjects, among other users.⁴⁶ One specific instance is PIBA,⁴⁷ whose objective is to address the pattern of consumption of secondary and preparatory level (middle-high, high-school) students, as well as the associated problems.

The PIBA programme, as a brief intervention on the consumption of addictive substances in adolescents, has been evaluated through different studies. For instance, Martínez et al.⁴⁸ informed about the success of the program in reducing the consumption of adolescents; this was noticed in the comparison among initial data and those of treatment and follow-up, with six month duration. Just as well, they observed an increment in the level of self-effectiveness to face hazardous situations, a reduction in problems associated to consumption and that the strategies to confront the situations of consumption were useful in maintaining the changes. Later, a study was carried out involving seventy adolescent subjects, alcohol consumers from Distrito Federal (the Capital State) and from the state of Aguascalientes. The outcome showed a reduced consumption of the participants, which endured within the first three and six months after the close of the programme.⁴⁹ Finally, an internal comparison of the program was performed by means of experimental methodology, with the objective of assessing the effects of the variants of brief intervention; PIBA with a duration of five sessions, Brief Advice in one session and a control group. Analyses of repeated measures were performed and they showed that PIBA and Brief Advice (Consejo Breve, CB) are effective interventions to attain the decrease of the pattern of alcohol consumption in adolescents, without significant differences arising from the geographical profile.⁵⁰ Nevertheless, one finding is that the proportion of the effect of PIBA was greater, to an extent of seventy five percent (75%), than that of CB.

These studies convey that PIBA shows an initial level of efficiency, given its results have been demonstrated through single-case studies and comparisons among groups. In contrast with this, although an experimental design was reported in the last effectiveness study, the CONSORT criteria for random clinical essays are only partially accomplished (in

this case, the criterion about the blinding of project coordinators and therapists was not fulfilled) and the size of the samples in the various articles which display its results being rather small.⁵¹

In spite of these improvements, in our country there are very few interventions⁵¹ for the treatment of addictions which have been thoroughly assessed. It is expected that the decisions made in clinical practice be based on the best available evidence as a guarantee of good clinical practice.⁵²

One controversial aspect is to what extent and at which moment during the investigation should the transference of the technology in development start. In this case, the issues are the programs for intervention and the function of public health policies in the determination of the ones to be implemented within the health-care institutions. The "National Centre on Addictions" (Centro Nacional para las Adicciones, CENADIC) has already published several editions of the "Manual for Interventions",⁵³ partly because of the results obtained on the efficacy of PIBA and due to its very features (brief, structured, susceptible to evaluation) which addressed an emergent and immediate need for the treatment of adolescent subjects; different strategies, mainly based on the model of Rogers,¹¹ have been proposed for the manual to be put into practice by health-care personnel after training, either in site³² or on-line⁴⁵ and the making of readily accessible manuals.

The work on the transference of brief interventions, in this case PIBA, is only beginning; that is, manuals and in site and on-line training have been relevant attempts, though dispersed and scarcely assessed. Whereof, an advancement of some critical elements is needed to achieve a successful transference of the program in the future: 1. To discard the model of unidirectional communication which has customarily framed the strategies for the transference of the model and to foster the nearness with the health-care personnel and other personnel who would carry out the program, with an aim to know first-hand their doubts and the possible obstructions for the acquisition of the program; 2. Revisit the proposal of the Doheny-Farina⁹ model on the "re-invention" of the program in a frame of collaboration and interchange of information and expertise among researchers, clinicians and users, systematically reporting the adaptations performed by the clinicians without deviating from the theoretical guidelines; 3. To assess the process of transference and re-invention, observing the modification of the efficacy of the treatment in the settings where the innovation is applied and the level of acquisition achieved among the possibly interested personnel; 4. To offer a long-term follow-up to determine the success of the acquisition. Now the challenging task is to render a proposal of procedures for the successful transference of PIBA technology pondering these critical elements, especially the possibility of re-inventing the model in clinical settings, and to reach the best quality of scientific evidence.

One final and important aspect is that the success of any process of transference of technology implies the support of financing institutions who bestow the budget for such process. Just as important is an environment of correspondence between scientific activity and the policies on science regarding the treatment of addictions.

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